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The Symbiosis of Generative AI and Work

Expanding Horizons or Eroding Human Competence?

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ABOUT THIS PAPER

The research project “Generative Artificial Intelligence at the Workplace” (GENKIA) is conducted by the Berlin Social Science Center (WZB) in cooperation with the Weizenbaum Institute and the Alexander von Humboldt Institute for Internet and Society (HIIG), funded by the Federal Ministry of Labor and Social Affairs (BMAS). We explore how genAI is changing work for individuals, organizations, and professional fields. As generative AI is set to significantly influence knowledge work, our research focuses on five socially relevant fields where such systems are already being used: marketing, human resource management, programming, journalism, and public administration. We aim to understand how employees interact with genAI and the challenges and opportunities that arise in these fields.

Our project operates on multiple levels – the individual level, organizational level, and professional field level – and employs diverse research methods. By combining literature reviews, interviews, case studies, online forum analyses, and experimental studies, we aim to provide a comprehensive understanding of generative AI's effects in the workplace and to develop recommendations for promoting decent work in the context of new technologies. More information: <https://www.weizenbaum-institut.de/en/projects/generative-ki-in-the-workplace/>

ABOUT THE WEIZENBAUM INSTITUTE

The Weizenbaum Institute is a joint project funded by the German Federal Ministry of Education and Research (BMBF) and the State of Berlin. It conducts interdisciplinary and basic research on the digital transformation of society and provides evidence- and value-based options for action in order to shape digitalization in a sustainable, self-determined and responsible manner.

Weizenbaum Discussion Paper

The Symbiosis of Generative AI and Work

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Abstract

The proliferation of generative AI (GenAI) applications in the workplace has led to widespread speculation about the future of work. In this discussion paper, we formulate five theses on the relationship between GenAI and work, based on theoretical considerations and initial empirical impressions. They also serve as hypotheses for the GENKIA research project, in which we empirically examine changes in work across programming, journalism, marketing, HR management and public administration. The hypotheses are as follows: (1) Despite technical breakthroughs, GenAI is not an equivalent to human intelligence; (2) GenAI becomes usable through human labor; (3) GenAI represents a new quality of interaction between humans and machines; (4) The introduction of GenAI creates work; (5) Generative AI requires new answers to ensure good working conditions.

¹ This headline was developed using ChatGPT and subsequently modified. The prompts used (in German) were: "Generate a creative title for a text on the topic 'generative AI and work'"; "More suggestions please, and more creative ones!"; "More suggestions, please!".



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Introduction

AI applications for generating texts, images, videos, and music have rapidly proliferated in recent years. The workplace is no exception to this, leading to widespread speculation about the future of work. Will generative AI (GenAI) render humans increasingly redundant, even surpassing us? Or is it a sort of technological superpower that can amplify human abilities? What prerequisites are needed to use GenAI effectively? And under what conditions could the application of GenAI be beneficial in terms of social justice and decent work? In this paper, we explore these questions and formulate hypotheses based on theoretical considerations and initial empirical insights. These hypotheses serve as a foundation for a comprehensive empirical study within the research project “Generative AI at the Workplace,” funded by the German Federal Ministry of Labor and Social Affairs (BMAS).

Hypothesis 1: Technical Breakthroughs – But No Equivalent to Human Intelligence

Large Language Models (LLMs), which GenAI primarily relies on, are algorithms designed to predict and generate text. Their underlying transformer architectures use statistical methods capable of modeling even complex semantic relationships. This enables the reproduction of language in various application contexts – with astonishingly accurate results that have surprised even experts.

Despite the remarkable capacities and applications of these new technologies, they differ from human abilities. They can process far larger amounts of data than humans and handle content in diverse ways. However, their results stem from statistical methods, not conscious reflection. GenAI doesn't understand the content it conveys and lacks knowledge of specific social, institutional, or technical contexts. Due to these deficiencies, GenAI applications have difficulties with logical reasoning and sometimes produce factually incorrect or inappropriate results.

There is controversy about whether these challenges can be overcome within the current development paradigm. Proponents of the scaling hypothesis, such as OpenAI founder Sam Altman, argue that models will become increasingly superior with more computing power, data, and larger model sizes, eventually surpassing human capabilities. However, it is more likely that without significant scientific breakthroughs, further development will eventually reach a plateau. Given the prevailing technical paradigm, there is no direct path to achieving machine reasoning comparable to human intelligence, and even if such reasoning were possible, it would fundamentally differ from human intellect.

Beyond these speculations about AI's future development, it's crucial for today's discussion on GenAI's impact on work that its current forms differ from human intelligence and are largely unaware of contextual conditions. Therefore, productive use relies heavily on human input and oversight to ensure results are appropriate and accurate. This could lead to a new quality of human-machine interaction.

Hypothesis 2: GenAI Use Depends on Human Inputs

Perceptions of GenAI are shaped by mystification. It appears as if the AI systems independently write poems, design images, or develop plots for audio plays. Indeed, it's astonishing how quickly seemingly thoughtful results can be produced with these GenAI tools. GenAI sometimes even appears intelligent and faster than humans. However, such attributions overlook the human contribution on three levels: first, the systems are powerful because they've been fed vast amounts of collective knowledge derived from human culture, communication, and science; second, GenAI systems were designed by humans to be usable by the general public²; third, there's always a human behind the impressive GenAI results who at least devised the initial prompt (i.e., text input) and decided whether the results are useful. Complex outputs are actually sequences of interactions between humans and GenAI systems, where prompts are tested and discarded, and GenAI results are continuously modified until they fit. Overlooking this human agency leads to erroneously attributing human qualities to GenAI systems. This is problematic because it overestimates GenAI's capabilities and underestimates the human role in the creative process.

Applying GenAI resembles a large social experiment where people develop suitable applications, solutions, and methods to use the technology meaningfully. Human labor capacity is crucial here – the totality of skills, experiences, and decision making a person brings to the work process. We believe that human expertise remains significant for meaningful GenAI use and may even gain importance. Whether this is acknowledged, promoted and rewarded in organizations remains an open question. Given staff shortages and work intensification, short-term automation and productivity expectations may dominate – to the detriment of a holistic GenAI implementation that recognizes the value of human labor contributions.

Against this background, the discussion about introducing GenAI should focus on two key aspects. First, the learning processes required to use the technology thoughtfully. Neglecting this increases the risk of improper or ineffective use of GenAI and potential conflicts over its implementation. Second, the role that human labor capacity plays in interacting with GenAI and the need to upgrade human work to this end.

2 While it's true that LLMs largely "program themselves" within the framework of so-called unsupervised learning, strategic decisions about the systems' architecture, data bases, processing methods, and business models are made by humans. Additionally, all common GenAI systems are filtered, that is, the automatically created content is modified by decision rules crafted by humans.

Hypothesis 3: A New Quality of Human-Machine Interaction

Every past technological leap has generated uncertainties about substituting human workers with technology. This is no different with GenAI today, especially when considering that some of the content produced by it is scarcely distinguishable from manually created texts, images, or music. Accordingly, there are already areas where GenAI has led to the partial substitution of human labor – for example, creating product descriptions in e-commerce or virtual news anchors in journalism. Such GenAI applications allow companies to quickly generate specific and extensive content that would otherwise require time-consuming human work. What's new is that substitution now affects areas of knowledge work and isn't limited to routine tasks. Therefore, potential substitution effects must be taken seriously. In the coming years, conflicts may arise over tasks being upgraded or downgraded by GenAI or significant shifts in job composition across many professions.

However, interpreting GenAI primarily as a substitution technology falls short. As noted, human intervention remains essential, particularly for final assessments and adapting results to specific contextual requirements, with GenAI-driven processes frequently supplemented by human corrections to ensure accuracy. A new level of human-machine interaction emerges when GenAI is used as a brainstorming tool or sparring partner to develop new ideas. Uniquely, humans can assign a wide range of roles and tasks to GenAI, including those that other humans can't fulfill or only with great effort. Who, for instance, can spontaneously turn a book into a podcast? It's not primarily about substituting existing tasks but exploring new horizons and possibilities that didn't even exist before.

This leads to changes or shifts in task profiles. The quality of GenAI results depend on the competencies of those operating it. This often requires building on existing knowledge by developing new skills in GenAI operationalization. We believe that integrating GenAI across professions will necessitate additional training, particularly in crafting effective prompts, selecting suitable collaboration methods with GenAI, and critically evaluating its outputs. People working with GenAI need not only technical expertise but also critical thinking and professional expertise to correctly classify and continuously adjust AI-generated content. The use of GenAI also encourages reflection on core competencies in certain professions, potentially enhancing the focus on human expertise, as indicated by our preliminary study on GenAI applications in programming, science, and coaching.³

We also expect that the use of GenAI will lead to a restructuring of work beyond individual workplaces. In some areas, there's a trend toward a bifurcation of products and services. On one side are mass-produced, inexpensive solutions generated with AI; on the other, there's a growing demand for high-quality, personalized services that are controlled and adapted by human exper-

3 Butollo F, Haase J, Katzinski A-K, Krüger, AK (forthcoming): Uncertain futures of work. The perception of generative AI in knowledge professions. In: Kox T, Ullrich A, Zech H (2024) Uncertain journeys into digital futures: Inter- and transdisciplinary research for mitigating wicked societal and environmental problems. Nomos.

tise. This trend is evident in the translation industry, for instance, where machine translations are commonly used, but professional translators remain in demand for more complex tasks.

The division of labor between companies might also change. In marketing, product descriptions are currently handled by specialized agencies, which may outsource the work to crowd workers. If clients can now perform these tasks with GenAI, previously outsourced activities could be reintegrated (“insourcing”)—or agencies might specialize in GenAI-generated content, largely substituting crowd work.

Overall, we anticipate a far-reaching transformation of employment fields, where competencies, workflows, divisions of labor, and even power relations are redefined. In this context, GenAI signifies more than just automating the status quo.

Hypothesis 4: Introducing GenAI Requires Work

Due to the mystification of GenAI in public discourse, expectations for rapid productivity gains in companies are enormous. While GenAI has the potential to greatly enhance productivity in knowledge work, expectations for quick returns should be approached with caution. Implementing GenAI requires significant effort. Beyond technical innovation, companies and public institutions must also focus on social innovation—that is, adapting processes, work organization, and competencies to this evolving environment.

First, this requires determining under what circumstances GenAI can be used in companies. Most companies need solutions that are data-protection compliant and deliver excellent results for their specific business tasks. This requires adapting GenAI systems by training them with domain-specific material so results align with the context of their application, while also ensuring sensitive data isn’t externally shared. Introducing GenAI necessitates strategic decisions about specific software solutions and interactions with software providers. Whether companies purchase customized GenAI applications or ready-made solutions depends on financial resources. Additionally, they must comply with the European AI Act, which addresses the reliability of generated results and accountability.

Second, practical methods for using GenAI must be established. Past research on digitalization in organizations shows that companies often introduce new technologies top-down, and employees must learn to handle them subsequently. However, effectiveness depends crucially on human labor capacity. We believe that management cannot mandate meaningful GenAI use. Instead, employees must experiment within their contexts to integrate new tools effectively into their routines. GenAI’s potential is only realized if people know how to use these tools: risks like hallucinations, data bias, and privacy issues can be exacerbated by a lack of competency. Spaces for experimentation are vital for acquiring these skills. For example, large publishers are creating “AI labs” where employees can develop, test, and potentially discard applications. These spaces are part of broader approach to organizational learning, addressing not only new competencies but also new departments, job profiles, or roles (e.g., fact-checking teams in journalism).

In summary, we expect that the application of GenAI does not guarantee productivity gains. As with previous digitalization efforts, organizational innovation processes are necessary, bringing diverse challenges and potentially short-term costs. GenAI also implies new, specific challenges.

Hypothesis 5: Generative AI and Labor Policy

GenAI's impact on work can vary greatly, depending on the application area and negotiation processes. Work can be enhanced if new GenAI skills and existing expertise are acknowledged; however, employees' positions may be threatened if knowledge-intensive activities, such as translation or graphic design, are displaced by automated products. GenAI can ease workloads when used as a brainstorming partner, but it can also create new pressures if introduced primarily as a tool to rationalize work processes.

Ultimately, the results will depend on how politics and social partners shape these processes. We identify three key areas for action: monitoring labor market developments, establishing agreements on relief effects, and updating co-determination mechanisms.

Monitoring Labor Market Developments

In many professions, fear of technological mass unemployment is widespread. Substitution effects in specific fields can drive social inequality and insecurity. There will be winners and losers across sectors; the social composition and internal division of labor in organizations will change. Even if we don't primarily view GenAI as a job-destroying automation technology, its effects on knowledge work should be closely monitored to address social disadvantages and, importantly, to provide opportunities for retraining.

Negotiating Workload Relief

We believe that successful GenAI implementation largely depends on whether it brings noticeable improvements for employees. Its effective application significantly relies on the initiative and motivation of those working with it on a daily basis. While management can decide to introduce GenAI tools, they can't dictate effective interaction with them. Employees need to experiment to find out which prompts work and which applications are worthwhile. This requires that employees embrace the tools and recognize their personal benefits. Sufficient space and support are needed to explore new possibilities.

To ensure GenAI use improves working conditions, concrete agreements should be made at the company level. A central issue is balancing productivity gains with relief from excessive work burden. This involves defining expected time savings from GenAI, determining how to monitor them, and understanding how they contribute to tangible employee relief. Only if GenAI advantages lead to noticeable easing of workloads will employees be motivated to proactively support its introduction and find ways to perform their jobs better and more effectively.

Updating Co-Determination

GenAI's diffusion challenges established forms of co-determination of working conditions. Works councils are often overwhelmed by the speed and quantity by which new GenAI applications are introduced. What is more, many GenAI systems' functionalities are hard to grasp – it's fundamentally challenging to explain how GenAI derives its results, and management often isn't willing to transparently convey background information about these software tools. The German Works Council Modernization Act of 2023 allows councils to consult external experts, a necessity given the technical complexities of this environment.

Another challenge is that technology changes during use through software updates or by learning from usage data. Therefore, procedural co-determination forms are needed, where the effectiveness of agreements is monitored and adjustments made as necessary. If technical systems change over time, agreements between management and employees must also be adaptable.

\\ Imprint

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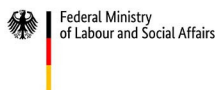
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