

**MASTER OF SCIENCE IN MANAGEMENT AND SYSTEMS**

**Applied Project Capstone**

**MASY GC- 4100**

**MEMORANDUM**

TO: Dr. Andres Fortino

FROM: Xiaoyun Bian

DATE: 04/03/2024

RE: **Literature Review** **Assignment A – Ten to Fifteen References**

# References

1. Growth trends for selected occupations considered at risk from automation. (2022). *Monthly Labor Review*, 1–34.

***Abstract:***

*The article provides a list of occupations considered highly vulnerable to substitution by robots and artificial intelligence (AI) and examines the occupations' employment trends since 1999 and projected employment to 2029. Topics include the offsetting factors and other limitations of the automation, the impact of the computing capacities of new robots and AI on technological change and job displacement, and the projection models of the U.S. Bureau of Labor Statistics (BLS) on growth trends.*

***ChatGPT provided summary:***

*The document "Growth trends for selected occupations considered at risk from automation" from July 2022 critically examines the employment impact of AI and robotics on occupations deemed vulnerable to technological advances. Utilizing U.S. Bureau of Labor Statistics data from 1999 and projecting to 2029, it argues against a widespread acceleration of job loss due to automation. Instead, it suggests that the actual and projected employment trends do not support the narrative of significant displacement, highlighting the nuanced reality of automation's impact on the workforce, which includes both challenges and opportunities for job creation.*

***Researcher comments:***

*This reference underpins the project by challenging the prevalent automation anxiety with empirical employment trends, thus enriching our understanding of AI's actual impact on jobs. Its insights will guide the nuanced analysis of automation potential in various roles via the "Robot Replaceability Radar," ensuring the tool not only identifies replaceable tasks but also aligns with real-world labor dynamics, emphasizing areas where technology complements rather than displaces human labor.*

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1. Cheng, W.-J., Pien, L.-C., Kubo, T., & Cheng, Y. (2020). Trends in Work Conditions and Associations with Workers’ Health in Recent 15 Years: The Role of Job Automation Probability. *International Journal of Environmental Research and Public Health*, *17*(15). https://doi.org/10.3390/ijerph17155499

***Abstract:***

*Job automation and associated psychosocial hazards are emerging workplace challenges. This study examined the trends in work conditions and associations with workers’ health over time in jobs with different automation probabilities. We utilized data from six waves of national questionnaire surveys of randomly selected 95,762 employees between 2001 and 2016. The Job Content Questionnaire, the Copenhagen Burnout Inventory, and the Self-Rated Health Scale were applied, and working time was self-reported. Automation probability was derived for 38 occupations and then categorized into three groups. Trends in work conditions and the associations between automation probability, work conditions and health were examined. We observed a 7% decrease in high automation probability jobs, an overall increase in job demands for and prevalence of shift work, and a decrease in job control. Workers with high automation probability jobs had low job demands, low job control and high job insecurity. Low automation probability was associated with burnout in logistic regression models. The odds ratio of job insecurity, long working hours, and shift work relating to health was higher in the later years of the surveys. In conclusion, there has been a decrease in high automation probability jobs. Workers employed in jobs with different levels of automation probability encountered different work condition challenges.*

***ChatGPT provided summary:***

*The study "Trends in Work Conditions and Associations with Workers' Health in Recent 15 Years: The Role of Job Automation Probability" examines the evolving landscape of work conditions and their impact on worker health, considering the role of job automation. Over 15 years, data from 95,762 employees across Taiwan was analyzed to identify trends in job conditions, shift work prevalence, job demands, and control, alongside health outcomes like burnout and self-rated health. It found a decrease in jobs with a high probability of automation and differing work condition challenges across automation probability levels, suggesting complex relationships between automation, job conditions, and worker health.*

***Researcher comments:***

*This study's insights into the nuanced effects of automation on worker health and job conditions will critically inform the "Robot Replaceability Radar," guiding a holistic approach to assessing automation's broader implications on the workforce.*

1. Tschang, F. T., & Almirall, E. (2021). Artificial Intelligence as Augmenting Automation: Implications for Employment. *Academy of Management Perspectives*, *35*(4), 642–659. https://doi.org/10.5465/amp.2019.0062

***Abstract:***

*There has been concern that artificial intelligence (AI) may cause significant unemployment; however, proponents say that AI augments jobs. Both of these positions have substance, but there is a need to articulate the mechanisms by which AI may actually do both, and, in the process, transform the balance of work available. We examine economic studies of automation’s impact on employment and skills, illustrating the favoring of nonroutine skills over the routine, and a hollowing-out of middle-skill jobs. We then use case evidence of AI and automation to show how AI is augmenting automation to the same effect, allowing firms to modularize and control routine work. The remaining work tends to be nonroutine and low-skilled (allowing for further replacement in the future), or high skilled. We illustrate the dynamic effects that occur when AI is combined with other key technologies, creating economies of scale and scope for firms. Through augmentation, the resulting employment structures may also have lower quantities of high-skilled work. This depends on advances in AI, and its ability to replace more complex forms of work. We end with a call for more critical conversations between society and business, and on what business schools should teach.*

***ChatGPT provided summary:***

*The article "Artificial Intelligence as Augmenting Automation: Implications for Employment" examines the dual role of artificial intelligence (AI) in the workforce, highlighting both its potential to augment jobs by enhancing productivity and its capacity to replace jobs through automation. The authors delve into the economic and organizational impacts of AI, illustrating how automation preferences non-routine over routine skills, leading to a hollowing-out of middle-skill jobs. They provide case evidence on how AI is being used to modularize and control routine work, resulting in employment structures that favor either low-skilled or high-skilled jobs. The article calls for a more nuanced discussion on AI's role in the future of work and suggests that business schools should adapt their curricula to reflect these emerging dynamics.*

***Researcher comments:***

*This article is pivotal to my project as it provides a comprehensive analysis of AI's complex impact on employment, echoing the underlying concerns of my "Robot Replaceability Radar" project. The insights into how AI is reshaping job structures and skill demands will inform my approach to assessing automation potential across job roles. It underscores the importance of considering both the opportunities AI offers for job augmentation and the risks it poses for job displacement, guiding the development of the project towards a balanced view on the automation of work.*

1. Mvuyisi Mabungela. (2023). Artificial Intelligence (AI) and Automation in the World of Work: A Threat to Employees? *Research in Social Sciences and Technology*, *8*(4), 135–146.

***Abstract:***

*The introduction of machines driven by artificial intelligence (AI) and automation technologies has already had a significant impact on the manufacturing, automotive, logistics, retail, and wholesale industries, and the repercussions of their replacement on the human labor has been a hotly disputed subject. AI and automation technical advancements are having a big influence on workforce turnover. The aim of this study was to look at employees' attitudes on Artificial Intelligence and Automation at work, specifically whether they see AI as a threat or not. Secondary data sources from several authors were utilised in this article. This data was gathered from published and peer-reviewed publications, internet sources, and textbooks pertinent to the issue under consideration. Some researchers contend that automation is likely to add to South Africa's high unemployment rate. There is a scarcity of empirical data in the form of published empirical research concentrating on the stress that AI and automation place on employees, hence the study is being conducted. Based on this study, it appeared that employees feel threatened by this rise of Artificial Intelligence and Automation.*

***ChatGPT provided summary:***

*The article "Artificial Intelligence (AI) and Automation in the World of Work: A Threat to Employees?" by Mvuyisi Mabungela explores the impact of AI and automation on employment, particularly focusing on the apprehensions surrounding job displacement. It delves into how technological advancements in AI and automation have already significantly influenced various industries and discusses the prevalent concern regarding their potential to replace human labor. The study seeks to understand employee attitudes towards AI and automation at work, emphasizing the need for skills development to mitigate potential unemployment risks. It highlights the dual nature of AI and automation as both a threat to low-skilled jobs and an opportunity for enhancing productivity and creating new job avenues through appropriate training and development.*

***Researcher comments:***

*This article emphasizes the transformative impact of AI and automation on jobs, reinforcing the need for skills development in my project's context, which seeks to assess automation potential across roles.*

1. Varfa, R., Khare, U., Gupta, A., & Sharma, G. (2023). Robotic Process Automation: Chatbot integration for task automation (Banking Industry). *Grenze International Journal of Engineering & Technology (GIJET)*, *9*(2), 648–655.

***Abstract:***

*This research paper examines the use of robotic process automation (RPA) in banking chatbots. As the banking industry continues to drive digital transformation, chatbots are becoming an increasingly popular tool for customer service and support. However, chatbots have limited functionality and can struggle with complex banking tasks. RPA offers a way to automate these tasks within chatbots, providing more accurate and efficient service. Make it available to your customers. This whitepaper examines the benefits and challenges of using his RPA in a banking chatbot and presents a successful implementation. The findings of this study may help banks looking to improve their chatbot capabilities and enhance the customer experience.*

***ChatGPT provided summary:***

*The article "Robotic Process Automation: Chatbot Integration for Task Automation (Banking Industry)" explores the integration of Robotic Process Automation (RPA) with chatbots to enhance task automation in the banking sector. It discusses how combining RPA with chatbots can optimize business processes by automating routine tasks, leading to more efficient and error-free operations. This integration aims to augment chatbots' capabilities, enabling them to handle complex banking tasks more effectively, thereby improving customer service and operational efficiency. The research highlights the potential benefits of RPA in banking chatbots, including reduced manual effort, increased accuracy, and enhanced customer experience.*

***Researcher comments:***

*This article offers valuable insights into leveraging RPA and chatbots for automating banking tasks, aligning closely with the objectives of the "Robot Replaceability Radar" project. The findings underscore the importance of integrating advanced technologies to streamline operations and enhance service delivery, which will inform our approach to assessing and implementing automation solutions in various job roles.*

1. Peng, G., & Bhaskar, R. (2023). Artificial intelligence and machine learning for job automation: A review and integration. *Journal of Database Management (JDM)*, *34*(1), 1-12.

***Abstract:***

*Job automation is a critical decision that has brought about profound changes in the workplace. However, the question of what drives job automation remains unclear. This study conducts an interdisciplinary review of five theoretical frameworks on job automation, paying particular attention to the role played by artificial intelligence and machine learning. It highlights the concepts and mechanisms underlying each of the frameworks, compares and contrasts their similarities and differences, and highlights challenges and suggests opportunities of job automation. It also proposes an integrated framework on job automation by addressing the research gaps in extant frameworks and thereby contributes to the research and practice on this important topic.*

***ChatGPT provided summary:***

*The article "Artificial Intelligence and Machine Learning for Job Automation: A Review and Integration" provides a comprehensive analysis of job automation through the lens of artificial intelligence (AI) and machine learning (ML), examining five theoretical frameworks. It delves into the drivers of job automation, contrasting the roles of AI and ML, and proposes an integrated framework by highlighting research gaps in existing literature. The focus is on the differentiation between routine and non-routine tasks and the potential of ML to automate tasks previously thought un-automatable, alongside practical considerations in the automation decision-making process.*

***Researcher comments:***

*This review offers crucial insights into AI and ML's role in automating tasks, vital for the "Robot Replaceability Radar" project. It highlights the complexity of automation beyond routine tasks, supporting a more nuanced approach to assessing job automation potential.*

1. Melo, G., Nascimento, N., Alencar, P., & Cowan, D. (2023). Identifying factors that impact levels of automation in autonomous systems. *IEEE Access*.

***Abstract:***

*The need to support complex human and machine collaboration has increased because of recent advances in the use of software and artificial intelligence approaches across various application domains. Building applications with more autonomy has grown dramatically as modern system development capability has significantly improved. However, understanding how to assign duties between humans and machines still needs improvement, and there is a need for better approaches to apportion these tasks. Current methods do not make adaptive automation easy, as task assignments during system operation need to take knowledge about the optimal level of automation (LOA) into account during the collaboration. There is currently a lack of explicit knowledge regarding the factors that influence the variability of human-system interaction and the correct LOA. Additionally, models have not been provided to represent the adaptive LOA variation based on these parameters and their interactions and interdependencies. The study, presented in this paper, based on an extensive literature review, identifies and classifies the factors that affect the degree of automation in autonomous systems. It also proposes a model based on feature diagrams representing the factors and their relationships with LOAs. With the support of two illustrative examples, we demonstrate how to apply these factors and how they relate to one another. This work advances research in the design of autonomous systems by offering an adaptive automation approach that can suggest levels of automation to facilitate human-computer interactions.*

***ChatGPT provided summary:***

*The article "Identifying Factors That Impact Levels of Automation in Autonomous Systems" discusses the increasing need for complex human-machine collaboration due to advancements in software and artificial intelligence across various domains. It focuses on the challenges of assigning duties between humans and machines and emphasizes the necessity for better approaches to distribute tasks, considering the optimal level of automation (LOA) during system operation. The study presents an extensive literature review to identify and classify factors affecting the degree of automation in autonomous systems and proposes a model representing these factors and their relationships with LOAs. Through illustrative examples, the article demonstrates how these factors relate to one another, advancing research in designing autonomous systems by offering an adaptive automation approach that suggests levels of automation to facilitate human-computer interactions.*

***Researcher comments:***

This article's insights into factors influencing levels of automation and its proposed model for adaptive automation are highly relevant to the "Robot Replaceability Radar" project. It informs the project by providing a structured approach to understanding how various factors, such as task complexity, human-machine collaboration, and environmental conditions, influence the decision-making process regarding the appropriate LOA. This framework will be instrumental in refining the project's methodology for assessing the automation potential of job roles, ensuring a nuanced approach that accounts for the complex interplay of these factors.

1. Sørensen, N. L., Bemman, B., Jensen, M. B., Moeslund, T. B., & Thomsen, J. L. (2023). Machine learning in general practice: scoping review of administrative task support and automation. *BMC primary care*, *24*(1), 14.

***Abstract:***

***Background:*** *Artificial intelligence (AI) is increasingly used to support general practice in the early detection of disease and treatment recommendations. However, AI systems aimed at alleviating time-consuming administrative tasks currently appear limited. This scoping review thus aims to summarize the research that has been carried out in methods of machine learning applied to the support and automation of administrative tasks in general practice.*

***Methods:*** *Databases covering the fields of health care and engineering sciences (PubMed, Embase, CINAHL with full text, Cochrane Library, Scopus, and IEEE Xplore) were searched. Screening for eligible studies was completed using Covidence, and data was extracted along nine research-based attributes concerning general practice, administrative tasks, and machine learning. The search and screening processes were completed during the period of April to June 2022.*

***Results:*** *1439 records were identified and 1158 were screened for eligibility criteria. A total of 12 studies were included. The extracted attributes indicate that most studies concern various scheduling tasks using supervised machine learning methods with relatively low general practitioner (GP) involvement. Importantly, four studies employed the latest available machine learning methods and the data used frequently varied in terms of setting, type, and availability.*

***Conclusion:*** *The limited field of research developing in the application of machine learning to administrative tasks in general practice indicates that there is a great need and high potential for such methods. However, there is currently a lack of research likely due to the unavailability of open-source data and a prioritization of diagnostic-based tasks. Future research would benefit from open-source data, cutting-edge methods of machine learning, and clearly stated GP involvement, so that improved and replicable scientific research can be done.*

***ChatGPT provided summary:***

*The article "Machine learning in general practice: scoping review of administrative task support and automation" conducts a comprehensive analysis of the application of machine learning (ML) methods in supporting and automating administrative tasks within general practice settings. It identifies the research efforts made to alleviate the time-consuming administrative tasks through ML, highlighting the potential for ML to significantly benefit general practice by optimizing various scheduling tasks and other administrative functions. The review underscores the current limitations in the field, such as the scarcity of open-source data and a predominant focus on diagnostic tasks over administrative ones, suggesting a considerable gap and opportunity for future research.*

***Researcher comments:***

*This review underscores the untapped potential of ML in streamlining administrative tasks in healthcare, aligning with our project's aim to assess automation potential across job roles. It highlights the necessity for broader data access and a shift in research focus, which will guide our methodology in developing the "Robot Replaceability Radar."*

1. Liu, L. (2023). Job quality and automation: Do more automatable occupations have less job satisfaction and health?. *Journal of Industrial Relations*, *65*(1), 72-87.

***Abstract:***

*Social scientists have made predictions about the automation of jobs, as well as the negative consequences that technology has on job quality, but not how these phenomena are connected. Are occupations with a higher susceptibility of automation associated with lower job quality? This study involves an empirical examination of automation-related measures from Frey and Osborne and applies them to job quality variables (job satisfaction and self-rated health) drawn from the US General Social Survey (GSS), Quality of Working Life and Work Orientation Panel from five different waves (2002 to 2018 every 4 years; N =7240). The finding is that highly automatable occupations have lower level of job satisfaction and health and, hence, less job quality. This has implications on the future of work, which could be but not necessarily characterized by fewer bad quality jobs.*

***ChatGPT provided summary:***

*The article "Job Quality and Automation: Do More Automatable Occupations Have Less Job Satisfaction and Health?" investigates the correlation between the potential for job automation and its effects on job quality, specifically job satisfaction and health. Analyzing data from the U.S. General Social Survey, it concludes that occupations at higher risk of automation are associated with lower job satisfaction and health, signaling a decrease in job quality. This suggests a critical link between automation susceptibility and the broader implications for worker well-being.*

***Researcher comments:***

*This study's exploration of automation's impact on job satisfaction and health provides key insights for the "Robot Replaceability Radar" project. It underscores the importance of considering worker well-being in assessing the automation potential of job roles, reinforcing the project's aim to evaluate not just the technical feasibility of automation but its human-centered implications.*

1. Luan, Z., Lai, Y., Huang, R., Lan, X., Chen, L., Chen, B., ... & Yu, S. (2023, November). Automatic Robotic Development through Collaborative Framework by Large Language Models. In *2023 China Automation Congress (CAC)* (pp. 7736-7741). IEEE.

***Abstract:***

*Despite the remarkable code generation abilities of large language models (LLMs), they still face challenges in complex task handling. Robot development, a highly intricate field, inherently demands human involvement in task allocation and collaborative teamwork. To enhance robot development, we propose an innovative automated collaboration framework inspired by real-world robot developers. This framework employs multiple LLMs in distinct roles-analysts, programmers, and testers. Analysts delve deep into user requirements, enabling programmers to produce precise code, while testers fine-tune the parameters based on user feedback for practical robot application. Each LLM tackles diverse, critical tasks within the development process. Clear collaboration rules emulate real-world teamwork among LLMs. Analysts, programmers, and testers form a cohesive team overseeing strategy, code, and parameter adjustments. Through this framework, we achieve complex robot development without requiring specialized knowledge, relying solely on non-experts' participation.*

***ChatGPT provided summary:***

*The paper "Automatic Robotic Development through Collaborative Framework by Large Language Models" introduces an innovative approach for automating robot development tasks using a collaborative framework of Large Language Models (LLMs). This framework employs multiple LLMs acting in distinct roles such as analysts, programmers, and testers to efficiently develop complex robotic systems. By mimicking real-world development team dynamics, this method allows for the precise generation of executable code and effective task handling without the need for specialized knowledge, showcasing significant advantages in efficiency and accuracy over traditional development methods.*

***Researcher comments:***

*This paper's exploration of LLMs in automating complex robot development tasks offers valuable insights for the "Robot Replaceability Radar" project. The collaborative framework presented aligns with our goal of assessing automation potential across various roles, emphasizing the importance of teamwork and role differentiation in automating complex processes.*

1. Tai, R. H., Bentley, L. R., Xia, X., Sitt, J. M., Fankhauser, S. C., Chicas-Mosier, A. M., & Monteith, B. G. (2024). An Examination of the Use of Large Language Models to Aid Analysis of Textual Data. *International Journal of Qualitative Methods*, *23*, 16094069241231168.

***Abstract:***

*The increasing use of machine learning and Large Language Models (LLMs) opens up opportunities to use these artificially intelligent algorithms in novel ways. This article proposes a methodology using LLMs to support traditional deductive coding in qualitative research. We began our analysis with three different sample texts taken from existing interviews. Next, we created a codebook and inputted the sample text and codebook into an LLM. We asked the LLM to determine if the codes were present in a sample text provided and requested evidence to support the coding. The sample texts were inputted 160 times to record changes between iterations of the LLM response. Each iteration was analogous to a new coder deductively analyzing the text with the codebook information. In our results, we present the outputs for these recursive analyses, along with a comparison of the LLM coding to evaluations made by human coders using traditional coding methods. We argue that LLM analysis can aid qualitative researchers by deductively coding transcripts, providing a systematic and reliable platform for code identification, and offering a means of avoiding analysis misalignment. Implications of using LLM in research praxis are discussed, along with current limitations.*

***ChatGPT provided summary:***

*The article "An Examination of the Use of Large Language Models to Aid Analysis of Textual Data" investigates the application of Large Language Models (LLMs) to support traditional deductive coding in qualitative research. By analyzing sample texts with a codebook and comparing LLM coding to human coders, the study demonstrates LLM's potential to offer systematic and reliable code identification. It suggests that LLM analysis could reduce bias and improve the reliability of qualitative data analysis, providing a novel tool for researchers to enhance the deductive coding process.*

***Researcher comments:***

*This study's examination of LLMs for aiding textual data analysis directly informs the methodology of the "Robot Replaceability Radar" project by showcasing the potential of AI in automating analytical tasks. The findings will guide the integration of LLMs to ensure precise task automation evaluation, highlighting the intersection of AI's capabilities with qualitative analysis in workforce assessment.*

1. Li, Y., Tuckey, M. R., Chen, P. Y., & Dollard, M. F. (2024). Job characteristics and employee outcomes: criterion validity of the US Occupational Information Network (O\* NET) job analysis database in the Australian context. *European Journal of Work and Organizational Psychology*, 1-15.

***Abstract:***

*Occupational Information Network (O\*NET) is a comprehensive job analysis repository, developed and periodically updated in the U.S. The study aims to validate O\*NET in the Australian context and illustrate the potential to use O\*NET as a source of robust occupational research data internationally. We first link O\*NET data at the occupational level with individual-level data in the Australian Workplace Barometer (AWB) database containing a sample of 3,829 individuals working in 209 occupations. We then conceptually replicate the primary hypothesized relationships from nine published studies that used O\*NET ratings of four job characteristics (job hazards, emotional labor requirements, job autonomy, and task significance) to predict work-related outcomes. Specifically, we selected the same O\*NET job descriptors used in the nine studies and linked them to similar but not identical employee outcomes obtained from the AWB database. Multi-level analyses showed that the hypothesized relationships were predominantly supported at the occupational level, demonstrating the criterion validity of the O\*NET job characteristic profiles in the Australian context. Overall, our research highlights the potential to use O\*NET in research and policy applications on a broader international scale, predicated on obtaining solid validation evidence.*

***ChatGPT provided summary:***

*The article "Job characteristics and employee outcomes: criterion validity of the U.S. Occupational Information Network (ONET) job analysis database in the Australian context" explores the applicability of the ONET database for occupational analysis outside the U.S., specifically in Australia. It aims to validate the use of ONET in predicting work-related outcomes in the Australian workforce by linking ONET data with individual-level data from the Australian Workplace Barometer (AWB). The study investigates the relationships between four job characteristics (job hazards, emotional labor requirements, job autonomy, and task significance) derived from ONET and various employee outcomes. The findings suggest that ONET job characteristics are significantly related to employee health and job satisfaction in the Australian context, thus supporting the criterion validity of O\*NET in an international setting.*

***Researcher comments:***

*This article's findings demonstrate the global applicability of O\*NET in understanding job characteristics and their impact on employee outcomes, reinforcing the value of the "Robot Replaceability Radar" project. It highlights the importance of robust occupational analysis tools in accurately assessing automation potential and its implications on worker well-being and job satisfaction.*

1. Vidgof, M., Bachhofner, S., & Mendling, J. (2023, September). Large language models for business process management: Opportunities and challenges. In *International Conference on Business Process Management* (pp. 107-123). Cham: Springer Nature Switzerland.

***Abstract:***

*Large language models are deep learning models with a large number of parameters. The models made noticeable progress on a large number of tasks, and as a consequence allowing them to serve as valuable and versatile tools for a diverse range of applications. Their capabilities also offer opportunities for business process management; however, these opportunities have not yet been systematically investigated. In this paper, we address this research problem by foregrounding various management tasks of the BPM lifecycle. We investigate six research directions highlighting problems that need to be addressed when using large language models, including usage guidelines for practitioners.*

***ChatGPT provided summary:***

*The article "Large Language Models for Business Process Management: Opportunities and Challenges" discusses the integration of Large Language Models (LLMs) into various stages of the Business Process Management (BPM) lifecycle. It explores the potential of LLMs to enhance BPM tasks, such as identifying processes from documentation, process selection, and discovery from communication logs. The paper highlights the versatility of LLMs in processing vast volumes of text and structured data to streamline BPM activities, despite challenges like the accuracy of generated content and the need for specific usage guidelines for practitioners.*

***Researcher comments:***

*This article provides crucial insights into leveraging LLMs for enhancing BPM, which is directly relevant to the "Robot Replaceability Radar" project. It highlights innovative approaches to integrate AI in assessing and improving business processes, underscoring the project's aim to employ cutting-edge technology for a comprehensive evaluation of job automation potential.*

1. Al-Anqoudi, Y., Al-Hamdani, A., Al-Badawi, M., & Hedjam, R. (2021). Using machine learning in business process re-engineering. *Big Data and Cognitive Computing*, *5*(4), 61.

***Abstract:***

*A business process re-engineering value in improving the business process is undoubted. Nevertheless, it is incredibly complex, time-consuming and costly. This study aims to review available literature in the use of machine learning for business process re-engineering. The review investigates available literature in business process re-engineering frameworks, methodologies, tools, techniques, and machine-learning applications in automating business process re-engineering. The study covers 200+ research papers published between 2015 and 2020 in reputable scientific publication platforms: Scopus, Emerald, Science Direct, IEEE, and British Library. The results indicate that business process re-engineering is a well-established field with scientifically solid frameworks, methodologies, tools, and techniques, which support decision making by generating and analyzing relevant data. The study indicates a wealth of data generated, analyzed and utilized throughout business process re-engineering projects, thus making it a potential greenfield for innovative machine-learning applications aiming to reduce implementation costs and manage complexity by exploiting the data’s hiding patterns. This suggests that there were attempts towards applying machine learning in business process management and improvement in general. They address process discovery, process behavior prediction, process improvement, and process optimization. The review suggests that expanding the applications to business process re-engineering is promising. The study proposed a machine-learning model for automating business process re-engineering, inspired by the Lean Six Sigma principles of eliminating waste and variance in the business process.*

***ChatGPT provided summary:***

*The document "Using Machine Learning in Business Process Re-Engineering" reviews the application of machine learning (ML) techniques in business process re-engineering (BPR), covering frameworks, methodologies, tools, and the potential of ML to automate and improve business process re-engineering tasks. It analyzes over 200 research papers, highlighting a significant interest in applying ML to manage complexity, reduce costs, and uncover patterns in business process management. This study indicates a promising area for further innovation in automating BPR through ML, addressing process discovery, behavior prediction, improvement, and optimization.*

***Researcher comments:***

*The insights from this study on integrating ML in BPR illuminate potential avenues for the "Robot Replaceability Radar" project, especially in automating complex business processes. This reinforces the project's objective to employ ML for a nuanced analysis and automation of tasks, showcasing the transformative power of ML in redefining BPR.*

1. Makridakis, S., Petropoulos, F., & Kang, Y. (2023). Large language models: Their success and impact. *Forecasting*, *5*(3), 536-549.

***Abstract:***

*ChatGPT, a state-of-the-art large language model (LLM), is revolutionizing the AI field by exhibiting humanlike skills in a range of tasks that include understanding and answering natural language questions, translating languages, writing code, passing professional exams, and even composing poetry, among its other abilities. ChatGPT has gained an immense popularity since its launch, amassing 100 million active monthly users in just two months, thereby establishing itself as the fastest-growing consumer application to date. This paper discusses the reasons for its success as well as the future prospects of similar large language models (LLMs), with an emphasis on their potential impact on forecasting, a specialized and domain-specific field. This is achieved by first comparing the correctness of the answers of the standard ChatGPT and a custom one, trained using published papers from a subfield of forecasting where the answers to the questions asked are known, allowing us to determine their correctness compared to those of the two ChatGPT versions. Then, we also compare the responses of the two versions on how judgmental adjustments to the statistical/ML forecasts should be applied by firms to improve their accuracy. The paper concludes by considering the future of LLMs and their impact on all aspects of our life and work, as well as on the field of forecasting specifically. Finally, the conclusion section is generated by ChatGPT, which was provided with a condensed version of this paper and asked to write a four-paragraph conclusion.*

***ChatGPT provided summary:***

*The document "Large Language Models: Their Success and Impact" examines the rapid growth and success of ChatGPT, a state-of-the-art Large Language Model (LLM) that has transformed AI's capability to perform tasks resembling human intelligence. It details ChatGPT's widespread adoption, marked by achieving 100 million active monthly users in just two months, and discusses its significant impact across various fields, including forecasting. The paper evaluates ChatGPT's accuracy in answering questions within specific domains and considers the future of LLMs in enhancing forecasting methods and their broader societal implications.*

***Researcher comments:***

*This document offers essential insights into the capabilities and limitations of LLMs like ChatGPT, which are crucial for my project on the "Robot Replaceability Radar." It underscores the potential of LLMs to contribute to our understanding of automation's impact on jobs and highlights the importance of further research to harness these technologies effectively in forecasting and beyond.*