

Afterwork and No Happy Hour¹

By 1985, machines will be capable of doing any work Man can do.

— Herbert Simon

What happens once Herbert Simon's thesis is fulfilled? For fulfilled it will be!

In *Player Piano* Kurt Vonnegut portrays a society where a few well-trained engineers and managers oversee and develop an automated production system. The others who cannot compete or interact with machines have exactly what they need, correctly assessed and calculated by the computer. They are kept busy in permanent labor market measures with a choice between the army and the *Reconstruction and Reclamation Corps* ("Reeks and Wrecks"). It is not an evil Orwellian 1984-society but an extension of a welfare system when unemployment goes towards one hundred percent.

Vonnegut began his career writing science fiction and it is probably how his book was perceived when it came out in 1952². Today it is only science: The combined developments of computers, communication systems, robotics, 3-d printers, laser cutters and sensors provide fantastic opportunities to produce goods and services without human labor. Erik Brynjolfsson and Andrew McAfee³ address the development and gives examples such as Google's self-driving car and IBM's Jeopardy-winning computer Watson. They provide constructive suggestions on how spread in income and social status can be reduced, without being convincing in terms of new jobs that must be created to replace those rationalized away. Hence, I would like to go one step further: What happens in the long run when all human labor becomes redundant and all jobs eventually disappear?

I know of no counterproof to Herbert Simon's thesis that there would be no work that cannot be replaced by machines. Work defined for a human being will not be automated as a monolithic task; rather, it is split into components, each of which is automated, that are coordinated into a greater mission. Those with expertise that is hard to replace will see it being spread and replicated so that even when it is still needed, fewer and fewer are required to provide it. One example is the massive open online courses now offered to thousands of students; a course round can have more students than a teacher otherwise trains throughout his working life in the normal classroom model.

The jobs will disappear gradually. Here are some consequences. Firstly, we can deduct the cost of labor for the production of all goods and services. Even those who still have jobs that are not automated will see wages move toward zero for two reasons: first, they compete for the remaining jobs with those who have lost theirs, driving down wages; and the imminent risk of automation means that one cannot become too expensive because those jobs get automated first where there are real savings to be made.

Furthermore, the production may be faster and done with higher quality. The capital cost per produced unit is negligible due to a manufacturing system that can produce products in high volume even if each individual product is only produced in a few copies (the parts are printed and assembled). The same applies to services.

There remains the cost of energy and for products also the cost of raw materials. The marginal cost is zero for renewable energy because it is inexhaustible. Production of goods will be geographically distributed with every factory on the optimal distance between the source of raw materials and consumers to minimize transportation; services are provided from the places where the computer

¹ Originally published in Swedish, *Att leva utan att verka*, Axess magasin, 2014; a feature issue: When Machines Take Over. Translation by Google, with minor manual adjustments and addition of footnotes.

² There were researchers foreseeing both industrial automation and humanoid robots, eg John Diebold who wrote *Automation: The Advent of the Automatic Factory*, 1952, and William Shockley. For an interesting account, see David C. Brock, "Shockley's robot dream," *IEEE Spectrum*, Volume: 50, Issue: 12, 2013, pp 40 – 55; DOI: 10.1109/MSPEC.2013.6676995

³ *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*, Norton, 2014

centers are located (at sea along the equator where solar panels provide electricity and the depths provide cooling water, or in the north where there is plenty of both electricity and cooling).

That leaves cost for raw material, but the cost of extraction consists only of the right to access raw materials; labor and shipping are done at no cost. Raw materials can be recycled with negligible waste⁴ when machines can sift and sort garbage and disassemble disposed equipment; the energy required for the process is, as I said free. Thus, your house may be demolished and rebuilt again and again by machines, after changing tastes and new housing needs⁵. This is true, moreover, for all infrastructures.

Now, if the cost of labor disappears, it is also reasonable to expect that the return on capital tends to zero. Competition is increasing when everything is replicable and no competitive advantage remains for a long time. I also believe that intellectual property is lost when the machines are able to find variants that go beyond the protection of an idea. As for copy protection, a work is broken down into minute pieces that can be assembled without traceability. Data analysis of large amounts of creative works of music, lyrics and images can provide rules that allow a computer to create new works that cannot be traced to those analyzed and synthesized together, for example, to compose new music in the spirit of Bach or Skrillex. With appropriate robots, a computer can paint both clumsily as Baselitz and as elegant as O'Keeffe, and with a 3D printer, it can reproduce all sculptures ever made plus brand new.

When new works created by people are added to the large database of artistic works they get incorporated immediately into new creations. The rules develop through machine learning. The approach to analyze all made works for creating new one is of course different than the human creative process. So what, does it matter if the works are inseparable from humanly created?

Similarly, democracy may be operated continuously by computers that are listening in on our lives; they detect and adapt rules and controls for maximum welfare, minimal poverty and highest happiness (the German Pirate Party calls it *Liquid Democracy* - a continuous flow of decisions⁶).

When will all this happen? Once the programs spin, according to Herbert Simon: *In the computer field, the moment of truth is a running program; all else is prophecy*. It is matter of technological research and development.

Although it is possible to eliminate man, it does of course not mean that we must do it! It is enough that people generally choose human production instead of cheaper and better machine production. For that to happen we just need a worldwide ascetic revivalist movement... Otherwise we create a strange world where the only remaining task for us is just to be human beings; all other tasks are handled cheaper and better by machines. What about life and society then? It is a great challenge that neither engineers nor humanists take on. Here are some questions we should discuss before we enter the second machine age and must resign ourselves to live without working.

We can remunerate each other for giving massages, holding dance classes, or giving theater performances. We can only use the salary to buy interpersonal services of each other and the consumption is naturally limited by our available time. The currency, corresponding to human time and attendance, is not useful for the production system because our work is worthless. We depend on a production system that we no longer are part of. How and to whom do we pay for goods and services, or are they distributed according to some democratically established criteria? Does it make sense to own a production system if there is no return, or do they become publicly owned? The only net supply

⁴ This is referred to as *cyclic economy*.

⁵ The Economist reports on a demolition of a 25-storey building in Lyon that was recycled to 95 percent. *Demolition technology: Bringing the house down*, The Economist, Technology Quarterly Q3, September 6, 2014.

⁶ http://de.wikipedia.org/wiki/Liquid_Democracy

is raw material: But who shall have the right to charge for the right of extraction? And what would they then be able to do with the money? Go to the opera 24/7?

We are programmed to connect our time, our work, creativity, skills and initiative to our standard of living, social status and living situation. When our input is no longer worth anything, we cannot work our way up and change our lives. Who will then stay in the villa on the sunny side with sea views and who must live in Hicksville? We are heading towards a society that we do not know how it will work.

Something entirely different: Some time ago, on April 14, 2013, died Marcella Pattyn, 92, the last beguine in the world⁷. With her died a way of life that has existed for 800 years. Beguines lived simply and worked in their community. They supported themselves on craftsmanship and caregiving, owned possessions and were free to leave the community.

About a week after I read about Pattyn's death and a few months after I finished reading Vonnegut's book, I visited Ghent where there are several extant beguine communities. Each consists of small charming houses with flowering courtyards situated around a chapel on a larger lawn. Perhaps that is how we'll live in the future: in a shielded area where we have fellowship and may find meaning in being with each other, with emphasis on personal creativity, and with rituals and routines for structuring life; because outside the walls, we aren't needed.

An alternative is otherwise to get a dog.

⁷ Read the fine obituary of her in The Economist, April 27, 2013.