

The Economist

The Next Workforce

Knowledge workers are the new capitalists

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A century ago, the overwhelming majority of people in developed countries worked with their hands: on farms, in domestic service, in small craft shops and (at that time still a small minority) in factories. Fifty years later, the proportion of manual workers in the American labour force had dropped to around half, and factory workers had become the largest single section of the workforce, making up 35% of the total. Now, another 50 years later, fewer than a quarter of American workers make their living from manual jobs. Factory workers still account for the majority of the manual workers, but their share of the total workforce is down to around 15%—more or less back to what it had been 100 years earlier.

Of all the big developed countries, America now has the smallest proportion of factory workers in its labour force. Britain is not far behind. In Japan and Germany, their share is still around a quarter, but it is shrinking steadily. To some extent this is a matter of definition. Data-processing employees of a manufacturing firm, such as the Ford Motor Company, are counted as employed in manufacturing, but when Ford outsources its data processing, the same people doing exactly the same work are instantly redefined as service workers. However, too much should not be made of this. Many studies in manufacturing businesses have shown that the decline in the number of people who actually work in the plant is roughly the same as the shrinkage reported in the national figures.

Before the first world war there was not even a word for people who made their living other than by manual work. The term “service worker” was coined around 1920, but it has turned out to be rather misleading. These days, fewer than half of all non-manual workers are actually service workers. The only fast-growing group in the workforce, in America and in every other developed country, are “knowledge workers”—people whose jobs require formal and advanced schooling. They now account for a full third of the American workforce, outnumbering factory workers by two to one. In another 20 years or so, they are likely to make up close to two-fifths of the workforce of all rich countries.

The terms “knowledge industries”, “knowledge work” and “knowledge worker” are only 40 years old. They were coined around 1960, simultaneously but independently; the first by a Princeton economist, Fritz Machlup, the second and third by this writer. Now everyone uses them, but as yet hardly anyone understands their implications for human values and human behaviour, for managing people and making them productive, for economics and for politics. What is already clear, however, is that the emerging knowledge society and knowledge economy will be radically different from the society and economy of the late 20th century, in the following ways.

First, the knowledge workers, collectively, are the new capitalists. Knowledge has become the key resource, and the only scarce one. This means that knowledge workers collectively

own the means of production. But as a group, they are also capitalists in the old sense: through their stakes in pension funds and mutual funds, they have become majority shareholders and owners of many large businesses in the knowledge society.

Effective knowledge is specialised. That means knowledge workers need access to an organisation—a collective that brings together an array of knowledge workers and applies their specialisms to a common end-product. The most gifted mathematics teacher in a secondary school is effective only as a member of the faculty. The most brilliant consultant on product development is effective only if there is an organised and competent business to convert her advice into action. The greatest software designer needs a hardware producer. But in turn the high school needs the mathematics teacher, the business needs the expert on product development, and the PC manufacturer needs the software programmer. Knowledge workers therefore see themselves as equal to those who retain their services, as “professionals” rather than as “employees”. The knowledge society is a society of seniors and juniors rather than of bosses and subordinates.

His and hers

All this has important implications for the role of women in the labour force. Historically women's participation in the world of work has always equalled men's. The lady of leisure sitting in her parlour was the rarest of exceptions even in a wealthy 19th-century society. A farm, a craftsman's business or a small shop had to be run by a couple to be viable. As late as the beginning of the 20th century, a doctor could not start a practice until he had got married; he needed a wife to make appointments, open the door, take patients' histories and send out the bills.

But although women have always worked, since time immemorial the jobs they have done have been different from men's. There was men's work and there was women's work. Countless women in the Bible go to the well to fetch water, but not one man. There never was a male spinster. Knowledge work, on the other hand, is “unisex”, not because of feminist pressure but because it can be done equally well by both sexes. That said, the first modern knowledge jobs were designed for only one or the other sex. Teaching as a profession was invented in 1794, the year the Ecole Normale was founded in Paris, and was seen strictly as a man's job. Sixty years later, during the Crimean war of 1853-56, Florence Nightingale founded the second new knowledge profession, nursing. This was considered as exclusively women's work. But by 1850 teaching everywhere had become unisex, and in 2000 two-fifths of America's students at nursing school were men.

There were no women doctors in Europe until the 1890s. But one of the earliest European women to get a medical doctorate, the great Italian educator Maria Montessori, reportedly said: “I am not a woman doctor; I am a doctor who happens to be a woman.” The same logic applies to all knowledge work. Knowledge workers, whatever their sex, are professionals, applying the same knowledge, doing the same work, governed by the same standards and judged by the same results.

High-knowledge workers such as doctors, lawyers, scientists, clerics and teachers have been around for a long time, although their number has increased exponentially in the past 100 years. The largest group of knowledge workers, however, barely existed until the start of the 20th century, and took off only after the second world war. They are knowledge technologists—people who do much of their work with their hands (and to that extent are the

successors to skilled workers), but whose pay is determined by the knowledge between their ears, acquired in formal education rather than through apprenticeship. They include X-ray technicians, physiotherapists, ultrasound specialists, psychiatric case workers, dental technicians and scores of others. In the past 30 years, medical technologists have been the fastest-growing segment of the labour force in America, and probably in Britain as well.

In the next 20 or 30 years the number of knowledge technologists in computers, manufacturing and education is likely to grow even faster. Office technologists such as paralegals are also proliferating. And it is no accident that yesterday's "secretary" is rapidly turning into an "assistant", having become the manager of the boss's office and of his work. Within two or three decades, knowledge technologists will become the dominant group in the workforce in all developed countries, occupying the same position that unionised factory workers held at the peak of their power in the 1950s and 60s.

The most important thing about these knowledge workers is that they do not identify themselves as "workers" but as "professionals". Many of them spend a good deal of their time doing largely unskilled work, eg, straightening out patients' beds, answering the telephone or filing. However, what identifies them in their own and in the public's mind is that part of their job involves putting their formal knowledge to work. That makes them full-fledged knowledge workers.

Such workers have two main needs: formal education that enables them to enter knowledge work in the first place, and continuing education throughout their working lives to keep their knowledge up to date. For the old high-knowledge professionals such as doctors, clerics and lawyers, formal education has been available for many centuries. But for knowledge technologists, only a few countries so far provide systematic and organised preparation. Over the next few decades, educational institutions to prepare knowledge technologists will grow rapidly in all developed and emerging countries, just as new institutions to meet new requirements have always appeared in the past. What is different this time is the need for the continuing education of already well-trained and highly knowledgeable adults. Schooling traditionally stopped when work began. In the knowledge society it never stops.

Knowledge is unlike traditional skills, which change very slowly. A museum near Barcelona in Spain contains a vast number of the hand tools used by the skilled craftsmen of the late Roman empire which any craftsman today would instantly recognise, because they are very similar to the tools still in use. For the purposes of skill training, therefore, it was reasonable to assume that whatever had been learned by age 17 or 18 would last for a lifetime.

Conversely, knowledge rapidly becomes obsolete, and knowledge workers regularly have to go back to school. Continuing education of already highly educated adults will therefore become a big growth area in the next society. But most of it will be delivered in non-traditional ways, ranging from weekend seminars to online training programmes, and in any number of places, from a traditional university to the student's home. The information revolution, which is expected to have an enormous impact on education and on traditional schools and universities, will probably have an even greater effect on the continuing education of knowledge workers.

Knowledge workers of all kinds tend to identify themselves with their knowledge. They introduce themselves by saying "I am an anthropologist" or "I am a physiotherapist." They may be proud of the organisation they work for, be it a company, a university or a

government agency, but they “work at the organisation”; they do not “belong to it”. Most of them probably feel that they have more in common with someone who practices the same specialism in another institution than with their colleagues at their own institution who work in a different knowledge area.

Although the emergence of knowledge as an important resource increasingly means specialisation, knowledge workers are highly mobile within their specialism. They think nothing of moving from one university, one company or one country to another, as long as they stay within the same field of knowledge. There is a lot of talk about trying to restore knowledge workers' loyalty to their employing organisation, but such efforts will get nowhere. Knowledge workers may have an attachment to an organisation and feel comfortable with it, but their primary allegiance is likely to be to their specialised branch of knowledge.

Knowledge is non-hierarchical. Either it is relevant in a given situation, or it is not. An open-heart surgeon may be much better paid than, say, a speech therapist, and enjoy a much higher social status, yet if a particular situation requires the rehabilitation of a stroke victim, then in that instance the speech therapist's knowledge is greatly superior to that of the surgeon. This is why knowledge workers of all kinds see themselves not as subordinates but as professionals, and expect to be treated as such.

Money is as important to knowledge workers as to anybody else, but they do not accept it as the ultimate yardstick, nor do they consider money as a substitute for professional performance and achievement. In sharp contrast to yesterday's workers, to whom a job was first of all a living, most knowledge workers see their job as a life.

Ever upwards

The knowledge society is the first human society where upward mobility is potentially unlimited. Knowledge differs from all other means of production in that it cannot be inherited or bequeathed. It has to be acquired anew by every individual, and everyone starts out with the same total ignorance.

Knowledge has to be put in a form in which it can be taught, which means it has to become public. It is always universally accessible, or quickly becomes so. All this makes the knowledge society a highly mobile one. Anyone can acquire any knowledge at a school, through a codified learning process, rather than by serving as an apprentice to a master.

Until 1850 or perhaps even 1900, there was little mobility in any society. The Indian caste system, in which birth determines not only an individual's status in society but his occupation as well, was only an extreme case. In most other societies too, if the father was a peasant, the son was a peasant, and the daughters married peasants. By and large, the only mobility was downward, caused by war or disease, personal misfortune or bad habits such as drinking or gambling.

Even in America, the land of unlimited opportunities, there was far less upward mobility than is commonly believed. The great majority of professionals and managers in America in the first half of the 20th century were still the children of professionals and managers rather than the children of farmers, small shopkeepers or factory workers. What distinguished America

was not the amount of upward mobility but, in sharp contrast to most European countries, the way it was welcomed, encouraged and cherished.

The knowledge society takes this approval of upward mobility much further: it considers every impediment to such mobility a form of discrimination. This implies that everybody is now expected to be a “success”—an idea that would have seemed ludicrous to earlier generations. Naturally, only a tiny number of people can be outstanding successes; but a very large number are expected to be adequately successful.

In 1958 John Kenneth Galbraith first wrote about “The Affluent Society”. This was not a society with many more rich people, or in which the rich were richer, but one in which the majority could feel financially secure. In the knowledge society, a large number of people, perhaps even a majority, have something even more important than financial security: social standing, or “social affluence”.

The price of success

The upward mobility of the knowledge society, however, comes at a high price: the psychological pressures and emotional traumas of the rat race. There can be winners only if there are losers. This was not true of earlier societies. The son of the landless labourer who became a landless labourer himself was not a failure. In the knowledge society, however, he is not only a personal failure but a failure of society as well.

Japanese youngsters suffer sleep deprivation because they spend their evenings at a crammer to help them pass their exams. Otherwise they will not get into the prestige university of their choice, and thus into a good job. These pressures create hostility to learning. They also threaten to undermine Japan's prized economic equality and turn the country into a plutocracy, because only well-off parents can afford the prohibitive cost of preparing their youngsters for university. Other countries, such as America, Britain and France, are also allowing their schools to become viciously competitive. That this has happened over such a short time—no more than 30 or 40 years—indicates how much the fear of failure has already permeated the knowledge society.

Given this competitive struggle, a growing number of highly successful knowledge workers of both sexes—business managers, university teachers, museum directors, doctors—“plateau” in their 40s. They know they have achieved all they will achieve. If their work is all they have, they are in trouble. Knowledge workers therefore need to develop, preferably while they are still young, a non-competitive life and community of their own, and some serious outside interest—be it working as a volunteer in the community, playing in a local orchestra or taking an active part in a small town's local government. This outside interest will give them the opportunity for personal contribution and achievement.