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ADDRESSING THE TRUSTWORTHINESS IN AUTONOMOUS SYSTEMS AND CHALLENGE OF PSYCHOLOGICAL ACCEPTABILITY OF ANTHROPOMORPHISM

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ABSTRACT

This article explores the acceptance of autonomous systems in corporate management through the contribution of anthropomorphism. By ascribing human-like qualities to machines, anthropomorphism can make or break trust and acceptance of these systems by human workers. Our research reveals that although anthropomorphized AI creates a sense of reliability and familiarity, too many human-like qualities create discomfort, the so-called "uncanny valley" effect. This study delves into the implications of such dynamics on corporate governance, with a focus on the need for ethical models and openness in the utilization of AI systems. Through an exhaustive examination of case studies as well as empirical evidence, we determine the most crucial factors affecting employee acceptance as trustworthiness, psychological preparedness, and perceived advantages from AI adoption. The study adds to knowledge about how anthropomorphism impacts the relationship between human workers and autonomous systems, eventually offering frameworks for successful regulation and control of AI technologies within business contexts.

Keywords: Autonomous Systems, Corporate Governance, Psychological Acceptance, Anthropomorphism, Technological Progression, Human-Machine Interaction

INTRODUCTION

Anthropomorphism refers to the act of giving human qualities to inhuman objects. the real-life example of this process are autonomous systems (Arleen Salles et.al, 2020). Improving and adjusting the performance over time by machine learning the artificial intelligence is one of the means of adding human like behavior to machines or robots (Mohsen Soori et.al, 2023). These are the technology-based entities that are capable of executing work independently without any involvement from humans. They utilize sophisticated algorithms, machine learning, artificial intelligence (AI), and sensor technologies to sense their surroundings, process data, and make decisions. Their defining characteristic is the fact that they can execute complicated work autonomously (Vijay Kanade, 2022). This paper is the examination of the association of the anthropomorphism and AI and with autonomous systems in particular relation to the corporate governance. The set of rules, practices, and processes to direct and control the companies, referred to as corporate governance, involves balancing the interests of many of a company's stakeholders, among whom shareholders, management, customers, suppliers, financiers, government, and the community are included. Good corporate governance renders the approach to achieve the objectives of a company along with its management, encompassing action plans and internal controls to measure the performance and corporate disclosure. The need to analyze the effects of ever improving anthropomorphism in corporate governance is strongly aligned with the potential

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ability of AI to contribute in the global economy up to 15.7 trillion by 2030 (Amani Alabed et.al, 2022). In regard to autonomous systems, robust corporate governance is pivotal to address ethical considerations, uphold regulatory compliance, and build public trust in these advanced technologies (Ciro Mennella et.al, 2024). It involves setting policies and practices that guide the development, deployment, and oversight of autonomous systems

With the technological growth AI agents becoming more and more human like with the great degree of progress made not only in terms of their cognitive abilities but also their appearance. Despite the increasing use of AI in corporate governance a little is known about the interactions of AI governors and the natural employees. Though significant work has been done on contribution of AI to the corporations however the gap exists in respect of examination of psychological acceptance for AI agents in the position of directors of the companies (Govenda, 2018). The existing work focuses majorly on the trustworthiness, empathy and consumer acceptance of these systems (Robert G. Eccels and Miriam Vogel, 2022). However, the acceptance by the employees working under command of AI agents is an area of salient gap.

The potential of anthropomorphized AI is receiving growing attention (van Doorn et al., 2017), even researchers are acknowledging its value. The prior work concentrates on how users perceive the anthropomorphized AI characters in corporate governance and not on how they relate to the users and employees. An extent of study supports that individuals psychologically correspond to technologies and non-animate entities (Hollenbeck and Kaikati, 2012), but the dynamics of this relation and interaction with these AI agents who might appear and behave like humans is under discussion. This study unveils these areas and stresses on the need to understand the emerging and increasing leadership roles of AI agents in corporate governance. It thus builds on this prior work to explain activation of human schema by AI agents enabling them to feel congruent and compatible with this new governance method ensuring effective management.

METHODOLOGY AND APPROACH

In addition to empirical data, this study employs thought experiments and theoretical frameworks to explore hypothetical scenarios and conceptual models that guide the analysis of trustworthiness and acceptability. The study utilizes ethical frameworks proposed by Borenstein et al. (2017) to assess the ethical implications of autonomous systems in leadership roles. Who underscores the significance of ethical guidelines to maintain biases and promote ethical conduct in AI applications in addition to discussing the ethical considerations in terms of engineering socially just autonomous systems. These frameworks offer systematic methods for assessing fairness, accountability, and transparency in AI-governed decision-making. The research also includes technological implications due to the capacity of technological-feasibility-based experiments to investigate the possible capabilities and constraints of autonomous leaders. Drawing from advances in AI and robotics, they picture future uses and technological developments. By taking into account the feasibility of technology, the research considers real challenges and opportunities related to bringing autonomous systems into leadership positions in different industries. This study includes the analysis of the feasibility and challenges of applying autonomous systems in leadership positions in different fields, such as corporate settings, the medical field, and public service. The main goals are:● To assess the trustworthiness, security, and ethical conduct of autonomous systems. This includes looking at case studies, current literature, and empirical evidence to identify the degree to which such systems can be trusted with leadership tasks.

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- To explore the human factors that contribute to the acceptance of autonomous systems. This would involve researching the impact of anthropomorphism, user comfort, and trust in interacting with autonomous systems intended for leadership positions.
- To formulate guidelines and best practices for corporate governance of autonomous systems. This is to ensure that such systems are created, implemented, and governed in a manner that takes full advantage of their value while keeping risks and ethics to a minimum.
- To determine viable uses of autonomous systems as leaders and assess their functionality in practice. This includes pilot projects and case studies to offer an overview of effectiveness and adoption of these systems.

By providing answers to these goals, this study hopes to present an in-depth understanding of the feasibility and implications of deploying autonomous systems into leadership positions, adding to the larger discussion regarding the future of AI and robotics in society.

LITERATURE REVIEW

This paper synthesizes a broad range of literature to advance an integrated understanding of the trustworthiness and psychological acceptability of autonomous systems in leadership positions. Through the integration of findings from multiple studies and empirical instances, this synthesis will shed light on central findings and patterns associated with integrating AI-driven technology into organizational governance structures. These methods facilitate the synthesis of perspectives across different disciplines and applications. This article critically analyzes academic studies, books, and reports on autonomous systems' reliability, security, and ethical concerns in leadership positions. New AI technological development has made AI technologies easily integrated into leadership positions, with the potential for greater efficiency and decision-making (Smith, 2020). Research highlights ethical guidelines to regulate AI applications to make them more transparent, accountable, and fair (Rahman et al., 2023).

Notable studies are those conducted by Thrun et al. (2006) on autonomous vehicle decision-making capabilities and Clarke (2004) on corporate governance principles applied to future technologies. While Thrun et al. (2006) look at how autonomous vehicles perceive the world and make decisions, offering preliminary insights into AI decision-making processes. In the same vein, Clarke (2004) addresses theoretical frameworks that inform corporate governance principles for use with autonomous systems, providing insights on accountability and transparency in technology applications. The research offers key knowledge and theoretical foundation required in assessing the integration of autonomous systems into leadership positions. In the further progression this research emphasizes the revolutionary impact of AI on organizational processes, from operations efficiency to strategic decision-making processes.

CASE ANALYSES

Empirical evidence for practical applications is derived from case studies of organizations such as JP Morgan Chase and Maersk, which have incorporated autonomous systems within governance and operational models. The cases demonstrate how AI-based governance models increase operational efficiency and transparency in dynamic organizational settings. Examples of JP Morgan Chase's AI-driven contract intelligence (COiN) and Maersk's use of the blockchain technology in the supply chain management illustrate actual applications and results of autonomous systems as leaders. These case studies add empirical considerations to the success and challenges of deploying autonomous systems across various organizational contexts.

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EVOLUTION AND CAPABILITIES OF AUTONOMOUS SYSTEMS IN VARIOUS INDUSTRIES

The evolution of autonomous systems has registered impressive advancements in AI, machine learning, and robotics, revolutionizing various industries. The past few years have also recorded remarkable progress in the transportation industry with autonomous vehicles (AVs). Waymo, Cruise, and Tesla are some of the companies that have registered significant progress in the development of AVs incorporating a suite of sensors, machine learning algorithms, and real-time data processing to safely move around complex urban settings (Waymo, 2023; Cruise, 2023). Research suggests that these vehicles can enhance traffic flow efficiency by potentially decreasing accidents involving human error (Litman, 2023).

In the health sector, autonomous systems are having a significant impact. Robotic process automation (RPA) and artificial intelligence diagnostics are improving operational efficacy and precision. Technologies such as IBM Watson Health leverage AI to process enormous amounts of data, helping detect diseases at an early stage coupled with individualized treatment strategies (Topol, 2019). The pandemic of COVID-19 fast-tracked the use of these technologies, with autonomous systems taking central roles in telemedicine, robotic support, and lab process automation (Yang et al., 2021). Autonomous systems have also impacted manufacturing. Sophisticated automation and robotics technologies have enhanced the precision and efficiency of production lines to achieve higher flexibility and lower downtime. Collaborative robots or cobots are more commonly employed to work alongside human employees, improving productivity and risk mitigation (Wang et al., 2022).

IMPORTANCE OF AUTONOMOUS SYSTEMS IN CORPORATE GOVERNANCE

Autonomous systems have the capacity to transform corporate governance to make it more profitable, transparent, and efficient. Current literature presents strong evidence on the possibility of these systems achieving these ends.

Profitability

Autonomous systems are capable of driving profitability through efficient optimization of processes and cost savings. AI and machine learning can sift through vast amounts of data to find cost-reduction opportunities and streamline supply chains (Baryannis et al., 2019). Predictive analytics, for instance, can improve demand forecasting, enabling businesses to reset their production timelines and stock levels, thereby avoiding wastage and boosting profitability (Choi et al., 2021).

In managing finances, autonomous systems can improve profitability by automated investment and trading plans. Trading platforms powered by artificial intelligence can detect market trends and make trades at high speed, usually performing better than human traders (Jiang & Liang, 2023). Such an ability enables companies to achieve optimum returns on investments and enhance the bottom line.

Transparency

Transparency in corporate governance is most essential to developing trust among stakeholders. Independent systems can bolster transparency by offering real-time monitoring and reporting functions. Blockchain technology, for example, provides a clear and unalterable ledger of transactions, which can be employed for tracing financial transactions, the supply chain movements, and compliance histories (Casino et al., 2019).

AI-based compliance systems can track regulatory updates automatically and reflect changes in company policies accordingly. Such systems can also provide real-time reports of the compliance

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status, facilitating companies to better prove compliance with regulatory requirements and ethical standards (Meyer, 2023).

Efficiency

Autonomous systems greatly enhance efficiency due to the automation of time-consuming and routine tasks. Robotic process automation (RPA) is capable of performing tasks like data entry, invoice processing, and customer service questions, allowing human employees to concentrate on more strategic work (Willcocks et al., 2020). This improves productivity while decreasing the possibility of human error.AI algorithms in decision-making have the ability to process large amounts of information rapidly and provide insight that enables more timely and informed decisions. For instance, AI can detect trends and outliers in financial information, and this enables the manager to see possible problems ahead and take corrective measures (Shrestha et al., 2019).Existing Applications and Case Studies number of firms have been able to implement autonomous systems in their corporate governance structures with beneficial consequences. Some examples include:JP Morgan ChaseJP Morgan Chase has introduced an AI system known as COiN (Contract Intelligence) to analyze legal documents and extract key points of data. The system can quickly scan and process documents in seconds, a process that used to take legal teams thousands of hours (JP Morgan Chase, 2019). The usefulness of COiN is saving a considerable time of the bank and cost involved in the analysis of legal documents, improving the efficiency and profitability of its operations.

Maersk

Shipping behemoth Maersk has embraced the blockchain-based technology to enhance efficiency and transparency within its supply chain processes. Its Trade Lens platform, created in partnership with IBM, employs blockchain to extend real-time visibility into the movement of shipping containers (IBM, 2023). With greater transparency, there has been enhanced trust between stakeholders and supply chain processes have become smoother, diminishing delays and operational expenses.

General Electric (GE)

General Electric has brought together AI and predictive analytics in its maintenance activities through the application of the Digital Twin technology. Digital Twins are identified as the virtual copies of physical assets to employ real-time data as well as forecast maintaining requirements and enhancing performance (Fuller et al., 2020). Through the application of Digital Twins, GE has succeeded in minimizing downtime, increasing asset utilization, and enhancing overall operational effectiveness.

Walmart

Walmart has used autonomous systems in its stock management processes. The retail giant utilizes autonomous robots to scan shelves and refresh inventory records in live mode. The robots can detect out-of-stock products, misplaced products, and mispriced products, ensuring that shelves are always stocked and organized correctly (Walmart, 2022). This has enhanced inventory accuracy and efficiency, resulting in improved customer satisfaction and higher sales.

KPMG

KPMG, an international professional services company, has implemented RPA to streamline mundane audit processes, including data extraction and reconciliation. Not only has this automation made audits more efficient and accurate, but it has also enabled auditors to devote more time to higher-value work, like risk assessment and strategic advisory (KPMG, 2021). Consequently, KPMG has optimized its service delivery and client satisfaction

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PSYCHOLOGICAL BARRIERS TO ADOPTION

Current studies have shown that moderate anthropomorphism can promote user acceptance and engagement with autonomous systems. When robots or AI display human-like characteristics like facial expressions, voice recognition, and conversational skills, users are more likely to trust and identify the robots or AI as trustworthy and more human-like (Waytz et al., 2023). Nevertheless, over-anthropomorphizing can create the "uncanny valley" effect wherein machines that look like humans but are not really human can create discomfort and unease in users (Mori et al., 2012). This effect points to the need for developing autonomous systems with a balance of human-like familiarities and recognizable machine identities so as not to elicit adverse responses.

Trust Issues

Trust is a fundamental driver of autonomous system adoption in any domain. Current literature presents various dimensions of trust needed to encourage user acceptance:

- Reliability: Users need to have faith in the fact that autonomous systems will execute tasks effectively and consistently. AI algorithms that yield consistent predictions, recommendations, and decision-making features are essential to establishing trust (Rahman et al., 2023).
- Transparency: Open systems that reveal their decision-making criteria and procedures build trust with users. Knowledge of how AI systems gather and process data and how they arrive at conclusions improves transparency and raises trust levels (Meyer, 2023).
- Security: User data security and privacy are absolutely critical for continued trust in autonomous systems. Powerful cybersecurity ensures that data breaches and unauthorized access are thwarted, which are crucial to upholding user trust (Casino et al., 2019).

CRITERIA FOR EVALUATING TRUSTWORTHINESS AND ACCEPTABILITY

The evaluation criteria for determining the trustworthiness and acceptability of autonomous systems are designed through lessons derived from the literature review, case studies, and theoretical models. These criteria serve as evaluative tools to assess the readiness and suitability of autonomous systems for leadership roles.

Trustworthiness Criteria

Trust is a psychological state of reliance and a social feeling of confidence that makes a profound increase in the efficiency of any system. Humans relate more to a system or organization that gains their trust (Kate Devitt). This criterion involves assessing the accuracy of the decisions of a system and its ability to operate diligently in varying circumstances. (Gartner, 2023) this requires to conduct a thorough analysis of such systems to inquire for failures and downtime incidents that can help identify potential risks and vulnerabilities. (IEEE, 2021) with the emerging technologies the risk of crimes is also increasing proportionally. Therefore, the need to adopt cybersecurity measures is always ancillary to any such system. The data protection protocols against cyber threats helps develop trust of people in the integrity and confidentiality of an AI driven system. Thus, a strong adherence to regulatory standards and industry guidelines is critical for maintaining data privacy and security. (ISO, 2023) The guidelines should also be followed in respect of ethical standards including fairness, transparency and accountability. They should incorporate societal values in their operational framework. (AI Now Institute, 2020) The use of bias detection algorithms and fairness measurements can assist in alleviating algorithmic biases (Barocas & Selbst, 2016).

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Acceptability Criteria

This criterion is multidimensional and considers psychological, cultural, and social considerations that affect their integration into leadership positions. Psychological experiments by Nass and Moon (2000) and Waytz et al. (2014) are noted for emphasizing how anthropomorphic design affects trust and acceptance in AI-driven technology. Assessing user perceptions and acceptance of autonomous systems, considering factors such as anthropomorphism and human-machine interaction and examining societal norms and cultural factors that influence the acceptance of autonomous systems in leadership roles. (Zhou et al. 2023) helps understand the human-robot interactions.

Indicators of Psychological Acceptability

The assessment of psychological acceptability indicators to learn about users' perception, attitudes, and behavioral reactions towards autonomous systems in positions of leadership. Studies show that anthropomorphic attributes in AI systems can instill greater trust and acceptance among users (Nass et al., 2005). Positive user experience, enabled by user-friendly interfaces and efficient human-machine interaction, leads to greater acceptance rates (Norman, 2013). It is important to take into consideration cultural values and norms when developing AI systems that appeal to plural user populations (Hofstede, 1980). Organizational leadership and culture support are vital factors influencing user attitudes and adoption of AI technologies (Berson & Linton, 2005).

The Dichotomy of Progression and Acceptance

State of Technology: Capabilities and Limitations

Technological Capabilities

The capability of an AI technological system refers to its proficiency in analyzing data while using sophisticated algorithms in making autonomous decisions. The systems become enabled to compute large volumes of data promptly and to make complex, accurate decisions by virtue of advanced AI algorithms, such as machine learning and the deep learning models (Russell & Norvig, 2022). Thus, AI-driven automation enhances operational efficiency by automating repetitive tasks and workflows. Cost savings, reduced human error, and improved productivity in various industries are the valuable merits (Brynjolfsson & McAfee, 2017). Therefore, the organizations should make use of predictive analytics, as it predicts future outcomes by assessing historical data. It would improve insights for strategic planning, risk management, and optimizing business processes (Provost & Fawcett, 2013).

Technological Limitations

The use of AI in leadership roles is also subject to certain limitations. For instance, it raises ethical concerns regarding fairness, impartiality, objectivity, and accountability. AI systems may be subjected to inheriting biases in their training, which may impact decision-making and outcomes. (Jobin et al., 2019) they may also struggle with adapting to new or unexpected situations that require human-like judgment or creativity. They are generally good at handling routine tasks but may falter when faced with novel or ambiguous scenarios (Müller & Bostrom, 2016). They also pose cybersecurity risks, such as data breaches and attacks. Securing AI systems against malicious activities is thus crucial to maintaining trust and protecting sensitive information (Shrobe, 2021).

State of Human Acceptance: Psychological Readiness and Barriers

Facilitators of Acceptance

The system is widely accepted due to its perceived benefits. Such benefits including improved effectiveness, innovation and decision-making capabilities make the AI technologies more admissible among stakeholders. Highlighting these advantages can promote acceptance and

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adoption. (Davis, 1989) Thus, to increase this acceptance the awareness should be given about AI technologies can reduce skepticism and uncertainty among stakeholders. Education initiatives can help clarify misconceptions and build trust in AI systems (Goodall, 2020). The Positive user experiences with AI systems, characterized by reliability, ease of use, and intuitive interfaces, also play a significant role in fostering acceptance and satisfaction among users (Norman, 2013).

Barriers to Acceptance

The biggest fear hindering acceptance of AI is its ability to replace humans. This resistance and skepticism is commonly seen among workers and labor unions. Addressing these fears through retraining programs and emphasizing AI's role as a complement rather than a replacement can mitigate resistance. (Brynjolfsson & McAfee, 2017) In addition, the Privacy, equity, and fairness issues are secondary in the mainstream integration of AI technologies. This elucidates the imperative need of ethical standards and regulatory mechanisms to solve these issues and guarantee responsible AI deployment. (Floridi & Cowls, 2019) another would-be impediment is established by cultural factors and societal norms shape the adoption of AI technologies in various regions and societies. Knowledge of cultural outlooks can assist in customizing AI deployments to match local belief and preference (Hofstede, 1980).

The Gap between Technological Capability and Psychological Acceptance

The high rate of technological change typically surpasses the readiness and adaptability of society. This resulted in difficulties in efficiently deploying AI technologies, as the stakeholders might find it hard to cope with the rate of change. (Kohli & Melville, 2020) The lack of sufficient education and training schemes for stakeholders has also widened the gap that prevents the successful deployment and utilization of AI-driven technologies. Investing to education projects can shorten knowledge gaps and make it easier to adopt processes (Davenport & Kirby, 2015). In addition, the concerns regarding AI-driven tools can be alleviated and promote their reliability through information tranparency about AI capabilities, limitations, and ethical practices is crucial as such practices can help alleviate concerns and build confidence in AI technologies amongst stakeholders (Rahwan et al., 2019).

CONCLUSION

The emerging era of the co-existence of robots and humans raise a significant concern to spread awareness about their mode of operations their benefits and potential risks. The use of AI is not alien to any field or area. Corporate governance is no different to it. The boards of companies comprising of AI agents is an increasing area of interest. there exists a great probability of such methods becoming common within no time. The vast spread and steady growth of anthropomorphism in AI also raise concerns for their acceptance. There is no denial of the benefits corporate governance has acquired through AI. However, at the same time the success of any corporation depends on the degree of compatibility and understanding amongst its board and employees. Humans easily follow the command when not only they are able to comprehend but also, can trust the authority. The trustworthiness of autonomous systems depends on how closely the AI agents relate to humanlike characteristics. As humans easily adapt to an agent within the bounds of human cognition and not totally super human force. This requires to follow norms of logic and work rationally and ethically. The autonomous systems though artificial should not be too artificial. They need to incorporate social standards, ethical principles and reputational concerns. Only then a human-like trust relationship can be built which forms the basis of corporate governance. In addition, the awareness is essential to keep a balance in rapidly developing technology and human understanding. Sometimes the technology progresses so drastically that

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humans are not able to comprehend. Therefore, the periodical trainings can keep them aware of the new progressions and possible developments. Keeping them in touch with any possible coming concept of AI can prepare their minds before rather than subjecting them immediately to such mode of governance which would ultimately require significant time and effort. This would put in difficulty not only the employees who would struggle with new command structure but also the corporation itself as it can delay or hinder the work of a company. For this purpose, this study has in detail provided an analysis of the human-AI relation in terms of corporate governance and has laid some recommendations to overcome the hurdles in the smooth running of this relationship. However, future studies can be conducted providing a quantitative analysis of the effectiveness of the AI boards in corporate governance.

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