The New Role of Leadership in the Context of New Technologies and Transformational Changes

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Abstract

Technology is rapidly and continuously evolving, altering how business and organizations run. With the emergence of new technologies and disruptive changes, there is a need for leaders to embrace, adopt and implement technology that will enable them to run their organizations effectively, especially in the face of unplanned for events. In this literature, a deep, comprehensive investigation on the new role of leadership in the context of new technologies and transformation will be performed.

The major fields of investigation include the importance of using technology such as data analytics competency to improve firm decision-making, impact of digital literacy and skills on entrepreneurial performance and the use of technology in addressing the challenges faced by leaders in managing geographically dispersed teams.

The findings from this research suggest that leaders need to adapt to new technologies and change by developing skills in data analytics, digital literacy and cultural intelligence. Moreover, it is essential for leaders to embrace new technology to manage geographically dispersed and diverse teams. In addition, they should adopt new leadership models that foster collaboration, communication, and innovation.

This literature piece concludes by highlighting the need for leaders to continually learn and adapt to new technologies and transformational change to maintain competitive advantage in the contemporary dynamic business environment.

1. Introduction and Background

The everyday evolution and inventions in the world of technology have resulted in significant changes in how the corporate world is run. With the rapid emergence of new technologies, businesses and organizations should establish ways of integrating these technologies into their operations to ensure that they remain competitive in the market and industry. The emergence of new technology in the corporate world leaves leaders with out-of-date expertise, knowledge and skills required to run their businesses (Banks et al., 2022). Leaders' adoption of new technology poses various risks and opportunities; however, leaders must adopt the change regardless to gain a competitive advantage in the corporate world.

Transformational, transactional, and laissez-faire are some of the common leadership styles adopted in many organizations. These leadership styles are essential in running business and organization operations. However, as explained above, leaders need to integrate technology while employing these styles to ensure that their business operations run effectively. Transformational

leadership empowers and inspires employees to achieve common goals through a shared vision (Nanjundeswaraswamy & Swamy, 2014). However, the lack of technology integration in this leadership form can limit the vision's achievement. Transactional leadership majors on the need to reward or punish based on Performance (Nanjundeswaraswamy & Swamy, 2014). However, in the current world, precise measurement of performance calls for the use of technology and the provision of feedback and rewarding employees. Mihai & Cretu (2019) explain that accurate measurement and incentivizing performance calls for using technology to ensure accurate and exact results. Laissez-faire leadership hardly involves direct leadership as the leader does not give much direction and guidance on how the business/organization is supposed to be managed (Nanjundeswaraswamy & Swamy, 2014). Therefore, leaders who fail to adopt technology may miss important signals and fail to respond effectively and efficiently to new threats and opportunities.

This study aims to address the problem of many leaders struggling to adapt to the rapid pace of technological change and the challenges associated with this adoption. Therefore, the role of new technology in transforming leadership in businesses and organizations will be analyzed and discussed in detail. Moreover, effective leadership with the integration of new technologies will be explained to ensure that organizations gain a competitive advantage in their operations (Banks et al., 2022).

Literature resources on various fields, including technology, leadership and organizational behavior, will be used to build on the content for this study. Leaders, managers, policymakers and other relevant professionals are responsible for guiding organizations and companies through transformational change, hence, are the target audience for this study. Moreover, any parties interested in the intersection of technology and leadership, such as researchers, academics and students, are beneficiaries of this study.

2. Literature Review

Various literature resources exist about the topic, "The New Role of Leadership in the Context of New Technologies and Transformational Change". To provide a comprehensive approach to the topic, this study will draw on a range of primary and secondary sources, which include scholarly books, articles and other relevant publications associated with the topic. The problem for this literature is the need to change landscape of technology and transformational change. Therefore, the major areas of focus will be emerging technologies on leadership styles and models, the impact that data and analytics have in decision-making, and the importance of digital literacy and innovation and the challenges that leaders face by leading diverse and geographically dispersed teams.

2.1 Leadership 4.0: Digital Leaders in the Age of Industry 4.0

The majority of current leadership models were developed in the 20th century and are ill-equipped in handling the challenges of the 21st century, including the evolution of new technologies, increasing cultural diversity and globalization. Many organizations that do not embrace technology in their operations are likely to lag behind in production as they lack efficiency in running their operations (Cortellazo, Bruni & Zampieri, 2019). Therefore, there is a need to embrace current

technology such as Industry 4.0. Industry 4.0 refers to the fourth industrial revolution and is a term that refers to the rapid transformations in the design, production, implementation and service manufacturing systems, products and components (Obarer & Erkollar, 2018). Achievement in any industry heavily depends on its ability and capability to build in the following dimensions: human-machine interaction, data and connectivity, analytics and intelligence and conversion to the physical world. Obarer & Erkollar (2018) performed a study to investigate the priority of the human dimension in Industry 4.0. The study was conducted by analyzing behavioral leadership theories that focused on the specific behaviors of a leader. Obarer & Erkollar (2018) explain that the first three revolutions happened due to mechanization, electricity and information technology. Therefore, the introduction of the Internet of Things technology is an establishment of the fourth industrial revolution in the manufacturing environment. Therefore, increased production, advanced production levels, and mass production are all attributed to digital transformation in the industries.

The article written by Obarer & Erkollar (2018) majors primarily focuses on the challenges and opportunities of digital leadership in the context of Industry 4.0, which is characterized by the widespread adoption of new digital technologies such as artificial intelligence, big data and the Internet of things. The authors argue that it is essential for leaders to possess a variety of skills and competencies in order to effectively navigate the rapidly evolving digital landscape of Industry 4.0 (Obarer & Erkollar, 2018). Effective collaboration across departments and organizations, fostering a culture of continuous development and learning and leveraging data analytics and other digital tools to drive innovation and change in the industry. The concept of leadership 4.0, discussed by Obarer & Erkollar (2018) in their article, has also gained much support from other authors who have also argued for a new leadership paradigm that is well tailored for the digital age. Mumford & Hemlin, (2017) argue that it is very crucial for leaders to be well-equipped with skills and knowledge such as critical thinking, decision making and creativity, as well as deep comprehension of the potential and limitations of the digital technologies.

Similarly, Khaw et al. (2022) emphasizes the need for digital leaders to manage the complex interplay between technology, culture and people and should possess leadership competencies that are suitable for the digital era. The importance of digital leadership in the context of Industry 4.0 gains support from a variety of empirical studies. For example, Mumford & Hemlin, (2017) discovered that digital leadership was positively associated with employee creativity and innovation in high-tech firms. Overall, the literature written by Khaw et al. (2022) suggests that digital leadership is a crucial aspect of success in this digital age. Moreover, there is a need to embrace new skills and competencies required to effectively navigate the challenges and opportunities of Industry 4.0.

2.2. Data Analytics Competency for Improving Firm Decision Making Performance

Leadership models established in the 20th century lack data analytics competencies. Therefore, they are short of the necessary skills and competencies that are essential to lead digital transformations and utilize data analytics to drive business decision-making. Ghasemghaei, Ebrahimi & Hassanein (2018) performed a systematic review of existing literature to investigate and report on the role of technology, specifically data analytics, in decision making. The authors argue that the abundance of data in organizations creates an opportunity for leaders to improve

decision-making and gain a competitive advantage through the use of data analytics. The authors give a recap of how data analytics has improved over time, from simple data analysis to advanced techniques such as machine learning and artificial intelligence. Ghasemghaei, Ebrahimi & Hassanein (2018) explain that the findings, which were based on empirical analysis of survey data from 151 Information technology managers and data analysts, reveal the large, significant, positive relationship between data analytics competency and firm decision-making Performance. From the results collected, it was evident that all dimensions of data analytics competency significantly improve the quality of decisions made in a firm. The authors go further to highlight data quality, data governance and data literacy as the major determinants of the success of data analytics projects. Ghasemghaei, Ebrahimi & Hassanein (2018) went ahead to propose a conceptual framework for data analytics competency, which includes knowledge, skills and abilities that are essential for effective data analytics. They bring forth the argument that developing competency is very crucial in improving decision-making performance in firms and provide examples of how organizations have successfully implemented data analytics to gain a competitive advantage.

2.3. The Role of Digital Literacy and Skills in the Performance of Enterprises

The leadership models established in the 20th century also focus on hierarchical structures and centralized decision-making processes. However, these models do not address the issues of a decentralized team or the adoption of technology across various departments. It is common to find an organization with technology adoption only at the top hierarchies as decisions are made from these positions (Cortellazo, Bruni & Zampieri, 2019). However, digital literacy is an important aspect across all units of an organization. Digital literacy plays a crucial role in the success of any enterprise, whether small, medium or large and is crucial in helping a firm gain a competitive advantage. Sariwulan et al. (2020) performed a research with the aim of determining the direct and indirect effects of digital literacy, economic literacy and entrepreneurial skills on the Performance of small and medium-sized enterprises in the context of garment clusters in the Bulak tourism industry Depok.

The researchers carried out quantitative research using questionnaire data collection techniques. The questionnaires included items related to entrepreneurial literacy, skills and Performance. The research employed saturation sampling which identified 90 respondents, and the data was analyzed using the SPSS software. Sariwulan et al. (2020) based their content on knowledge from previous studies on the topics of entrepreneurial literacy, skills and Performance, as well as entrepreneurship. For example, the authors referred to the works of Suparno & Saptono (2018), who explained that entrepreneurship could be learned and developed. In the context of our research topic, "The New Role of Leadership in the Context of New Technologies and Transformational Change", Suparno & Saptono (2018) explain that entrepreneurial skills consist of technical communication enhanced by the use of technology, environment monitoring, problem-solving, technology implementation and use the use of interpersonal and organizational skills.

Among other elements integrated into entrepreneurial skills, the authors highlighted leadership and innovation as crucial aspects of entrepreneurial skills (Sariwulan et al., 2020). From the results obtained, economic literacy, entrepreneurial skills and digital skills positively affect the Performance of small and medium-sized enterprises. The greatest finding from this study was that digital literacy is the major contributor to the success of SME entrepreneurs, both directly and

indirectly, hence, an essential contribution to developing business and marketing networks (Sariwulan et al., 2020).

2.4 Adoption of Artificial Intelligence in an Organization's Decision-Making

From the earliest days, the existed the controversy whether artificial intelligence came to replace the role of leaders in decision making or to help them make decisions in a better manner. To gain deeper insight and understanding on the effectiveness of Artificial Intelligence in decision-making in an organization, Cao et al. (2021), conducted qualitative research by use of large-scale questionnaire survey of 269 UK business managers. Much has been developed on the role of Artificial Intelligence in decision making, however, little knowledge exists on the attitudes of leaders towards the use of artificial intelligence. Cao et al. (2021), explains that from their research, they found out that there still exists a large percentage of firms that have not adopted Artificial Intelligence. The lack of adoption has been contributed majorly by the negative attitudes of leaders and managers towards the use of Artificial Intelligence. Therefore, training and education sessions are some of the factors that can help leaders learn on the importance of adopting artificial intelligence to change their attitudes (Cao et al. 2021). Moreover, leaders should not be blinded from the dark side of adopting artificial intelligence to avoid adoption of inadequately bounded and dangerous AI's.

3. Analysis of Major Themes Arising from the Literature Review

The analysis of major themes in the literature review highlights the crucial role that leadership plays in navigating the challenges and opportunities of new technologies and transformational change in an organization. As mentioned earlier, major areas of focus will be emerging technologies on leadership styles and models, the impact that data and analytics have in decision-making, the importance of digital literacy and innovation and the challenges that leaders face by leading diverse and geographically dispersed teams. Therefore, major themes with reference to these areas as well as with reference to our research topic, "The New Role of Leadership in the Context of New Technologies and Transformational Change", will be derived.

3.1. Emerging Technologies on Leadership Styles and Models

As previously discussed, there are various technologies emerging in a constant and rapid manner, which call for transformational changes in the leadership of an organization. With the evolution of new technology, there is a transformation of the traditional models of leadership. Artificial intelligence, machine learning, and data analytics, among others, are some of the technologies being integrated into the operations of organizations (Cao et al. 2021). However, their integration calls for the need for leaders to also adapt their leadership styles and models to ensure they remain relevant and effective in a rapidly changing world.

3.2.The Role of Leadership 4.0 in changing 20th Century Leadership Models

Oberer & Erkollar (2018) explain how emerging technologies such as Industry 4.0 are changing the nature of leadership and the skills and knowledge required by leaders in this digital era. Industry 4.0 calls for leadership 4.0 which emphasizes the need for agility, digital literacy and

innovation in leaders. Industry 4.0 refers to the fourth industrial revolution, which is an era of rapid transformations in the design, production, implementation, operation and service of manufacturing systems (Ghobakhloo, 2020; Oberer & Erkollar, 2018). Industry 4.0 is characterized by cloud computing, cyber-physical systems and the Internet of Things. This results in "smart factories" with greater production, efficiency, and flexibility. Equipment is outfitted with sensors and communication systems in Industry 4.0, allowing them to gather and share data, optimize their own operations, and interface with other equipment and systems on the shop floor.

3.3.The Role of Technology in a firm's Decision-Making Process

Leadership 4.0 refers to the ability to effectively lead in the setting of Industry 4.0. Leaders must grasp and use evolving technology, be agile and adaptable, and build an innovative and continuous learning culture. Venkatesh (2020) explains that leaders 4.0 give their teams the freedom to experiment and make decisions, encourage cross-functional cooperation, and are at ease with ambiguity and complexity. They employ data analytics to inform decisions and develop strategic alliances to promote enterprise-wide transformation. The difference between traditional leadership and Leadership 4.0 is the integration of technology in Leadership 4.0 (Venkatesh, 2020). Moreover, the latter emphasizes the need for digital literacy, agility and innovation in leaders.

Decision-making is a crucial role for any leader in an organization. Cao et al. (2021), discovered that artificial intelligence is an important technology that has been used in firms to help leaders in the decision-making process. Whereas there existed doubts on whether AI comes to replace the role of leaders, the doubts have since been cleared and AI is a crucial tool that supplements decision making in organizations. Cao et al. (2021), explains that artificial intelligence has been adopted in many organizations for the following reasons: speed, reduced bias, improved accuracy, improved efficiency and enhanced risk management. Similarly, Ghasemaghaei, Ebrahimi & Hassanein (2018) explain the role of technology in improving the decision making of the firm. The authors major in the role of data analytics and how they have transformed relationships in the organization. With data analytics at hand, leaders can make decisions across various departments and units, thus improving decision-making and, consequently, the Performance of the firm. Sariwulan et al. (2020) explain that digital literacy, which entails equipping the organization with the relevant technological resources, contributes to the success of SMEs and organizations, hence, is essential in developing business and marketing networks. From these articles, Industry 4.0, digital literacy, and data analytics are emerging technologies that have altered leadership styles to suit their adoption in organizations as well as improve the operation of the organizations.

3.4.The Importance of Digital Literacy

Digital literacy refers to the ability to effectively use digital tools and information as well as technologies to access, evaluate and create information in an organization. Digital literacy is very crucial and essential in any organization as it enables employees to effectively navigate and communicate in the increasingly digital and technology-driven corporate world (Morakanyane, Grace & O'Reilly, 2017). In their research and findings, Oberer & Erkollar (2018, p. 44) explain that digital leaders need to be able to easily comprehend, analyze and draw inferences from data as well as interpret this knowledge into effective decision-making. This theme reveals the need for

leaders to develop skills and competencies in order to effectively lead in the context of new technologies and transformational change.

3.5 Establishing Digital Literacy in the Organization

Leaders in an organization embrace digital literacy by establishing a culture of learning and development within the organization. In their research, Sariwulan et al. (2020) discovered that digital literacy is the key contributor to success for small, medium and even large enterprises. The business environment is constantly and rapidly changing; hence, there is a need for continuous learning and skills development in this continuously changing business environment (Ismail, Khater & Zaki, 2017). However, this change can only take place if leaders play a significant role in the promotion of the culture of learning and development within their organizations. Sow & Aborbie (2018) explain that it is very crucial for leaders to understand the benefits that come with a digital transformation. With these benefits in mind, they can establish a culture of digital literacy in the organization by organizing training, workshops, and education sessions. Cybersecurity, data analytics, digital marketing and social media management are some of the key areas of training that can promote digital transformation in an organization.

3.6 Integration of Data Analytics in the Decision-Making Process

From strategy development to operational planning, there exists the need to integrate data analytics in all aspects of an organization's decision-making process. Ghasemghaei, Ebrahimi & Hassanein (2018) explain that data analytics is crucial in optimizing the Performance of a firm to enable a firm to perform more efficiently, maximize profit or make well-grounded and strategically guided decisions. With the emergence of new technologies, organizations need to be able to effectively collect, analyze and use data to drive decision-making and improve Performance. The use of data analytics is essential for firms operating in highly competitive industries and markets. Ghasemghaei, Ebrahimi & Hassanein (2018), in their article, explain the importance of developing data analytics competency within an organization to improve decision-making performance. Ghasemghaei, Ebrahimi & Hassanein (2018) explain that data analytics is essential in the provision of valuable insights into consumer behaviors, market trends and operational efficiency. Leaders should adopt data analytics in the operations of their organizations not for the purpose of simple data collection and analysis but also integration in decision-making and drawing insights from data to improve the performance of an organization.

3.7.The Role of Leaders in Establishing Technology Data-Driven Decision-Making

Leadership, whether transactional, transformational or/and laissez-faire, plays a very crucial role in developing and implementing data-driven decision-making culture within the workplace (Monino, 2021; Agrawal, 2014). Therefore, they are obliged to ensure that the business environment is provided with the necessary resources, which include technology and training to ensure that employees effectively collect, analyze and use data. The leadership of any organization should also ensure that data analytics are integrated into all crucial areas of an organization. Therefore, data analytics can inform and guide decision-making across all functions of an organization which include marketing, finance and operations (Ismail, Khater & Zaki, 2017;

Elgendy & Elragal, 2016; Agrawal, 2014). For instance, data analytics are crucial in identifying areas where resources can be better allocated and enhancing customer experience and satisfaction.

3.8.Attitudes of Leaders towards the Adoption of Technology in the Organizations

In their research, Cao et al. (2021) further discovered that many organizations still lag behind due to lack of technology adoption. The authors explain that many firms lack the employment of artificial intelligence in their operations, as leaders have a negative attitude towards this technology. There is the belief that artificial intelligence has the capability of taking over the roles of leaders, however, Cao et al. (2021), explains that leaders should embrace Artificial intelligence and use it to help them carry out tasks in the organization. Therefore, educating leaders on the benefits of using artificial intelligence can raise the adoption of this technology in firms. Regardless of the need to educate leaders on the benefits of AI, there also exists a need to inform them of the challenges posed by this technology. Workshops and benchmarking can also be effective in changing the attitudes of leaders towards artificial intelligence.

4. Key Findings

4.1 Importance of Digital Literacy in the Performance of an Organization

Optimal business performance can only be achieved if leaders have digital literacy. As mentioned above, digital literacy refers to the ability to use digital technologies such as computers, software applications, and the Internet of Things to find, evaluate, create and communicate information effectively among various employees and across departments (Mohd Abas, Yahaya & Din, 2019). Digital skills refer to the exact skills needed to use digital technologies to achieve certain goals and tasks. Digital literacy is a major contributor to the success of enterprises and plays a very essential and crucial role in marketing networks, hence, improving the overall performance of the firm. Entrepreneurs must possess digital literacy and abilities in order to compete in the fast-paced business world of today. Mohammadyari & Singh (2015) explain that traditional business models have been shaken by digitization and companies that don't keep up risk falling behind. Entrepreneurs that possess digital abilities can take advantage of cutting-edge tools and technology to boost efficiency, productivity, and communication. Entrepreneurs can access a wealth of information, evaluate data, and make data-driven decisions thanks to digital literacy.

4.2.Role of Leadership in Managing Geographically Disperses and Diverse Teams

Geographically distributed and varied teams are more widespread in enterprises in today's globally connected society. While there are numerous advantages to this, such as improved productivity and creativity, it also presents difficulties for managers of these teams. Success in managing widely distributed and varied teams depends on effective leadership. The following are some of the most crucial functions that leaders can play:

1. Facilitating communication: Effective communication is essential for the success of any team, but it is more crucial when working with diverse, geographically distributed teams (Pantelli, Yalabik & Rapti, 2019). Leaders must make sure that all team members have the resources and tools they need to communicate successfully, such as project management

software and video conferencing. Additionally, they must provide clear communication guidelines, support direct and encourage them to communicate openly.

2. Fostering teamwork: Teams that are geographically separated and diverse could struggle to cooperate well because they lack a sense of unity and a common goal (Lilian, 2014). By establishing shared objectives, fostering relationships between team members, and promoting cooperation and knowledge sharing, leaders must promote a feeling of teamwork.
3. Recognizing cultural differences: Diversity in teams can result in a range of viewpoints and ideas, but it can also bring up difficulties due to cultural differences (Lilian, 2014). To make everyone feel included and appreciated, leaders must comprehend and respect the cultural backgrounds and viewpoints of team members.
4. Managing performance: Managing the Performance of varied and geographically distributed teams is more difficult. Clear performance metrics must be established, and advancement must be routinely checked. To make sure everyone is pursuing the same objectives, they must also give team members both individual and collective feedback and coaching.
5. Supporting professional development: Teams that are geographically spread and varied could have particular difficulties in fostering professional growth. Pantelli, Yalabik & Rapti (2019) explain that leaders must make sure that team members have access to the tools and chances they need to enhance their knowledge and careers, such as mentoring and training programs.

4.3.The emergence of digital Leaders who possess the Necessary Competencies and Skills to Lead in the Digital Era.

Competence in data analytics is critical for increasing corporate decision-making performance. Organizations must be able to gather, analyze, and interpret data in order to make educated decisions that lead to increased performance and competitive advantage. Ghasemaghaei et al. (2018) highlight the relevance of data analytics competency in their article titled "Data Analytics Competency for Improving Firm Decision-Making Performance." Data analytics proficiency and precision are very critical for organizations' data-driven decisions that contribute to the overall improvement of the organization (Mihardjo et al., 2019). Business skills, entrepreneurial skills and technical skills are the three types of data analytics competency that can be applied in any organization. Technical skills are the capacity to acquire and process data, analytical skills are the ability to analyze and comprehend data, and business skills are the ability to manage a firm. Mihardjo et al. (2019) further explain that leadership is very crucial in fostering a culture that embraces data-driven decision-making.

Mihardjo et al. (2019) explain that the organization's leadership must give data analytics capability top priority and incorporate it into every step of the decision-making process, from strategy creation to operational planning. The effectiveness of business decision-making is positively impacted by data analytics proficiency, according to one of the study's primary findings. The authors discovered that businesses with strong data analytics capabilities made wiser judgments that boost Performance (Ghasemaghaei et al., 2018). Additionally, they discovered that businesses with high levels of data analytics proficiency are nimbler in their decision-making and better able to adapt to changes in their business environment (Klein, 2020). Another crucial finding of the

study is that digital literacy is the most important factor in the success of SME businesses. The authors discovered that digital literacy is a major contributor to the success of SME entrepreneurs, both directly and indirectly, and so plays an important role in the development of business and marketing networks (Klein, 2020). This conclusion highlights the significance of incorporating data analytics into decision-making processes, especially in the context of developing technologies and digital transformation.

4.4.The Emergence of New Leadership in the Context of Emerging Technologies

Finally, the significance of data analytics proficiency in increasing company decision-making performance cannot be emphasized. Organizations that invest in data analytics proficiency are better positioned to make informed decisions that lead to enhanced Performance and a competitive edge (Klein, 2020). By fostering a culture that values data-driven decision-making, investing in staff training in data analytics, and incorporating data analytics into all facets of the organization's decision-making processes, leadership plays a vital role in growing data analytics competency. This finding has important relevance to the study question "The new role of leadership in the context of new technologies and transformational change" because leaders need to become proficient in data analytics to stay competitive and address the issues posed by digital transformation.

The business world has undergone tremendous change as a result of emerging technologies, and leaders must modify their models and styles of leadership to match the new requirements. New leadership models are emerging to fill the void left by the traditional command and control leadership models, which are losing their effectiveness. The emergence of new leadership models in the context of developing technology will be explained in this section (Corbett & Spinello, 2020; Cortellazzo, Bruni & Zampieri, 2019). The servant leadership paradigm is one newer style of leadership. In contrast to the conventional paradigm, which depicts the leader as being served by their followers, this model places more emphasis on the leader's responsibility to serve and meet the needs of their followers. In the context of developing technology, servant leaders must be skilled at fostering an innovative culture where followers are encouraged to try out novel concepts and tools. Additionally, they must be open to hearing the worries and suggestions of their supporters so that they may modify their approach (Lin et al., 2020; Cortellazo, Bruni & Zampieri, 2019).

The transformative leadership model is another new type of leadership. In this concept, the importance of a leader encouraging and motivating their followers to work together toward a common objective is highlighted. Transformational leaders must be able to motivate their followers to adopt cutting-edge ideas and technologies in the context of developing technology while also instilling a sense of meaning and purpose in their work.

The agile leadership paradigm is a third new type of leadership. This approach places a strong emphasis on a leader's capacity for adaptability and flexibility in the face of change (Ardi et al., 2020). Agile leaders in the setting of evolving technologies must be able to quickly adapt to new technology and market developments while also being able to reorient their strategy to satisfy changing requirements. The importance of leaders being able to adjust to new technology and market developments, as well as being able to inspire and motivate their followers toward a shared

objective, is generally highlighted by these evolving leadership paradigms (Corbett & Spinello, 2020; (Cortellazzo, Bruni & Zampieri, 2019). To inspire their followers to a spirit of invention, flexibility, and adaptability, leaders must be able to foster a culture of innovation.

Recommendations

1. The acquisition of digital literacy and other skills necessary for performing their jobs successfully in the age of new technologies should be a top priority for leaders who invest in training and development programs for their workforce.

2. Organizations should devise plans that give data-driven decision-making top priority. To guarantee that data analytics is integrated into all facets of the organization's decision-making processes, from strategy formulation to operational planning, leaders should invest in data analytics proficiency.

3. In the context of changing technologies, leaders should embrace the emergence of new leadership paradigms. In order to continue leading teams and organizations in a dynamic environment, they should adapt to the changing nature of leadership.

4. Leaders should use technology that promotes communication and collaboration to manage geographically distributed and varied teams. The use of google meetup, zoom meetings, and Skype, among others, have been common, especially when the covid-19 kicked in.

Conclusion

There have been tremendous changes in many facets of life, including leadership, as a result of the emergence of new technology. To continue leading teams and organizations in a dynamic environment, leaders must adjust to the changing nature of leadership.

Leaders should give priority to investing in staff training in data analytics skills since having data analytics competency is critical for enhancing the effectiveness of a company's decision-making process. Organizations should give priority to investing in training programs for employees to develop these skills since they are crucial for entrepreneurial Performance.

Effective communication, teamwork, and a culture of inclusion and respect for other viewpoints and opinions are necessary for managing geographically distributed and varied teams.

Finally, in the context of developing technologies, leaders should embrace the emergence of new leadership paradigms. They ought to adjust to the rapidly and continuously changing nature of leadership to ensure that they maintain effectiveness in managing their employees.

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