The Future Role of IT Leadership Behaviors in Virtual Project Management Environments

N. Vinodh[1] and A. K. Subramani[2]
{ srivirsphd@gmail.com[1] }

Ph.D. Research Scholar, Saveetha School of Management, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, Tamil Nadu, India[1]
Professor and Ph.D. Research Supervisor, Saveetha School of Management, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, Tamil Nadu, India[2]

Abstract. The rapid advancement of artificial intelligence (AI) is reshaping Virtual Project Management (VPM) and redefining the role of IT leadership across higher education and industry. This study examines how IT leadership behaviors, supported by robust IT infrastructure, influence the effective integration of AI into organizational processes. Adopting a mixed-method approach, the research combines a systematic literature review, theory development, and semi-structured interviews with academic and industry leaders. The analysis identifies four critical determinants of effective IT leadership in AI-enabled VPM environments: upper management support, systems expertise, perceived capabilities, and strategic vision. Comparative results show that while AI delivers efficiencies and decision support across sectors, leaders must address ethical risks, the massification of education, and organizational sustainability challenges. The findings emphasize the importance of mindful and authentic leadership practices in balancing innovation with human-centric values. This paper contributes a practical model for IT leadership development that enhances AI adoption while safeguarding ethical and sustainable practices, offering valuable guidance for universities, policy makers, and industry practitioners.

Keywords: AI, Education, Leadership, Infrastructure, Teaching, Training.

1 Introduction

Strategic, risk-based leadership plays a vital role in achieving long-term academic excellence in Higher Education Institutions (HEIs). The Higher Education Council (HEC) ensures quality by conducting continuous evaluations to help universities maintain standards and gain recognition both nationally and internationally. There are a number of risks associated with achieving sustained excellence in teaching, learning, and assessment when making strategic plans to achieve academic excellence. If these risks are not controlled, performance will suffer. Public universities in country face two main threats: mass education and financial danger. In terms of finances, students pay roughly 4% of the overall tuition cost, with the government covering the majority of the university's budget. The student-to-faculty ratio increased significantly as a result of mass education, which had an impact on the standard of instruction, learning, and evaluation. Through established regulations and processes, HEC oversees the operations of private institutions in order to preserve and uphold academic excellence [1].However, the HEC must be fully involved in important things like authorizing new programs, hiring key management academic members, and holding seminars and conferences [2]. This causes delays in the process and has an impact on how the university manages its operations. Furthermore,

ICITSM-Part II 2025, April 28-29, Tiruchengode, India

DOI 10.4108/eai.28-4-2025.2357983

three national reviews wear out academic members and divert their focus from academically related issues [3].A group of risks was identified through interviews with influential people in the higher education sector, including those in leadership positions at HEIs and HEC. These individuals highlighted significant risks like actions that could damage one's reputation, ineffective business models, risks associated with mass education, lengthy approval processes, repeated recognition, and accreditation requirements. This article will emphasize the dangers that universities face in achieving academic excellence in the context of a risk-based approach. In order to sustain academic excellence in higher education, recommendations will be made at the HEI and HEC levels.

2 IT Infrastructure and Leadership

The success of institutional policies in Higher Education Universities today rely heavily on information technology (IT) to successfully raise the standard of education. Therefore, in order to accomplish organizational objectives, IT leadership and IT infrastructure typically have an impact on the success of tertiary institutions [4]. Because IT has so much to offer institutions and organizations in terms of capacity growth and leadership development, leadership is essential. This study adopts a leadership theory that can be utilized to investigate how leadership can affect and be influenced by information technology, after reviewing the literature to develop a comprehensive understanding of IT leadership in businesses [5]. This study employs a mixed methods approach, whereby the model is tested quantitatively and leadership-related interviews are conducted qualitatively [6]. By adopting and modifying a number of models and theories, this learning seeks to categorize the variables to facilitate concern the usage of information technology in infrastructure and leadership in postsecondary institutions. Support from upper management, systems expertise, perceived capabilities, and IT strategy and vision are the four main determinants of IT leadership and infrastructure. Formal elements aid in the growth of IT infrastructure and leadership; feedback is incorporated into development plans and need to be viewed as a crucial procedure for the sustained prosperity of universities. This study highlights the necessity for additional empirical research that would gain from a deeper comprehension of IT leadership development.

2.1 Effective Leadership

According to this paradigm, the leadership process begins with the individual qualities, traits, and experiences of teams, followers, and leaders [7]. The second stage is made up of the relationships, interactions, and behaviors. The team, the company, and the person (leader and follower) all benefit from these relationships. The reciprocal aspect of leadership is exemplified via a feedback loop, whereby results are attained (or not), influencing subsequent conduct. Finally, each step of the leadership process may be impacted by the external moderating variables and the setting. The fundamental ideas of well-known leadership theories are compiled in this synopsis. Lastly, the leadership process moderators and research challenges are highlighted. In addition to adding to the continuing conversation on rethinking leadership in the AI era, this study aims to investigate the applicability and feasibility of AI in leadership [8]. It also provides enlightening guidance for people and companies trying to negotiate this changing landscape.

2.2 Project teams

The project team's virtual collaboration is highly relevant in these times of globalization and societal shift about remote work [9]. Working remotely and from home is made possible by the ongoing advancements in cutting-edge information technology.

3 Result and Discussions

The genuine leadership and artificial intelligence the world is changing quickly due to artificial intelligence (AI), and its effects on leadership are currently being investigated [10]. There is mounting evidence that leaders can benefit greatly from mindfulness in navigating the opportunities and difficulties presented by AI [11].

4 Comparative Analysis Graphs

This explores the ways in which mindfulness can assist leaders in recognizing the advantages and disadvantages of artificial intelligence, including its ability to automate tasks, introduce new types of prejudice, and be applied unethically. Leaders who are mindful are able to recognize hazards and create plans to reduce them [12].

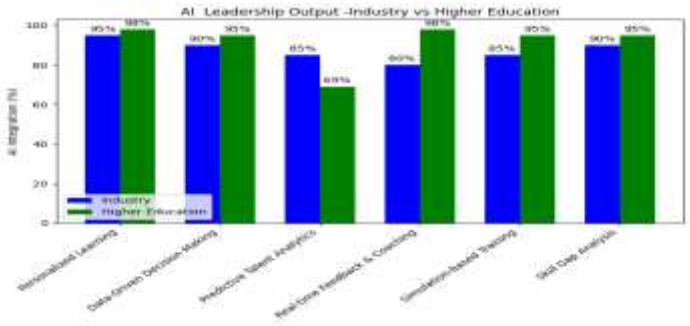

Fig. 1. AI Leadership Output -Industry vs Higher Education.

Make moral choices regarding AI, a potent instrument with both good and bad potential. Conscientious leaders are able to make moral choices regarding AI and guarantee that it advances civilization. Fig 1 develop closer ties with AI-powered systems as they advance in sophistication and gain the ability to communicate with people in more intricate ways [13]. Mindful leaders may take advantage of these systems potential and forge closer bonds with them[14].

The connection between AI and authentic leadership, proposing that authentic leaders are eager to try out new methods of operation, are open to new concepts and technology, and are not scared of change. As a result, they are in a position to guide companies through the shift to an AI-powered future. Genuine leaders are open, moral, truthful, and responsible with AI. This increases the confidence and trust necessary for effective leadership.

5 Artificial Intelligence (AI)

The artificial intelligence leadership development in both industrial and higher education settings is examined in the current paper. We examine how AI technologies are changing

leadership development and examine existing implementations, all the while examining the crucial harmony between relationship-oriented and task-oriented methodologies[15]. According to our analysis, human-in-the-loop procedures, relationship-building-preserving pedagogical design, and thorough AI literacy instruction are all necessary for successful AI integration[16]. The presents the idea of "taxonomical leapfrogging" and shows how artificial intelligence (AI) might improve conventional leadership development by means of intelligent feedback systems, tailored learning routes, and complex content sequencing. The offer a useful framework for putting AI technologies into practice while pointing out important obstacles including ethical issues and large-scale quality assurance. With specific recommendations for both academic programs and industry initiatives, our findings imply that effective leadership development necessitates integrated approaches that preserve vital human qualities while utilizing AI's capabilities.

6 Result and Analysis

The fig 2 shifting educational leadership's artificial intelligence will alter the trajectory of educational leadership in education as it becomes a pervasive concern in education and beyond.

Fig. 2. Leadership Output.

The advocates and gatekeepers of technology use in schools are educators and leaders. While taking into account cultural, social, and emotional issues that are inextricably linked to educational environments, they must think about how AI may improve education. In order to comprehend how educators now view and use AI, the body of existing literature and include enlightening interviews with experts in the fields of AI and education. The parallels and discrepancies between the present and future visions of Table 1 AI held by educators and AI developers.

Table 1. Application to Information Technology.

Human Resource Assignment		
S. No	**AI management**	**AI Education**
1	The making sure artificial intelligence shifts education in a positive way builds on the modifications covered in the earlier and on decisions made about AI in education that prioritize the success and well-being of students.	The ability of technology tools that use AI models to concentrate on students' emotions in addition to information generation will increase, putting these goods in a challenging ethical position. Assessing the reliability of AI tools is closely related to the duties of school administrators.
2	The leaders in education can adapt to the changes that artificial intelligence will bring about in classrooms.	The leaders might adopt a comprehensive approach to considering how AI can be included into an educational system that benefits all students by including ethical principles

The artificial intelligence to improve top managers' leadership AI innovation is increasingly being determined by the impact of top management. Scholars have written extensively about this subject, based on the upper echelons theory, which holds that the performance and strategic choices of businesses are influenced by the leadership of their top management. In order to fully utilize AI and successfully incorporate it into the business decision-making process, leaders have transformed their responsibilities and competencies. A thorough literature analysis is necessary to compile and elucidate the ways in which AI affects top managers' leadership, nevertheless, because the current research is dispersed.

7 Future Scope

The E-leadership Technology-mediated leadership is more important than ever because of the COVID-19 epidemic, which has made social separation a necessity. E-leadership provides insight into how to integrate leadership and cutting-edge information technology to coordinate and transform the workforce. Nonetheless, the current body of research on e-leadership continues to assume that it is a system of natural intelligence (i.e., human intelligence) aided by technology. Because AI-simulated leaders can learn and apply what they have learned to their work, they may be a good substitute for human leaders. When combined with AI technology, the fig 3 pandemic forces us to review and reconsider e-leadership from an AI standpoint. By incorporating AI into e-leadership, suggest "e-leadership which investigates the potential for using AI in place of natural intelligence in a leadership setting. This chapter examined the prospect of replacing human leaders with AI-simulated leaders and boundary conditions from the perspectives of leader presence and leadership substitute theory.

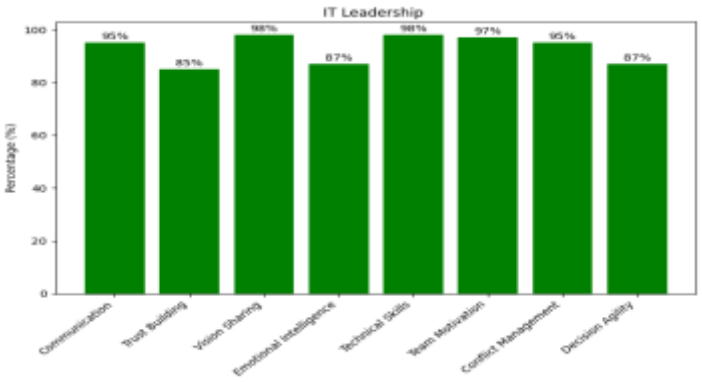

Fig. 3. IT Leadership.

8 Conclusions

The technology and leadership ideas and concerns the economic, social, cultural, and political interconnectedness of nations has led to a revolution in recent decades, driven by the more rapid advancements in science and technology. Organizational configurations become volatile, uncertain, complex, and ambiguous as a result of the new social and work paradigm brought about by globalization. This paradigm allows for communication and interaction at any time, from any location, in person or online. VUCA, that is. In this environment, technology is playing a bigger role in mediating leadership processes .The future will see an even greater prevalence of this reality. Therefore, it is essential to undertake research that investigates the dynamics underlying the interdependent link between these elements. The literature on technology's role in leadership is examined in this essay. In addition to identifying pertinent questions for the discussion of what is and will be, one of the most important debates of the twenty-first century, it aims to advance theoretical clarity on this subject. The practice of a leader using technology to inspire and guide followers is known as e-leadership. To do this, leaders must be able to establish a stable atmosphere, foster confidence, be supportive, and be communication-oriented.

References

[1] H. Nanang et al., "The importance of E-Leadership in Higher Education Institutions Determined by Advanced Information Technology," 2023 Eighth International Conference on Informatics and Computing (ICIC), Manado, Indonesia, 2023, pp. 1-5, doi: 10.1109/ICIC60109.2023.10381955.

[2] C. Mayer, S. Mütze-Niewöhner and V. Nitsch, "Empirical Classification of Advanced Information Technology Towards Their Support of Leadership Behaviors in Virtual Project Management Settings," 2020 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM), Singapore, Singapore, 2020, pp. 275-279, doi: 10.1109/IEEM45057.2020.9309948.

[3] H. Nanang, H. T. Sukmana, Y. Durahman, V. Arifin, D. Khairani and S. U. Masruroh, "The Success of Higher Education Institutional Policy Is Determined by IT Leadership and IT Infrastructure," 2023 11th International Conference on Cyber and IT Service Management (CITSM), Makassar, Indonesia, 2023, pp. 1-5, doi: 10.1109/CITSM60085.2023.10455570.

[4] D. H. Syahchari, H. Saroso, Lasmy, D. Sudrajat and M. G. Herlina, "The Effect of Information Technology, Strategic Leadership and Knowledge Management on The Competitive

Advantage in The Chemical Industry," 2020 International Conference on Information Management and Technology (ICIMTech), Bandung, Indonesia, 2020, pp. 120-125, doi: 10.1109/ICIMTech50083.2020.9211198.
[5] E. P. Manapuram and T. Shankar, "A preliminary study on Information Technology Startup Challenges and their Plausible Solutions from Lean-Agile Methodology," 2023 International Conference on Advances in Computation, Communication and Information Technology (ICAICCIT), Faridabad, India, 2023, pp. 1051-1056, doi: 10.1109/ICAICCIT60255.2023.10465682.
[6] R. P. Jacobis et al., "The Effect of E-Leadership and Innovative Work Behavior on Employee Performance: The Mediating Role of Technology Adoption," 2024 12th International Conference on Cyber and IT Service Management (CITSM), Batam, Indonesia, 2024, pp. 1-6, doi: 10.1109/CITSM64103.2024.10775725.
[7] D. Qianqiu, "Exploration on the cultivation of College Students' leadership under the smart campus system," 2020 International Conference on Modern Education and Information Management (ICMEIM), Dalian, China, 2020, pp. 76-79, doi: 10.1109/ICMEIM51375.2020.00024.
[8] K. Priya, R. V, S. A. Krishnan, V. P. Rameshkumaar, B. Premkumar and P. Jyothi, "Exploring Effective Leadership Strategies to Drive Organisational Success & Foster Sustainable Growth," 2024 Second International Conference on Advances in Information Technology (ICAIT), Chikkamagaluru, Karnataka, India, 2024, pp. 1-6, doi: 10.1109/ICAIT61638.2024.10690843.
[9] N. Saputra, "Mixing Digital Intelligent with Servant Leadership for Establishing Service Quality in the Service Industry," 2023 International Conference on Information Management and Technology (ICIMTech), Malang, Indonesia, 2023, pp. 13-17, doi: 10.1109/ICIMTech59029.2023.10277816.
[10] Juharyanto et al., "Strengthening the Benefit of PPID-UM Website Development and Innovation through Leadership Intervention," 2021 7th International Conference on Education and Technology (ICET), Malang, Indonesia, 2021, pp. 32-37, doi: 10.1109/ICET53279.2021.9575094.
[11] X. Zhao and S. Shen, "Research on Behavior Patterns of School Administrators in the MOOC of ICT Leadership," 2019 Twelfth International Conference on Ubi-Media Computing (Ubi-Media), Bali, Indonesia, 2019, pp. 301-305, doi: 10.1109/Ubi-Media.2019.00066.
[12] W. W. K. Ma and L. -K. Lee, "A Review on Information and Communications Technology in Higher Education: Learning Theories and Applications," 2024 International Symposium on Educational Technology (ISET), Macau, Macao, 2024, pp. 397-401, doi: 10.1109/ISET61814.2024.00085.
[13] M. A. Santos, A. M. A. Marques and P. M. d. E. Santo, "The Impact of Leadership and Rewards on Project Management Success, mediated by the cohesion of work teams," 2021 16th Iberian Conference on Information Systems and Technologies (CISTI), Chaves, Portugal, 2021, pp. 1-6, doi: 10.23919/CISTI52073.2021.9476296.
[14] H. Abbu, G. Gudergan, S. Khan and P. Mugge, "Exploring Digital Leadership Traits: An Approach to Understanding Their Internalization," 2024 IEEE International Conference on Engineering, Technology, and Innovation (ICE/ITMC), Funchal, Portugal, 2024, pp. 1-10, doi: 10.1109/ICE/ITMC61926.2024.10794399.
[15] P. D. Junianto, R. F. Aji and R. R. Suryono, "Impact of Leadership in Transitioning IT Roles from Turnaround to Strategic: Case Study of PT. XYZ," 2022 Seventh International Conference on Informatics and Computing (ICIC), Denpasar, Bali, Indonesia, 2022, pp. 1-6, doi: 10.1109/ICIC56845.2022.10006899.
[16] S. Saide, N. Ningsi, D. Muwardi, D. Jelita and N. Antasari, "Ambidexterity and High-Performance Work Systems: the Roles of Knowledge Sharing, Leadership Style, and Social Media," 2024 5th International Conference on Artificial Intelligence and Data Sciences (AiDAS), Bangkok, Thailand, 2024, pp. 55-59, doi: 10.1109/AiDAS63860.2024.10730280.