



TUM

TECHNISCHE UNIVERSITÄT MÜNCHEN
INSTITUT FÜR INFORMATIK

From data sovereignty to skill sovereignty

Alois C. Knoll und Hanns C. Suckfüll

TUM-I24112

From data sovereignty to skill sovereignty

Generative AI makes it possible for the first time to develop sovereignty-creating trust models for data and function

The following text focuses on an issue that looms on the horizon in the context of the developing “skills economy”, namely the question of how people can maintain and even enhance their social and professional standing and skills in an increasingly powerful AI-based working environment. To this end, we introduce the concept of skill or functional sovereignty.

There have been dramatic headlines in the German daily press in recent months: The CEO of the Federal Labour Agency complains that 35,000 of its 113,000 employees will retire in the next ten years, that there are no replacements in sight and (surprise!) that the agency’s services can therefore only be provided through automation, through the use of artificial intelligence. And further: the Swedish financial services provider Klarna is already no longer hiring any new employees apart from engineers, but has reduced the number of its employees from 5,000 to 3,800 within a year through the use of AI and is aiming for a reduction to 2,000 in the long term – with a simultaneous increase in the total volume of work.

These developments will accelerate and lead to a significant change in the world of work, driven by the rapid and ever-increasing speed at which state-of-the-art artificial intelligence processes will become available. People will work together with a large number of “AI agents”; in many cases, they will no longer be able to tell the difference between them and working with another person – except perhaps in the speed of response from their “partner” in the computer.

These developments in the field of “knowledge work” are in many ways comparable to the developments in the field of “manual labour” in production since the 1970s. The important difference, however, is that in the field of information processing there are hardly any fundamental limits to the computer, while industrial robots tend to take over the strenuous and rough aspects of human activities and still do not come close to the dexterity of the trained human hand.

This raises the question: What consequences does this have for individual knowledge workers and society? And above all: Is this more of an opportunity or a danger? As is so often the case, the answer is: it depends on what we make of it.

Firstly, it should be remembered that the basis of value creation in the knowledge society is the broad and immediate availability of data. It is the raw material from whose analysis and linking knowledge is created that can be used directly or via further processing steps. If you recognise this, it is not difficult to see that the German principle of “data sparsity” is the direct path to impoverishment. Yet everyone in Germany produces a huge amount of data, which they more or less voluntarily make available to the large digital corporations, who are known to use it to create gigantic values and monopolise and influence ever more parts of the economy and society. Just think of your own address data collections, without which you cannot even access basic messenger services.

If you take all areas of a person's life in developed countries together, the production volume of a middle-aged person can easily reach several hundred gigabytes per year (LinkedIn profiles, online job applications, digital invoices and contracts, online banking, e-commerce, social media posts about family and work, ...). According to our considerations, the corresponding data to be utilised via AI can be estimated at the equivalent of ten to fifteen thousand euros per year.

Unfortunately, there is as yet no entity that enables individuals to actually realise this capital, e.g. through an institution that manages this data in trust and sells it to the highest bidder. We therefore have the essentially bizarre situation that data protection legislation and the lack of operational mechanisms for individual data utilisation prevent value creation in society in many places, while at the same time every individual has to disclose a large amount of data in order to be able to participate in modern life in cyberspace – but receives little or nothing in return. However, the real task of the state government should be to provide each individual with a comprehensive set of tools to gain sovereignty over their data and decide for themselves what to do with it.

Even if legislation and an operational basis for such individual data sovereignty are not yet recognisable, it is not too late to implement it. However, it is high time that policymakers got to grips with this issue so that we do not simply give away the next stage of the knowledge society, namely the enormous potential for value creation through generally available personal and individual capabilities, or “skills”, to the digital giants.

We therefore urgently need measures to create “functional sovereignty” or “skill sovereignty”.

What does this mean? Every knowledge worker receives input data or information that is supported by input data and processes it into output data, typically texts, tables, images, etc. He or she does this according to certain rules that they have learnt in their training and which they enrich with experience over the course of their professional life. In this way, they develop their own competence, their own way of working or “mode of operation”, which sometimes distinguishes them fundamentally from their colleagues.

As mentioned above, this individual expertise is now gradually being transferred to the computer, i.e. to an AI. The AI can initially only replicate a few aspects of work, but over time more and more. The mechanisms for “skill transfer” are becoming increasingly efficient and it is foreseeable that this will lead to complete coverage of the work of a large number of knowledge workers. As an aside, it should be noted that back in the early 1980s, during the hype surrounding “expert systems”, attempts were made to mould the knowledge of experts into rules that could then be interpreted by the computer. However, this was very unsatisfactory because, on the one hand, computing technology was still not very efficient and, on the other, only very specialised groups of people were prepared to participate in it – the fear of losing their own jobs was too great.

It is clear, therefore, that professional expertise is an extremely valuable asset, very different from the data produced by an individual, and therefore requires special protection. Conversely, there are also enormous opportunities for those who transfer their professional competences to the computer – they can multiply their knowledge workforce, their skills, practically indefinitely and continue to use them. This is a decisive difference to the Luddites of the 19th century – they had no chance to defend themselves against the machines, their labour simply became superfluous.

The decisive factor is that the person who reproduces and expands his or her abilities always and for all time remains master of these abilities and they cannot be taken away from him or her. The person can, for example, be employed by several employers at the same time, but they cannot then use the person's "functional replicants" independently and the humans retain the "copyright", i.e. the full right of disposal over their entire stock of replicants.

Of course, even in a knowledge economy, nothing comes for free. The entire computing technology is still in the hands of the digital giants, as are the basic functions of AI. Their utilisation, at least so far, has devoured vast amounts of capital and, above all, energy. This causes costs for everyone who wants to reproduce their labour and ensures that the prices for this cannot plummet if the market behaviour of those involved is fair. However, it is all the more evident that the provision of computing capacity and basic AI services is an existential task of public services, without which an AI-based skills economy cannot develop – at least not one that supports and does not undermine Europe's overall sovereignty.

We are therefore once again at a crossroads in Europe: do we want fear-driven legislation that hinders innovation or legislation that proactively addresses and shapes emerging developments and strengthens the European idea of the right of the individual by giving them the opportunity to strengthen rather than lose sovereignty over their data and capabilities?

So it should be clear what we need to do: Firstly, mechanisms and institutions for achieving data sovereignty must be created that help to overcome the highly restrictive mental barriers, particularly in Germany, and revolutionise the concepts of data protection and the individual development of all members of society. In the emerging skills economy, it is even more crucial to secure the skills sovereignty of the individual and thus the independence of Europe as a whole through consistent research and development of the basic concepts while at the same time building the corresponding infrastructure as a "data and skill trust" and largely self-organising sets of rules governing it.