2020

Factors Influencing the Adoption of Artificial Intelligence in Organizations - From an Employee's Perspective

Loknath Sai Ambati
Dakota State University

Kanthi Narukonda
Dakota State University, kanthi.narukonda@trojans.dsu.edu

Giridhar Reddy Bojja
Dakota State University

Dave Bishop
Dakota State University

Factors Influencing the Adoption of Artificial Intelligence in Organizations – From an Employee's Perspective

Conference Paper · April 2020

CITATIONS
0

READS
57

4 authors, including:

Loknath Sai Ambati
Dakota State University
7 PUBLICATIONS **4** CITATIONS

SEE PROFILE

5-28-2020

Factors Influencing the Adoption of Artificial Intelligence in Organizations – From an Employee's Perspective

Loknath Sai Ambati
loknathsai.ambati@trojans.dsu.edu

Kanthi Narukonda

Giridhar Reddy Bojja

David Bishop

Factors Influencing the Adoption of Artificial Intelligence in Organizations – From an Employee's Perspective

Loknath Sai Ambati
Dakota State University
LoknathSai.Ambati@trojans.dsu.edu

Kanthi Narukonda
Dakota State University
Kanthi.Narukonda@trojans.dsu.edu

Giridhar Reddy Bojja
Dakota State University
Giridhar.Bojja@trojans.dsu.edu

David Bishop
Dakota State University
Dave.Bishop@dsu.edu

ABSTRACT

Artificial intelligence (AI) is set to take over the world in the next decade. Our current innovations and inventions are gearing up to clear the path for this to happen. While folks are excited and curious about this shift, it remains unclear how organizations and their employees feel about it. The goal of this research is to understand the factors that influence the adoption of AI techniques and technologies in organizations from an employee's perspective. To achieve this goal, the authors make use of grounded theory and semi-structured interviews. Discovering the positive or negative emergent factors that affect the adoption of AI in an organization can help the executives of the organization make design-specific policies for its implementation. Conducting this research from an employee's perspective is crucial since the employees are the ones that use AI techniques and technologies to meet their job responsibilities.

Keywords

Artificial Intelligence, grounded theory, qualitative, employee preference

INTRODUCTION

Modern AI is a broad field of study which uses advanced techniques to derive insights from a huge array of data. The core concept of AI is training machines to learn, reason, and solve problems that we face daily.

The introduction of machine learning in the early 21st century has increased the rate of development in AI. We can attribute this increase to the hardware and computational power of machine learning techniques. As the potential of computational power increases, so does development in the field of AI. The future of AI includes components that can enable machines to learn and think more like a human (Lake et al. 2016).

Adopting AI, at an organizational level, can improve the productivity and efficiency of crucial decision making (Knight 2015). Studies indicate various advantages of implementing AI in organizations, yet organizations still face difficulties in adopting AI technologies (Chui and Malhotra 2018). One of the reasons behind these difficulties is the failure of the organizations to understand where and how to implement AI. Another reason is the failure of organizations to extract insights at an enterprise level to best implement the business strategy on AI adoption (Andrews 2017). Before understanding where to implement AI at the enterprise level, it is important to understand the underlying factors associated with it. This research focuses on interpreting the employee perspective of AI to understand the factors that influence AI adoption at an enterprise level.

The remainder of this article is divided as follows. Section II makes use of grounded theory principles to perform a preliminary literature review. Section III describes the methodology that investigates the factors influencing the adoption of AI at the organizational level from an employee perspective. Finally, section IV concludes by summarizing the research.

LITERATURE REVIEW

AI research is continuously striving towards optimization (Miikkulainen et al. 2018), improving the accuracy of AI techniques (McGovern et al. 2017) and innovation of new algorithms (Torrado et al. 2018). These articles also discuss the improvements in AI and its advantages of implementing it at the enterprise level. At the moment, less than 10% of

organizations have adopted AI successfully. The remaining organizations either did not adopt AI or are under the misguided assumption that IoT techniques are AI techniques (Daugherty and Wilson 2018). To those organizations that have adopted AI, there has been a change in their workplace environment from a traditional style into an adaptive process style, thereby, easing the job of the employee.

There is little clarity on what factors employees of an organization use to form their perspective on the usage and adoption of AI techniques. The reason behind this is the limited amount of research that is focused on understanding an employee's preferences towards the adoption of AI. Although there are efforts to implement the organization readiness analysis before the adoption of AI (Alsheibani et al. 2018), there is no research on understanding the factors affecting the employee perspective towards the adoption of AI in their workplace. Therefore, it is of great significance to understand these factors, as employees play a major role in the growth and sustainability of an organization.

From an organizational decision-making standpoint, AI adoption needs to be evaluated using factors such as relative advantage, compatibility, top management, organization size, resources, competitive pressure and government regulatory issues (Alsheibani et al. 2018). If the organization chooses to adopt AI, it is difficult to implement it in the workplace without properly understanding the employees' perspective on it.

Since employees are the key players who execute the AI techniques at the ground level, it is essential to understand their underlying preferences for the adoption of AI. All these factors paved the way for this research question – finding and understanding the factors that influence the employees' perspective on the adoption of AI at an organizational level.

METHODOLOGY

The objective of this research is to understand individual employee preferences and the underlying factors affecting the employee to use AI techniques and technologies. The employees in our research play no part in their organization's decision-making.

In the last few decades, whenever there was a discussion about adoption of technology in organizations, the Technology Acceptance Model (TAM) served as a credible model. This research is no different. A few artifacts from the TAM like perceived ease of use and perceived usefulness serve as inspirations in our research. We believe that adoption of AI is contingent upon the employees' beliefs with regard to the ease of use of AI technology and the relative usefulness of AI technology. Behavioral factors are strong motivators in any setting – organizational or academic.

The Theory of Reasoned Action (TRA) and the Unified Theory of Acceptance and Use of Technology (UTUAT) also serve as excellent sources of theoretical adoption models, more so than TAM. Drawing from UTUAT, social influence is a big behavioral motivator for employees to begin using new technologies. In our research, we would like to understand if social influence plays a role in the adoption of AI among employees. In spite of their wonderful influence on our research, we believe using a grounded theory approach serves us well. The grounded theory approach is employed to develop theory, models and rich descriptions of new phenomena (Wiesche et al. 2017).

To develop an empirical theory to discover constructs from the employee's perspective, a grounded theory approach following the qualitative research methodology is the most appropriate (Birks et al. 2013). The article follows the grounded theory principles in organizing the preliminary literature review to avoid theoretical bias (Dunne 2011).

This research relies heavily on qualitative selective sampling to target employees who deal with AI in their regular job roles. Using qualitative analysis can result in achieving rich insights into understanding the phenomenon itself. This is contrary to quantitative representative random sampling, which ensures that the participants are randomly selected to represent the general employee population (Coyne 1997; Delice 2010).

To collect data from the employees, this research effort employs a semi-structured interview technique. The reason behind the choice to allow open-ended questions is that the interviewer can have an opportunity to probe on relevant aspects based on the participant's answers. To this extent, a semi-structured interview questionnaire was developed.

To conduct this research, a list of 5 employee contacts was created. These contacts work in relevant technology roles such as, but not limited to Data Scientist, Data Analyst, Business Analyst, Data Engineer and Business Intelligence Developer. We would like to conduct these interviews with employees who have been working in those positions way before their organizations have begun to employ AI technology. This will provide a unique perspective on how these employees have come to view and perceive AI.

The interviews will be conducted on the phone. The interviews will be recorded and later, transcribed into a written format. The transcribed data will be analyzed using grounded theory and open coding techniques to understand the factors

influencing an employee's adoption of AI techniques and technologies at the organizational level. Atlas.ti will be employed to analyze and interpret the text using open coding techniques and annotations. The codes will be grouped into categories. The categories will be summarized based on the codes and annotations. These categories act as the factors which can be compared and contrasted with the extant literature.

At the end of the interview, each participant may choose to share contacts of other employees in similar roles who might be interested in participating in this study. This technique of collecting participant list is often called a snowball approach (Flynn 1973). To achieve a theoretical saturation on the results, at least 15-20 participants will be interviewed.

CONCLUSION

This research focuses on employee's perspective of AI adoption at the organizational level. The challenges of AI adoption in an organization can be dependent on factors involving employees such as risk of losing job and resistance towards adoption or any other issue with migration of technology. This research targets the organizational executives as the audience to help them understand and build business strategies such as awareness, reducing work overload and expanding the business. This will be accomplished in such a way that it might add to the employment by discovering the factors influencing adoption of AI in the case of an employee at an organizational level. These employee perspective factors can help the executives in downplaying the factors that decrease the AI preference.

REFERENCES

1. Alsheibani, S., Cheung, Y., and Messom, C. 2018. "Artificial Intelligence Adoption: AI-Readiness at Firm-Level," in *PACIS 2018 Proceedings*, Association for Information Systems, p. 9.

2. Andrews, W. 2017. "Applying Artificial Intelligence to Drive Business Transformation: A Gartner Trend Insight Report," *Gartner*, , August 29. (https://www.gartner.com/en/documents/3792874/applying-artificial-intelligence-to-drive-business-trans, accessed February 21, 2020).

3. Birks, D. F., Fernandez, W., Levina, N., and Nasirin, S. 2013. "Grounded Theory Method in Information Systems Research: Its Nature, Diversity and Opportunities," *European Journal of Information Systems* (22:1), Taylor & Francis, pp. 1–8. (https://doi.org/10.1057/ejis.2012.48).

4. Chui, M., and Malhotra, S. 2018. "Adoption of AI Advances, but Foundational Barriers Remain | McKinsey," *McKinsey*, , November. (https://www.mckinsey.com/featured-insights/artificial-intelligence/ai-adoption-advances-but-foundational-barriers-remain, accessed February 21, 2020).

5. Coyne, I. T. 1997. "Sampling in Qualitative Research. Purposeful and Theoretical Sampling; Merging or Clear Boundaries?," *Journal of Advanced Nursing* (26:3), pp. 623–630. (https://doi.org/10.1046/j.1365-2648.1997.t01-25-00999.x).

6. Daugherty, P. R., and Wilson, H. J. 2018. *Human + Machine: Reimagining Work in the Age of AI*, Harvard Business Press.

7. Delice, A. 2010. "The Sampling Issues in Quantitative Research," *Educational Sciences: Theory and Practice* (10:4), Educational Consultancy, Ltd (EDAM), pp. 2001–2018.

8. Dunne, C. 2011. "The Place of the Literature Review in Grounded Theory Research," *International Journal of Social Research Methodology* (14:2), Routledge, pp. 111–124. (https://doi.org/10.1080/13645579.2010.494930).

9. Flynn, J. P. 1973. "Snowball Sampling for Voluntary Participation Research," *Journal of Voluntary Action Research* (2:1), pp. 60–63. (https://doi.org/10.1177/089976407300200106).

10. Knight, R. 2015. "Convincing Skeptical Employees to Adopt New Technology," *Harvard Business Review*. (https://hbr.org/2015/03/convincing-skeptical-employees-to-adopt-new-technology).

11. Lake, B. M., Ullman, T. D., Tenenbaum, J. B., and Gershman, S. J. 2016. "Building Machines That Learn and Think Like People," *ArXiv:1604.00289 [Cs, Stat]*. (http://arxiv.org/abs/1604.00289).

12. McGovern, A., Elmore, K. L., Gagne, D. J., Haupt, S. E., Karstens, C. D., Lagerquist, R., Smith, T., and Williams, J. K. 2017. "Using Artificial Intelligence to Improve Real-Time Decision-Making for High-Impact Weather," *Bulletin of the American Meteorological Society* (98:10), pp. 2073–2090. (https://doi.org/10.1175/BAMS-D-16-0123.1).

13. Miikkulainen, R., Iscoe, N., Shagrin, A., Rapp, R., Nazari, S., McGrath, P., Schoolland, C., Achkar, E., Brundage, M., Miller, J., Epstein, J., and Lamba, G. 2018. "Sentient Ascend: AI-Based Massively Multivariate Conversion Rate Optimization," in *Thirty-Second AAAI Conference on Artificial Intelligence*, , April 27. (https://www.aaai.org/ocs/index.php/AAAI/AAAI18/paper/view/17332).

14. Torrado, R. R., Bontrager, P., Togelius, J., Liu, J., and Perez-Liebana, D. 2018. "Deep Reinforcement Learning for General Video Game AI," in *2018 IEEE Conference on Computational Intelligence and Games (CIG)*, , August, pp. 1–8. (https://doi.org/10.1109/CIG.2018.8490422).

15. Wiesche, M., Jurisch, M. C., Yetton, P. W., and Krcmar, H. 2017. "Grounded Theory Methodology in Information Systems Research," *MIS Quarterly* (41:3), pp. 685–701. (https://doi.org/10.25300/MISQ/2017/41.3.02).