

Professor Neil Lawrence Google Deep Mind Professor of Machine Learning, University of Cambridge State of Open: The UK in 2024 Phase One: AI and Open Innovation



Professor Neil Lawrence
Google Deep Mind
Professor of Machine
Learning, University of
Cambridge

Neil Lawrence argues that to preserve the open society, we must subject technology creators to scrutiny. Open development processes are crucial for accountability, and we need to empower professionals with tools and knowledge to critically understand these technologies. This means redesigning how humans interact with these systems, giving administrators the ability to question their functioning.

The open society relies on institutions working together to solve societal issues pragmatically, but big tech companies now endanger the ecosystem. He suggests that to ensure the survival of the open society, it must adopt open development practices, allowing collaborative problem solving.

Thought Leadership: The software of the past versus the Software of the future

In Goethe's poem *The Sorcerer's Apprentice*, a young sorcerer learns one of their master's spells and deploys it to assist in his chores. Unfortunately, he cannot control it. The poem was popularised by Paul Dukas's musical composition, in 1940 Disney used the composition in the film *Fantasia*. Mickey Mouse plays the role of the hapless apprentice who deploys the spell but cannot control the results.

When it comes to our software systems, the same thing is happening. The Harvard Law professor, Jonathan Zittrain calls the phenomenon intellectual debt. In intellectual debt, like the sorcerer's apprentice, a software system is created but it cannot be explained or controlled by its creator. The phenomenon comes from the difficulty of building and maintaining large software systems: the complexity of the whole is too much for any individual to understand, so it is decomposed into parts. Each part is constructed by a smaller team. The approach is known as separation of concerns, but it has the unfortunate side effect that no individual understands how the whole system works. When this goes wrong, the effects can be devastating. We saw this in the recent Horizon scandal, where neither the Post Office or Fujitsu were able to control the accounting system they had deployed, and we saw it when Facebook's systems were manipulated to spread misinformation in the 2016 US election.



When Disney's *Fantasia* was released, the philosopher Karl Popper was in exile in New Zealand. He wrote *The Open Society and its Enemies* when his hometown of Vienna was under Nazi rule. The book defends the political system of liberal democracy against totalitarianism. For Popper, the open society is one characterised by institutions that can engage in the pragmatic pursuit of solutions to social and political problems. Those institutions are underpinned by professions: lawyers, the accountants, civil administrators. To Popper these "piecemeal social engineers" are the pragmatic solution to how a society solves political and social problems.

In 2019 Mark Zuckerberg wrote an op-ed in the *Washington Post* calling for regulation of social media. He was repeating the realisation of Goethe's apprentice, he had released a technology he couldn't control. In Goethe's poem, the master returns, "Besen, besen! Seid's gewesen" he calls, and order is restored, but back in the real world the role of the master is played by Popper's open society. Unfortunately, those institutions have been undermined by the very spell that these modern apprentices have cast. The book, the letter, the ledger, each of these has been supplanted in our modern information infrastructure by the computer. The modern scribes are software engineers, and their guilds are the big tech companies. Facebook's motto was to "move fast and break things". Their software engineers have done precisely that and the apprentice has robbed the master of his powers.

This is a desperate situation, and it's getting worse. The latest to reprise the apprentice's role are Sam Altman and OpenAI who dream of "general intelligence" solutions to societal problems which OpenAI will develop, deploy, and control. Popper worried about the threat of totalitarianism to our open societies, today's threat is a form of information totalitarianism which emerges from the way these companies undermine our institutions.

So, what to do? If we value the open society, we must expose these modern apprentices to scrutiny. Open development processes are critical here, Fujitsu would never have got away with their claims of system robustness for Horizon if the software they were using was open source. We also need to re-empower the professions, equipping them with the resources they need to have a critical understanding of these technologies. That involves redesigning the interface between these systems and the humans that empowers civil administrators to query how they are functioning. This is a mammoth task. But recent technological developments, such as code generation from large language models, offer a route to delivery.

The open society is characterised by institutions that collaborate with each other in the pragmatic pursuit of solutions to social problems. The large tech companies that have thrived because of the open society are now putting that ecosystem in peril. For the open society to survive it needs to embrace open development practices that enable Popper's piecemeal social engineers to come back together and chant "Besen, besen! Seid's gewesen." Before it is too late for the master to step in and deal with the mess the apprentice has made.



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