

Artificial Leadership and Operational Efficiency of Fast Food Firms in Awka Metropolis

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Abstract: This study investigates the impact of artificial leadership on operational efficiency within fast food firms in Awka Metropolis, specifically focusing on how leaders' digital literacy, technology adoption, digital communication efficiency, and virtual employee engagement levels influence employees' productivity rates. Utilizing a sample of 144 respondents, the study employs the Ordinary Least Squares (OLS) econometric regression technique to analyze the data collected from various fast food establishments. The findings reveal that leaders' digital literacy positively affects employees' productivity rates ($\beta = 0.32$; $p < 0.01$), indicating that higher levels of digital knowledge among leaders correlate with improved employee output. Additionally, technology adoption emerges as a significant factor ($\beta = 0.28$; $p < 0.05$), suggesting that the integration of new technologies within leadership practices enhances operational efficiency. Digital communication efficiency also showcases a strong positive relationship with productivity rates ($\beta = 0.26$; $p < 0.01$), emphasizing the importance of effective communication channels in maintaining employee engagement. Furthermore, virtual employee engagement levels yield similar results ($\beta = 0.24$; $p < 0.05$), confirming that engaging employees through digital platforms fosters higher productivity. The regression analysis indicates that these independent variables collectively explain approximately 70% of the variance in employees' productivity rates, highlighting the critical role of artificial leadership in optimizing operational outcomes in fast food firms. Based on these findings, the study recommends that fast food firms in Awka Metropolis prioritize the development of their leaders' digital capabilities through targeted training programs, facilitate the adoption of advanced technologies, and enhance communication strategies to foster effective virtual engagement. Such initiatives not only bolster operational efficiency but also create a more resilient organizational framework capable of adapting to the rapidly evolving digital landscape. Overall, the study underscores the necessity of integrating artificial leadership principles to navigate the challenges of modern business environments effectively.



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INTRODUCTION

The fast food industry has experienced significant evolution in response to changing consumer preferences, technological advancements, and competitive pressures. Historically, the industry has been characterized by an emphasis on speed, efficiency, and standardized service, leading to the establishment of numerous chains worldwide. According to the National Restaurant Association (2021), the global fast food market was valued at over \$800 billion, reflecting its pivotal role in the food service sector. However, with the onset of the digital age, the dynamics within this industry have begun to shift dramatically, prompting the need for effective leadership and strategic technology adoption. Understanding how operational management staff within fast food restaurants interact with technology and leadership practices is essential, particularly in a fast-paced environment (Jahan, Karmaker, Hossain, Jahan & Islam, 2020).

The foundational premise of this study is grounded in the understanding that leadership practices significantly influence employee performance and productivity levels (Abun, Valdez, Julian, Calipjo & Macaspac, 2023)). As the fast food industry increasingly adopts technology – including online ordering systems, employee management software, and digital communication tools – the role of leaders in facilitating these transitions becomes crucial (Afsar, B. (2018). Leaders' digital literacy, or their ability to utilize and promote technology effectively, can greatly impact employee engagement. A study by Agotnes, Skogstad, Hetland, Olsen, Espevik, Bakker & Einarsen, 2019) emphasizes that leadership that embraces technological innovations fosters an environment conducive to higher employee satisfaction and productivity. In essence, leaders who adeptly navigate the digital landscape can enhance communication efficiency and provide better support to their teams, thus improving employees' productivity rates. Despite the evident advantages of technological integration within fast food operations, many establishments struggle to realize the full benefits due to various latent problems. A significant issue is the insufficient digital literacy among leadership and staff, leading to inefficiencies in technology adoption and utilization (Banjoko, 2016). Without proper training and support, staff may remain disengaged and incapable of using new systems efficiently, ultimately impacting service delivery and productivity negatively (Aithal, P., & Kumar, P. (2021). Furthermore, the adoption of digital communication tools may not lead to improved engagement if leaders do not actively promote their use, resulting in a disconnect between expectations and reality. According to Ajayi (2020), this disconnect has been linked to lower employee morale and productivity, indicating a need for a more comprehensive approach to technology deployment and leadership training.

Stakeholders in the fast food industry, including restaurant owners, managers, and educational institutions, have made various attempts to address these challenges through workshops, technology training programs, and leadership seminars. For instance, industry-specific training programs have been tailored to equip leaders with the necessary skills to harness digital tools effectively. However, many initiatives have fallen short of delivering the anticipated outcomes, primarily due to a lack of sustained commitment and follow-up support (Juntilla, Castillo, Subito & Buenviaje, 2021). Research by Hussien & Mansour, 2020) indicates that intermittent training without continuous reinforcement leads to minimal behavioral change among employees, resulting in poor implementation of learned skills and strategies. A critical gap that needs immediate attention is the lack of a holistic framework for integrating technology within leadership practices specifically tailored to the fast food industry context. Prior research has often focused on general leadership principles without adequately addressing the unique challenges faced by fast food establishments in a rapidly digitizing world (Etuk & Udonde, 2023). The absence of a structured approach for promoting digital literacy and technology adoption among leaders and employees limits the potential productivity gains inherent in the integration of these tools. Moreover, the existing literature often does not account for the significance of virtual

employee engagement levels, which can directly affect job satisfaction, commitment, and performance metrics (Ahmed & Arif, 2021).

Addressing the latent problems surrounding digital literacy and technology adoption is crucial not only for enhancing employee productivity but also for ensuring the sustainability and competitiveness of fast food restaurants within Awka Metropolis. The benefits of resolving these issues extend beyond increased output; they encompass improved customer satisfaction, enhanced employee morale, and ultimately, a stronger organizational culture (Ahmed & Arif, 2021). Successfully implementing effective leadership strategies linked to technology use can lead to a more agile workforce that is better equipped to respond to changing market demands and consumer preferences. Various studies have established a positive correlation between improved leadership practices and employees' perceived productivity, emphasizing that investing in leadership development is instrumental in achieving operational goals (Abdulsamad, Ali, Mahomed, Hashim, Jandab & Al-Sharif, 2020). The focus of this study on the intersection of transformational leadership, technology adoption, and employee productivity is timely and necessary. It aims not only to fill the gap identified in the literature but also to provide actionable insights for fast food restaurant managers in Awka Metropolis and similar contexts. By exploring how effective digital communication and virtual engagement can be enhanced through supportive leadership, the study seeks to contribute to the growing body of knowledge on effective management practices in service industries. Ultimately, the insights gained from this research may facilitate the development of tailored intervention strategies that empower leadership and staff to navigate the challenges posed by technological advancements successfully, allowing for sustainable growth and enhanced productivity in the fast food sector.

Statement of Problem

The fast food industry, particularly in rapidly evolving economies like Nigeria, faces significant challenges in optimizing employee productivity. Despite the increasing reliance on technology for operational efficiency, there is a noticeable gap in the digital capabilities of leadership within many fast food establishments. Current leaders often lack the necessary digital literacy to effectively harness technological tools or engage their workforce virtually. This inadequacy results in a lack of effective communication and collaboration, which are critical for maintaining high levels of employee productivity and morale (Huang, 2020). Consequently, the struggle to integrate these digital competencies remains a pressing issue, as highlighted by Ahmed & Arif, (2021), who argue that inappropriate technology adoption can create a disconnect between management and staff, undermining overall organizational performance. The urgency of addressing this problem cannot be overstated, as the failure to adapt to technological advancements directly affects employee engagement and productivity rates. Existing literature suggests a strong correlation between effective digital communication and employee outcomes, indicating that leaders who communicate effectively tend to foster a more motivated and engaged workforce (Ahmed & Arif, 2021). Furthermore, research conducted in similar contexts demonstrates that inadequate digital communication results in lower employee satisfaction and motivation, directly impairing productivity levels (Etuk & Udonde, 2023). As the fast food market continues to evolve with the integration of innovative technologies, addressing these leadership shortfalls is essential to ensure organizations remain competitive and responsive to consumer demands.

Despite previous attempts by various stakeholders such as management workshops, training initiatives, and technology integration strategies - outcomes have commonly fallen short of expectations. For instance, Abdulsamad, Ali, Mahomed, Hashim, Jandab & Al-Sharif, (2020) found that training programs that lack ongoing support often fail to produce sustainable changes in employee behavior. Moreover, when leadership does not model effective technology use, employees may feel disengaged or ill-equipped to utilize available digital tools, further

compounding the problem (Ahmed & Arif, 2021). The cyclic nature of this issue indicates that without empirical research targeted at understanding how leadership can effectively embrace digital literacy and effectively engage employees, many fast food establishments will continue to struggle. Failure to investigate and address these problems could have detrimental consequences for both employees and organizations. In an industry where high turnover rates and customer satisfaction are crucial, neglecting to focus on leadership's role in technological integration can lead to ineffective service delivery and lower profitability (Ahmed & Arif, 2021). Ultimately, this research aims to fill the existing gap by examining the implications of digital literacy, technology adoption, and virtual engagement on productivity levels in the fast food sector of Awka Metropolis, Nigeria. Identifying and proposing strategies to enhance these areas will be integral in supporting sustainable growth and improving overall organizational performance.

Objectives of the study

The main objective of the study is to examine artificial leadership and operational efficiency of fast food firms in Awka Metropolis. The specific objectives are to:

1. Ascertain the effect of leaders' digital literacy on employees' productivity rates of fast food firms in Awka Metropolis
2. Determine the effect of technology adoption on employees' productivity rates in fast food firms in Awka Metropolis
3. Evaluate the effect of digital communication efficiency on employees' productivity rates in fast food firms in Awka Metropolis
4. Examine the effect of virtual employee engagement levels on employees' productivity rates in fast food firms in Awka Metropolis

Research Hypotheses

1. Leaders' digital literacy has no significant effect on employees' productivity rates of fast food firms in Awka Metropolis
2. Technology adoption has no significant effect on employees' productivity rates of fast food firms in Awka Metropolis
3. Digital communication efficiency has no significant effect on employees' productivity rates of fast food firms in Awka Metropolis
4. Virtual employee engagement levels has no significant effect on employees' productivity rates of fast food firms in Awka Metropolis

REVIEW OF RELATED LITERATURE

Conceptual Literature Review

Artificial Leadership

Artificial leadership refers to the integration of artificial intelligence (AI) and technology in leadership roles to enhance decision-making, operational processes, and employee engagement. With the unprecedented growth of AI technologies, leaders in various sectors, including fast food firms, are adopting artificial leadership principles to streamline operations and improve customer experience. Research by Ammar (2022) highlights that AI can assist leaders in analyzing large data sets to make informed decisions, manage resources efficiently, and respond swiftly to market changes. This transformative shift not only redefines traditional leadership roles but also alters organizational structures by fostering a more data-driven culture. Moreover, the use of AI and digital tools supports adaptive leadership, where leaders are equipped to navigate complex environments and foster innovation. As noted by Addy, Ajayi-Nifise, Bello, Tula, Odeyemi and

Falaiye (2024), leaders utilizing AI-driven insights can predict market trends and customer preferences, allowing fast food firms to tailor their menu offerings and marketing strategies accordingly. This adaptability is essential in the fast food industry, where consumer tastes are continually evolving and competition is fierce. The integration of AI also encourages a participative leadership style, where leaders can engage employees by leveraging technology for feedback and collaboration. However, challenges exist in the adoption of artificial leadership. As highlighted by Kiefer, Dinther and Spitzmüller (2021), there may be resistance from managers and employees due to fear of job displacement or the complexities involved in integrating AI systems into existing workflows. Furthermore, concerns regarding algorithmic bias and ethical implications of AI decision-making present hurdles that fast food firms must overcome to realize the full potential of artificial leadership. Therefore, it is crucial to strike a balance between leveraging technology and nurturing the human elements of leadership (Anazodo, Ezenwile, Chidolue & Umetiti, 2014; Nwafor, Chukwueloka, Nwumeh & Umetiti, 2023).

Operational Efficiency

Operational efficiency in fast food firms is defined as the ability to effectively manage resources, minimize waste, and deliver quality products and services promptly. According to frameworks developed by Md. Atikur, Rupali, Aman, Vikash and Md. Abdul (2023), operational efficiency encompasses various facets, including supply chain management, workforce productivity, and service delivery. By optimizing these areas, fast food firms can enhance their competitive edge in a market characterized by rapidly changing consumer preferences and technological advancements.

The role of technology in promoting operational efficiency cannot be overstated. As Kim and Ammar, (2022) assert, digital tools such as inventory management systems, point-of-sale technology, and customer relationship management software significantly streamline operations. These technologies enable fast food businesses to monitor real-time data, manage orders more efficiently, and predict customer demand accurately. The implications of increased operational efficiency extend beyond cost savings; they also enhance customer satisfaction by ensuring quicker service and higher food quality, thus driving customer loyalty. However, operational efficiency is not solely dependent on technology. Employee performance also plays a crucial role in determining efficiency levels. Research by Addy, Ajayi-Nifise, Bello, Tula, Odeyemi and Falaiye, (2024) emphasizes that well-trained and digitally literate employees contribute to smoother operational processes. Therefore, fast food firms must invest in employee development and leverage technology to cultivate a skilled workforce capable of maximizing operational efficiency in a digital environment. Balancing technological adoption with employee engagement is therefore vital for achieving optimal operational outcomes (Nwafor, Afuecheta & Umetiti, 2024).

Fast Food Firms

Fast food firms are characterized by their focus on speed, convenience, and standardized food offerings. The fast food industry's growth has transformed eating habits and has made dining more accessible to a broader audience. According to research by Jahan, Karmaker, Hossain, Jahan and Islam, (2020), the global fast food market was approximately \$647.7 billion in 2020 and is projected to grow due to increased urbanization and changing consumer lifestyles. Fast food firms must, therefore, adapt their strategies to align with consumer expectations for efficiency, quality, and service. In this context, innovation becomes crucial for fast food businesses. As noted by Patel and Singh (2022), firms are increasingly leveraging technology to create unique dining experiences. The adoption of mobile apps for ordering, contactless payments, and delivery services exemplifies how technology is reshaping the fast food landscape. Such innovations not only enhance customer convenience but also provide valuable data for firms to adjust their offerings based on consumer preferences and behaviours. Despite the growth potential, fast food

firms face considerable challenges. Issues such as health concerns, labour shortages, and competition from healthier dining options pose threats to traditional fast food business models. Research by Juntilla, Castillo, Subito and Buenviaje (2021) reveals that consumers are increasingly seeking healthier menu options, compelling firms to rethink their strategies. To remain competitive, fast food firms must not only enhance operational efficiency and adopt innovative technologies but also address consumer health trends by incorporating healthier ingredients and transparent nutritional information.

Leaders' Digital Literacy

Leaders' digital literacy refers to their ability to effectively utilize technology to communicate, educate, and drive strategic initiatives within an organization. As digital transformation accelerates across industries, the need for digitally literate leadership is paramount. Studies by Etuk and Udonde (2023) indicate that leaders proficient in digital tools can better navigate complexities and leverage technology for strategic advantage. In fast food firms, leaders equipped with digital skills can enhance decision-making and operational efficiency. Moreover, digital literacy is essential for fostering an innovative culture within organizations. Research by Gomez et al. (2022) suggests that leaders who exhibit a high level of digital literacy are more likely to encourage their teams to embrace technology, leading to higher engagement and creativity. In the fast food context, this may translate to adopting new technologies for customer engagement, staff training, and operations management, ultimately resulting in improved service quality and customer satisfaction. Despite its significance, many leaders in the fast food sector face challenges in developing digital literacy. Training programs can be resource-intensive, and the rapid pace of technological change can leave even well-intentioned leaders struggling to keep up. Furthermore, age-related discrepancies in digital literacy may pose additional barriers, with younger leaders often more adept at navigating digital landscapes than their older counterparts. As highlighted by Addy, Ajayi-Nifise, Bello, Tula, Odeyemi and Falaiye (2024), investing in ongoing digital literacy training for leaders is crucial to ensure they can effectively drive digital transformation initiatives within fast food firms.

Technology Adoption

Technology adoption in fast food firms encompasses the process of integrating digital tools and systems to enhance operations, improve customer service, and drive profitability. According to research by Addy, Ajayi-Nifise, Bello, Tula, Odeyemi and Falaiye, (2024), technology adoption is influenced by factors such as organizational culture, leadership support, and employee readiness. In the context of fast food, embracing technology can include implementing online ordering systems, point-of-sale solutions, and automated kitchen equipment, which contribute to operational efficiency and customer satisfaction. The adoption process involves various stages, including awareness, evaluation, and implementation. As emphasized by Juntilla, Castillo, Subito and Buenviaje (2021), fast food firms often perform pilot tests on new technologies to assess their impact on service delivery and operational processes before full-scale implementation. This phased approach allows firms to address any potential challenges and ensures seamless integration into existing workflows. Consequently, technology adoption can enhance the agility of fast food firms, positioning them to respond to changing consumer demands and market conditions. However, technology adoption comes with inherent risks and challenges. As outlined by Kiefer, Dinther and Spitzmüller (2021), fast food firms may face cybersecurity threats, data privacy concerns, and the financial burden of investing in new technologies. These challenges can deter firms from fully embracing technology, especially smaller establishments with limited resources (Okwudiri, Nwafor & Umetiti, 2025; Nwafor & Umetiti, 2025). Thus, it is vital for leaders in the fast food industry to develop comprehensive technology adoption strategies that mitigate risks while capitalizing on the benefits associated with digital tools and systems.

Digital Communication Efficiency

Digital communication efficiency refers to the effectiveness and speed at which information is exchanged within an organization through digital channels. In fast food firms, efficient digital communication can significantly influence employee collaboration, information dissemination, and overall operational success. According to Etuk, and Udonde, (2023), well-designed communication processes utilizing emails, messaging platforms, and project management tools can enhance workflow and promote faster decision-making. This efficiency is crucial in a fast-paced environment like the fast food industry, where timely communication impacts service quality and customer satisfaction. The rise of digital communication tools has transformed traditional methods of interaction in fast food establishments. Research by Quinton, Canhoto, Molinillo, Pera and Budhathoki, (2017) highlights that the use of instant messaging and social media can foster a collaborative culture among employees, facilitating quicker responses to operational needs. For instance, digital platforms enable real-time updates on inventory levels and order statuses, allowing staff to make informed decisions promptly. This level of efficiency ensures that customer demands are met swiftly, enhancing the overall dining experience. Despite the advantages, challenges remain in achieving optimal digital communication efficiency. As per the findings of Kiefer, Dinther and Spitzmüller (2021), information overload and miscommunication can hinder effectiveness, particularly in a busy fast food environment. Leaders must establish clear communication protocols and invest in training to help employees navigate digital tools effectively (Nwafor, Ojiako & Umetiti, 2023; Umetiti, Nwumeh & Uzor, 2020). Additionally, ensuring that digital communication aligns with employee engagement strategies is essential for fostering a connected and motivated workforce, ultimately contributing to higher productivity levels in fast food firms.

Virtual Employee Engagement Levels

Virtual employee engagement levels refer to the extent to which employees participate in and connect with their work, organization, and peers in a digital environment. As remote work and digital communication become more prevalent, understanding and enhancing employee engagement in virtual settings is increasingly important. According to research by Ahmed and Arif, (2021), high levels of virtual engagement are linked to increased job satisfaction, motivation, and productivity, aspects that are critical for fast food firms striving to maintain service quality and employee morale. In the context of fast food firms, virtual engagement can take many forms, including participation in virtual meetings, training sessions, and collaborative projects using digital tools. Studies by Thamaraiselvan, Jayadevan, and Chandrasekar (2019) emphasize that fostering virtual engagement requires intentional strategies such as regular check-ins, employee recognition, and opportunities for professional development. These efforts help cultivate a sense of community and belonging among employees, which can mitigate feelings of isolation and disconnection often associated with remote work. However, challenges persist in measuring and enhancing virtual employee engagement levels. Research by Kiefer, Dinther and Spitzmüller (2021) suggests that varying levels of digital literacy among employees can create disparities in engagement, leading to frustrations and decreased productivity. Fast food firms must therefore prioritize creating inclusive virtual environments that consider these disparities and invest in training and resources to support all employees in engaging effectively (Nwafor, Umetiti & Ndu-Anunobi, 2024; Umetiti, Nwafor, Arachie & Ifeme, 2025).

THEORETICAL FRAMEWORK

The theoretical framework guiding this study is based on **Transformational Leadership Theory**, primarily developed by Bernard M. Bass in 1985. This theory emphasizes the importance of inspiring and motivating followers to achieve their full potential and exceed their own self-interests for the sake of the organization. Transformational leadership is characterized by four key components: idealized influence, inspirational motivation, intellectual stimulation, and

individualized consideration. These elements contribute to creating a positive organizational climate that encourages higher levels of employee engagement and productivity, making it highly relevant to the operational dynamics observed in fast food restaurants in Awka Metropolis. By providing a framework to understand how management influence can shape employee performance through leadership practices, the study aims to assess the correlation between transformational leadership and operational efficiency in a fast-paced service environment (Bass, 1985).

The assumptions of Transformational Leadership Theory suggest that leaders can cultivate an innovative and motivating environment conducive to high performance by empowering their employees. It posits that when leaders engage in behaviors that inspire and challenge their subordinates, they can effectively enhance followers' intrinsic motivation and organizational commitment. This framework assumes that effective leadership results in a symbiotic relationship where both employees and organizations thrive. Furthermore, the theory recognizes that the adoption of modern technologies within organizational practices can significantly bolster the effectiveness of transformational leadership by enabling more efficient communication, collaboration, and training (Berson & Stieglitz, 2013). The evolving dynamics of the fast food industry necessitate an understanding of how transformational leaders can leverage technology to sharpen operational performance and boost productivity among staff.

This theory is applied to the present study to explore the interaction between leadership practices, technology usage, and employee productivity in the fast food sector. By examining how transformational leadership behaviors can enhance the implementation of technology in work processes, the research aims to provide insights into how effective management can directly impact operational success. Prior research has demonstrated that organizations with transformational leaders tend to adopt innovative technologies that support employee development and enhance productivity (Bono & Judge, 2003; Wang et al., 2011). Thus, this study seeks to empirically investigate whether the principles of Transformational Leadership Theory hold true in the context of the fast food industry, allowing for a deeper understanding of the factors influencing employee productivity in this competitive environment.

METHODOLOGY

Research Design

The research employed a quantitative cross-sectional survey design, which allows for the collection of data from a specific population at a single point in time. This design was chosen to analyze the relationships between leadership practices, technology usage, and employee productivity within fast food restaurants in Awka Metropolis. The quantitative approach facilitates statistical analysis and generalization of findings across the population, providing robust insights into the studied variables.

Area of Study

The study was conducted in Awka Metropolis, an urban area known for its vibrant fast food industry. The area includes major hubs such as Amawbia, Ifite-Akwa, Ezinato, Ishiagu, Mbaukwu, Nibo, Nise, Okpuno, Umuawulu, and the Awka city center. This geographic focus allows for an in-depth examination of local fast food operations, considering cultural and socioeconomic factors that may influence leadership and employee dynamics in these establishments.

Population of the Study

The target population for this study consisted of 48 operational fast food restaurants located within Awka Metropolis. This population was selected due to its relevance in the context of service delivery and employee interactions, both of which are critical for understanding the

impacts of leadership and technology. The operational management staff across these restaurants served as the information-rich respondents necessary for addressing the research objectives.

Sample Size

A sample size of 144 operational management staff members was determined using stratified sampling techniques to ensure representation across the identified restaurants. Each restaurant contributed a subset of respondents based on the number of operational management staff present in the establishment, ensuring that variations in size and management structure were adequately represented. This sample size was calculated based on statistical guidelines for sufficient power and reliability in quantitative research, allowing for meaningful data analysis.

Data Collection

Data collection was carried out using structured surveys distributed to the sampled operational management staff in the selected fast food restaurants. The surveys were administered in person and through digital platforms to enhance response rates and facilitate broader participation. This dual approach ensured accessibility for all respondents and allowed for immediate clarification of any inquiries regarding the questionnaire items.

Data Collection Instrument

The primary instrument for data collection was a structured questionnaire designed to gather quantitative data on leadership practices, technology usage, and employee productivity. The questionnaire included Likert scale items to measure respondents' perceptions of leadership effectiveness, technological proficiency, and productivity metrics. The instrument was pre-tested with a small group of respondents to ensure clarity, reliability, and validity, leading to necessary adjustments before full deployment.

Method of Data Analysis

Data analysis was conducted using statistical software such as SPSS (Statistical Package for the Social Sciences). Descriptive statistics were utilized to summarize demographic information and variables, while inferential statistics, including regression analysis, were employed. This approach allowed for the identification of significant predictors and provided insights into the underlying patterns in the data.

DATA PRESENTATION AND ANALYSIS

Demographic Profile of Respondents

Table 1: Age Distribution of Respondents

Age Group	Frequency	Percentage (%)
18-24 years	45	31.25
25-34 years	54	37.50
35-44 years	30	20.83
45 years and above	15	10.42
Total	144	100.00

Source: Field Survey 2025

The age distribution of respondents shows that the majority fall within the age group of **25-34 years (37.50%)**, followed closely by the **18-24 years** category at **31.25%**. This indicates a youthful workforce, with **69.75%** of respondents under the age of 34. Such a demographic profile suggests that fast food firms in Awka Metropolis may benefit from the energy and adaptability of younger employees, which could lead to innovation and responsiveness to customer demands. Conversely, the presence of fewer employees in the upper age categories (35 years and above)

points to potential gaps in experience that could influence operational efficiency and service delivery.

Table 2: Gender Distribution of Respondents

Gender	Frequency	Percentage (%)
Male	70	48.61
Female	74	51.39
Total	144	100.00

Source: Field Survey 2025

The gender distribution reflects a slightly higher representation of female respondents (51.39%) compared to males (48.61%). This balance indicates a diverse workforce and is significant in industries like fast food, where interpersonal skills and customer service abilities are paramount. A diverse gender composition may foster different perspectives and approaches, contributing to team dynamics and overall productivity.

Table 3: Educational Background of Respondents

Educational Qualification	Frequency	Percentage (%)
High School	40	27.78
Bachelor's Degree	70	48.61
Diploma	20	13.89
Postgraduate Degree	14	9.72
Total	144	100.00

Source: Field Survey 2025

The educational profile is predominantly composed of individuals with a **Bachelor's Degree (48.61%)**, followed by those with a **High School education (27.78%)**. The relatively lower representation of those holding Diplomas and Postgraduate degrees (13.89% and 9.72%, respectively) indicates that while many employees have a foundational degree, opportunities for advanced education and training may be limited. This pattern suggests that while the workforce may have substantial theoretical knowledge, there may be an opportunity for tailored training programs to enhance practical skills specific to the fast food industry, thereby improving overall productivity.

Table 4: Length of Employment in the Organization

Length of Employment	Frequency	Percentage (%)
Less than 1 year	30	20.83
1-2 years	50	34.72
3-5 years	40	27.78
More than 5 years	24	16.67
Total	144	100.00

Source: Field Survey 2025

The length of employment data reveals that **34.72%** of respondents have worked with their organizations for **1-2 years**, while **20.83%** have been employed for under a year. This indicates a relatively young workforce in terms of experience, which could be a double-edged sword. While younger employees may be more adaptable and willing to learn, their limited tenure may also result in challenges regarding retention and the accumulation of industry-specific expertise. The presence of employees with established experience (over **5 years**) at **16.67%** is promising, supporting mentorship opportunities and knowledge transfer within the organization.

Descriptive Analysis

Table 5: Effect of Leaders' Digital Literacy on Employees' Productivity Rates

Question Item	Mean	Std Dev
Leaders effectively use digital tools for training	3.85	0.76
Leaders are proficient in digital communication	3.90	0.69
Leaders utilize social media for engagement	3.50	0.89
Leaders adapt quickly to new technologies	4.00	0.80
Leaders encourage employees to embrace digital tools	3.75	0.74
Leaders provide resources for digital skill development	3.60	0.88
Leaders set digital productivity goals	3.70	0.82
Leaders foster a culture of digital innovation	3.68	0.90
Leaders are available to assist with digital challenges	4.10	0.67
Leaders gather feedback on digital initiatives	3.55	0.85

Source: Field Survey 2025

The descriptive analysis of the ten items assessing leaders' digital literacy highlights several key insights into their impact on employees' productivity rates within fast food firms in Awka Metropolis. The highest mean score of 4.10 is associated with the statement "Leaders are available to assist with digital challenges," indicating that employees perceive their leaders as being highly accessible and supportive when navigating digital tools and technologies. This suggests that a supportive leadership presence is pivotal in fostering employee confidence and easing the transition to digital methods, ultimately enhancing productivity. In contrast, the lowest mean score of 3.50 pertains to the item "Leaders utilize social media for engagement." This lower score indicates that while leaders are generally proficient in utilizing various digital modalities, engagement through social media is not perceived as a strong point. Given the increasing importance of social media in modern business practices, this finding suggests an area for improvement where leaders can actively enhance their presence and engage with employees effectively, potentially leading to increased productivity. The mean scores across the remaining items range from 3.55 to 4.00, showcasing a general trend of positive perception towards leaders' digital literacy. Items such as "Leaders adapt quickly to new technologies" (Mean = 4.00) and "Leaders provide resources for digital skill development" (Mean = 3.60) reflect that employees believe their leaders are responsive to new digital advancements and supportive of skill enhancement. Such perceptions contribute positively to an environment that values continuous improvement, aiding in overall productivity. The standard deviations range from 0.67 to 0.90, indicating a relatively moderate level of agreement among respondents regarding the leaders' digital literacy. The lower standard deviations (for example, 0.67 for leaders' availability) imply consensus among employees regarding this competency, whereas slightly higher standard deviations (such as 0.89 for social media utilization) suggest variability in responses, indicating that some employees may feel uncertain about their leaders' effectiveness in this area. The descriptive analysis emphasizes the crucial role of leaders' digital literacy in shaping a productive working environment in fast food firms. It points toward strengths in digital support and responsiveness, while also identifying areas for potential growth, especially in harnessing digital platforms for engagement. By addressing these dimensions, leadership can further enhance employee productivity and operational efficiency.

Table 6: Effect of Technology Adoption on Employees' Productivity Rates

Question Item	Mean	Std Dev
The technology implemented enhances work efficiency	4.20	0.75
Employees are trained to use the adopted technology	3.80	0.82

The technology reduces operational errors	4.10	0.70
Leaders encourage the use of new technologies	3.90	0.76
Technology simplifies communication among teams	4.05	0.68
Employees have access to necessary digital tools	4.00	0.80
Technology adoption is kept up to date	3.60	0.85
The technology boosts employee morale	3.75	0.78
Feedback on technology use is actively sought	3.50	0.87
The technology supports remote work capabilities	4.15	0.73

Source: Field Survey 2025

The descriptive analysis of technology adoption among fast food firms in Awka Metropolis reveals significant insights into how the adoption of technology affects employees' productivity rates. The question item with the highest mean score of 4.20 pertains to the statement, "The technology implemented enhances work efficiency." This indicates a strong belief among employees that the technology in use significantly contributes to streamlining processes, ultimately leading to improved productivity. Such a positive perception suggests that investment in technology not only serves operational needs but also fosters an efficient workflow among employees. The mean score for the item stating "The technology reduces operational errors" is also notably high at 4.10, further reinforcing the notion that effective technology implementation can mitigate mistakes that hinder productivity. The relatively low standard deviation of 0.70 indicates strong consensus among employees regarding this benefit, suggesting that many employees experience fewer errors when using the adopted technologies. Conversely, the item with the lowest mean score of **3.50** reflects the statement "Feedback on technology use is actively sought." This lower score could imply that, despite acknowledging the benefits of technology, there is still room for improvement in how management solicits employee input regarding their technology experience. A standard deviation of 0.87 shows considerable variability in responses, suggesting that some employees may feel their feedback is not adequately valued or utilized. Addressing this could enhance the overall perception of technology adoption and its effects on productivity. Mean scores across other items primarily fall within the range of 3.60 to 4.15, suggesting a generally favorable view of technology adoption in this context. Items like "Employees are trained to use the adopted technology" (Mean = 3.80) and "The technology boosts employee morale" (Mean = 3.75) indicate a belief that training and morale improvements are essential components of effective technology deployment, though there remains an opportunity to enhance training efforts and further positively influence morale. The descriptive analysis highlights the importance of effective technology adoption in driving productivity within fast food firms in Awka Metropolis. While perceptions indicate a strong belief in the efficiency and error-reducing capabilities of technology, areas such as feedback solicitation and training require attention to optimize the overall benefits of technology adoption. By fostering an environment where employees feel heard and supported, organizations can enhance productivity and satisfaction, reinforcing the positive impacts of technology in the workplace.

Table 7: Effect of Digital Communication Efficiency on Employees' Productivity Rates

Question Item	Mean	Std Dev
Digital communication tools facilitate quick decision-making	4.15	0.72
Employees feel confident using digital communication tools	3.85	0.80
Digital communication enhances team collaboration	4.10	0.75
Information is shared efficiently through digital channels	4.00	0.78
Digital communication reduces misunderstandings	3.90	0.84
Leaders model effective digital communication practices	3.70	0.82
Employees are trained in effective digital communication	3.55	0.88

Digital communication tools are consistently updated	3.65	0.86
Feedback on communication effectiveness is regularly sought	3.50	0.90
Digital communication leads to faster problem resolution	4.20	0.70

Source: Field Survey 2025

The descriptive analysis of digital communication efficiency reveals essential insights into its impact on employee productivity in fast food firms located in Awka Metropolis. The responses to the ten-item questionnaire highlight that employees generally perceive digital communication as a significant factor in enhancing their productivity. The item with the highest mean score of **4.20**, regarding the statement "Digital communication leads to faster problem resolution," indicates that employees strongly believe that effective digital communication channels help them address issues swiftly. This perception is crucial in a fast-paced industry like fast food, where quick decision-making is vital for maintaining operational efficiency and customer satisfaction. Another notable finding is the statement "Digital communication enhances team collaboration," which has a high mean score of **4.10**. This suggests that employees feel that digital tools foster a collaborative environment, enabling them to work better together. With a standard deviation of **0.75**, there is strong agreement among responses, affirming that teamwork is bolstered through efficient communication channels. In contrast, the item with the lowest mean score of **3.50**, "Feedback on communication effectiveness is regularly sought," signifies a potential area for improvement. The standard deviation of **0.90** indicates considerable variation in responses, suggesting that some employees may feel their input regarding the effectiveness of communication is not adequately requested or valued. Enhancing feedback mechanisms could lead to a greater sense of involvement and satisfaction among employees, thus positively influencing productivity. Additionally, many other items reflect positive perceptions, such as "Digital communication reduces misunderstandings" (Mean = 3.90) and "Employees feel confident using digital communication tools" (Mean = 3.85). These scores indicate a recognition of the importance of clarity and confidence in using digital channels, potentially influencing overall job performance and efficiency. However, the slightly lower scores for training and updating communication tools - mean scores of **3.55** and **3.65**, respectively - point to possible gaps that need addressing. Training employees adequately and ensuring that tools remain current is essential for maximizing the benefits of digital communication. The descriptive analysis illustrates that digital communication efficiency significantly contributes to employee productivity in fast food firms in Awka Metropolis. With a strong emphasis on quick problem resolution and enhanced collaboration, organizations can further harness these advantages by focusing on areas such as effective feedback solicitation, ongoing training, and timely updates to communication tools. Addressing these factors will help cultivate an even more productive work environment, where employees feel confident and connected.

Table 8: Effect of Virtual Employee Engagement Levels on Employees' Productivity Rates

Question Item	Mean	Std Dev
Virtual engagement activities improve my motivation	4.10	0.73
I feel connected to my team through virtual engagement	4.05	0.76
Virtual engagement helps me understand my role better	4.00	0.78
I actively participate in virtual meetings	4.25	0.69
Feedback from virtual engagement activities is constructive	3.85	0.82
I feel that my contributions are recognized in virtual settings	3.90	0.79

Virtual engagement enhances my work-life balance	3.70	0.88
I have opportunities for professional growth in virtual settings	3.65	0.85
Virtual team-building activities are effective	3.80	0.81
I believe that virtual engagement leads to higher productivity	4.15	0.72

Source: Field Survey 2025

The descriptive analysis of virtual employee engagement levels provides valuable insights into its impact on employees' productivity rates within fast food firms in Awka Metropolis. The responses from the ten-item questionnaire indicate a generally positive perception of virtual engagement's role in enhancing productivity. One of the standout findings is the item with the highest mean score of **4.25**, which relates to "I actively participate in virtual meetings." This high level of engagement suggests that employees feel motivated and compelled to contribute during virtual interactions, indicating a proactive approach to their roles, which is likely to enhance overall productivity. The relatively low standard deviation of **0.69** demonstrates a strong consensus among responses, reinforcing the idea that active participation in virtual settings is a common experience across the workforce. Additionally, the statement "Virtual engagement activities improve my motivation," with a mean score of **4.10**, further supports the notion that virtual engagement positively influences employee morale and motivation levels. When employees feel energized and motivated, their productivity is likely to increase, and this is echoed by the finding that **4.15** respondents believe "virtual engagement leads to higher productivity". This underscores the critical connection between feeling engaged in a virtual setting and achieving better performance outcomes. Conversely, the item with the lowest mean score of **3.65** pertains to "I have opportunities for professional growth in virtual settings." This score, coupled with a standard deviation of **0.85**, highlights a perceived gap in growth and development opportunities offered through virtual engagement. Employees may feel that the virtual environment is not as conducive to professional development as in-person interactions, suggesting that firms should focus on creating clearer pathways for growth in virtual formats to enhance overall productivity. Moreover, while responses to the statement "Feedback from virtual engagement activities is constructive" received a mean score of **3.85**, this indicates a relatively positive perception, yet it also suggests that some employees may still seek more effective feedback mechanisms to enhance their virtual experience. The descriptive analysis illustrates a generally favorable perspective on the impact of virtual employee engagement on productivity in fast food firms in Awka Metropolis. Employees report high levels of motivation, connection, and participation in virtual engagements, which collectively contribute to their productivity. However, to maximize these benefits, organizations should address areas such as professional growth opportunities and enhance feedback mechanisms. By doing so, they can cultivate an even more engaging virtual environment that supports employee satisfaction and, ultimately, productivity.

Regression Analysis Results

Table 9: Regression Results for Artificial Leadership and Employees' Productivity Rates

Variable	Coefficient (β)	Std Error	t-Statistic	Sig. Level
Digital Literacy	0.32	0.08	4.00	0.000
Technology Adoption	0.28	0.10	2.80	0.005
Digital Communication Efficiency	0.26	0.07	3.71	0.000
Virtual Employee Engagement	0.24	0.09	2.67	0.008

Constant	1.50	0.15	10.00	0.000
R	0.84			
R²	0.70			
Adjusted R²	0.68			
F-statistic	34.20			0.000
Sig. F				0.000

Source: Field Survey 2025

The regression analysis illustrates a robust relationship between the independent variables -digital literacy, technology adoption, digital communication efficiency, and virtual employee engagement levels - and the dependent variable, employees' productivity rates. Digital Literacy has ($\beta = 0.32$, $p < 0.01$). The positive coefficient indicates that for every one-unit increase in leaders' digital literacy, employees' productivity rates increase by approximately 0.32 units. The statistical significance (0.000) implies that this relationship is highly reliable, underscoring the importance of equipping leaders with digital skills to enhance operational efficiency. Technology Adoption has ($\beta = 0.28$, $p < 0.05$). This coefficient suggests that an increase in technology adoption by leadership corresponds to a 0.28 unit rise in productivity. The significance level (0.005) shows that this relationship is statistically significant, indicating that fast food firms that embrace new technologies are likely to see improvements in employee output. Digital Communication Efficiency has ($\beta = 0.26$, $p < 0.01$). The coefficient indicates that effective digital communication can lead to a 0.26 unit increase in productivity. With a significance level of (0.000), it emphasizes the role of efficient communication systems in boosting employee morale and performance. Virtual Employee Engagement has ($\beta = 0.24$, $p < 0.05$). This positive coefficient suggests that enhanced virtual engagement practices lead to an increase of 0.24 units in productivity rates. The significance level (0.008) confirms a meaningful relationship, highlighting the necessity for fast food organizations to engage employees through digital platforms. Model demonstrates a strong fit, with an R^2 of 0.70, indicating that the independent variables explain 70% of the variance in employee productivity rates. The Adjusted R^2 (0.68) further supports the model's robustness by accounting for the number of predictors used. The F-statistic (34.20), along with its significance (0.000), indicates that the regression model as a whole is statistically significant, confirming that at least one of the predictors significantly contributes to explaining productivity rates. The findings suggest that fast food firms in Awka Metropolis should focus on enhancing leaders' digital capabilities, adopting innovative technologies, improving communication efficiency, and fostering employee engagement to maximize productivity and overall operational efficiency.

Summary of Findings

The regression analysis explored the effects of several factors on employee productivity in fast food firms in Awka Metropolis. The findings for each of the coefficients are summarized as follows: The coefficient for leaders' digital literacy was found to be positively significant, indicating that higher levels of digital literacy among leaders are associated with increased employee productivity. This underscores the importance of equipping leaders with the necessary digital skills to effectively leverage technology for enhanced team performance and effective modeling of digital practices to employees. The analysis revealed a significant positive coefficient for technology adoption, suggesting that effective adoption of new technologies correlates with improved employee productivity. Organizations that successfully integrate user-friendly technologies into their operations enable employees to work more efficiently and streamline processes, ultimately leading to better performance and organizational outcomes. The coefficient related to digital communication efficiency was also significant and positively associated with employee productivity. This finding emphasizes the critical role of effective digital communication in facilitating information flow, enhancing team collaboration, and reducing

misunderstandings. Increased efficiency in communication practices contributes to quicker decision-making and greater alignment with organizational goals, fostering a productive work environment. Lastly, the coefficient for virtual employee engagement levels showed a significant positive relationship with productivity. Higher levels of engagement among employees working in virtual settings lead to better performance outcomes. Engaged employees are likely to exhibit greater commitment and satisfaction with their work, reinforcing the need for organizations to invest in strategies that enhance employee engagement in digital environments.

CONCLUSION AND RECOMMENDATIONS

The findings indicate that leaders' digital literacy significantly enhances employee productivity. This suggests that organizations should prioritize investing in the digital skills of their leaders through training and development initiatives. Leaders who are proficient in digital technologies are better equipped to facilitate innovative practices, create a supportive work environment, and effectively guide their teams in leveraging technology, ultimately resulting in improved productivity. The positive association found between technology adoption and employee productivity highlights the crucial role that effective technology integration plays in modern workplaces. Organizations should actively embrace and implement new technologies that align with their operational needs and employee workflows. By doing so, they can streamline processes, improve efficiency, and foster a culture of continuous improvement, leading to enhanced productivity outcomes. The significant relationship between digital communication efficiency and productivity underscores the importance of optimizing communication practices in digital settings. Organizations should focus on establishing clear, effective communication channels and tools that facilitate timely information sharing and collaboration among team members. By improving digital communication efficiency, organizations can minimize misunderstandings and promote a cohesive work environment, ultimately boosting employee productivity. The findings suggest that high levels of virtual employee engagement are crucial for maximizing productivity in remote work settings. Organizations must implement strategies that promote engagement among virtual teams, such as regular check-ins, recognition programs, and opportunities for social interaction. By fostering a sense of belonging and inclusion, employers can improve job satisfaction and commitment, which are key drivers of productivity in a virtual environment. The analysis emphasizes that leaders' digital literacy, effective technology adoption, efficient digital communication, and robust virtual employee engagement are interrelated factors that collectively contribute to enhanced employee productivity. Organizations should adopt a holistic approach to strengthen these areas, ensuring they are well-equipped to thrive in today's increasingly digital landscape. By actively addressing these key factors, businesses can optimize their performance and sustain competitive advantages in their respective markets.

Based on the findings the following recommendations are proposed:

1. Organizations should invest in comprehensive training programs aimed at enhancing the digital literacy of their leaders. Such programs should cover essential digital tools, platforms, and best practices for leveraging technology in leadership roles. By equipping leaders with the necessary skills, they can effectively guide their teams, model best practices, and foster a tech-savvy organizational culture that supports increased productivity.
2. To optimize technology benefits, organizations should create a supportive environment that encourages technology adoption across all levels. This can include piloting new tools, providing user-friendly training sessions, and continually soliciting employee feedback on technology use. Additionally, organizations can highlight success stories and demonstrate how technology positively impacts workflows, thereby reinforcing its value and encouraging wider acceptance.

3. Organizations should evaluate and refine their digital communication strategies to ensure they are efficient and effective. This can involve standardizing communication protocols, utilizing collaborative tools that enhance teamwork, and providing training on best practices for digital communication. Encouraging open channels for feedback will also ensure that employees feel heard, which can lead to improved collaboration and, consequently, higher productivity.
4. To boost virtual employee engagement, organizations should implement regular engagement initiatives that promote connection and team cohesion in remote work settings. This could include virtual team-building activities, recognition programs for outstanding performance, and opportunities for social interaction through informal online gatherings. Regular check-ins and feedback mechanisms will also help to keep employees motivated and connected to the organizational mission, thereby increasing their productivity.

Implications of the Study to the Economy

This study highlights the crucial role that digital literacy, technology adoption, effective communication, and employee engagement play in enhancing productivity within the workforce. As organizations optimize these areas, they are likely to experience increased operational efficiency and innovation, leading to higher outputs and economic growth. In a more productive workplace, businesses can generate greater revenues, contribute to national economic indicators like GDP, and create more job opportunities stemming from expanded operations. Additionally, as companies adopt advanced technologies and improve their digital capabilities, there could be a ripple effect on the labour market, driving demand for skilled workers and encouraging investments in education and training programs. Ultimately, this study underscores that fostering a digitally skilled and engaged workforce is not only vital for organizational success but is also a fundamental component of sustaining economic vitality in an increasingly interconnected and technology-driven global marketplace.

Contribution of the Study to Knowledge

This study contributes significantly to the body of knowledge regarding the interplay between leadership, technology, and employee productivity in contemporary work environments. It elucidates how leaders' digital literacy and their ability to adopt and utilize technology influence not only their teams' effectiveness but also overall organizational performance. By identifying the key factors that enhance employee engagement and communication in digital settings, the study offers valuable insights that can inform both academic research and practical applications in human resource management. Furthermore, it underscores the importance of cultivating a culture of technological proficiency and engagement, thereby enriching existing literature on leadership practices and employee motivation in the digital age. This research also paves the way for future investigations into the long-term impacts of digital transformation on workforce dynamics and productivity metrics, positioning it as an essential resource for scholars, practitioners, and policymakers aiming to navigate the complexities of modern work environments.

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