# Knowledge Workers, Experts, and the Analysis of Knowledge

People are at the heart of any organization. They set the organization's goals, they manage the organization, they deal with organization's customer relationships, and they work together to produce the organization's products and services. In the past few months, I've reviewed several books that emphasize different aspects of the human side of business processes, and I thought I'd try to summarize current thinking on the subject in this Advisor

In my review of *Working Minds* by Crandall, Klein, and Hoffman, I included a diagram to describe some of the types of processes and the types of jobs that occur in most every company. (See Figure 1.) Simple processes are done by workers who simply follow procedures. More complex jobs require knowledge workers who think. In some cases, these workers simply analyze a situation and decide which of several alternative paths to follow. In some cases, they diagnose, design, redesign, program, plan or schedule. And, in other cases, they create new products, new processes or entirely new ways of positioning a product or the company. Very complex jobs require experts who can analyze and solve very complex problems.
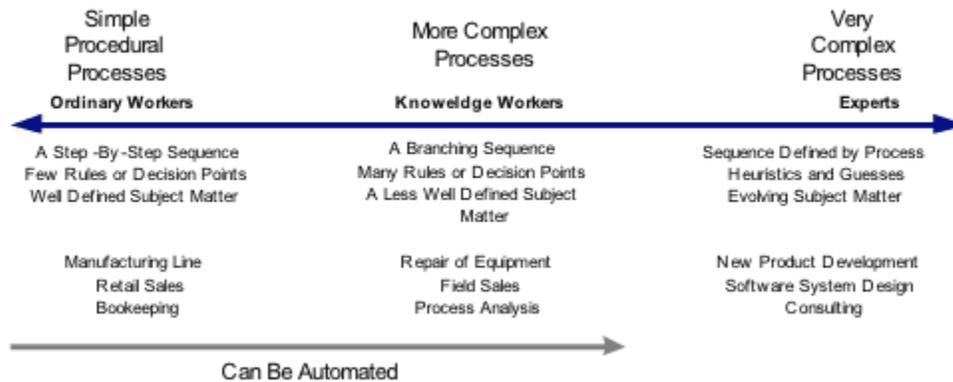

**Figure 1. The Process/Knowledge Continuum**

In the spring, we reviewed Tom Davenport's new book on *Knowledge Workers* and considered some of the challenges they create for modern organizations. It's a commonplace to observe that the US has become a service economy that is run by knowledge workers. In other words, many US companies have lots of knowledge workers doing more complex tasks than in the past. One need only think of a software firm that employs hundreds of software architects, designers and programmers, or a movie company with all of the specialists required to create a movie -- from writers and actors to directors and special effects people, or a financial firm with specialists who help individuals create and manage their financial portfolios. Knowledge workers create special problems for those who must recruit and manage them. Managers need to be especially careful in designing performance reviews and incentive and motivation programs for knowledge workers. When you think of CEO's and senior managers as the ultimate knowledge workers, you can begin to understand the difficulties boards encounter when they try to define goals or motivate them.

Knowledge workers also create special problems for anyone who tries to analyze the processes they manage. These usually aren't processes one would try to automate, although these knowledge workers typically rely on complex software systems to perform their work. Don't misunderstand. It's easy to diagram a supply chain that employs hundreds of knowledge workers and experts. One can
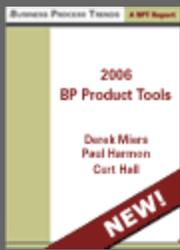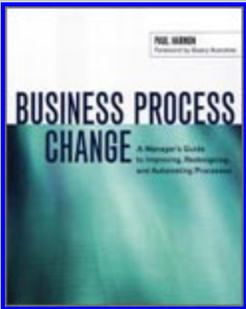
easily decompose the analysis from level one processes to level two or three
processes and identify just what activities each knowledge worker or expert is
expected to accomplish and when they are to be performed. The problem occurs
when you try to move lower and define the specific procedures that individual
knowledge workers or experts are to follow. That's usually hard and, in some
cases, it's impossible. The work involves thought and creativity and we simply
don't have good tools for capturing these kinds of processes.

One problem process analysts face when they try to define the specific
procedures knowledge workers follow arises from the fact that knowledge keeps
evolving and procedures are constantly changing based on new information
acquired by the knowledge worker.

Knowledge workers, to remain useful, need to continue to acquire knowledge
regarding new theories, facts, and procedures. They need training and they
need to network with peers. Many Knowledge Management (KM) programs are
focused on providing ways to facilitate the sharing and accumulation of insights
acquired by knowledge workers. Some KM programs provide Websites where
knowledge workers can share their insights with others facing similar problems.
Other programs provide summaries of new articles or new procedures. Still
others simply identify individuals with particular skills so those in need of help or
advice know where they can turn.

A related problem is that knowledge workers often need to communicate with
others as they solve problems. Email has become one of the most important
tools in many organizations. Groupware represents an effort to facilitate such
interaction, and it will become more important as international companies
increasingly build teams that require the participation of knowledge workers in
multiple locations around the world.

As you think about these issues, imagine diagramming a process that includes
steps that depend on the exchange of email among dozens of different
employees at different locations around the world. High level diagrams that
don't try to capture the details are easy enough to draw, but a diagram that
might someday be rendered in BPEL and turned into a BPMS application can be
pretty daunting.

It's important to distinguish between knowledge workers and true experts. It
typically requires 10 years to become a real expert. Studies have shown that
experts understand the problems they face by means of very complex networks
of cognitive concepts and that they solve problems by employing thousands of
rules. A physician who diagnoses meningitis infections typically employs 10,000
rules to determine the specific type of meningitis confronting him or her.
Moreover, the rules change and get reorganized each month as the physician
reviews relevant new studies being published in medical journals. It is rarely
cost-effective to try to automate the work of a human expert. As expensive as it
is to maintain such experts, it is cheaper to hire them and pay them to remain
up to date than it is to try to capture and automate their knowledge. (For more
information on expertise, check our review of *The Cambridge Handbook of
Expertise and Expert Performance* by Ericsson, Charness, Feltovich and
Hoffman.)

Knowledge workers, on the other hand, do not employ such complex cognitive
networks or use quite so many rules. A knowledge worker often employs a few
hundred rules to solve the problems he or she encounters. In many cases,
process practitioners are asked to analyze the jobs of knowledge workers. This
is particularly true in high-turnover organizations, like the US Army or Air Force,
where people need to be rapidly trained to perform complex jobs that they may
only occupy for 3-5 years. Similar situations occur in corporate environments
when new technology is introduced and knowledge workers need to rapidly learn
to perform in new ways. This usually involves analyzing the knowledge used by
the knowledge worker, capturing that knowledge in some form, and developing
training programs to pass that knowledge on to new workers. To accomplish
this, the process analyst needs to do cognitive task analysis, capture and
document knowledge structures and knowledge rules, and then work with others
to create software systems or other types of training programs to deliver the
information and skills to the workers who will need them. This isn't something

taught in beginning process analysis courses, but tools will increasingly be required by process professionals as they seek to redesign complex processes.

Over the next several months, BPTrends will be providing more information and analysis on these types of process analysis problems and the skills required to analyze and improve them.

Till next time,
Paul Harmon