

Future of Work





The Global Challenge

Not since the Industrial Revolution, when work migrated from fields to factories, from villages to company towns and cities, and from families to corporations, have the context, form, and nature of work been in such flux. Organizations now question how to make the best use of their people resource and educational institutions seek to predict what skills will be required for the next generation. Individuals increasingly think in terms of work not balanced with other priorities, but integrated into their lives. I see that the future of work is influenced by four unstoppable trends each of which will have significant impact. Taken collectively they suggest the need for a fundamental rethinking of management, the way we work and what we work on:

Geographic and Economic Dislocation: Networks have reduced or eliminated barriers to entry to national labor markets for many categories of work. This is particularly evident in areas such as IT (through outsourcing), engineering (e.g. Innocentive tapping global talent pools), and medicine (e.g. tele-radiology). As off-shoring increases, it puts pressure on wages in the rich countries, and skills rise in nations with lower per capita income. And, as income increases in emerging markets such as India, China, and Brazil, growth in demand for skilled services will occur disproportionately outside the developed world. Together, these two effects lead to income stagnation in the rich countries and rapid wage and employment growth in emerging economies. Looking ahead, these all point to equalization of purchasing power incomes, segment by segment. Eventually this may inhibit globalization through backlash against growing displacement, increasing the pressure for barriers to trade, and could put multinational corporations at odds with their home governments.

Automation: Farming once occupied 60% of the U.S. workforce; now the number is 3%; manufacturing in the U.S. now occupies about 15 million people -fewer than 10% of the workforce; and this number will continue to fall by 1.5 million per year through to 2016. As networks and decision-making algorithms become more powerful, we can predict that services jobs will be displaced next. Although many offer ideas, it is difficult to identify exactly what will replace them.

Education: Life spans and careers continue to grow longer as the half-life of knowledge continues to shrink. A decreasing proportion of value will be added by repetitive work: physical machines will become more self-aware and adaptive, requiring less supervision; more importantly, information technology will eliminate services and middle management labor. Since the growth in 'value added' will be through innovation and creation, a major challenge will be to ensure that education (both early and continuing) will support the development of a "creative class" of all ages, in the same the way that public high school taught people to work in large enterprises organized around the division of labor. Since the educational institutions in the rich world have proven very resistant to change, it is likely that innovations in primary and secondary education will come from emerging economies and, in university and ongoing education, from the business sector and self-organized networks.

Collaboration: Web 2.0 is teaching organizations about the power of collective work product, leading to "Enterprise 2.0," an organizational form with porous boundaries, shared responsibilities, greater transparency, and fewer mandatory rules and practices. In part, these organizations will likely help answer the education question, as jobs become more diverse and stimulating and the habit of looking outside one's organization for answers becomes prevalent; the challenge will be to discover how management will take place in these adaptive enterprises.

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These four evident and ineluctable trends will impact us all in different ways and the implications for how our

individual work lives are multiple and varied.

Options and Possibilities

Each of the four identified trends is significant, and they are neither mutually exclusive nor exhaustive. When considered together, they raise many questions, and suggest issues to monitor as the next decade unfolds. Three of the most pertinent are:

What will global capitalism learn about work from the emerging economies? For example: Will copyright and patent law be the framework for intellectual property (IP) in the emerging economies? What is the future of full-time employment? (In India only 7% of the labor force has formal jobs.) And, how can incentive systems fairly measure, motivate and reward collaborative work?

Reverse Imperialism? How strongly will the rich economies resist globalization if the export of high-paying jobs becomes more of an issue than the import of inexpensive goods and services? As consumer and corporate benefits have acted as a catalyst, the off-shoring trend of recent years has served both the developed and the developing countries well, but will that continue for much longer?

IP rights in an information economy? IT has reduced the marginal cost of IP to essentially zero. Collaboration in the human genome project and many other bioscience projects (the sequencing of the SARS virus, for example) is demonstrating the power of open access to new information. So, how will incentives for creative work change to recognize these two powerful economic shifts? Will the open innovation movement evolve to a point where know-how and capability rather than pure IP in the traditional sense is the currency? If so, how will organizations monetize collaboration?

The context in which these issues will unfold will be radically, but predictably, different from the past. I believe the most important is the locus of growth. Today, there are over six billion people on the planet, about one billion of them in rich countries. In 2050, there will be nine billion people - yet still only one billion in current rich countries. E growth will be centered in the emerging economies, where the middle classes are growing rapidly in both number and consumption per capita. The requirements in the developing world for basic products and services - food, health care, housing - will be the world's largest growth opportunity. Global companies will be seeking to engage these next billions not only as consumers, but as human resources. They will be inhibited, however, to the degree they bring with them business models and practices from the rich world.

Technology innovation will clearly continue to change the business environment: Software will continue to erode white collar and professional work. It has already de-skilled many professions - spreadsheets make everyone a financial analyst, iPhone-based software can now make everyone a solar panel installer. And robots being developed in Japan help take care of the aged: Automated people-care will be big business.. In



one recent study, half an hour with Paro, a robot resembling a fur seal, improved the brain function of Alzheimer's patients more than an hour of music therapy. Innovations in preventative healthcare will reduce the very high projections of growth in this industry. Next, workflow automation and smart infrastructure will assume much of the surveillance and coordination work done to keep supply

chains, transportation systems, utilities, and security systems functioning.

The technological advancement pattern of the Industrial Revolution will write its next chapter with information technology. Once again, progress will reduce manual labour, save time and increase wellbeing, but will also reduce traditional roles and limit opportunity for some.

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The Way Ahead

Industrial technology was born in the UK and grew up in the US. Information technology was born in the US, and is growing up in the emerging economies. The US will fall behind for a period, while it learns to adopt the approaches developed elsewhere. What are these? Looking globally I see four pathways that will influence work by 2020.

Digital Natives in different countries will work together more effectively than the connected and the unconnected within a single country. Digital Natives may find new protocols arising from social networking behavior, and tele-presence technologies will improve in cost and performance. It's possible that global collaboration could become much more effective through the development of a range new IT solutions - as it has through email. Cisco, Google, Infosys, Microsoft, IBM and the like are all placing big bets in these areas.

In the next decade, I also foresee a revolution in our approach to education. In Singapore, teachers have been sharing and improving one another's lesson plans for a decade. In India, "para-teachers" are being trained to teach focused elements of the curriculum under the supervision of senior teachers, one teacher for ten para-teachers; what is more, the para-teachers are

trained using on-line tools and experiences. In addition both schools and corporations worldwide are experimenting with simulations and games as training tools. In the US, MIT has put much of its syllabus on-line and home schooling is growing more popular, and home schoolers are sharing materials and resources.

None of these practices amount to an important major global trend yet, but they have the potential to disrupt the way education, training, and feedback and evaluation are done. Education will be industrialized - broken into small, repeatable tasks and thus increasingly deskilled. It will also become "informationalized" - benefiting from training tools that are owned and improved by their "Web 2.0" user communities. Success could address both the "life-long learning" challenge in the rich world and the need to rapidly educate tens of millions of people in the emerging economies.

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As well as these pathways I can imagine two more speculative shifts will, both enabled by advances in collaboration technologies.

The first one of these concerns the development of North-South vs. East-West trade routes. As development accelerates in the southern hemisphere and communications and collaboration technologies improve, the attraction of doing business in the same time zone will become powerful. No longer will 24/7 be the only way to link between the centers of resource: Europe will increasingly work with African people resource pools, and the North - South America working dynamic will grow.

The second shift that I see having increasing impact concerns individuals' predispositions to work together.

Human beings are biologically tribal - consequently some amount of face-to-face meeting is required for collaboration among people who don't know one another. But time zones are inescapable - global cooperation requires that most communication be asynchronous. And language barriers, though lower than ever before, persist. As in the North-South dimension outlined above, these forces could lead to increased in-country partnerships. As the outsourcing trend is mitigated by rising costs of employment in the emerging economies, we may expect to see an increasing shift from off-shoring to on-shoring of jobs in which ongoing relationships are important. This will not decrease, however, the development of global supply chains and the tapping of pools of capital - financial and human - wherever they exist.

Impact and Implications

If I had to put money on it I would suggest the industrialization of information work is certain, and will affect pretty much every business. A revolution in education is less probable, but this would affect the most people globally, make a difference to their entire lives, affect nations politically and economically, and represent a force for equalizing income around the world.

Were I in charge and free from all constraints I would announce a plan for eliminating intellectual property rights over the next 25 years. I would require corporate boards to have some form of representation of each stakeholder. I would develop performance measures that reflect performance in non-financial dimensions. Perhaps most importantly I would fund a global effort on the scale of the Apollo Program to share progress in education globally. And, in the United States, I would institute a two-year requirement for national service with one year spent outside the country.

Compromises have to be made so I suggest, with an own-country perspective, at least three articles of faith in US business should be re-examined: The focus on individuals as the source of organization performance; the primacy of shareholders over other stakeholders; and the value of competition as currently practiced in assuring efficient resource allocation.

Pragmatically, if all the trends discussed above go forward, it is possible that there will be a bifurcation of business systems - a world of utilities



(telecommunications, supply chains, manufacturing and natural resources), patterned on the capital-intensive industrial economy, in which business will be a zero-sum game, a fight for market share and dominance; and a world of experiences (software, media,

hospitality), based on positive-sum collaboration and open sourcing. But beware: these two worlds may have difficulty dealing with each other because of their fundamental differences around trust and value.

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