Introduction

Thanks to the writings of Peter Drucker I have been interested in knowledge work for more than 35 years. My interest has centered on what Drucker once termed "the great management task of this century," namely, making knowledge work productive. There was a time when I thought that knowledge work was done in the head, where it couldn't be seen. Consequently, I also once thought that the secret to making knowledge work productive was to make it visible. To some extent both those notions are true but I now accord them far less importance than once I did. The first and most important thing to know about making any kind of work productive is to focus on the work, not the worker.

The Nature of Work

Work is a process; it has a result and it uses resources. Work is *effective* to the extent that the required, desired or specified result is produced; in other words, the extent to which it satisfies requirements. Work is *efficient* to the extent that waste is minimized. Work is more or less *productive* in accordance with the ratio of output to input (i.e., the ratio of results to resources). Work is made more productive as a consequence of increasing the ratio of results to resources and doing so constitutes productivity improvement. Working is the patterned, purposeful expenditure of energy by the worker, of engaging in patterned, purposeful activities, the results of which satisfy specified requirements.

Requirements can specify results and the standards those results must meet, restraints and constraints on routines and the standards those routines must meet as well as resources and the standards those resources must meet. Resources include the following: time, money, materials, equipment, machinery, facilities, information and expertise. Worker activities are patterned actions; more specifically, they are purposeful interactions between the worker in a role as the processor in a work system and the inputs to that work system. The result of these interactions might be an output such as a physical product or an outcome such as a decision made.

Categories of Work

One of the key characteristics of knowledge work pointed out by Drucker is that the working activities or responses of a knowledge worker are configured instead of prefigured. Drucker also pointed out that work, knowledge or otherwise, is a process and it has a result. As a process, one important aspect of work is its content (i.e., that which is being processed). So far as I am able to ascertain, the content of all work falls into two categories: materials and information. What has moved center stage in my current thinking about knowledge work and the task of making it productive is the interplay between the nature of the worker's working activities (i.e., prefigured or configured) and the content of the work (i.e., materials or information). Figure 1 depicts that interplay and suggests four basic categories of work.

Materials Production Work

This category of work is materials-based and marked by prefigured work routines. A prime example is assembly line or production work, hence the name of this category. In this category, the result of the work process is a physical product; the consequence of carrying out carefully prescribed procedures in accordance with specified standards. The chief measures of this kind of work are volume and adherence to standard. Pace or speed also plays a role.

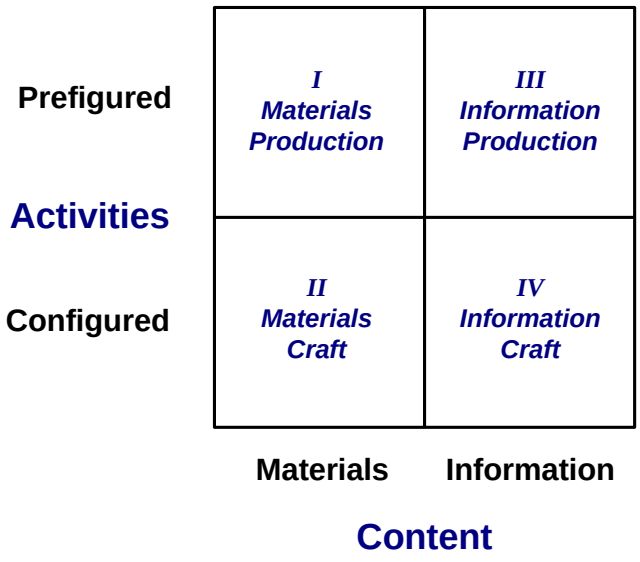

Figure 1 - Categories of Work

Materials Craft Work

Like Materials Production Work, Materials Craft Work is materials-based and yields a physical product. However, unlike Materials Production Work which relies on prefigured routines, Materials Craft Work depends on configured work routines. A cabinetmaker making custom cabinets for a client offers one example. A tailor making a suit provides another. In Materials Craft Work, the standards might exist in advance or they might be specified in the course of doing the work. In either case, the worker must figure out what to do in order to produce the product. Generalized procedures might exist but they must be adapted to fit the circumstances at hand.

Information Production Work

Unlike the preceding two categories which are materials-based, this one and the next are information-based. However, Information Production Work has much in common with Materials Production Work because the work routines in both categories are prefigured, which is to say that they require carrying out carefully prescribed procedures in accordance with specified standards. Much clerical work fits the category of Information Production Work, especially that of claims examiners, loan officers and insurance underwriters. The results of this category of work frequently take the form of decisions made on the basis of the information and the prescribed processing rules (e.g., an insurance claim is paid or denied, a loan application is approved or denied). These decisions take tangible form in documents but these are perhaps better thought of as artifacts than as the actual work products themselves.

Information Craft Work

This category of work is also information-based but consists of configured instead of prefigured routines. Like Materials Craft Work, the worker must figure out what to do instead of simply following prescribed procedure. A computer programmer offers one example. A project manager offers another. Financial analysts, researchers, managers, executives and consultants provide still more. Much of the work of salespeople, secretaries and executive assistants fits into this category. Indeed, this is perhaps the largest single category of work in the modern world. The worker frequently sets the standards for the work and much of the work itself is indeed performed in the head of the worker. This category of work also produces outcomes or results (e.g., source code, a completed project, a report to management, a sale).

The preceding discussion of the four basic categories of work is summarized in Table 1 below.

Table 1: Characteristics of Categories of Work

	Categories of Work			
Characteristics	**Materials Production**	**Materials Craft**	**Information Production**	**Information Craft**
Work Content	Materials	Materials	Information	Information
Work Process	Prefigured	Configured	Prefigured	Configured
Work Result	Tangible Product	Tangible Product	Intangible (Artifacts)	Intangible (Artifacts)
Chief Measures	Volume & Quality	Quality & Value	Volume & Quality	Quality & Value
Means of Control	Compliance with Procedures & Standards	Adherence to Good Practice (Professionalism)	Compliance with Procedures & Standards	Adherence to Good Practice (Professionalism)
Locus of Control	Management	Worker	Management	Worker

It's the Mix that Matters

But where is the much-vaunted knowledge worker and what about knowledge work itself? Well, I've come to believe that both are more fiction than fact; both come close to qualifying as myths, more the product of imagination than rigorous investigation. For one thing, all four of the preceding categories of work require people to use their

heads or minds and none completely excludes the use of their muscles. All work is some mix of those four categories. All work requires the worker to apply knowledge; all workers are therefore knowledge workers. For another, most people are in the business of processing or producing knowledge albeit it mainly for their own use and consumption. Few people are in the business of processing and producing knowledge for commercial purposes.

So, whether you lean toward the mind-muscle or brain-brawn distinctions between knowledge workers and other workers, the truth of the matter is that all workers make use of their minds and muscles, their brains and their brawn. All work is some mix of Production Work (prefigured activities) and Craft Work (configured activities), whether the content consists of materials or information. To make work productive, then, requires determining the mix of work for any particular worker or set of workers and then focusing on the critical category or categories. We know a great deal about how to make all four categories of work more productive.

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