Center for Digital Innovation

AI Reshaping Work Practices

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June 25, 2025
Digital Humanism

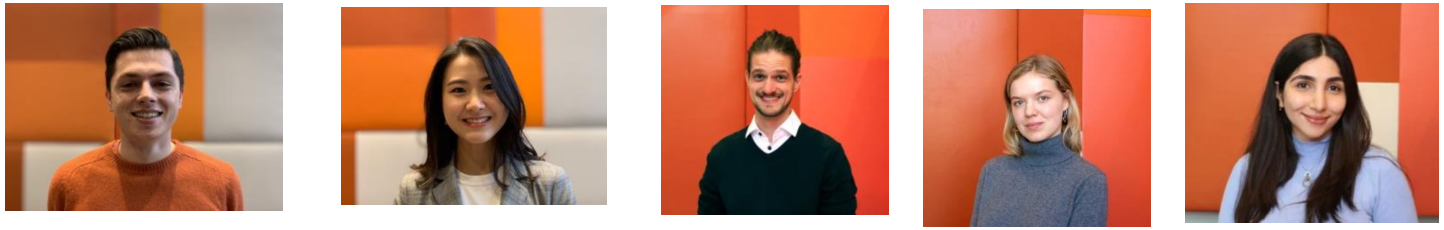
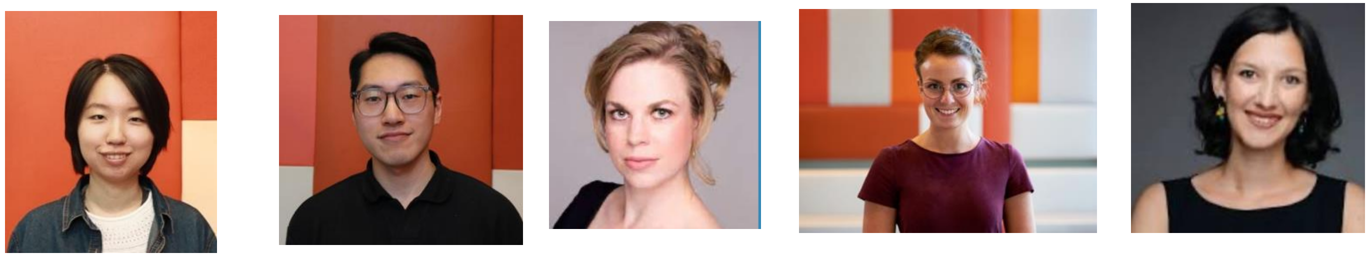
- Research on AI at work still rather conceptual and prospective

- Empirical research: unit of analysis either macro (e.g. labour market) or very micro (individual tasks)

- However, to assess AI's REAL consequences for work
  - Study the **actual work practices embedded in a particular context**
  - Include the **design of AI systems** as these influences its use
  - The most interesting findings are the **ripple 2nd order effects**
  - **To study all this: relational ethnographies are needed!**

AI@Work Lab

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AI@Work: practice perspective

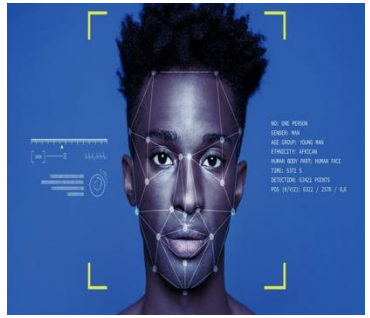
- A practice is a **bundle of interconnected actitivies**, eg. Predicting crimes, operating patients, creating promotion materials, selecting candidates, sorting vegetable seeds etc.

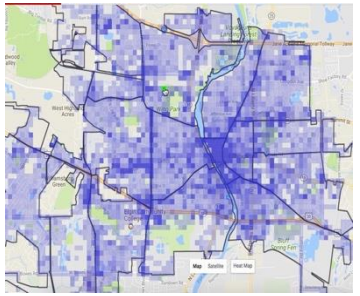
- **Shared** instead of individual;

- **Recurrent** instead of accidental;

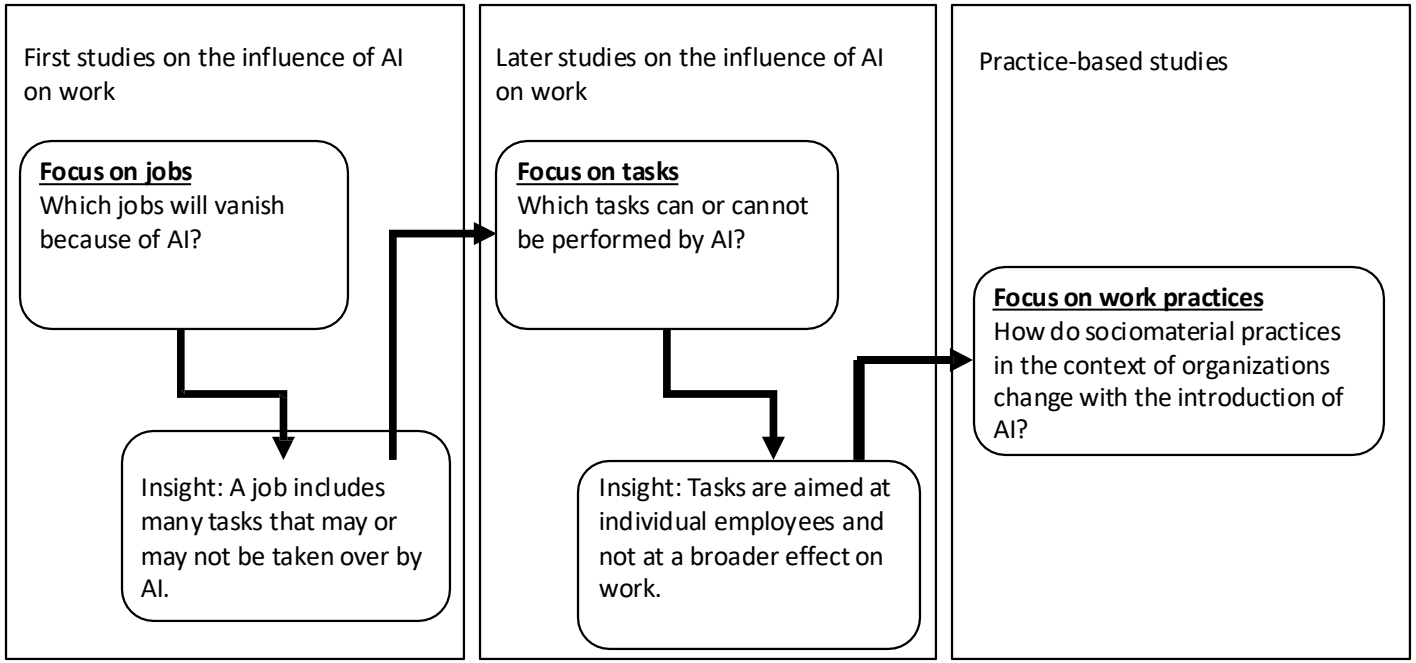
- **Sociomaterial:** practices are not purely social but are always intertwined with material elements, such as tools, technologies, and physical spaces.

- **Micro-macro**: ripple effects / 2nd order effects / institutionalization





Perspectives on changing work



Requirees relational ethnography

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http://pubsonline.informs.org/journal/orsc

ORGANIZATION SCIENCE
Vol. 33, No. 1, January–February 2022, pp. 59–82
ISSN 1047-7039 (print), ISSN 1526-5455 (online)

In the Land of the Blind, the One-Eyed Man Is King: Knowledge Brokerage in the Age of Learning Algorithms

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Received: January 15, 2020
Revised: December 17, 2020; June 19, 2021; September 13, 2021
Accepted: October 2, 2021
Published Online in Articles in Advance: November 30, 2021

https://doi.org/10.1287/orsc.2021.1544

Abstract. This paper presents research on how knowledge brokers attempt to translate opaque algorithmic predictions. The research is based on a 31-month ethnographic study of the implementation of a learning algorithm by the Dutch police to predict the occurrence of crime incidents and offers one of the first empirical accounts of algorithmic brokers. We studied a group of intelligence officers, who were tasked with brokering between a machine learning community and a user community by translating the outcomes of the learning algorithm to police management. We found that, as knowledge brokers, they performed different translation practices over time and enacted increasingly influential brokerage roles, namely, those of messenger, interpreter, and curator. Triggered by an impassable knowledge boundary yielded by the black-boxed machine learning, the brokers eventually acted like "kings in the land of the blind" and substituted the algorithmic predictions with their own judgments. By emphasizing the dynamic and influential nature of algorithmic brokerage work, we contribute to the literature on knowledge brokerage and translation in the age of learning algorithms.

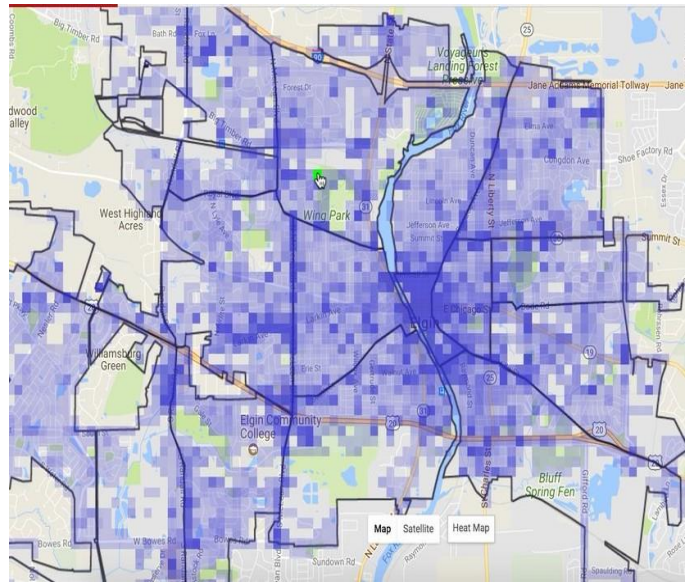
History: This paper has been accepted for the Special Issue on Emerging Technologies and Organizing.

Keywords: learning algorithms • artificial intelligence • algorithmic brokers • knowledge brokerage • knowledge sharing • knowledge translation

Introduction

From healthcare to recruitment, litigation, and law enforcement, learning algorithms are increasingly prevalent in everyday work (e.g., Brayne 2020, Rezazade Mehrizi et al. 2020, Zhang et al. 2020, Lebovitz et al. 2021, Van den Broek et al. 2021). By combining large data sets with advanced computational and statistical methods to make connections between data points—a process that is called "machine learning" (Burrell 2016, Brynjolfsson and McAfee 2017, Davenport 2018)—learning algorithms generate algorithmic predictions (Faraj et al. 2018). Learning algorithms deserve specific scholarly attention, as we cannot rely on the existing understanding of "intelligent technologies" in organizations (Von Krogh 2018, Bailey and Barley 2020, Huysman 2020, Pachidi et al. 2021). Earlier "rule-based" technologies, such as expert systems, reflected the expert knowledge that was coded into them (Forsythe 1993), and developers could explain their outputs. In contrast, through machine learning, the input data and the knowledge of developers are autonomously transformed into algorithmic predictions. The downside of machine learning is that it is difficult for humans to discern how and which connections between data points are made, which makes it challenging to understand how algorithmic predictions are generated. This problem is often referred to as the "opaque nature" (Burrell 2016, Christin 2020) or "black box problem" (Pasquale 2015, Anthony 2021) of learning algorithms.

The opaque nature of learning algorithms makes trusting and using algorithmic predictions in practice problematic (Bader and Kaiser 2019, Lebovitz et al. 2019, Glikson and Woolley 2020). As a potential solution, recent studies posit that "algorithmic brokers" (Kellogg et al. 2020) could emerge to facilitate the use of these systems by translating predictions to users (Henke et al. 2018, Gal et al. 2020, Sachs 2020). The work of algorithmic brokers should therefore resemble what is referred to in organizational theory as "knowledge brokers" (e.g., Carlile 2004, Pawlowski and Robey 2004, Meyer 2010)—actors who enact translation practices to solve knowledge boundaries between communities (Brown and Duguid 1998). These knowledge boundaries are defined by the practices that are easily shared by actors within communities and equally difficult to share by actors from different communities. For algorithmic brokers, this means solving a knowledge boundary between a machine learning community and a user community.



	DIscriminative AI	Generative AI	Avenues for mid-range theory development
Scope	Task specific	Multi-purpose	Enabling easy integration into and reshaping of a diverse array of professional fields and sectors
Adoption	Top-down	Bottom up	Shifting the balance of power and control within the organizations. Raising questions of governance, oversight and ethical use.
Behavior and output	Structured	Emergent	Creating unpredictable, biased and 'hallucinated' content, wrought with ethical concerns, for knowledge workers, managers, organizations, and professional institutions.

GenAI's multipurpose use

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- Workers increasingly rely on GenAI as their go-to source for all manner of information search, brainstorming, proofing work, coding, constructing images

- GenAI can 'democratize' knowledge by reducing dependence on others.

- **But what are the implications for managers ?**

ARTICLE IN PRESS

Business Horizons (xxxx) xxx, xxx

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Managing a ChatGPT-empowered workforce: Understanding its affordances and side effects

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KEYWORDS
Generative AI;
ChatGPT;
Large language models;
Affordances;
Knowledge work

Abstract Generative AI, particularly ChatGPT, creates new managerial concerns. This article addresses a crucial managerial challenge: While employees are including the tool as their private knowledge assistant in many aspects of their daily work, it is difficult for managers to see and understand the impact within their organization. There is more and more literature on what ChatGPT means for business, but we cannot say much as long as we are uninformed about its actual use. So, getting an insider's perspective is needed to think about the consequences for organizations. The article is grounded in a qualitative study of employees' experiences of interacting with ChatGPT among 50 early ChatGPT adopters. First, we show how employee-ChatGPT relations develop from private, experimental use into an integral part of knowledge work. Second, we identify six affordances: searching for information, brainstorming ideas, structuring content, writing a first draft, embellishing text, and proofing work. Further, we highlight three looming side effects of ChatGPT use that threaten knowledge ties, the quality of knowledge in organizations, and how work roles are configured. Accordingly, this article offers managers guidance in managing a ChatGPT-empowered workforce in a way that aims to mitigate these side effects while harnessing opportunities.

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https://doi.org/10.1016/j.bushor.2024.04.009
0007-6813/

Table 2. ChatGPT affordances: What participants use ChatGPT for

Affordance	Description	Illustrative prompts: Creating a marketing campaign proposal
Searching for information (37 participants)	Finding information; Seeking advice; Filling blanks	Please conduct research on client xyz's industry. Identify key trends, opportunities, and challenges that impact the industry's growth and potential.
Structuring content (35 participants)	Asking to summarize content; Asking for an outline	Please summarize the following marketing report into one paragraph, followed by three key takeaways.
Brainstorming ideas (36 participants)	Asking for initial ideas and options that are then narrowed down and expanded upon	Give me five suggestions for a marketing campaign slogan that is timely and memorable.
Writing a first draft (34 participants)	Creating an initial, basic version of a draft that can be edited	Write me a project proposal for a marketing campaign, and include the following information…
Embellishing text (16 participants)	Adding flourishes to existing text	Add descriptive adjectives to the following copy, in the style of a 1950s advertising campaign.
Proofing work (25 participants)	Feeding work in to check if spelling or grammar is correct; Checking for tone; checking and correcting for bugs in computer code	Please check whether the campaign proposal is in professional English, with appropriate use of slang for a creative industry context

Table 3. ChatGPT's affordances: Effects, implications, and recommendations

	Affordances with side effects	Implications for knowledge work	Recommendations for managers
Side effect 1	ChatGPT offers immediate assistance with tasks (e.g., proofing work, embellishing text, brainstorming ideas); employees turn to it instead of to each other/managers	Broken knowledge ties: Isolated workers and siloed knowledge	Repair and retain knowledge ties: Designing social interactions • Facilitate social interactions • Discuss work routines • Encourage live collaboration
Side effect 2	Reliance on ChatGPT for searching information, writing a first draft, and validating (for example) is risky; intertwinement with ChatGPT means employees cannot tell where their knowledge ends and AI starts	Lacking oversight of the quality of knowledge: Hallucinated content can reach clients, lack of validation of knowledge, social checks and balances are missing	Get involved in order to set the standards • Use ChatGPT so that the possibilities and limitations are understood • Resource key users to provide guidance: partner a star user with a skeptical user • Keep GenAI policies dynamic and responsive to changes
Side effect 3	Skills and tasks required to perform knowledge work change (e.g., first drafts can be generated quickly but need to be edited carefully)	Reconfigured work roles: Assessing and developing employee performance becomes a key challenge as people's roles shift in response to changing capabilities	Look to the horizon: What do ChatGPT's affordances mean for work in the long-term? • Realize how ChatGPT affordances can relieve work pressure • Hold open conversations about ChatGPT's role in knowledge work • Revisit talent development initiatives and emphasize the importance of live experiences for new hires

Implications for the social fabric of organizations

GenAI use can disrupt the flow of **Expertise, Trust and Sociality**

Future of work: collection of **one-man bands**?

Baygi and Huysman (in press) "Generative AI and the Social Fabric of Organizations", Strategic Organization

EMERGENT CAPABILITY

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Scope	Task specific	Multi-purpose	Enabling easy integration into and reshaping of a diverse array of professional fields and sectors
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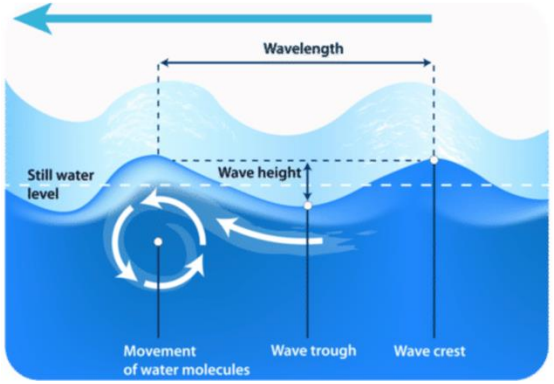
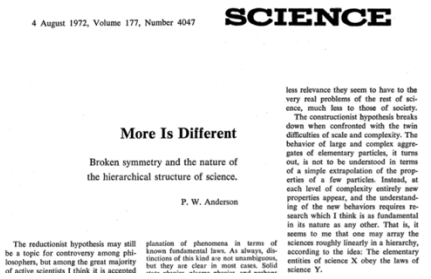
Behavi… and output	Structured	Emergent	Creating unpredictable, biased and 'hallucinated' content, wrought with ethical concerns, for knowledge workers, managers, organizations, and professional institutions.

- GenAI can produce unpredictable outcomes (and lead to outcomes that often surprises its own developers Wei et al 2022).

- This is due to its **emergent capability** = Self-organizing collective behavior that appear when **a large collection of things acts as one .e.g molecules and waves.**

- **How to work with tools that have unpredictable outcomes?**




4 August 1972, Volume 177, Number 4047 SCIENCE

More Is Different

Broken symmetry and the nature of the hierarchical structure of science.

P. W. Anderson

SPIRITED HORSE

*“ To ride a **spirited horse** is to encounter a **lively animal other.** In its pre-or nonhuman context, the horse has **a life of its own ….** (Don Ihde)*

GENAI is like a spirited HORSE because it has a (limited) **‘life of its own’** prompting brings it to life, but the underlying model is operating continuously

Capacity to surprise, fascinate, frustrate, and even ‘disobey’. It is never entirely predictable.

This spiritedness and unpredictable capacity makes it risky (hallucination) but also alluring and generative, particularly in creative work.

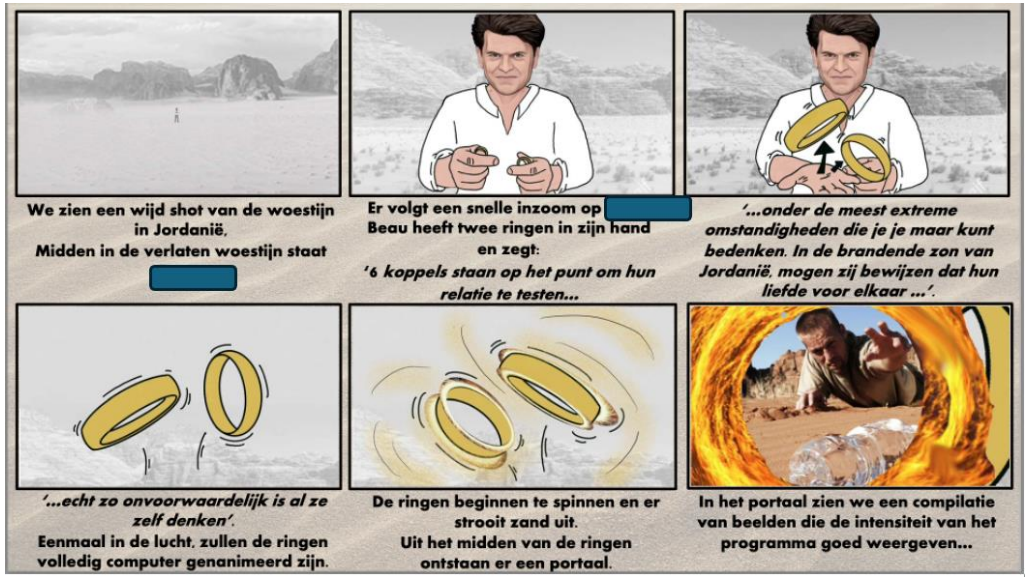
“Promo-department” at Broadcast.com

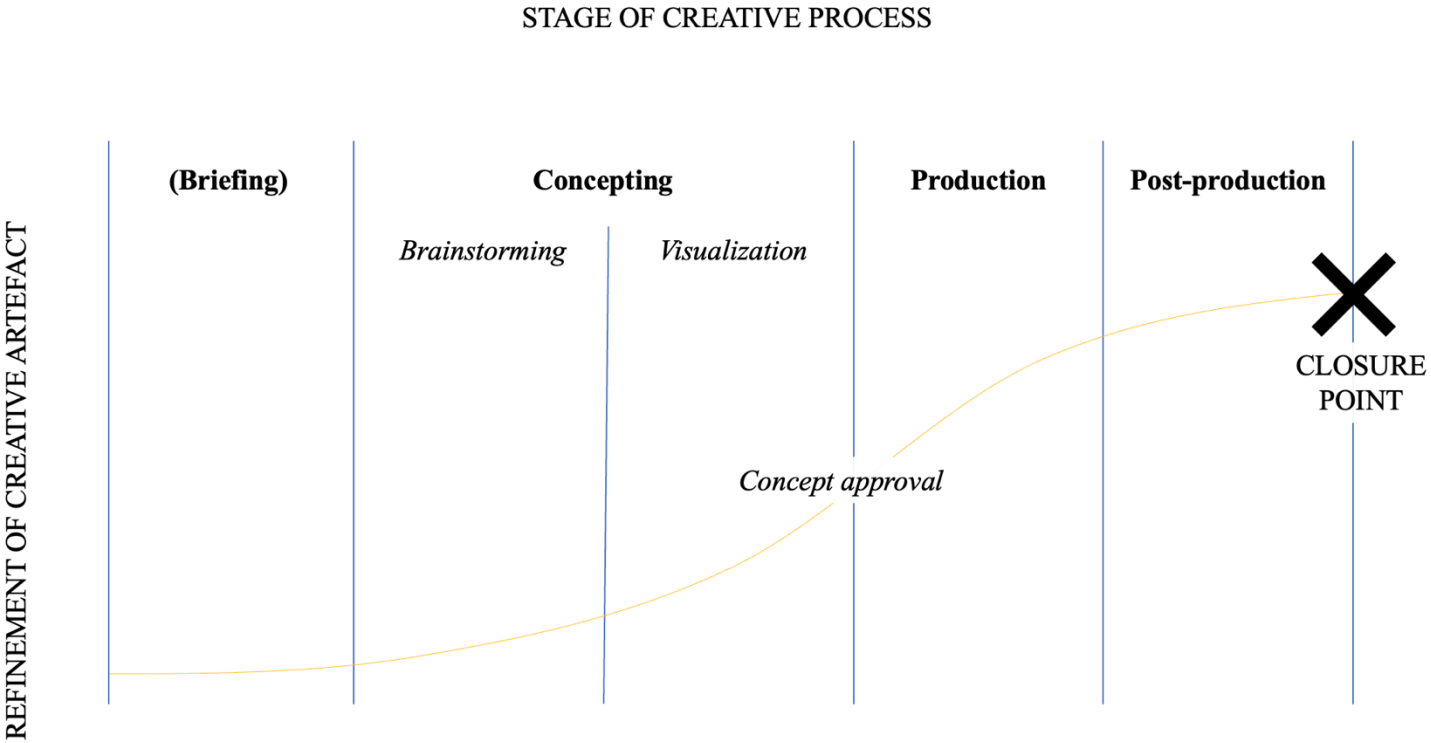
- Fast content provider, **many reality shows**, highly commercial, large marketing/sales/promotion department
- TV shows are mainly considered advertising opportunities
- Promo is main ‘client” of the marketing department
- Quickly jumped on GenAI to economize on the production of promotion material
- Midjourney as main tool

The Work Practice:
Designing Promotional Material for a Client

- **Shared by:** 10 people – clients / designers / producers
- **Routine practice**
- **Socio-technical:** Midjourney as the main "colleague" ("the spirited technology")
- **Ripple Effects:** All creative decisions are made in the initial concept phase by one solo-worker. What follows – production and post-production – becomes low skilled repetitive execution work.

Graphic design before Midjourney

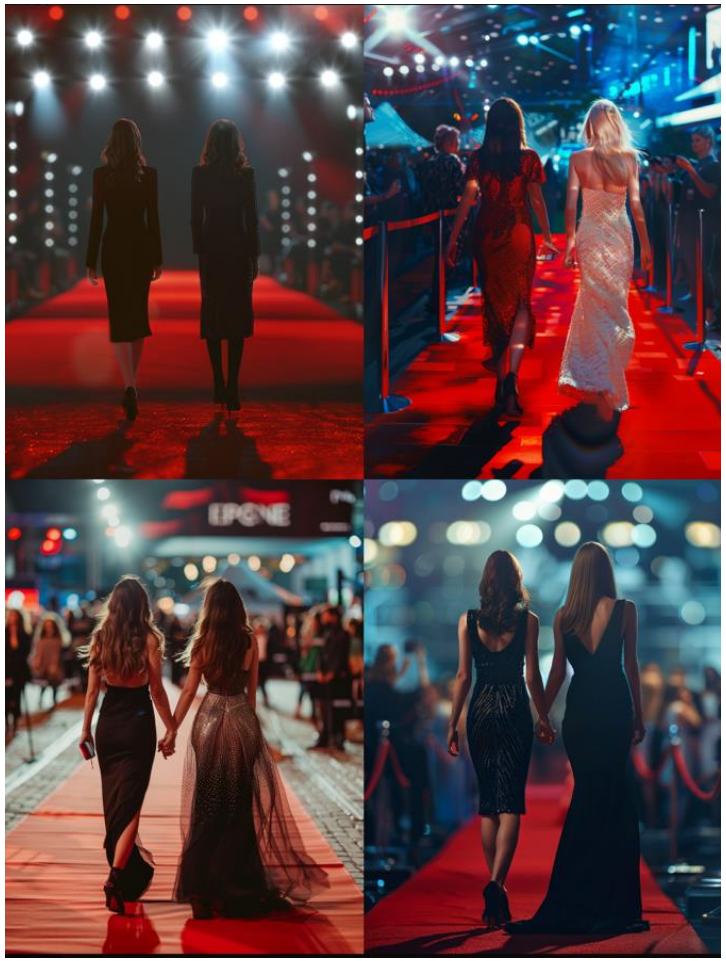


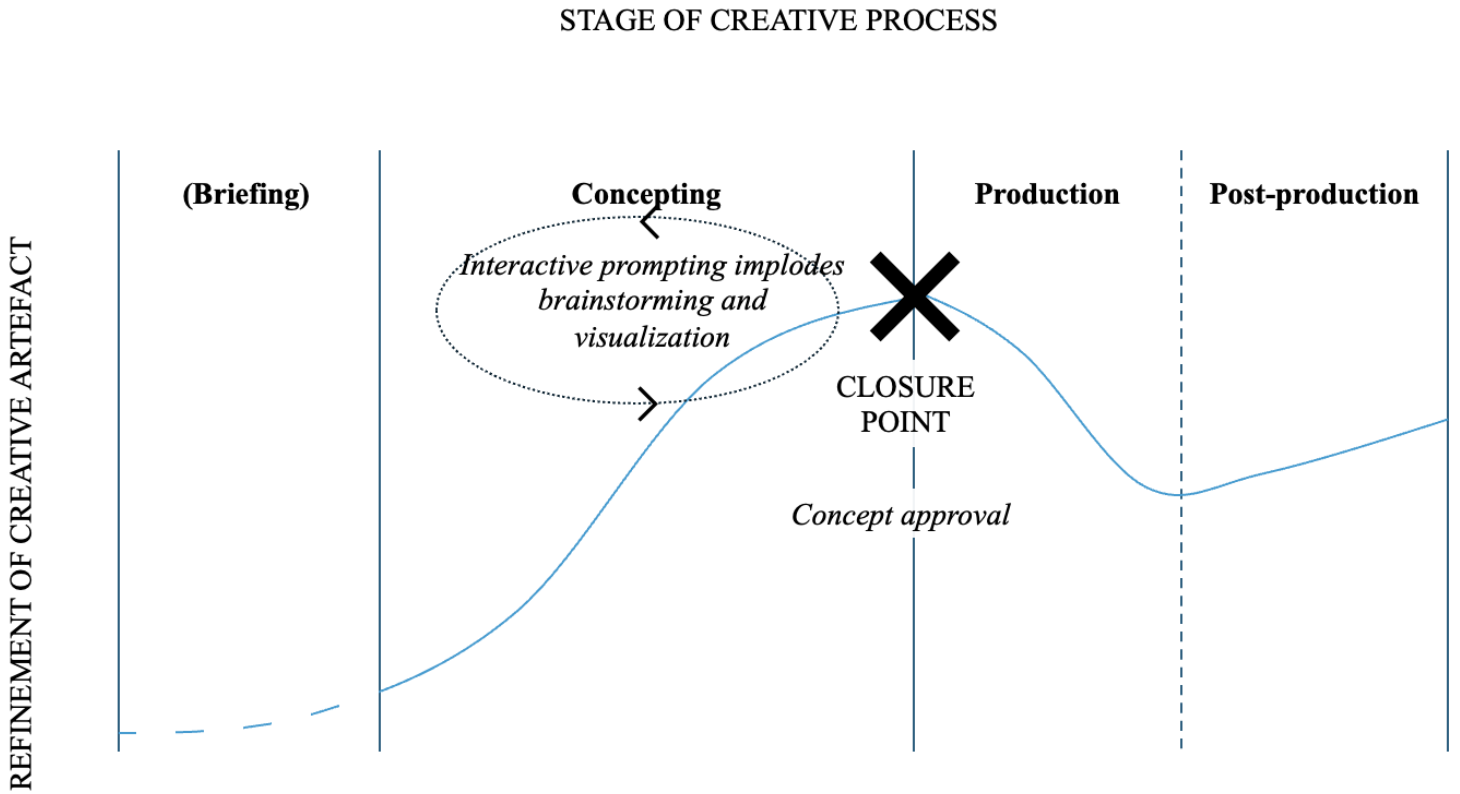


Storyboard with Midjourney

Production stage: recreate/imitate the image

Graphic design with Midjourney





Some reflections

- Working with GenAI as a spirited technology not only triggers solo work but also pushes the creative levels (wow effect)

- Reconfiguring of roles and work practices

- Implications for the creative industry (including e.g. fast productions, mimicking, artists copy rights, legal and reputational risk, model collapse)

- Its not possible to develop a typology of AI@Work
- Every context reveals very different (long term) effects
- Collecting many cases for comparative analysis
- Collaborations with organizations is our life bload