

Work, Technology, and Competence: Aspects of the history and the future of work

Today we are in the midst of a major social transformation. To understand it, and its implications, we have to rethink some very basic ideas that underlie our everyday life and its practices. In what follows, I shall focus on three important and central ideas of modern society. I will talk about work, and its changing role in human societies. I will re-evaluate some aspects of technological change. And, finally, I will try to propose some questions concerning the new forms of learning and competence development, which seem to be irreducibly bound with the new forms of work and technological change.

Some years ago, when Finland was in deep recession, we had unemployment rates above 20 percent. There was probably not a single family, which had not been touched either directly or indirectly by unemployment. The welfare state had its most stringent test, and, in many ways, one could say that it showed its strength.

In the middle of this turbulence, the welfare state was asked to do a curious job. There were frequent voices asking for the state to guarantee work for everyone. Human work was seen as a human right. Indeed, some went as far as to demand that the right for work should be included in the Finnish constitution. It was noted that without work we lose our social identity, future prospects, and self-respect. We heard stories about people who kept going to the work every morning, months after they had lost their jobs, just to give their neighbors, and sometimes families, the impression that everything is fine.

Against this context it is interesting to note how much there was talk about work, and how little it was actually discussed. Most of the time people seemed to be arguing that job creation and full employment are top priorities for the society; or that jobs are permanently being destroyed and that it is about time to wake up to the nightmare. Yet, the centrality of work in modern society was rarely discussed, and even less the reasons for this centrality. Work was so central that it could be taken for granted.

Human memory is short. No one had to ask why work is central and so important.

For us the natural way to succeed in life is to succeed better than our parents. During this century, it has been an easy job. After the Second World War factories produced a continuous flow of new exciting products, which were outside the imagination of every previous generation. Tractors replaced horses on the fields. New houses were built. Roads were constructed and cars were bought. The public sector expanded, providing socially prestigious jobs in abundance.

Diligence conquered need and want. As Virgil had stated over two millenniums ago: *labor omnia vincit*, work overcomes all obstacles.

For Virgil work, however, didn't have the same meaning as it has for us. His *labor* is not compensated by wages or salaries. He talks about agriculture. More specifically, he talks

about human want, and the ways humans can address the needs and necessities of everyday life. During the last two millennia we have not only moved from the fields to clean and well-lit offices, but also the meaning of work has radically changed. Sometimes it seems that the change has been so profound that it is not easy to understand what people were talking about when they talked about work.

For Hesiod, *ergon*—a word that is nowadays often translated as work—meant activity. Work was a way to prepare for the future. With work, man fills his barns, keeps the fiery-eyed hunger away, and secures a good life to himself and his family. With their work humans collect cattle and property, and become a source of pride to the gods.

In Hesiod's world, Golden Age meant time when people didn't have to work. Work appears only at the dusk of Golden Age, at the beginning of the Iron Age, together with the modern man. Work becomes a way to understand the difference between the Golden Age and the Iron Age. In a sense, work becomes an active process which constantly reproduces and reconstructs the fact that humans have lost something that the gods had. In this sense, work becomes a key part of the real nature of man, the aspect that distinguishes men from gods.

Ergon is something that both slaves and free men can be engaged with. This, however, is not the only known form of work. The other form is *ponos*. Ponos is work that does not necessarily produce anything, which has to be done for reasons beyond the control of the worker. Ponos is toil: rolling a huge rock to the top of the mountain, day after another, without a clear meaning or result.

Before Plato and Aristotle we therefore have two concepts of work: one that signifies the distancing of men and gods; and another that signifies the hard toils of slavery. In Aristotle, the interpretation of work, however, gets a new twist. The opposite to work is now *scholē*, time that is free from work. Ponos is something that constrains *praxis*, social activity that defines a person with full citizenship and good life. *Energeia*, being in the state of activity, becomes something that can be actualized as *praxis* and *poiesis*.

For a well-educated mind the modern concept of work, therefore, must have been incomprehensible. Why would anyone in his right mind want to have a constitution in Finland that dictates that everyone has to be provided with a job? What is this self-employed slavery? Where did this strange idea of full employment come from?

Part of the answer is in the Bible. To become real humans, we have to leave the Paradise and earn our living by the sweat of our brows. The difference between dust and life is work, and when work ceases, to dust we will return. In biblical terms, the idea of retirement does not make any sense. To put it bluntly, retirement means death. In this human microcosm life is full of work, and we reflect God, the worker, who creates the world, and rests on Sunday.

But in the human world Monday mornings are eternal. God's work has to be something different from the work of Adam. It is, of course, impossible that God would be punished

by toil. Yet, there has to be a link that connects the two. Indeed, Luther solves this problem by defining work as a form of prayer. By working, we become part of the work of God. Calvin goes even further, arguing that through work we realize God in ourselves. Only through success and profit from work, men are able to show that they are among the Elect.

At the same time, social utopists bring the theme of *ponos* back to the discussion. Work becomes a problem of planning. As Francis Bacon teaches us, work can be divided among the members of society, and only those who do their fair share earn their place in the society. Society becomes a society of ants. Work has to be understood as a social relation.

The interpretation of energy changes, as well. It becomes a hidden potential that can be stored and transformed into work at will. In the modern scientific worldview, this aspect of work becomes increasingly important. For the first time, work becomes abstract and detached from human nature. Work becomes one factor of production, which can be measured and mixed with land, money and machines to create products that never existed before. Instead of working for God, people start to work for other people.

In the middle of industrialization, Marx combines the view that work is part of human nature and the idea of social division of labor. Indeed, Marx argues that humans are fundamentally social beings that become what they are only as a result of collective activity of production. For Marx, human labor creates humans and their societies, and makes them different from apes. The human mind and social structure develop simultaneously with increasingly complex forms of production.

Marx, however, also notes that the social division of labor has its risks. In the process, the worker may lose his or her connection with the results of labor. Indeed, Marx argues that this process of alienation is the source that historically creates private property and the capitalist system, which further and further alienate workers from the meaning of the objects of the production. Work, according to Marx, becomes simply a means for survival. As a consequence, humans lose their distinctive character as social beings, and become animals again. Or, in other terms, they become parts of a machine, and subjects of forced labor.

In this century, all these aspects of work are simultaneously present. For a while, everything is fine. The demands of production, the values of culture, institutions of education, legal systems, opportunities, and individual progress are nicely aligned. Maybe we could characterize the industrial age as this short period in history when this perfect alignment occurs.

At the centers of industrial capitalism, productivity increases rapidly. Proletariat becomes bourgeois. Men and women go to work, the opportunities for consumption expand, and each succeeding generation has material evidence of its evident success. Capitalism marches along, and measures its progress by milestones that—at a closer look—appear to

be toasters, cars, nylon stockings, hot-water boilers, microwave ovens, blinking TV screens, and Barbie dolls.

The children of the Agrarian Age go to school, get educated, and land on middle-class public sector jobs, from time to time remembering their revolutionary youth, teaching their children the lesson they have just learned themselves: the importance of good education.

When we pass the turn of the millennium, the Age of Middle Class is now over. Work and education have become economic factors in the global equation. In a sense, the modern economy has now succeeded in fully detaching work from the human nature. Work has become a statistical problem, which we can get rid of by adjusting economic growth and the amount of money on the market.

From the economic point of view, however, we have no way of making a distinction between *ponos* and *ergon*. It makes no difference if we carry a stone from one pile to another, and back, or if we work to feed ourselves and our families. Economically both types of work may be as good. On the contrary, often it seems that when we do things that are meaningful for us, we are compensated less, in economic terms, as when we work to fulfill someone else's needs. Ask any modern poet.

Indeed, labor markets to some extent compensate for alienation, thus making meaningless work economically more valuable than work that directly addresses the needs of a worker. Moreover, when economic terms are used, it really doesn't matter whether work is done by humans or by machines, or whether some people work like slaves and the rest enjoy their eternal vacation on some distant tropical island. Here economic theory is blind like justice, but not because of impartiality. It is blind just because it doesn't care.

Paradoxically, however, the global system of economic competition requires today that jobs become inherently human. Those jobs that do not require human mind can be automated. Human workers are needed only where their creativity, knowledge, and commitment matter. If you want to argue that Marx is dead, this is the right argument. Today people spend a lot of effort and get a lot of training to make their work meaningful for them.

Jobs that require creativity, knowledge, and commitment have become important sources of meaning and identity. In modern times, we don't work for gods or other people who have taken the role of gods. Instead, we work for ourselves. Or, more exactly, we work our selves. Work has become one way to produce and reproduce our identity and social location. As a result those who are lucky enough to have such golden opportunities work more than ever before. There is no clear distinction between work and leisure anymore. Today we, as workers, have become our own slaves.

Modern planners often see the problem in matching worker competences and the needs of economy. Vocational education is sometimes like a production machine that eats raw material and spits it out to fill the needs of the every-hungry and inconstant market. I

don't believe optimal production planning is a major problem. Maybe planning works for non-discretionary and alienated occupations, but it probably needs to be reconsidered for discretionary jobs where education plays a different role. In general, there is no way to systematically upgrade worker competences so that they would answer the needs of global competition. To be better than their competitors, firms need exceptional competences. When the educational system eventually adjusts to produce skilled workers, they are not exceptional anymore. At least there is the risk that demands for skill levels grow faster than any pool of these skills. Although there may be local concentrations of skill that create local competitive advantage, in the long run these advantages easily fade away. These are the days when relative advantage is the only advantage, and being the fourth doesn't count. If we study the development of work compensation and income differences, I think we can see that the global economy pays for exceptional skill that is in short supply, and not for absolute levels of competence.

In this situation, the best way for a worker to generate exceptional competences is to be where new knowledge is created. Indeed, learning by doing is rapidly increasing its importance. Today, *ergon* is an important form of *scholē*. Learning opportunities and work opportunities have become interdependent. We don't really understand the implications of this for the educational system. How do we manage the system of competence development if private firms control the best competence development opportunities? How do we measure skills when Microsoft holds the certificate?

Technology has the important characteristic that it accumulates human learning. When we develop new machines and tools for production, we always build on the best existing foundation. In essence, we multiply our previous results when we improve our best current technology. This, in practice, means that technological development is exponential. At the same time it means that no human—however competent he or she is—can compete with technological progress. There can be no human worker who could become twice as fast every 18 months, have twice the number of neurons every 16 months, or fill one fourth of previous physical space every three years. For technical artifacts this, however, is possible.

The paradox of information society is that we assume that the only sustainable way to create new jobs is by creating them in exactly those areas that increase the speed of technical development. We associate technical development with economic development, and economic development with social development. This association is derived from economic theory and the religious belief that work is part of human destiny. To be a legitimate member of modern capitalist society, people have to work and earn their living. When agricultural and traditional industrial jobs disappear, people, therefore, have to move to those jobs that characterize the modern society. And what, indeed, would be more modern than the new wonders enabled by technology?

When we try to predict the future of occupations and educational needs we could, however, ask whether the nature of work is changing. Maybe the economic aspect of labor is diminishing in value. Maybe we should think *praxis* and *poiesis*, in addition to

ponos. After all, implicitly we have been talking about occupations: our identity and place in the social space.

I think Marx got it wrong also because he believed that alienation of work can be understood as a relation between worker and capitalist. Today, the consumer plays an important part in the transformation of work. Both capitalists and workers do what the consumers want. This closes the equation in a way that Marx couldn't have seen. In varying proportions we all are consumers, capitalists, and workers.

From this perspective we can predict that there are three major forms of work that will grow fast in the future. We could call the related products and services *informational*, *transformational*, and *experiential*. Sometimes the new products are clearly in one segment, but often they package several aspects of the new economy into a single product. They all help the post-modern consumer to integrate his or her identity back into a unified personality. Informational products provide us with tools to make sense of the world around us and coordinate our activities in it. Transformational products, such as education, bodybuilding, health food, therapy, and trendy clothes help us transform our bodies and minds. Experiential products are probably the fastest growing segment. The modern world is rapidly becoming a Disney World.

I think André Gortz made a valid point in the 1970's when he, in essence, proposed that we should combine ponos and poiesis, so that every member of the society has his or her fair share of them. Such a social zebra-model would mean that social stratification occurs within each individual member of the society, and not between people. The stripes of the zebra should be visible both when we observe human life on its everyday level and across the lifespan. The various forms of learning and work should be interlaced. This, of course, requires major reforms in our institutions.

Vocational education is becoming, for example, a key component in the overall competence and knowledge generation system. In the process, the boundaries between organizational development, learning, innovation activities, and academic and industrial research become increasingly difficult to find.

As Manuel Castells has noted, today the global system is a network filled with holes. This is true also for competence networks. You can be close to the nodes of the network and yet disconnected. Although we now live in a society that can be characterized as multiple overlapping networks of communication, exchange, production, power, and trust, there is a clear tendency of these networks to become aligned. If you are a node in one of the central networks, you tend to be a node in all of them. But if you fall through the net, you tend to drop all the way.

One of the most fundamental networks for human beings is the network of communications. The resource in short supply in the future is access to meaningful discourse. When you are linked to the system of social meaning processing, you know how to interpret the world and what is relevant in it. Furthermore, the access to communication networks enables you to continuously update your knowledge and

maintain your competence. As the socially relevant stocks of knowledge are constantly changing, formal education easily becomes just a means to get ahead in the social queues. When that happens—or did it happen already—formal education will have a hard time competing with the real producers of new vocational knowledge, such as Microsoft, IBM, or SAP.

Indeed, some of the socially most interesting networks are today in areas where new technology is being developed. I think this is because of two reasons.

Social mobility happens fastest where there is a lot of movement. The constant revolution generated by innovation opens new opportunities. In the industrial society, social mobility was a process of accumulation and predictable progress. Today social mobility depends on your personal speed. Those who are fastest in dropping everything and grasping the unpredictable opportunity move fastest up the social ladder. Silicon Valley, as a region, has made an institution out of this. It is full of successful dropouts.

In this sense, labor market and formal education are losing their relevance. The new formula for success is to hang in a bar in Hollywood, Silicon Valley, or in the City. A good career seems more and more obsolete an idea. People are trying to hit the jackpot and economically it makes all the sense to stand next to the machine if you want to win. The high-tech labor market is now much closer to the stock market than it is to the traditional industrial job market. People select their jobs based on intellectual and economic options, and these become increasingly intertwined.

The domain of technology development is also interesting today because of this tight linkage between economy and technology. Economic growth and technical development are fundamentally related. The global economic system has already for some time essentially covered the whole globe, and there are not many economically interesting peripheries left for economic expansion. Technology, however, constantly creates new regions for economic activity. Innovation breaks the boundaries of economy, and allows it to expand. Furthermore, the speed of growth can be fastest in these new areas of development. This, in turn, means that global capital flows into such areas of rapid growth, accelerating the speed of change further.

There is nothing inherently wrong with change. We should note, however, that in the current economic system there are no obvious mechanisms that would automatically and optimally adjust the speed of change. On the contrary, one can argue that it is exactly here that the markets don't work. This is because the economic system has a tendency to make those people irrelevant who are not able to move fast enough. The economic system heavily over-counts those who move at the pace of the economic frontier. By definition, however, a frontier is a boundary that can be occupied only by a few.

This is the modern world. Of course, we should ask whether this is a socially, economically, or psychologically sustainable model. This is why even the most committed market liberals have to think about the division of surplus, be it intellectual or material. A society where citizens queue for a small number of lottery tickets has a

very different future than a society where different meaningful opportunities exist in abundance. This, of course, is why politics is becoming increasingly important in the network society. At the same time we bring the social back to economy. My guess is that the end result is a profound change in our economic theories, and social institutions. My message, therefore, is that we should critically evaluate our concepts of work and competence when we try to understand the future challenges and opportunities.

What, indeed, is the role of knowledge and competence in the modern society, and how the formal system of education addresses the current needs of people? What is the link between technological and social change? How do we plan to keep the network tight enough so that the global and local in the world remain parts of the same world? How should we re-conceptualize work? What is the role of vocational education and training in a world where most learning and knowledge generation happens in work? Is there still a role for it?

It is my guess that these questions are no more just philosophical or theoretical questions. Instead, they are very practical questions. They look big, maybe even too big, just because they are so central in our current world. Our attempts to answer them will enable us to address some of the challenges they imply.