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Diffusion of AI Governance

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ABSTRACT

Artificial intelligence (AI) has the potential to address social, economic, and environmental challenges. However, effective use of AI in organizations relies on the establishment of an AI governance framework. Although existing studies have discussed a variety of issues raised by AI-based systems and proposed AI governance frameworks to overcome those issues, organizations face challenges in adopting AI governance. Informed by innovation diffusion theory, this research evaluates the impact of internal and external influences on AI governance adoption between highly regulated and less regulated industries. We also assess the effect of adopting AI governance on organizational performance. Findings from this study will not only provide a nuanced understanding of the source of AI governance adoption, but also provide implications and guidelines for implementing AI governance in organizations.

Keywords

AI governance, organizational adoption, innovation diffusion, organizational performance, social systems.

INTRODUCTION

Artificial intelligence (AI) has enabled new innovations such as driverless vehicles and automated language translations. While AI has the prospects to reshape many aspects of human life (Wang and Siau, 2019), it also brings challenges regarding how the technology can be more effectively utilized in real-life by offering Fairness, Accountability, Transparency, and Ethics (i.e., FATE as termed by Microsoft) in AI-based solutions. As AI becomes more autonomous, an agency problem arises when AI systems do not necessarily work towards the benefits of humans, organizations, and societies (Sidorova and Rafiee, 2019). Organizations need to establish appropriate policies and structures to mitigate agency risks by ensuring the proper use of AI. This naturally leads to the need for organizations to adopt AI governance.

AI governance can ensure the effective use of AI and mitigate potential risks related to the technology. Research has discussed a variety of AI issues such as fairness, biases, explainability, and transparency (e.g., Adadi and Berrada, 2018) and proposed AI governance as a means to address some of those problems (e.g., Gasser and Almeida, 2017; Wang and Siau, 2018). AI governance adoption issues and the impact that AI governance structure adoption has on organizational performance need to be studied. This research addresses the following research questions:

RQ1: What factors influence organizational decisions to adopt an AI governance framework to address emerging issues raised by AI?

RQ2: How does the adoption of an AI governance framework impact organizational performance?

THEORETICAL FOUNDATION AND HYPOTHESES

This research investigates organizational adoption of AI governance from the well-established theoretical foundation of innovation diffusion. Innovation diffusion describes the process by which an innovation is communicated and adopted over time through certain channels among the members of a social system (Rogers, 1995). The decision to adopt AI governance can be affected by various organizational and environmental factors. Specifically, Mahajan and Peterson (1985) suggested three fundamental innovation diffusion models, namely internal, external, and mixed influence models. The three influence models

differ in the primary source of influence (Hu et al., 1997; Mahajan and Peterson, 1985). The internal influence model assumes that the decision to adopt an innovation is mainly influenced by communications between adopters and non-adopters within a social system (e.g., interpersonal communication and word-of-mouth). In contrast, the external influence model proposes that the main source of influence is from outside the social system (e.g., via mass media channels). The mixed influence model combines the effects of both internal and external influences by suggesting that a specific innovation is communicated through both interpersonal and mass media channels existing within the social system.

In this research, we focus on the diffusion of AI governance among organizations within an industry in which organizations follow similar regulations such as the SWIFT (society for worldwide interbank financial telecommunication) standards for banking and finance. Most industries, regardless of the degree of regulation, have social systems that serve as conduits, such as industry seminars, for the exchange of ideas and information (e.g., emerging technologies, external issues). Similarly, organizations within an industry form social systems in which regulations and policies for AI use are communicated and diffused.

Specifically, we argue that internal and external communication channels impact organizational decisions to adopt AI governance differently in industries with varying degrees of regulations. For example, for industries that are heavily regulated, those social systems can also be used for exchanging ideas regarding new AI regulations to be implemented. Social systems can be used to communicate regulations and best practices of AI governance. Therefore, we suggest that highly regulated industries will utilize their social systems for more extensive purposes (i.e., exchange of regulatory information and ideas) versus industries that are subject to fewer regulations. Also, organizations in highly regulated industries will be more likely to seek out their internal influence sources for decisions surrounding the adoption of AI governance. Accordingly, the following hypotheses are proposed:

H1: Organizations in more regulated industries are influenced to a higher degree by internal sources in their decisions to adopt AI governance than organizations in less regulated industries.

H2: Organizations in less regulated industries are influenced to a higher degree by external sources in their decisions to adopt AI governance than organizations in more regulated industries.

Although studies have suggested that AI and related business analytics can create competitive advantages for organizations and thus improve their performance (Teo et al., 2016), the mere use of AI technologies does not necessarily help in building an organization's competitive capability. Specifically, Serge-Lopez et al. (2020) suggested that organizations can increase performance through AI capabilities only when AI has been used to reconfigure their processes. Essentially, effective use of AI depends on the adoption of a governance framework that ensures AI use is aligned with corporate strategies and policies. Thus, the adoption of AI governance plays an imperative role in building organizational competitive advantages which impact corporate performance. Therefore, we hypothesize that:

H3: The adoption of AI governance is positively associated with corporate performance.

In the strategic management literature, the resource-based view (RBV) of the firm (Barney, 1991; Wernerfelt, 1984) suggests that competing companies are heterogenous in their resources and capabilities, and it is those resources possessed by a company, instead of its competitors, that can create competitive advantages for the company. From the perspective of RBV, early adopters of AI governance have relatively more competitive advantages than the followers. Thus, the following hypothesis is proposed:

H4: Early adopters of AI governance have higher corporate performance than the followers.

RESEARCH METHOD AND EXPECTED CONTRIBUTIONS

The research method proposed is a field study utilizing empirical data. We plan to collect data from companies by conducting a survey. Statistical methods will be used to analyze the data and test the proposed hypotheses. The findings of this research can provide insights into the dynamics associated with organizational adoption of AI governance, as well as its impact on organizational performance. It can also provide guidance for effective governance of AI-based systems and best practices for the effective use of AI technologies to build competitive capabilities for organizations.

REFERENCES

1. Adadi, A., and Berrada, M. (2018) Peeking inside the black-box: A survey on explainable artificial intelligence (XAI), *IEEE Access*, 6, 52138-52160.
2. Barney, J. (1991) Firm resources and sustained competitive advantage, *Journal of Management*, 17, 1, 99-120.
3. Gasser, U., and Almeida, V.A. (2017) A layered model for AI governance, *IEEE Internet Computing*, 21, 6, 58-62.
4. Hu, Q., Saunders, C., and Gebelt, M. (1997) Research report: Diffusion of information systems outsourcing: A reevaluation of influence sources, *Information Systems Research*, 8, 3, 288-301.
5. Mahajan, V., and Peterson, R.A. (1985) *Models for innovation diffusion*. Sage.
6. Rogers, E.M. (1995) *Diffusion of innovations*, (4th ed.). New York: The Free Press.
7. Serge-Lopez, W.-T., Samuel Fosso, W., Jean Robert Kala, K., and Chris Emmanuel Tchatchouang, W. (2020) Influence of artificial intelligence (AI) on firm performance: The business value of AI-based transformation projects, *Business Process Management Journal*, 26, 7, 1893-1924.
8. Sidorova, A., and Rafiee, D. (2019) AI agency risks and their mitigation through business process management: A conceptual framework, Proceedings of the *52nd Hawaii International Conference on System Sciences*, 5837-5845.
9. Teo, T.S.H., Nishant, R., and Koh, P.B.L. (2016) Do shareholders favor business analytics announcements? *Journal of Strategic Information Systems*, 25, 4, 259-276.
10. Wang, W,. and Siau, K. (2018) Artificial intelligence: A study on governance, policies, and regulations, MWAIS 2018 Proceedings. 40.
11. Wang, W., and Siau, K. (2019) Artificial intelligence, machine learning, automation, robotics, future of work and future of humanity: A review and research agenda, *Journal of Database Management*, 30, 1, 61-79.
12. Wernerfelt, B. (1984) A resource-based view of the firm, *Strategic Management Journal*, 5, 2, 171-180.