



The next revolution in interactions

Successful efforts to exploit the growing importance of complex interactions could well generate durable competitive advantages.

Bradford C. Johnson, James M. Manyika, and Lareina A. Yee

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An introductory note

Scott C. Beardsley, James M. Manyika, and Roger P. Roberts

Economists have long tended to describe the critical shifts in the European and North American labor markets over the past 200 years as movements between broad sectors—from agricultural to industrial jobs and from manufacturing to service ones. While this assessment is certainly true, the big picture obscures important nuances in what workers and professionals actually do. The finer details of the employment landscape hold important lessons for the way companies organize to manage their talent and technology, for competition within industries, and for public policy in developed nations.

In today's developed economies, the significant nuances in employment concern interactions: the searching, monitoring, and coordinating required to manage the exchange of goods and services. Since 1997, extensive McKinsey research on jobs in many industries has revealed that globalization, specialization, and new technologies are making interactions far more pervasive in developed economies.

Currently, jobs that involve participating in interactions rather than extracting raw materials or making finished goods account for more than 80 percent of all employment in the United States. And jobs involving the most complex type of interactions—those requiring employees to analyze information, grapple with ambiguity, and solve problems—make up the fastest-growing segment.

This shift toward more complex interactions has dramatic implications for how companies organize and operate. In the mid-1990s, McKinsey studied the growing impact of interactions on the way people exchange ideas and information and how businesses cooperate or compete. In 1997, "[A revolution in interaction](#)" presented the findings of that research.

Over this past year, we looked closely at different kinds of interactions. Companies in many sectors are hiring additional employees for more complex interactions and fewer employees for less complex ones. For instance, frontline managers and nurses—who must exercise high levels of judgment and often draw on what economists call tacit knowledge, or experience- are in great demand. Workers who perform more routine interactions, such as clerical tasks, are less sought after. In fact, companies have been automating and outsourcing jobs that involve many of these transactional interactions.

The article that follows, "The next revolution in interactions," shows that the shift from transactional to tacit interactions requires companies to think differently about how to improve performance—and about their technology investments. Moreover, the rise of tacit occupations opens up the possibility that companies can again create capabilities and advantages that rivals can't easily duplicate.

Finally, "[Mapping interactions by industry](#)," a Web-exclusive series of interactive exhibits, examines the way tacit workers are deployed. In some industries, for instance, they create products and services, while in others they are concentrated largely in noncore areas such as administration, finance, and IT. In addition, each industry uses a different mix of tacit and transactional workers to manage its interactions with customers.



About the Authors

Scott Beardsley is a director in McKinsey's Brussels office, **James Manyika** is a principal in the San Francisco office, and **Roger Roberts** is a principal in the Silicon Valley office.

Like vinyl records and Volkswagen Beetles, sustainable competitive advantages are back in style—or will be as companies turn their attention to making their most talented, highly paid workers more productive. For the past 30 years, companies have boosted their labor productivity by reengineering, automating, or outsourcing production and clerical jobs. But any advantage in costs or distinctiveness that companies gained in this way was usually short lived, for their rivals adopted similar technologies and process improvements and thus quickly matched the leaders.

But advantages that companies gain by raising the productivity of their most valuable workers may well be more enduring, for their rivals will find these improvements much harder to copy. This kind of work is undertaken by, for example, managers, salespeople, and customer service reps, whose tasks are anything but routine. Such employees interact with other employees, customers, and suppliers and make complex decisions based on knowledge, judgment, experience, and instinct.

New McKinsey research reveals that these high-value decision makers are growing in number and importance throughout many companies. As businesses come to have more problem solvers and fewer doers in their ranks, the way they organize for business changes.

So does the economics of labor: workers who undertake complex, interactive jobs typically command higher salaries, and their actions have a disproportionate impact on the ability of companies to woo customers, to compete, and to earn profits. Thus, the potential gains to be realized by making these employees more effective at what they do and by helping them to do it more cost effectively are huge—as is the downside of ignoring this trend.

But to improve these employees' labor performance, executives must put aside much of what they know about reengineering—and about managing technology, organizations, and talent to boost productivity.

Technology can replace a checkout clerk at a supermarket but not a marketing manager. Machines can log deposits and dispense cash, but they can't choose an advertising campaign. Process cookbooks can show how to operate a modern warehouse but not what happens when managers band together to solve a crisis.

Machines *can* help managers make more decisions more effectively and quickly. The use of technology to complement and enhance what talented decision makers do rather than to replace them calls for a very different kind of thinking about the organizational structures that best facilitate their work, the mix of skills companies need, hiring and developing talent, and the way technology supports high-value labor. Technology and organizational strategies are inextricably conjoined in this new world of performance improvement.¹

Raising the labor performance of professionals won't be easy, and it is uncertain whether any of the innovations and experiments that some pioneering companies are now undertaking will prove to be winning formulas. As in the early days of the Internet revolution, the direction is clear but the path isn't. That's the bad news—or, rather, the challenge (and opportunity) for innovators.

The good news concerns competitive advantage. As companies figure out how to raise the performance of their most valuable employees in a range of business activities, they will build distinctive capabilities based on a mix of talent and technology. Reducing these capabilities to a checklist of procedures and IT systems (which rivals would be able to copy) isn't going to be easy. Best practice thus won't become everyday practice quite as quickly as it has in recent years. Building sustainable advantages will again be possible—and, of course, worthwhile.



The interactions revolution

Today's most valuable workers undertake business activities that economists call "interactions": in the broadest sense, the searching, coordinating, and monitoring required to exchange goods or services. Recent studies—including landmark research McKinsey conducted in 1997²—show that specialization, globalization, and technology are making interactions far more pervasive in developed economies. As Adam Smith predicted, specialization tends to atomize work and to increase the need to interact. Outsourcing, like the boom in global operations and marketing, has dramatically increased the need to interact with vendors and partners. And communications technologies such as e-mail and instant messaging have made interaction easier and far less expensive.

The growth of interactions represents a broad shift in the nature of economic activity. At the turn of the last century, most nonagricultural labor in business involved extracting raw materials or converting them into finished goods. We call these activities *transformational* because they involve more than just jobs in production.³ By the turn of the 21st century, however, only 15 percent of US employees undertook transformational work such as mining coal, running heavy machinery, or operating production lines—in part because in a globalizing economy many such jobs are shifting from developed to developing nations. The rest of the workforce now consists of people who largely or wholly spend their time interacting.

Within the realm of interactions, another shift is in full swing as well, and it has dramatic implications for the way companies organize and compete. Eight years after McKinsey's 1997 study, the firm's new research on job trends in a number of sectors finds that companies are hiring more workers for complex than for less complex interactions. Recording a shipment of parts to a warehouse, for example, is a routine interaction; managing a supply chain is a complex one.

Complex interactions typically require people to deal with ambiguity—there are no rule books to follow—and to exercise high levels of judgment. These men and women (such as managers, salespeople, nurses, lawyers, judges, and mediators) must often draw on deep experience, which economists call "tacit knowledge." For the sake of clarity, we will therefore refer to the more complex interactions as *tacit* and to the more routine ones as *transactional*. Transactional interactions include not just clerical and accounting work, which companies have long been automating or eliminating, but also most of what IT specialists, auditors, biochemists, and many others do (see sidebar, "[About the research](#)").

Most jobs mix both kinds of activities—when managers fill out their expense reports, that's a transaction; leading workshops on corporate strategy with their direct reports is tacit work. But what counts in a job are its predominant and necessary activities, which determine its value added and compensation.

During the past six years, the number of US jobs that include tacit interactions as an essential component has been growing two and a half times faster than the number of transactional jobs and three times faster than employment in the entire national economy. To put it another way, 70 percent of all US jobs created since 1998—4.5 million, or roughly the combined US workforce of the 56 largest public companies by market capitalization—require judgment and experience. These jobs now make up 41 percent of the labor market in the United States (Exhibit 1). Indeed, most developed nations are experiencing this trend.



EXHIBIT 1

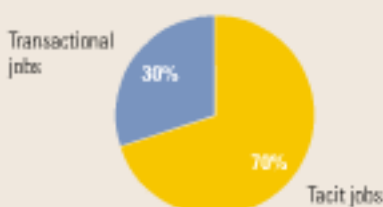
A new kind of worker

US employment and wages by job type¹

Total US employment, number of employees in millions, ² %	CAGR, ³ 1998–2004, %	Change, 1998–2004, millions of jobs
100% = 125	128	0.5
3.5		
Tacit	39	41
1.5		4.5
Transactional	43	44
0.6		1.9
Transformational	18	15
-2.3		-2.9
1998	2004	

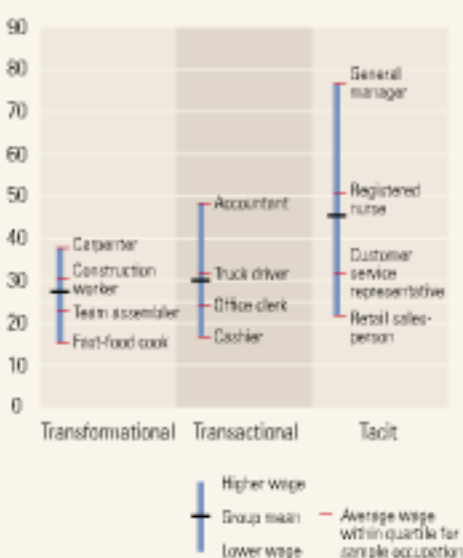
New jobs in United States, 1998–2004

100% = 6.4 million



Annual wage per employee in United States (nominal), \$ thousands	CAGR, ³ 1998–2004, %	Change, 1998–2004, \$ thousands
Average wage	29.7	37.0
	3.7	7.3
Tacit	37.5	47.4
	4.0	9.9
Transactional	25.8	30.6
	2.9	4.8
Transformational	22.5	27.0
	3.1	4.5
1998	2004	

Distribution of average wage by quartile,⁴ \$ thousands



¹ Categorized by predominant job activity: tacit = complex interactions; transactional = routine interactions; transformational = extraction or conversion of raw materials; 800 occupations studied.

² Excludes part-time and self-employed workers.

³ Compound annual growth rate.

⁴ Quartiles based on number of employees within given category.

Source: US Bureau of Labor Statistics; McKinsey analysis

The number of jobs that involve relatively **complex interactions** is growing at a phenomenal rate

The balance is tipping toward complexity, in part because companies have been eliminating the least complex jobs by streamlining processes, outsourcing, and automating routine tasks. From 1998 to 2004, for example, insurance carriers, fund-management companies, and securities firms cut the number of transactional jobs on their books by 10 percent, 6.5 percent, and 2.7 percent a year, respectively. Likewise, a more automated check-in process at airports makes for smaller airline check-in staffs, automated replenishment systems reduce the need for supply chain bookkeepers, and outsourcing helps companies shed IT help desk workers. Manufacturers too have eliminated transactional jobs.



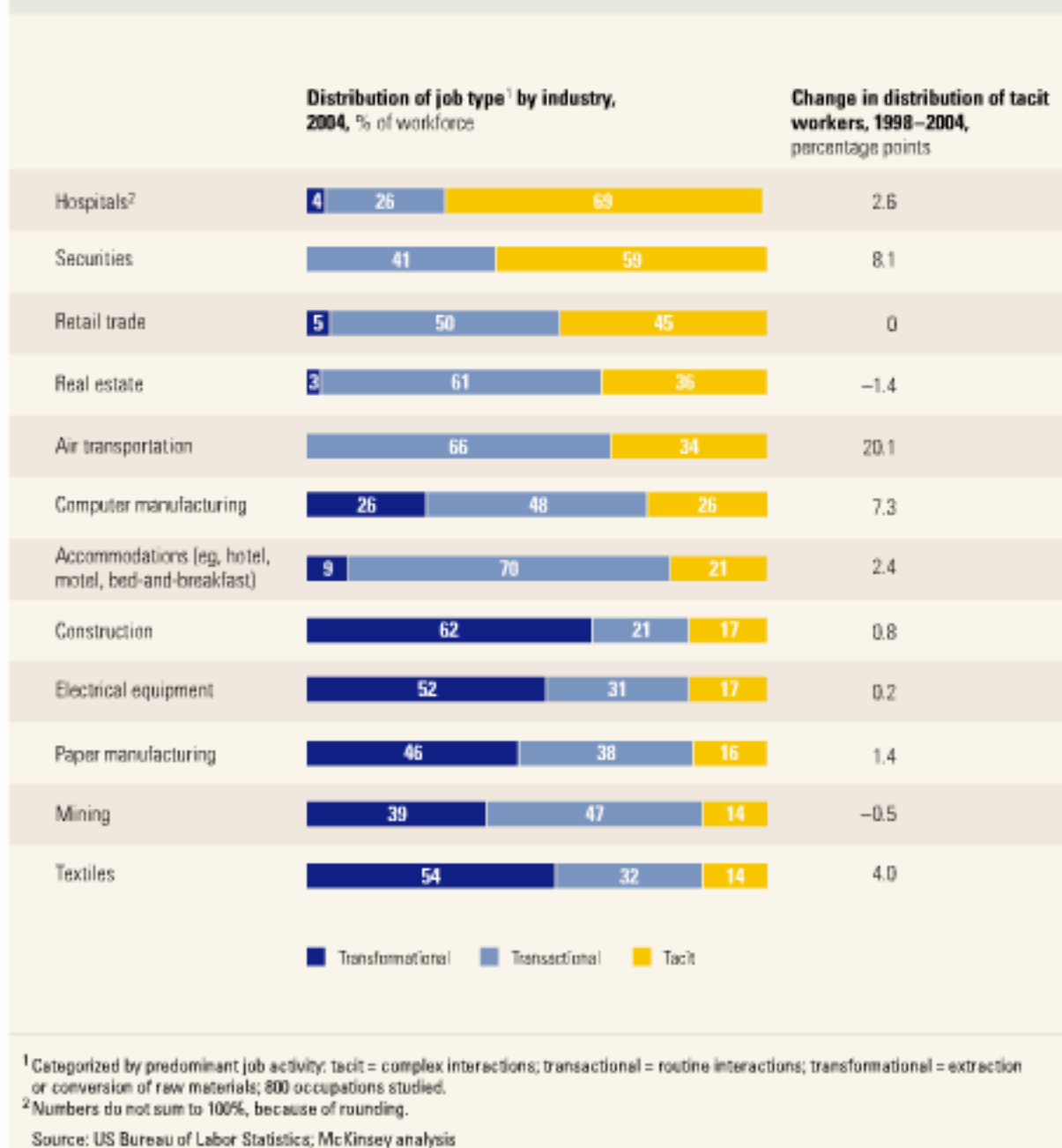
Maurizio Ammannato

Meanwhile, the number of jobs involving more complex interactions among skilled and educated workers who make decisions is growing at a phenomenal rate. Salaries reflect the value that companies place on these jobs, which pay 55 and 75 percent more, respectively, than those of employees who undertake routine transactions and transformations.

Demand for tacit workers varies among sectors, of course. The jobs of most employees in air transportation, retailing, utilities, and recreation are transactional. Tacit jobs dominate fields such as health care and many financial-services and software segments (Exhibit 2). But all sectors employ tacit workers, and demand for them is growing; most companies, for example, have an acute need for savvy frontline managers.

EXHIBIT 2

The job mix





A new path to better performance

The demand for tacit employees and the high cost of employing them are a clear call to arms. Companies need to make this part of the workforce more productive, just as they have already raised the productivity of transactional and manufacturing labor. Unproductive tacit employees will be an increasingly costly disadvantage.

The point isn't how many tacit interactions occur in a company—what's important is that they ought to add value. This shift toward tacit interactions upends everything we know about organizations. Since the days of Alfred Sloan, corporations have resembled pyramids, with a limited number of tacit employees (managers) on top coordinating a broad span of workers engaged in production and transactional labor. Hierarchical structures and strict performance metrics that tabulate inputs and outputs therefore lie at the heart of most organizations today.

But the rise of the tacit workforce and the decline of the transformational and transactional ones demand new thinking about the organizational structures that could help companies make the best use of this shifting blend of talent. There is no road map to show them how to do so. Over time, innovations and experiments to raise the productivity of tacit employees (for instance, by helping them collaborate more effectively inside and outside their companies) and innovations involving loosely coupled teams will suggest new organizational structures.

The two critical changes that executives must take into account as they explore how to make tacit employees more productive are already clear, however. First, the way companies deploy technology to improve the performance of the tacit workforce is very different from the way they have used it to streamline transactions or improve manufacturing. Machines can't recognize uncoded patterns, solve novel problems, or sense emotional responses and react appropriately; that is, they can't substitute for tacit labor as they did for transactional labor. Instead machines will have to make tacit employees better at their jobs by complementing and extending their tacit capabilities and activities.

Second, a look back at what it took to raise labor productivity over the past ten years shows that the overall performance of sectors improves when the companies in them adopt one another's managerial best practices, usually involving technology. In retailing, for instance, Wal-Mart Stores was a pioneer in automating a number of formerly manual transactional activities, such as tracking goods, trading information with suppliers, and forecasting demand. During the 1990s, most other general-merchandise retailers adopted Wal-Mart's innovations, boosting labor productivity throughout the sector.⁴

But in the world of tacit work, it's less likely that companies will succeed in adopting best practices quite so readily. Capabilities founded on talented people who make smarter decisions about how to deploy tangible and intangible assets can't be coded in software and process diagrams and then disseminated throughout a sector.

Tacit technology

Companies have three ways of using technology to enhance and extend the work of tacit labor. First, and most obviously, they can use it to eliminate low-value-added transactional activities that keep employees from undertaking higher-value work. Pharmacies, for example, are using robots to fill prescriptions in an effort to maximize the amount of time pharmacists can interact with their customers. Meanwhile, The Home Depot is trying out automated self-checkout counters in some stores. The retailer isn't just automating and eliminating transactional tasks; its chairman and CEO, Robert Nardelli, believes that automated counters can reduce by as much as 40 percent the time customers spend waiting at cash registers. Just as important, the new counters mean that people who used to operate the old manual ones can be deployed in store aisles as sales staff—a much higher-value use of time.



Furthermore, technology can allocate activities more efficiently between tacit and transactional workers. At some companies, for example, technology support—traditionally, tacit work undertaken by staff experts on PCs and networks—has been split into tacit and transactional roles. Transactional workers armed with scripts and some automated tools handle the IT problems of business users; only when no easy solution can be found is a tacit employee brought in.

Second, technology makes it possible to boost the quality, speed, and scalability of the decisions employees make. IT, for instance, can give them easier access to filtered and structured information, thereby helping to prevent such time wasters as volumes of unproductive e-mail. Useful databases could, say, provide details about the performance of offshore suppliers or expanded lists of experts in a given field. Technology tools can also help employees to identify key trends, such as the buying behavior of a customer segment, quickly and accurately.

Kaiser Permanente is one of the organizations now pioneering the use of such technologies to improve the quality of complex interactions. The health care provider has developed not only unified digital records on its patients but also innovative decision-support tools, such as programs that track the schedules of caregivers for patients with diabetes and heart disease. Although it is hard to determine quantitatively whether physicians are making better judgments about medical care, data suggest that Kaiser has cut its patients' mortality rate for heart disease to levels well below the US national average.

Finally, new and emerging technologies will let companies extend the breadth and impact of tacit interactions. Loosely coupled systems are more likely than hard-coded systems and connections to be adapted successfully to the highly dynamic work of tacit employees. This point will be particularly critical, since tacit interactions will occur as much within companies as across them.⁵ Broadband connectivity and novel applications (including collaborative software, multiple-source videoconferencing, and IP telephony) can facilitate, speed up, and progressively cut the cost of such interactions as collaboration among communities of interest and build consensus across great distances. Companies might then involve greater numbers of workers in these activities, reach rural consumers and suppliers more effectively, and connect with networks of people and specialized talent around the world.⁶

Competitive advantage redux

Technology itself can't improve patient care or customer service or make better strategic decisions. It does help talented workers to achieve these ends, but so, for example, do organizational models that motivate tacit employees and help them spot and act on ideas. These kinds of models usually involve environments that encourage tacit employees to explore new ideas, to operate in a less hierarchical (that is, more team-oriented and unstructured) way, and to organize themselves for work. Most of today's organizational models, by contrast, aim to maximize the performance of transactional or transformational workers. Tacit models are new territory.

The rigidity of traditional organizational models too often limits innovation and learning. See ["From push to pull: The next frontier of innovation"](#)

As a result, it won't be easy for companies to identify and develop distinctive new capabilities that make the best use of tacit interactions—new ways to speed innovations to market, to make sales channels more effective, or to divine customer needs, for instance. But at least such capabilities will also be difficult for competitors to duplicate. Best practices will be hard to transplant from one company to another if they are based on talented people supported by unique organizational and leadership models and armed with a panoply of complementary technologies. If it becomes harder for performance innovations to spread through a sector and thereby to boost the performance of all players, it will once again be possible to build operating-cost advantages and distinctive capabilities sustainable for more than a brief moment.



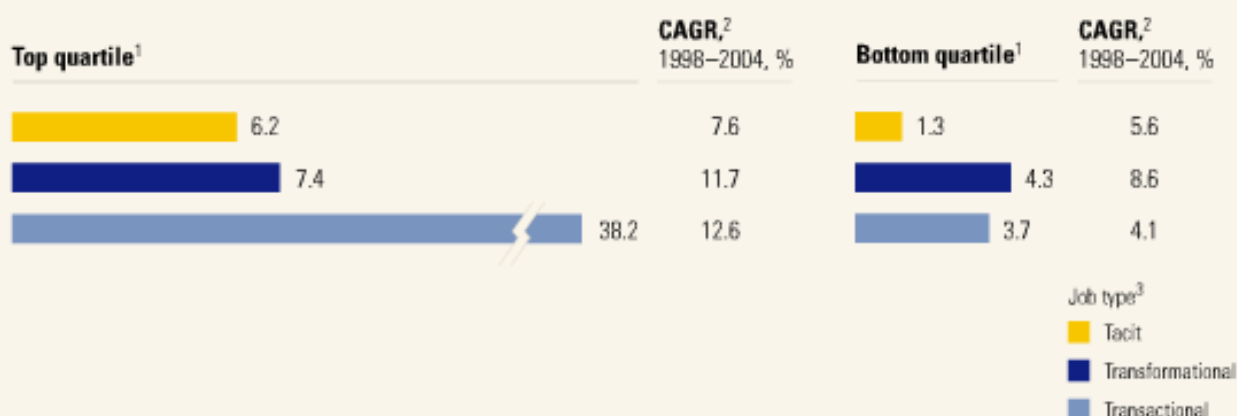
During the past few years, advantages related to costs and distinctiveness have rarely lasted for long: they eroded quickly when companies built them from innovations in the handling of what are essentially transactional interactions. E*Trade Financial, for instance, gained tactical advantages by optimizing transactional activities to create more efficient and less expensive ways of making trades but then watched its unique position evaporate when other discount brokers and financial advisers embraced the new technology and cut their trading fees. Cheap trades were no longer a sufficient point of differentiation.

By contrast, advantages built on tacit interactions might stand. A company could, for example, focus on improving the tacit interactions among its marketing and product-development staff, customers, and suppliers to better discern what customers want and then to provide them with more effective value-added products and services. That approach would create a formidable competitive capability—and it is difficult to see how any rival could easily implement the same mix of tacit interactions within its organization and throughout its value chain.

EXHIBIT 3

Investing in technology

IT stock per employee by job type, 2004, \$ thousands (nominal)



¹ Quartiles based on growth in labor productivity, 1998-2004.

² Compound annual growth rate.

³ Categorized by predominant job activity: tacit = complex interactions; transactional = routine interactions; transformational = extraction or conversion of raw materials; 800 occupations studied.

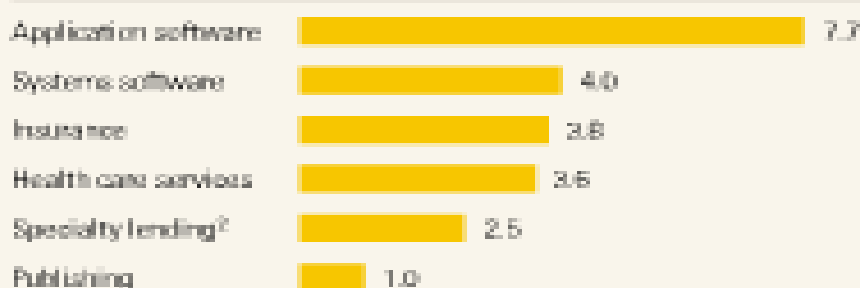
Source: US Bureau of Labor Statistics; McKinsey analysis



EXHIBIT 4

Performance varies

Dispersion of average EBITDA per employee for companies by industry type,¹ ratio of standard deviation to mean

Overall**By industry subsector****Tacit****Transactional****Transformational**

¹EBITDA = earnings before interest, taxes, depreciation, and amortization; categorized by predominant job activity within industry: tacit = complex interactions; transactional = routine interactions; transformational = extraction or conversion of raw materials; data reflect industry weighted-average GDP by job type.

²includes credit card issuers, mortgage lenders, education lenders.

³includes kitchen retail, movie rental, office supply stores.




Looking forward

As companies explore how to expand the potential of their most valuable employees, they face more than a few challenges. For one thing, they will have to understand what profile of interactions—transactional and tacit—is critical to their business success and to allocate investments for improving the performance of each. Some companies will have to redeploy talent from transactional to tacit activities, as Home Depot did. Others, following the example of companies such as Toyota Motor and Cisco Systems, may find it necessary to redeploy their available tacit capacity to transformational and transactional activities, thus bringing a new level of problem solving to many kinds of transformational jobs. At the same time, it will be necessary to guard against becoming overly reliant on a few star tacit employees and to manage critical tacit or transactional activities undertaken by partners or vendors.

On the human-resources side, companies will need a better understanding of how they can hire, develop, and manage for tacit skills rather than transactional ones—something that will increasingly determine their ability to grow. Certain organizations must therefore learn to develop their tacit skills internally, perhaps through apprenticeship programs, or to provide the right set of opportunities so that their employees can become more seasoned and knowledgeable. What's more, performance is more complex to measure and reward when tacit employees collaborate to achieve results. How, after all, do you measure the interactions of managers?⁷

Companies will also have to think differently about the way they prioritize their investments in technology. On the whole, such investments are now intended largely to boost the performance of transformational activities—manufacturing, construction, and so on—or of transactional ones. Companies invest far less to support tacit tasks (Exhibit 3).

So they must shift more of their IT dollars to tacit tools, even while they still try to get whatever additional (though declining) improvements can be had, in particular, from streamlining transactions. The performance spread⁸ between the most and least productive manufacturing companies is relatively narrow. The spread widens in transaction-based sectors—meaning that investments to improve performance in this area still make sense. But the variability of company-level performance is more than 50 percent greater in tacit-based sectors than in manufacturing-based ones (Exhibit 4). Tacit activities are now a green pasture for improvement. 

About the research

The next wave of performance improvements—to raise the effectiveness of tacit workers—will be far more difficult than the improvement efforts of the past. But companies that can innovate to make their complex, higher-value business activities deliver what their customers care about most will probably gain significant (and not easily duplicated) advantages in distinctiveness, quality, and cost.

We looked at the range of business activities involved in more than 800 occupations in the United States. Building on McKinsey's 1997 study, we placed every job in one of three categories: transformational (extracting raw materials or converting them into finished goods), transactional (interactions that unfold in a generally rule-based manner and can thus be scripted or automated), and tacit (more complex interactions requiring a higher level of judgment, involving ambiguity, and drawing on tacit, or experiential, knowledge). While any kind of work clearly involves activities in all three of our categories, we placed each job by determining its predominant activity. This occupational segmentation allowed us to develop a macroeconomic view of employment and wage shifts and to isolate trends in tacit interactions. We cross-checked the results with the 1997 activity-level analysis and with other economists' findings on interactions.

Then we linked the occupational analysis to the US government's industry classifications and quantified the mix of tacit, transactional, and transformational activities within and across industries. In addition, we used data from the International Labour Organization, the World Bank,



Maurizio Ammannato

and other sources to analyze these trends on a global basis. Finally, interviews with economists and with functional and industry experts throughout McKinsey helped us to identify and understand the key enablers of tacit and transactional interactions in today's companies.

About the Authors

Brad Johnson is an associate principal in McKinsey's Silicon Valley office, and **James Manyika** is a principal in the San Francisco office, where **Lareina Yee** is a consultant.

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Notes

¹ Lowell L. Bryan and Claudia Joyce, "The 21st-century organization," *The McKinsey Quarterly*, 2005 Number 3, pp. 24–33; and Lowell L. Bryan, "Getting bigger," *The McKinsey Quarterly*, 2005 Number 3, pp. 4–5.

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⁷ Lowell L. Bryan, "Making a market in knowledge," *The McKinsey Quarterly*, 2004 Number 3, pp. 100–11.

⁸ As measured by revenue or EBITDA (earnings before interest, taxes, depreciation, and amortization) per employee.