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The Emperor's New Information Economy

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According to the U.S. Commerce Department, 1990 was the first year in which capital spending relevant to the information economy (computers and telecommunications) exceeded capital spending on the more traditional aspects of the industrial infrastructure (plant, equipment, physical transportation, etc.). Many scholars and business-oriented commentators have greeted these data as evidence that the U.S. economy is now firmly rooted in the information age, that a new "information economy" has replaced the industrial economy that dominated most of the twentieth century.

This is a conclusion from which I heartily dissent. An information economy requires more than infrastructure investment. It requires a new social contract derived from a new moral vision, binding members of the firm together in ways that contrast profoundly with the well worn emotional pathways of the industrial hierarchy. Until these matters are seriously engaged by the leadership in a majority of our business organizations, the notion of an information economy is much like the foolish emperor of fairy tale fame, naked and very much at risk.

In an information economy, information is the core resource that firms exploit in order to create the value their customers seek. While businesses are generously investing in the information infrastructure to make this possible, they show little evidence of a commitment to creating the forms of organization and developing the people that can exploit that new infrastructure for value creation. Organization is a methodology for responding to complexity. The nature and degree of complexity in a globally integrated information-rich marketplace is exponentially greater than anything we have known. Organizational methodologies, however, are evolving far more slowly than the markets they endeavor to serve.

Considered in historical perspective the problem becomes more clear. In the early decades of the twentieth century, a new organizational form was invented and continued to be perfected over several decades. Known as the functional hierarchy, it was characterized by a number of

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brilliantly inventive features designed to meet the challenges of complexity associated with the new mass markets of that period. Strategically, firms concentrated on increasing throughput and lowering unit costs. Wealth derived from the coupling of physical products with new domestic channels of distribution, enabled by the then new modes of transportation and communication, rail and truck, telegraph and telephone. The organizational inventions of the early twentieth century constitute just about everything that has come to be regarded as definitive of modern work. These include the mass production techniques of the factory and office based on the separation of execution and conception, the fragmentation of tasks or minute division of labor, the professionalization of management and the growth of the managerial hierarchy to scrupulously standardize and control operations, the simplification and delegation of administrative functions to a newly contrived clerical workforce. These and many other features of the emerging industrial workplace proved to be incredibly successful, producing unprecedented wealth through productivity gains that were, over time, widely shared. They came to define the modern workplace, born in the USA, a colossus that reigned over the industrial life of the century.

Now, at the century's end, the structure of the marketplace and the technological infrastructure upon which it depends have changed yet again. The globalization of markets and the conditions of hypercompetition thus created have accelerated the commoditization of products in virtually every industry. Mass market approaches have been forced to give way to a highly differentiated and often information-saturated marketplace in which firms must distinguish themselves through the value-added they can create along the dimensions their customers deem important. New information technologies now provide the means through which these processes of value creation can occur. But this new infrastructure is not benign. It has profoundly altered the operational and managerial systems of the firm, and in so doing has transformed the nature of work at every level of the organization. The new work depends upon a radically different approach to the distribution of knowledge and authority within the organization, according to principles of equal access and equal opportunity. New organizational methodologies are required that allow complexity to be effectively managed at the point where it enters the organization. This would enable the identification and exploitation of opportunities for the creation of added-value at any point in the value chain. The transformation of information into wealth means that more members of the firm must be given opportunities to know more and to do more.

The problem is this: the brilliant inventions of the early twentieth century workplace are now the barriers that inhibit the next great leap forward. The successful reinvention of the firm consistent with the demands of an information economy will continue to be tragically limited as long as the principal features of modern work are preserved. Unlocking the promise of an information economy now depends upon dismantling the very same functionalized managerial hierarchy — with its moral vision, social system, entrenched interests, and vertical focus —that once spelled greatness.

In order to grasp the roots of these developments it is necessary to consider the nature of work, how it has changed, and the vast implications of this poorly understood transformation. The agony and the ecstasy of work have been the great story of the human spirit. Work was heroic. It meant physical sacrifice, exertion, and depletion. But the same physical engagement with work that put the body at risk was also the means by which precious skills of know-how and craft were

developed. For all of human history, most people have had to work in this way — giving up their bodies in the service of production, often in sorrow, sometimes with skill.

This is the immanent context in which humans have developed their tools and technologies. The universal logic of these developments has been to design tools that substitute for the human body, extending and amplifying its capabilities while saving it from ruin. This developmental process has not been a straight linear function. There have been eras and industries in which machinery has served to increase the agony of work. However, the overall historical pattern is one in which mechanization and later automation have served to marginalize the worker from the physical aspects of work. This pattern, most prominent in the twentieth century, has been coupled with a general shift in employment that absorbed more of the laboring population in "white collar" knowledge-oriented activities whose demands on the human body have tended to be of a very different nature. Indeed, the twentieth century is the first in human history in which it can be said of any society that a majority of the working population was exempt from the excesses of physical exertion and sacrifice that have been work's implacable companion.

This century's long trend toward the abstraction of work has been dramatically accelerated since the early 1980s by the adoption of information technologies. These new technologies were widely regarded as simply the next phase of automation. The logic of their development and deployment hardly varied from the ancient impetus toward labor substitution. But we have learned that these technologies are different, that the intelligence at their core provokes a discontinuity in the history of technological development. This is because even when information technologies are applied to automate, they simultaneously set into motion an entirely unique set of reflexive processes, translating newly automated activities into data and information for wide-ranging display. Information technologies symbolically render processes, objects, behaviors, and events so that they can be seen, known, and shared in a new way. In other words, these technologies codify and illuminate interior detail, creating transparency where there was opacity, an explicit public text where there was once fragmentation, privacy, and intuition. The organization, its internal processes and exchange relationships, becomes visible in a wholly new way, whether that pertains to thousands of newly codified variables in the production process or the global flow of cash tracked on an hourly basis. The word I coined to capture this unique capacity of information technology is "informate." These technologies informate as well as automate, and as they do, the organization is increasingly imbued with an electronic text, its mysteries surrendered to anyone with the skills to access and understand the relevant information.

Under these conditions what does it mean to work? Work is now an abstraction. It depends upon an understanding of, responsiveness to, and ability to manage and create value from information. It is in terms of its informating capacity that information technologies represent a radical discontinuity in the history of work and the evolution of industrial technology. Earlier generations of machines in the workplace tended to decrease the complexity and substantive content of work tasks, making it possible to employ people with ever lower levels of skill and wages. In contrast, informating technologies frequently increase the substantive complexity and intellectual content of work at all levels of the organization. This presents a profound challenge to the functional hierarchy and its management. It also brings us to the moral center of current debates about the information-based organization.

The essential logic of the managerial hierarchy rests on the premise that complexity can constantly be removed from lower level jobs and passed up to the management ranks. Automation has been a primary means of accomplishing this. An iron curtain was drawn between those whose tasks were simplified and through mechanization stripped of substantive content, and those who received that content and were expected to preside over it. Indeed, the management cadre was invented for this purpose. Over the course of the century, the manager's role evolved as guardian of the organization's knowledge base. The manager's legitimate authority derived from being credited as someone fit to receive, interpret, and communicate orders based on the command of information.

We have come to accept that the managerial hierarchy operating in this way reflects a reasonable division of labor, a neutral concept denoting efficiency and rationality. We are less comfortable discussing the moral vision at the heart of this arrangement, something I call the "division of love." Here I mean to suggest that the managerial hierarchy drew life not only from rational considerations of efficiency, or differences in the political power of its constituents, but importantly from the ways in which some organizational members were valued and others were devalued.

But why worry now about the emotional wounds of these hierarchical divisions, just as we are entering the brave new age of the information economy? The reason is this. The new information infrastructure creates an opportunity for firms to deal with complexity at the point where it enters the organization, whether that is the customer interface, the point of production, or in the act of service delivery. That capacity, or methodology, implies speed, informed action, and efficiency in the process of problem solving and value creation. These in turn are precisely the methodological features associated with the success of firms challenged by the current conditions of hypercompetition and hypercomplexity. But for firms to avail themselves of such opportunities, they must be prepared to drive a stake into the heart of the old division of labor and the division of love from which it continues to draw sustenance. Exploiting the newly informated environment means opening up the information base of the organization to members at every level, assuring that each level has the knowledge and skills to productively engage with that information, and endowing all members with the authority to express and ultimately act on what they can know. It implies a new social contract that redefines who people are at work, what they can know, and what they can do.

Lamentably, most of what has passed for transformational change in business organizations over the past decade remained formally indifferent to this moral heart of the matter. Most efforts at restructuring and downsizing have been aimed at slenderizing the managerial hierarchy without questioning its fundamental purpose and function. The widespread interest in reengineering has allowed firms to focus obsessively on operational efficiencies while ignoring the many necessary dimensions of change that would lead to a reimagining of the moral fabric and emotional texture of the firm, thus providing the basis for the serious work required to implement a new social contract.

Every powerful legacy harbors the secret of its own demise, and the mighty force that was the industrial workplace is no exception. The division of labor and division of love that characterized modern work have been the source of almost miraculous efficiency, but as we confront a new era

of discontinuity they have taken on a rigidity that desecrates the very spirit of inventiveness and adaptation from which they were derived. The moral, social, and emotional requirements of adaptation to an information economy have been badly underestimated. By the end of this economic transition, in twenty five years or so, the managerial hierarchy as we know it will have been dismantled and the purposes and functions of organizational membership will have been profoundly reconfigured. During this period of transition, environmental conditions will select for success firms that proactively adapt their organizational methodologies to the moral, social, and psychological requirements of an information economy. However, proactive adaptation requires the kind of moral leadership that can articulate new values and embed them in a complex and long-term process of change. Such leadership is rare. Without it, most firms will fall prey to the slow grind of the global marketplace. Many will die a long and painful death, while others wend their way, kicking and screaming across the decades, to a new moral universe. Only then will the promise of an information economy come true. Only then will the emperor come in from the cold, because we have found the way to clothe him.

About the Author

Shoshana Zuboff is the Benjamin and Lilian Hertzberg Professor of Business Administration at Harvard University, Graduate School of Business Administration. She earned her Ph.D. in Social Psychology from Harvard University and her undergraduate degree from the University of Chicago. Her pioneering research, *In the Age of the Smart Machine,* was aimed at understanding the implications of the massive diffusion of information technology for the nature of work, organization, and management. Professor Zuboff's continuing research focuses on the challenges of historical adaptation as firms confront the social, moral, and economic discontinuities associated with the shift to an information-based economy.