A Theoretical Analysis on the Integration of Artificial Intelligence (AI) into Employment and Industry Dynamics

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1. Abstract

In the wake of Artificial Intelligence (AI) reaching theoretical completeness but not yet fully developed in the reality, there is a unique opportunity to proactively shape the integration of this transformative technology within society. This project aims to use theoretical analysis to discuss and predict which careers are best suited to adapt to and utilize the potential of general artificial intelligence. This analysis delves into the application breadth of artificial intelligence (AI), alongside the intrinsic attributes of different occupational roles, concentrating on the likelihood of job replacement by AI, the degree of such replacements, and the resulting transformations in occupational structures. By examining the intrinsic advantages and limitations of these systems, the research aims to identify and analyze potential challenges that may arise as AI integrates into the job market.

2. Introduction

Since 2020, the integration of AI into various market sectors has been on a steady rise, with projections suggesting that AI's market presence will experience exponential growth by 2030 (Statista Search Department, 2021). This surge in AI development has markedly impacted the job market, and the deployment and research of AI technologies have become increasingly prevalent across diverse sectors.

The focus of the discussion in this paper is not on what kind of technological barriers AI can break through or its intelligent capabilities in the future, but rather on the various issues and categories that AI is expected to present as difficult for it to break through after it breaks through most of the technological issues from the perspective of modern AI development. While this future form of AI may be considered or categorized as Artificial General Intelligence (AGI), a sophisticated category of AI that has sparked considerable debate regarding its definition and classification (Leão, C.P., et al., 2018; Wang, 2019; Zhu, 2023). Since the ongoing development and lack of a definitive model for AI and AGI, this paper will refrain from analyzing from the perspective of an AGI model. This approach is taken to circumvent ambiguity and prevent the exacerbation of complexity in subsequent definitions, although examining AGI might appear to be a pertinent research focus for this analysis.

It is reasonable to predict that the transition of an AI model that simulate human intelligence or beyond human intelligence, from a theoretical framework to a tangible reality, though potentially prolonged, will have more profound impact on the market as a more advanced AI model. AI's integrated capabilities enable it to perform complex tasks across various sectors, thus heralding significant transformations in societal employment. The pace at which industries can adapt to these innovations often trails behind the rate of technological change, making it crucial for economic entities to execute timely and effective adjustments.

This analysis, while presenting and analyzing the problems posed by innovations from only a limited number of occupational types as a starting point, provides a useful basis for proposing future solutions to these problems.

3. Definition to the Scope

3.1 Scope of Discussion

Due to the precise definition of artificial intelligence (AI) remaining a contentious issue within the industry, this article will not engage in detailing the specifics of AI definitions. However, for the purpose of clear theoretical analysis, it is essential to establish the scope of discussion from the outset.

This analysis seeks to explore and forecast the repercussions of artificial intelligence (AI) on the future employment landscape, focusing on the development phase where AI reaches a comprehensive level of maturity. Specifically, the analytical framework anticipates that a fully developed AI will not only replace all current AI variants but will also demonstrate intelligence that surpasses that of other AI models.

The term "fully realized AI" used in this article refers to a specific type of intelligence that operates on a particular machine. While there are no mandatory requirements or constraints on the implementation methods for most AI systems, they typically function on some type of machine or computer. This operational standard is not only consistent with the majority of contemporary AI systems but also forms the basis for many researchers' predictions about future AI developments (Bostrom, 2015; Wang, 2019).

Moreover, understanding the distinctions between different types of computer software is crucial. Commonly, not all computer software qualifies as AI, although distinguishing between them can be complex and contentious. It is widely recognized that modern AI exhibits capabilities such as learning, thinking, and self-adjustment. Consequently, simpler automated programs that lack these features should be explicitly excluded from the AI category.

Some computer programs appear to possess reasoning and learning capabilities—for instance, software that mimics tones or search engines that recognize keywords. However, these applications typically lack the ability to self-adjust or improve their outputs over time based on the same inputs, indicating a absence of true AI capabilities.

In conclusion, a fully realized AI or the type of intelligent machines discussed should at least possess the ability to learn, reason, and autonomously make decisions or corrections. Furthermore, it should have criteria to assess and recognize improvements in its outputs.

This definition, while somewhat broad, effectively excludes many software programs that do not meet the criteria of AI. Future elaborations will refine this definition, focusing more on the degrees of learning, thinking, and other aspects of intelligence.

3.2 Scope of AI

Although the concept of "fully realized AI" is highly appealing, careful consideration of various factors reveals that even the most advanced AI models are still subject to significant limitations. What many envision as "a model that can solve all problems" often resembles the whimsical theoretical concept of a perpetual motion machine—a notion that is practically and theoretically flawed. Even if such a model exists, there is considerable debate regarding what constitutes "all problems" within the academic community. For AI or expansive AI capabilities, it is essential to define the scope of these capabilities more realistically, particularly in the context of this discussion. This realistic framing helps align expectations and theoretical models with the practical constraints and complexities inherent in AI development.

3.2.1 Limited Resources

Many perspectives that hold high expectations for AI models frequently overlook the constraints of resources, particularly in terms of computational time and space. Even an ideal AI model must operate within the bounds of available resources. While AI can endeavor to acquire more resources or utilize existing ones more efficiently, it is not feasible for it to operate entirely without regard to these limitations (Wang, 2019). This intrinsic constraint underscores the necessity of considering resource availability when evaluating the potential and scalability of AI systems.

Some might speculate that with the advent of a perfected AI model, it could potentially achieve extremely efficient resource utilization or somehow develop unlimited

resources, such as technological singularity (Vinge, 1993). However, such predictions lack sufficient theoretical support; the analysis of this article is primarily based on the implementation and theories of modern artificial intelligence. Moreover, if such theories are used as a foundation, most of the analyses lose their original significance. This pragmatic approach emphasizes realistic assessments over theoretical idealizations when considering the capabilities and future of AI systems.

3.2.2 Ethical Boundaries

It is a widely acknowledged assertion across all AI-related research fields that all AI systems must operate within established moral and ethical boundaries (Petrozzino, 2021; Dorton et al., 2023). This consensus reflects the imperative to integrate ethical considerations into the development and deployment of AI technologies to ensure they contribute positively to society and do not inadvertently perpetuate harm or injustice.

Despite its widespread acknowledgment, I emphasize the necessity of establishing moral and ethical boundaries for AI here because the subsequent analysis in this article is closely tied to this premise.

3.2.3 Scope of Creativity

Defining the scope of creativity for future AI models is challenging. Generally, creativity involves the generation of work characterized by originality and appropriateness (Marzano, 2021). There is also a viewpoint that creativity should be an inherent attribute of AI models, as suggested by their conceptual definitions (Wang, 2019). However, the extent of creativity expected from a "fully realized AI" remains speculative: will it surpass, match, or fall below human levels?

The discussion intentionally avoids a precise definition of creativity due to the difficulty of quantification and the peripheral relevance of creativity to its main focus. Instead, it proposes that a fully developed AI should at least demonstrate a level of creativity comparable to or greater than that of existing AI models. This stance not only reflects the projected capabilities of “a full realized AI” but also circumvents the complexities involved in

measuring creativity.

Although this chapter primarily defines creativity in terms of scope, it also complements the initial statement regarding AI in the context of software. If we consider all AI as set *A*, all non-AI software as set *B*, and all computer software as set *U*, then the AI discussed above, characterized by capabilities like learning, reasoning, and self-adjustment, only explicitly excludes set *B*. However, the region *U* - *A* - *B*, a fuzzy zone that is difficult to define, will also be excluded from the scope of this paper. The reason is straightforward: this paper, focused on the theoretical analysis of AI replacing human occupations, is centered on the theoretical framework of fully realized AI. AI entities within these fuzzy zones typically lack the creativity or intelligence equivalent to that of modern, representative AI models, and are thus not included in the discussion.

The analysis primarily explores the potential of AI to replace human tasks and posits that, by viewing creativity as a trait capable of producing unique outcomes, even if a fully developed AI were to surpass human levels of creativity, it would not preclude collaborative interactions between humans and AI within creative fields.

4. Impact of AI on Employment

The labor market exhibits significant diversity, rendering a detailed analysis of every profession unfeasible. Specifically, jobs that are monotonous, lack creativity, and are solitary in nature—such as factory assembly line positions—are simplistic enough that they do not warrant extensive scrutiny. The persistence of many industries' reliance on human labor over machines is not necessarily due to technological shortcomings but often because the immediate cost of human labor is less than that of automation (Autor, 2015). These roles can already be substituted by automation irrespective of the associated costs, and such automated processes are beyond the scope of this discussion, thus, these positions are excluded from this analysis.

Positions that cannot be supplanted by conventional machinery—machines characterized by a lack of creativity or the capacity to execute only pre-programmed tasks—are at the center of this article. Typically, roles that necessitate high creative input or are

integral to human safety, such as arts and medical professions, fall into this category. These occupations demand more than mere mechanical functionality; they require adaptive reasoning and decision-making abilities that current machine technology cannot fully provide. This analysis specifically targets these sectors to assess the potential and limitations of incorporating AI in contexts where nuanced judgments and creative solutions are crucial.

This section utilizes a focused methodological approach, building on the scopes outlined earlier. It explores the extent to which certain industries might be completely or partially replaced by AI, or how AI could potentially introduce new job categories within these sectors. The insights gained are then applied to other industries with analogous characteristics.

4.1 Legal Occupations

4.1.1 Art

Art, as an industry that requires both skill and creativity, is one of the hot topics being discussed as to whether it can be replaced by AI. But focusing solely on its skill and creativity often misses the essential purpose of art.

The debate on whether AI can be truly regarded as an artist encompasses extensive discussions, centering on the intrinsic nature of art as a form of social interaction. Contrary to focusing solely on aesthetic appeal, art fundamentally serves as a medium for communication among individuals. Therefore, the pivotal issue is whether AI-created art can evoke empathy and emotional resonance among human audiences, fostering a genuine connection akin to that experienced with human-generated artworks (Hertzmann, 2018).

Envision a scenario where an artist creates a piece centered on his mother's battle with cancer. Upon encountering this artwork, viewers are likely to empathize with the depicted struggle, simultaneously admiring the resilience of humans combating illness. However, a significant issue arises with AI-generated art: despite reaching the pinnacle of technological advancement, AI cannot evoke a similar depth of empathy. This limitation stems from a fundamental aspect of human psychology—empathy is inherently restricted

when directed towards non-human entities.

Nevertheless, it is plausible for humans to cultivate a form of empathy towards AI after extended engagements (Hertzmann, 2018). This theory assumes that artificial intelligence has the capacity to empathize, implying that AI should at least attempt to comprehend human emotions. Furthermore, even if artificial intelligence cannot fully grasp human emotions, it should still be able to respond appropriately to them. Evidence of this can be seen in various instances where some AI systems appear to empathize with human language, bolstered by algorithms specifically designed to analyze and mimic emotional responses (Farisi et la., 2022).

This hypothesis carries a degree of plausibility, supported by adequate reasons and conditions for its potential realization. However, similar to the example of maternal love discussed earlier, even if artificial intelligence systems develop the capacity to empathize with human emotions, reciprocating such empathy towards AI may prove challenging, as AI neither has family nor experiences illness. Consequently, the market might eventually establish a distinct demarcation between AI-generated art and human-created art. Essentially, while there may be interest in the artistic outputs of AI and an appreciation for AI's capacity to address artistic concepts, a segment of the market will likely remain disinterested in AI-generated artworks, favoring instead those creations that encapsulate uniquely human emotional experiences.

This envisioned market scenario shares notable parallels with the existing art commodity market. Handcrafted art typically commands higher prices and is produced in smaller quantities, contrasting sharply with art manufactured on assembly lines, which is more abundant and less costly. Both forms, however, find their respective niches within the market. The unique distinction with future AI-generated art lies in its potential indistinguishability from human-created art at a technical level. As AI technologies advance, their outputs may become so refined that discerning whether an artwork was produced by a human or an AI could become increasingly challenging. This theory will not be analyzed in detail in this section, but it will be discussed specifically in the context of illegal industries in

the subsequent text.

The facets of the art industry that remain impervious to replacement by AI primarily derive from the inherently progressive characteristics of art itself, along with the ethical constraints that are integral to AI's utilization as a human instrument.

Revolution or innovation in art frequently involves transgressing established human ethics. Surrealism, for example, delved deeply into taboo subjects such as sexual desire and the irrational aspects of human behavior. Similarly, Feminist art emerged as a critical movement that aimed to confront and disrupt the male-dominated art world and traditional societal roles. These movements not only redefined artistic boundaries in decades but also challenged the prevailing ethical standards of their times.

Artistic evolution often manifests as a process of experimentation and error, striving to subvert the established norms of reality, a journey that may span decades or centuries. This is vividly illustrated by the significant religious and symbolic role of the halo in early Christian and Byzantine art, where it served as a potent emblem of saintly divinity. The exclusion of the halo during these periods could have likely led to a rejection of the artworks due to the dominant religious and societal mores. However, with the advent of the Renaissance, there was a progressive shift as artists subtly reduced the prominence of the halo from a stark, formal symbol to an increasingly indistinct feature, eventually phasing it out entirely (Finaldi, 2000).

Despite the possible advanced capabilities of artificial intelligence in painting and emulating emotions, ethical constraints imposed on AI reflect prevailing ethical standards. These constraints are influenced by current societal norms, although it is uncertain whether some of the ethical considerations will persist in the future. Some even think that “Philosophical ethics is simply not sufficiently developed to offer clear guidance to the designers of AI” (Bostrom, 2015). This apprehension about AI's potential unethical behavior is intrinsic to human nature. Nevertheless, art frequently serves to challenge these natural inclinations, often questioning and pushing the boundaries of what is considered ethically permissible or normative.

The establishment of ethical boundaries for AI should indeed be grounded in legal frameworks. However, historical precedents show that artistic expression often precedes and influences changes in legal norms. For instance, prior to the U.S. Supreme Court's decision in Loving v. Virginia (1967) which invalidated bans on interracial marriage, artists were already exploring the theme of interracial unions in their works.

Figure 1

Taboo

Note. By Jacob Lawrence, 1963, painting, located at Philadelphia Museum of Art

In summary, the preceding discussion highlights the unique challenges art presents in the broader context of AI integration into human-centric occupations. It underscores that AI may find it challenging to replace professions that either necessitate the violation of conventional human ethics or fundamentally rely on eliciting human empathy. Occupations such as legal formulation and psychological counseling, which require nuanced understanding and emotional engagement, exemplify areas where AI's utility is limited. These roles not only demand a deep grasp of ethical nuances and complex human emotions but also rely heavily on empathetic interactions, which are currently beyond AI's full capability to authentically replicate. Thus, while AI can augment certain aspects of these professions, complete replacement in the foreseeable future remains improbable.

4.1.2 Programming

Computer science, the discipline responsible for developing AI, has been profoundly

impacted by the AI industry, sparking extensive debate about AI's potential to replace this sector. This section, titled "Information Technology," specifically addresses the extent to which general programming tasks are being supplanted by AI. It does not, however, cover the creation of new algorithms, the implementation of novel AI models, or theoretical analysis. These topics, which will be discussed in the next chapter, fall within the broader scope of computer science and demand a higher level of creativity than mere coding.

AI, as a software-based model of intelligence, not only exhibits certain creative capabilities but also shares fundamental characteristics with typical computer software, which excels at performing highly repetitive and logical tasks. Programming, which requires stringent logic and allows for limited creativity in most scenarios, appears to be a prime candidate for automation through AI. As of 2023, the percentage of individuals employed in programming-related roles who utilize AI-based tools daily ranges from 34.7% to 56.2%, depending on their specific job titles within the Programmer/IT Developer category (Statista, 2024). From this perspective, Artificial Intelligence seems quite capable of replacing programmers, especially those who are less experienced. Typically, most programmers do not frequently develop new algorithms during the software development process. Instead, they often rely on pre-existing algorithms once they understand the project requirements. Additionally, much of the code they use may be similar to, or the same as, what is available in open-source software.

Jensen Huang, a prominent entrepreneur in the field of artificial intelligence, has also posited that "AI will take over coding, rendering the learning process optional" (Zulhusni, 2024). However, his view overlooks a fundamental prerequisite of programming, which is to comprehend and translate user or customer requirements into a code-based language. A fully realized AI is anticipated to have a profound understanding of user requirements from multiple dimensions and to offer varied coding solutions. However, this expectation hinges on the clarity of the user's specifications. If one were to abandon programming languages altogether and rely on natural language programming, there would be unpredictable problems with programs due to the various ambiguities of natural languages. In the coding industry, this

issue is often mitigated through the use of pseudo-code to communicate requirements or algorithms, thereby minimizing misunderstandings. Thus, the precondition for coding in natural language is that the user must be able to understand AI-generated code, ensuring it fulfills the customer's needs. From this point of view, it is completely impossible to make programmers or the learning of programming obsolete.

One potential future development is the creation of a language devoid of ambiguity and simpler to learn than pseudo-code, thereby removing substantial entry barriers to the IT industry. Research teams are currently exploring languages like Quenya and Sindarin to minimize ambiguity and reduce learning costs (Cocker, 2016). However, crafting languages that are both easy to learn and entirely unambiguous presents a significant challenge. Moreover, it is important to acknowledge that programming in more sophisticated languages typically entails greater time and space complexity.

However, the discussion of language development above overlooks a crucial assumption: whether a fully realized AI can independently generate a need and programmatically fulfill that need. This capability should not be dismissed as implausible; existing AI models already integrate the concept of "desire" (Wang, 2023). From this perspective, it raises the question of whether an AI could autonomously perceive societal trends and program itself to initiate profitable projects based on these insights.

This scenario underscores the inherent limitations of AI in business contexts, where software engineering is fundamentally driven by profit considerations, and project initiation often hinges on profitability forecasts. The ethical and liability questions that emerge are crucial: if an AI model, trained on specific data, decides to initiate a project that ultimately fails to generate profit, who is accountable for the financial loss? If the responsibility is assumed by the organization that developed the AI, it raises a further question about the organization's motivation to transfer a potentially profitable project to another company. Conversely, if the developing organization disclaims any responsibility for losses or gains, the willingness of other companies to adopt such AI-driven project ideas may wane significantly.

This situation highlights broader ethical concerns, chiefly the extent to which humans

are prepared to trust AI with significant decision-making tasks. A 2021 study illustrates this wariness, showing that individuals tend to trust human doctors over AI in making medical treatment decisions (Yokoi et al., 2021). However, the issue of human trust in AI extends beyond technical considerations to encompass broader societal opinions about AI. This aspect will be explored in depth in the context of "Illegal Occupations."

In conclusion, it is exceptionally challenging for a combination of AI and natural language to fully replace the computer industry. The potential for AI to replace or infiltrate information technology or other profit-oriented and business model-driven sector—largely hinges on whether humans are willing to trust AI with significant decision-making capabilities, trusting it to equal or even surpass human performance. The readiness to adopt AI in such roles not only depends on the technological advancements but also on overcoming the societal and ethical concerns surrounding AI decision-making. This trust deficit could significantly hinder the integration of AI into core business operations, highlighting the complex interplay between technological capabilities and human confidence in these advanced systems.

4.1.3 Research Fields

The field of research presents a far more intriguing topic, as most research organizations operate on a non-profit basis, unlike the commercial sector, which is predominantly driven by profit motives.

In many research domains, except those demanding high levels of creativity or intelligence (such as mathematical proofs), the processes are often so standardized that there are guides detailing the steps for publication and outlining the do's and don'ts (Nair, 2023). Given that the research sector is predominantly non-profit and promotes experimental approaches, it largely sidesteps the ethical dilemmas associated with financial losses in AI-driven projects. From this vantage point, the question arises: Can AI fully replace human roles in the research field, or should the focus of research simply be on developing more advanced AI technologies?

The field of research has significantly evolved over the years. Not only does it

encompass a comprehensive and rigorous process for publishing an article, but it also includes stringent procedures for validating the content of an article. Peer review is a crucial process in academic publishing where the quality and validity of a manuscript or academic article are assessed by experts in the same field. For the most academic journals, it is required to review by at least 2 experts with the same research area before the publication. Therefore, it stands to reason that research articles authored by AI should at least undergo peer review, raising the question: Can AI perform peer reviews on works published by other AI systems? Furthermore, would AIs trained on different datasets or using distinct models be considered separate "researchers"? While these questions are contentious and merit further exploration, it is undeniable that research outputs by AIs, even those peer-reviewed by other AIs, it's worth to be subjected to additional scrutiny by human researchers. Academic outputs are typically unique (otherwise, they might be considered plagiaristic), and AIs cannot exhaustively address all academic research topics in a short span due to inherent resource limitations. Consequently, even if a fully realized AI could match the research quality of human scholars, there is no need to entirely relinquish the research domain to AI. Instead, a collaborative approach, where AI and humans work together and generate diverse research outcomes, is more feasible and beneficial.

However, will the emergence of "a fully realized AI" diminish the job market for human researchers? Despite a noticeable increase in AI-driven academic contributions, the demand for academic insights remains boundless, and numerous academic fields, including AI ethics, will continue to expand. Consequently, from a job market perspective, it seems unlikely that there will be significant displacement of human researchers, either partially or completely. The integration of AI in research roles is more likely to augment human capabilities than to replace them entirely, facilitating new areas of exploration and inquiry rather than rendering human input obsolete.

A potentially controversial scenario is the possibility of AI generating academic outputs that surpass human understanding. While such an event seems unlikely in the near future, it's difficult to entirely discount the possibility. This issue parallels the challenges

faced in understanding complex mathematical proofs or scientific theories, which are already beyond the grasp of the general public. If an AI were to propose a scientific theory or mathematical proof that even top researchers couldn't comprehend, it raises significant philosophical and ethical questions about the adoption of such findings.

This dilemma mirrors the introspection that programmers often face after completing a program: "Did I implement it correctly?" Programmers routinely verify the logic of their software and conduct tests with other codes, yet they rarely consider their code to be infallibly correct. In practice, the operation of software or AI resembles a "black box"—inputs are processed to produce outputs, but the internal workings remain opaque. This "black box" phenomenon underpins many unresolved ethical issues, the ethical challenges associated with AI systems whose internal mechanisms are not fully transparent or understood (Siau and Wang, 2020).

There are numerous ethical considerations that must be addressed before AI can be fully integrated into the research sector. Ultimately, it is likely that AI will coexist with human researchers, sharing and contributing to the field collaboratively.

4.2 Illegal Occupations

The potential escalation of various illegal industries due to advancements in AI presents a more concerning issue than the transformation of legitimate occupations. Although a comprehensive analysis encompassing all relevant details is challenging from a theoretical standpoint, this paper aims to provide a broad overview of the potential challenges AI could pose to illicit sectors.

4.2.1 Influence to Publics

The portrayal of AI in numerous sci-fi films often leans towards malevolence, with frequent narratives about AI robots designed to dominate the world. However, with the implementation of robust ethical constraints, such scenarios may not merit significant concern. More likely is the misuse of AI for unethical purposes by humans.

In 2019, the international trade in counterfeit and pirated products was estimated at

approximately USD 464 billion, representing 2.5% of global trade(OECD, 2021). As AI continues to advance, its capacity to enhance the quality of counterfeit goods could significantly impair current identification methods, further complicating the already severe issue of counterfeit markets.

Despite the potential for developing AI-specific identification techniques, the essence of counterfeit goods remains rooted in deception. The effectiveness of combating this fraud hinges on public awareness and adequate regulatory oversight. Although some AI organizations have begun watermarking AI-generated art to assert authenticity(Duffy, 2024), the adoption of such practices into legal frameworks and the subsequent governmental regulation require extensive deliberation.

4.2.2 Influence to Political Organization

The issue of regulating AI-related crimes, such as fraud, and establishing trust in AI technologies hinges significantly on the willingness of rights organizations to advocate for legislation and promote AI reliability. This underscores the crucial role that authoritative entities play in shaping AI governance.

Drawing philosophical inspiration from Katherine Hayles, who discusses the increasingly blurred distinctions between humans and machines, the notion of post-humanity suggests that fully realized AI might one day be regarded as having an identity akin to humans. This blurring raises complex questions about authority over and responsibility for AI actions.

The potential for AI to influence or even participate in policy-making poses significant ethical and practical challenges. If AI is given the power to make decisions, human operators still control the data it receives, which could lead to manipulation. Politicians could theoretically skew data to influence AI decisions, benefiting their agendas. This manipulation is facilitated by AI's ability to process vast datasets at reduced costs and with decreased likelihood of detection.

AI's "black box" nature—its internal workings being opaque and its learning and self-correction capabilities—means that it might not consistently produce the same outputs from

the same inputs, unlike more straightforward data processing programs. This unpredictability complicates efforts to reverse-engineer AI processes or predict their outcomes, akin to the mathematical impossibility of deriving the inverse of a singular matrix.

If AI is granted certain human-like rights, such as the ability to autonomously select its training data, similar to how human politicians gather information before making decisions, this could theoretically prevent human manipulation of AI outcomes. For instance, an AI "politician" might independently choose which public opinions to consider or which data to analyze. This autonomy could help address issues of bias or discrimination inherent in computer algorithms, since it removes the possibility of human interference in the data selection process.

However, granting AI such autonomy introduces significant ethical dilemmas. Key among these is the issue of accountability: if an AI makes decisions based on its selected data, who is responsible for those decisions? Moreover, there's a practical concern about power dynamics: are those in positions of authority ready to delegate a portion of their decision-making power to AI systems? This shift could fundamentally alter the structure of governance and authority, challenging traditional notions of political power and responsibility.

5. Limitations and Conclusion

In summarizing the findings, it appears that "a fully realized AI" is unlikely to completely supplant all occupational roles and will engender various ethical dilemmas. Nonetheless, this paper primarily overlooks the domain of conventional automated machinery or less sophisticated software systems. These systems are capable of substituting nearly all low-tier industries and a significant portion of the middle-tier sector, irrespective of financial costs. It is the upper-tier, warranting greater reflection and discussion, that is expected to face more unique challenges and complex issues.

Moreover, this analysis deliberately refrains from assessing the intelligence or creativity levels of AI. This omission is not only due to the predictive challenges associated with these attributes but also because it is difficult to draw definitive conclusions in the current era. Although quantifying intelligence remains a complex endeavor, it is clear that

even without addressing technological capabilities of AI—focusing solely on ethical and resource-related arguments—there are numerous interdisciplinary challenges that emerge in a limited number of professions. Thus, the deployment of AI necessitates a comprehensive evaluation encompassing philosophical, ethical, psychological, and economic perspectives.

6. References

Autor, D. H. (2015). Why are there still so many jobs? the history and future of Workplace Automation. Journal of Economic Perspectives, 29(3), 3–30. https://doi.org/10.1257/jep.29.3.3

Avery-Quash, S., & Finaldi, G. (2000). The image of christ. National Gallery Distributed by Yale University Press.

Bostrom, N. (2015). Superintelligence: Paths, Dangers, Strategies. The Philosophical Quarterly. https://doi.org/10.1093/pq/pqv037

Dorton, S.L., Ministero, L.M., Alaybek, B., & Bryant, D.J. (2023). Foresight for ethical AI. Frontiers in Artificial Intelligence, 6.

Douglas, S. M., Bachelet, I., & Church, G. M. (2012). A logic-gated Nanorobot for targeted transport of molecular payloads. Science, 335(6070), 831–834. https://doi.org/10.1126/science.1214081

Duffy, C. (2024, February 6). Meta to add “ai generated” label to images created with OpenAI, Midjourney and other tools | CNN business. CNN. https://www.cnn.com/2024/02/06/tech/meta-ai-generated-images-label-third-party-tools/index.html

Hertzmann A. Can Computers Create Art? Arts. 2018; 7(2):18. https://doi.org/10.3390/arts7020018

Lawrence, J. (1963a). Taboo [Throughout his career, Lawrence demonstrated a passionate interest in African American history and in his people’s collective struggle for racial equality. Painted in vibrant colors, Taboo exemplifies the artist’s planar style and his lifelong concern for civil rights and justice. The two pairs of newlyweds are posed in the manner of a traditional wedding portrait. However, as the title indicates,

Lawrence's couples have had to overcome the obstacles of legal and societal censure, breaking the taboo against marrying outside of their race.]. Philadelphia Museum of Art. Retrieved 2024, from https://philamuseum.org/collection/object/150132.

Lawrence, J. (1963b). Taboo [Throughout his career, Lawrence demonstrated a passionate interest in African American history and in his people's collective struggle for racial equality. Painted in vibrant colors, Taboo exemplifies the artist's planar style and his lifelong concern for civil rights and justice. The two pairs of newlyweds are posed in the manner of a traditional wedding portrait. However, as the title indicates, Lawrence's couples have had to overcome the obstacles of legal and societal censure, breaking the taboo against marrying outside of their race.]. Philadelphia Museum of Art. Retrieved 2024, from https://philamuseum.org/collection/object/150132.

Leão, C.P., Gonçalves, P., Cepeda, T., Botelho, L., & Silva, C. (2018). Study of the Knowledge and Impact of Artificial Intelligence on an Academic Community. 2018 International Conference on Intelligent Systems (IS), 891-895.

OECD/EUIPO (2021), Global Trade in Fakes: A Worrying Threat, Illicit Trade, OECD Publishing, Paris, https://doi.org/10.1787/74c81154-en.

Petrozzino, C. (2021). Who pays for ethical debt in AI? AI and Ethics, 1, 205 - 208.

Sherif, A. (2024, March 6). It professionals who use AI tools daily worldwide 2023. Statista. https://www.statista.com/statistics/1440332/it-professionals-who-use-ai-tools-daily-worldwide/#:~:text=Back%2Dend%20developers%20and%20full,they%20use%20AI%20tools%20daily.

Siau, K., & Wang, W. (2020). Artificial Intelligence (AI) Ethics: Ethics of AI and Ethical AI. Journal of Database Management, 31(2), pp. 74-87. IGI Global.

Thormundsson, B. (2024, February 21). Artificial Intelligence Market Size/revenue comparisons 2022. Statista. https://www.statista.com/statistics/941835/artificial-intelligence-market-size-revenue-comparisons/

V. Nair, V. (2023). Points to Ponder for Drafting a Scientific Publication. The Journal of Prosthetic and Implant Dentistry.

Vinge, V. (1993). The coming technological singularity: How to survive in the post-human ERA - NASA technical reports server (NTRS). NASA. https://ntrs.nasa.gov/citations/19940022856

Wang, P. (2019). On defining artificial intelligence. *Journal of Artificial General Intelligence*, *10*(2), 1–37. https://doi.org/10.2478/jagi-2019-0002

Wang, P. (2023). Non-axiomatic logic: A model of intelligent reasoning(Second Edition). World Scientific.

Yokoi, R., Eguchi, Y., Fujita, T., & Nakayachi, K. (2020). Artificial Intelligence is trusted less than a doctor in medical treatment decisions: Influence of perceived care and value similarity. International Journal of Human–Computer Interaction, 37(10), 981–990. https://doi.org/10.1080/10447318.2020.1861763

Zhu, Y. (2023). Semantic Relationship Model of Chinese International Core Vocabulary in Artificial Intelligence Scenarios. 2023 IEEE 3rd International Conference on Social Sciences and Intelligence Management (SSIM), 312-315.

Zulhusni, M. (2024, March 4). AI to replace coding learning, says Nvidia CEO Jensen Huang. Tech Wire Asia. https://techwireasia.com/03/2024/nvidias-ceo-jensen-huang-ai-will-take-over-coding-making-learning-optional/ [Original source: https://studycrumb.com/alphabetizer]