

Rethinking knowledge work: A strategic approach

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Knowledge workers' information needs vary. The key to better productivity is applying technology more precisely.

In the half-century since Peter Drucker coined the term “knowledge workers,” their share of the workforce has steadily grown—and so has the range of technology tools aimed at boosting their productivity. Yet there’s little evidence that massive spending on personal computing, productivity software, knowledge-management systems, and much else has moved the needle. What’s more, a wide variety of recent research has begun suggesting that always-on, multitasking work environments are so distracting that they are sapping productivity. (For more on this problem, see “Recovering from information overload,” on mckinseyquarterly.com.)

After researching the productivity of knowledge workers for years, I’ve concluded that organizations need a radically different approach. Yes, technology is a vital enabler of communication, of collaboration, and of access to rising volumes of information. But least-common-denominator approaches involving more technology for all have reached a point of diminishing returns. It’s time for companies to develop a strategy for knowledge work—one that not only provides a clearer view of the types of information that workers need to do their jobs but also recognizes that the application of technology across the organization must vary considerably, according to the tasks different knowledge workers perform.

Few executives realize that there are two divergent paths for improving access to the information that lies at the core of knowledge work.

The most common approach, giving knowledge workers free access to a wide variety of tools and information resources, presumes that these employees will determine their own work processes and needs. The other, the structured provision of information and knowledge, involves delivering them to employees within a well-defined context of tasks and deliverables. Computers send batches of work to employees and provide the information needed to do it.

Both the free-access and structured-provisioning approaches are in wide use, but they make radically different assumptions about how knowledge work should be performed and its productivity improved. Executives who aren't conscious of the trade-offs they are making between them and thus don't look for opportunities to harness the power of structure probably won't get the most from knowledge workers.

Equally important, leaders must pursue IT and productivity opportunities at the right level of granularity. While it might be tempting to think that a given approach will work well for an entire organization, reality is rarely so tidy. In my experience, the unit of analysis should be particular jobs and roles—or at least distinct categories of jobs and roles. To move the needle in a specific business unit or function, it's not enough to launch a set of company-wide initiatives or to count on a piece of software. Instead, leaders of knowledge workers should understand the key differences among them and tailor solutions to these peculiarities.

The free-access approach

Over the past two decades, giving knowledge workers free access to information and knowledge has been the primary way of arming them to do their jobs. The rise of the Internet, the establishment of organizational knowledge-management systems, and, most recently, the advent of social media provide knowledge workers with a vast array of information from public and private sources. More analytically focused knowledge workers may also draw upon warehouses of structured data and quantitative-analysis tools.

In this model, knowledge workers define and integrate their own information environments. The free-access approach has been particularly common among autonomous knowledge workers with high expertise: attorneys, investment bankers, marketers, product designers, professors, scientists, and senior executives, for example. Their work activities

are seen as too variable or even idiosyncratic to be modeled or structured with a defined process. Their need for access to IT sources—ranging from the Internet to various online databases and social media to work tools such as e-mail, spreadsheets, presentation tools, and more complex business intelligence analytics—is presumed to be equally eclectic and unpredictable. With an increasingly porous technology barrier between personal lives and jobs, these employees can often be found doing paid work from home and tending to their personal affairs in the office.

In the free-access model, the presumption is that knowledge workers, as experts, know what information is available and can search for and manage it themselves. It's also assumed that they have the discipline to avoid wasting time surfing the Web or watching pornography, sports, or funny YouTube videos at work. Of course, these assumptions may sometimes be incorrect.

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Benefits of the free-access approach

Knowledge workers typically enjoy the free-access approach, which provides plenty of autonomy in their work processes and in how they use information. For employers, this positive feeling is probably useful for retention and job engagement.

Free access is well suited to work where it's difficult to predict contingencies in advance. A structured-process technology would be inadequate, for example, when an investment-banking client suggests a completely novel way of structuring a transaction or, in legal settings, when a key witness becomes unavailable unexpectedly. Free-access approaches allow for creative responses to uncertainty and ambiguity.

The information technology behind the free-access model is relatively easy to implement. The Internet and social media are readily accessible to anyone, and access to third-party databases is possible with any Web browser—although closed company cultures sometimes impede knowledge sharing. Most knowledge workers know how to use basic office productivity tools, and some are even quite skilled at them. Systems integration issues are minor, since workers lie at the center of the information flow.

Shortcomings of the free-access approach

The problems of free access are fairly obvious: while workers may know how to use technology tools, they may not be skilled at searching for, using, or sharing the knowledge. One survey revealed that over a quarter of a typical knowledge worker's time is spent searching for information.¹ Another found that only 16 percent of the content within typical businesses is posted to locations where other workers can access it.² Most knowledge workers haven't been trained in search or knowledge management and have an incomplete understanding of how to use data sources and analytical tools.

Productivity losses can be substantial. Even before the advent of social media, workers in one 2005 survey sponsored by America Online and Salary.com cited personal Internet use as the biggest distraction at work. Another study of workplace productivity found that average knowledge workers access their e-mail more than 50 times, use instant messaging 77 times, and visit more than 40 Web sites a day.³ A UK study suggests that social-media use by knowledge workers costs British companies £6.5 billion a year in lost productivity.⁴

Productivity metrics are nearly nonexistent. If productivity is measured at all, it's only at the highest level, such as legal briefs developed per month, research articles written and published per year, or new drug compounds discovered per decade. Fine-grained monitoring of productivity and information would, of course, help to improve productivity but risks clashing with the spirit of free information access.

¹ Jeff Dance, "Enterprise technology delivers more efficiency (4 of 10)," *freshconsulting.com*, December 9, 2009.

² "Managers say the majority of information obtained for their use is worthless, Accenture survey finds," *accenture.com*, January 4, 2007.

³ Tony Wright, "Information overload: Show me the data," *blog.rescuetime.com*, June 14, 2008.

⁴ "Facebook costs UK billions," *GSS Monthly Newsletter*, *www.gss.co.uk*, February 2008.

The structured provision of knowledge

Structured-provision technologies first appeared in the early 1990s and have improved considerably of late. They often have a range of functions. The most important is workflow technology that controls how knowledge workers get information and job tasks. These workers may encounter supporting technologies that include information portals, business rules or algorithms to automate decisions, document- or content-management systems, business process management-and-monitoring systems, and collaboration tools. Increasingly modular component designs make these technologies easier to deploy.

In corporate parlance, such technologies are often called case-management systems because they allow workers to complete an entire case or unit of work. Such applications include the processing of legal cases, insurance claims, or bank loans; the issuing of permits or licenses; and the completion of interactions with patients in health care. Case management can create value whenever some degree of structure or process can be imposed upon information-intensive work. Until recently, structured-provision approaches have been applied mostly to lower-level information tasks that are repetitive, predictable, and thus easier to automate.

Benefits of the structured model

Productivity is the major benefit: as measured by the completion of key tasks per unit of work time, it often rises by 50 percent when organizations implement these technologies. One automobile-leasing company, for example, achieved such gains after it implemented a new system for lease processing and end-of-lease sale offers. The reason for the improvement was that workers had few distractions and spent no time searching for information.

Adding to the efficiencies, in most cases companies can route tasks globally to any worker with the time and expertise to undertake them; if Sally is away on vacation, the system knows and sends cases to Joe for approval instead. Work processes become more transparent, and it becomes easier to manage them, to exercise approval authority, and to monitor improvements. The structured model also facilitates collaboration and the coordination of tasks. Many implementations help companies engage multiple workers and groups to process cases. These systems also often incorporate business rules or algorithms, determined by an organization's best experts, that help companies

decide, say, whether to issue policies, make loans, or pay claims. For managers, these systems can therefore improve the quality and consistency of decision making, while also speeding it up through automation or semiautomation.

Shortcomings of the structured model

The downside of these technologies is negative reactions by the workers who use them. Some managers I have interviewed say that workers feel there is too much structure and too little autonomy in their work; they sometimes feel “chained to their desks.” Socialization at work—informal chats in the hallway—can decrease dramatically. In some cases where workers previously had a high degree of autonomy (physicians at an academic medical center, for example), they revolted against such systems. Some organizations that encountered initial resistance found that it decreased over time. Other organizations overcame workers’ objections by instituting new forms of social interaction that meshed with improved work processes.

In structured information environments, computer systems rather than knowledge workers integrate the work, so extensive system and process design is required up front for implementation. While these systems can be tailored to fit complex business processes, that kind of tight fit can become a problem if business environments or processes change. When the system includes an automated decision-making component, it’s important to monitor the business environment and the outcome of decisions to ensure that the system continues to produce the desired process output. One chilling example of how things can go awry: automated but insufficiently monitored mortgage decisions were among the contributors to the recent financial crisis.

How companies apply these principles

The greatest potential for productivity improvements involves bringing more structured knowledge to workplaces and processes where the free approach has dominated. So far, lower-level process work has been the primary beneficiary of structured-provision tools. However, advancing technologies are making them better suited to tasks that until now have been the preserve of free-access approaches—tasks centered on expert thinking and collaboration. In one example, a major academic medical center is employing “smart forms” that present physicians with all the available information about a particular patient’s disease on one screen and even produce first drafts of notes about their interactions with patients for medical records.

Some forward-looking companies are testing more structured approaches in a broader range of work, often with positive results. Here are three areas of progress.

High-level work

Companies have considerable opportunity for applying structured technology and processes to the more routine aspects of even highly collaborative jobs. An insurance company, for example, implemented workflow- and document-management technologies to help develop and modify its investment portfolio. The system replaced numerous spreadsheets and e-mails with a common global system that synchronized communications and transactions among several different groups across several countries. Each group (including operations, funding, controls, and legal) now adds its components to the portfolio. When a new portfolio or modification is completed, the documents are finalized and sent to an external custodian for management and recording. Fund managers find the system relatively noninvasive; if their involvement is needed for a decision or approval, they are notified automatically via e-mail.

Better processes

Technologies are also being used to structure previously unstructured processes. For example, GE Energy Financial Services, which specializes in lending for large energy projects, has worked to boost the productivity and quality of decisions in its loan underwriting. A managing director with responsibilities for the unit's marketing and investment strategy brought together GE analysts and researchers, who extracted typical decision rules from experienced company executives. The rules were embedded in a semiautomation decision system that scores prospective deals and recommends that they be approved or disapproved. Junior analysts can use the system to determine whether a deal is likely to succeed—without taking it to a credit committee comprising senior business unit executives, who can of course override the recommendation if they wish to do so. Deals made using the new approach have generated returns 40 percent higher than the old, unstructured one did.

Hybrid approaches

Some organizations combine the free and structured approaches. One of the easiest ways of doing so is to place partial restrictions on the types of information highly autonomous workers can use—for example, by limiting access to pornography, sports, or social-networking sites while at work. A more nuanced approach allows employees to be both free and structured. Partners Healthcare, which comprises several

teaching hospitals in Boston, has a structured system that automatically recommends appropriate drugs and treatments to physicians but allows them to override it. The organization also makes a variety of free-access knowledge databases available to doctors, but the structured system, which incorporates medical knowledge into the process for ordering care, is used much more frequently.

A related approach imposes structured techniques for only some aspects of a job. Some companies, for example, use product-lifecycle-management systems to structure the back end of the product design process but don't use them during the early product conceptualization and brainstorming stages. The key issue here is to decide which aspects of the relevant process could benefit from more structured technologies and processes and which should be left largely untouched by them.

Crafting a strategy for knowledge work

Few organizations have thought systematically about where additional structure could enhance productivity. A good starting point is identifying your knowledge workers and understanding the range of tasks they perform. The unit of analysis should be a particular knowledge job, not the organization as a whole. That's important because different types of knowledge workers within the same organization often have very different knowledge and information requirements. Furthermore, knowledge is more readily structured for some jobs than for others, and some workers can resist imposed structures more than others.

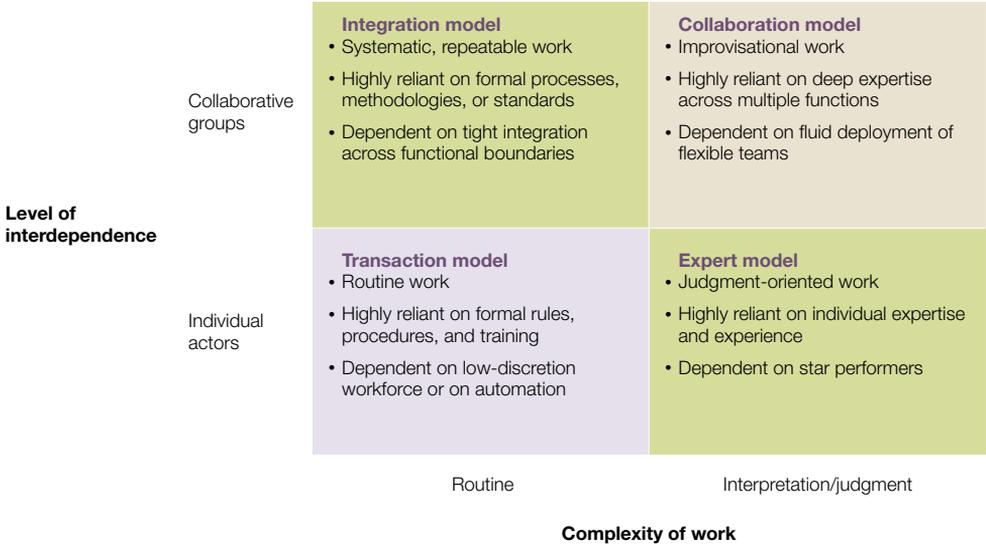
Matching technology and work

I have found the matrix in the exhibit very useful when planning technology strategies for knowledge workers. It is based on my experience that knowledge work generally falls into one of four clusters, each with its own characteristics. These four knowledge work classifications are shaped by two factors: the work's degree of complexity (x -axis) and the level of interdependence among workers who carry out a task (y -axis). Leaders can use this taxonomy as a guide to determine whether a structured, free, or hybrid approach best fits a given job.

The *transaction* cell of the matrix describes knowledge work requiring relatively low amounts of collaboration and judgment, such as employment in call centers, claims processing, and other administrative-intensive roles. Structured-provision approaches fit this type of work well—indeed, it is the only type where they are commonly applied.

Different types of knowledge workers require different kinds of support technologies.

- Structured-provision tools are commonly used
- Free-access tools are commonly used but structured provision may be applied in some areas
- Free-access tools are typically the only successful approach



One example is a call center system that channels calls from customers to workers, along with all the information and knowledge needed to meet the customers’ needs. Another would be an insurance-claims-processing system that delivers all necessary documents and forms to claims workers.

As the degree of collaboration required for a job moves up into the exhibit’s *integration* cell, free-access tools become widely available. It is common to find work circulating by way of e-mail and voluntary collaboration and much less common to find structured-provision technologies. Yet there are some semistructured exceptions, including lower-level roles in software development, engineering, and product design and development. The aforementioned product-lifecycle-management system that tracks designs, components, and approvals might help structure the work of certain engineers, for example.

In the exhibit’s *expert* cell, the goal is to apply expert knowledge to tasks or problems. The relevant knowledge traditionally is stored in the expert’s brain, but today many organizations want to supplement it with online knowledge. Although free-access technologies are typically the chief means of accessing it, in some instances structured approaches

can be applied, particularly when productivity and online-knowledge access are equally important. In such cases, the organization must find some way for a computer to mediate the expert's job, so that knowledge can be embedded in the flow of the work process, as some health care organizations have done with intelligent order entry systems for providers. Similarly, a few leading IT-consulting firms are attempting to bring more structure to the delivery of various IT services by using online tools. Expert jobs may also benefit from "guided" data-mining and decision analysis applications for work involving quantitative data: software leads the expert through the analysis and interpretation of data.

Finally, work in the exhibit's *collaboration* cell—which involves knowledge activities such as those of investment bankers crafting big deals, financial analysts creating corporate plans and budgets, marketers developing major marketing plans, attorneys working in teams on large cases, and scientists playing a part in large scientific projects—is usually iterative and unstructured. Typically, the only tools that succeed in such environments provide free access to information and are used voluntarily by the worker. Although systems involving structured workflows and embedded knowledge aren't entirely beyond the scope of this kind of work, they will be hard to develop. Exceptions might include areas such as knowledge reuse: a group of collaborating attorneys, for example, could recycle a legal brief.

Mastering common challenges

While the classification of work and roles will vary considerably across organizations, the pursuit of productivity through structure typically brings with it at least two common challenges. These are preventing the alienation of formerly free knowledge workers and avoiding automated crack-ups like the ones some financial-services firms experienced with mortgage approvals.

Allowing knowledge workers to override automated or semiautomation decisions can help alleviate both of these problems. Such measures can not only lead to better decisions but also reduce resentment or even rebellion against the system. Of course, if experts constantly override it, you must find out why.

Another way of smoothing the path to structure is letting knowledge workers use familiar, typically free-access tools when they interact with a structured system. To alert them when it's time to use a structured application, for example, have it send them an e-mail. If a structured

task requires, say, passing financial information to and from the system, let workers use a spreadsheet. Always remember: high-end knowledge workers don't want to spend all their working hours interacting with automated tools.

Finally, it's critical to ensure that at least some knowledge workers and executives understand how the structured system works, so they can be alert for signs that it is out of kilter with changes in the economic environment or business model. Identifying such mismatches will help organizations know when they should pull the plug on structured systems and return to human judgment—a return that can save them from losing lots of money, fast.



We live in a world where knowledge-based work is expanding rapidly. So is the application of technology to almost every business process and job. But to date, high-end knowledge workers have largely remained free to use only the technology they personally find useful. It's time to think about how to make them more productive by imposing a bit more structure. This combination of technology and structure, along with a bit of managerial discretion in applying them to knowledge work, may well produce a revolution in the jobs that cost and matter the most to contemporary organizations. ○

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