# ARTIFICIAL INTELLIGENCE AND LABOUR MARKET DYNAMICS IN THE BANKING SECTOR IN LAGOS, NIGERIA

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## Abstract

*The study's general objective is to examine the impact of artificial intelligence on labour market dynamics. It adopted the survey research method as its research design. Its specific objectives among others are to: examine the relationship between artificial intelligence technology and employment rates in the labour market; analyze the relationship between artificial intelligence and job types and occupations in the labour market; and establish the relationship between artificial intelligence technology and worker skills in the labour market. Taro Yamane's (1967) formula was used to derive a sample size of One Hundred and Twenty-Seven (127) staff; drawn from the study population of One Hundred and Eighty-Five (185). Data were collected via a well-structured and tested questionnaire. The data collected were analyzed using Correlation Statistics via SPSS statistical tools. The findings of the study revealed that artificial intelligence has a significant effect on employment rates in the labour market; artificial intelligence has a significant effect on job types and occupations in the labour market; and artificial intelligence has a significant effect on worker skills in the labour market. The study recommends that businesses should prioritize upskilling and reskilling their employees; employers can diversify their recruitment strategies, and adapt to changing market conditions to remain competitive and successful in the labor market; and collaborative effort between stakeholders is essential to ensuring a sustainable and inclusive labor market that benefits society as a whole.*

***Keywords**: Artificial intelligence, employment rates, labour market dynamics, , job types and occupation, worker skills*

## 1.0 INTRODUCTION

The emergence of digital transformation has led to a revolutionary change in the business paradigm in the last few years. Artificial Intelligence (AI) plays a significant role in the current technological dive by provisioning better data extraction, exploration, and utilization, resulting in more accurate predictions and performance in the market scenario. Artificial intelligence can be defined as a branch of computer science that aims to develop smart machines capable of performing tasks requiring human intelligence (Copeland, 2020). Artificial Intelligence can also be understood as the process "of developing systems endowed with the intellectual processes characteristic of humans, such as the ability to reason, discover meaning, generalize, or learn from experience" (Copeland, 2020). According to Russell and Norvig (2003), Artificial Intelligence (AI), also known as Machine Intelligence (MI) is intelligence demonstrated by machines, in contrast to the natural intelligence (NI) displayed by humans and other animals and it is defined as any device that perceives its environment and takes actions that maximize its chance of successfully achieving its goals. Gurpartap (2017) referred to artificial intelligence as the intellectual capability of machines to interpret, understand rationalize, and respond to external stimuli as living beings do. It is a relatively young field of computing and automation that creates machines that can perform actions that would previously require human faculties.

Artificial Intelligence possesses the capabilities to emulate human intelligence, performing various tasks that require analytical thinking and learning, solving problems, and making various decisions (Shabbir & Anwer, 2015). Artificial Intelligence has been reputed for efficiently performing cognitive tasks while considerably increasing people's reliance on technology. Artificial intelligence (AI) tools possess the capability to process large volumes of data while also being able to extract and analyze data at supersonic speed. Shabbir and Anwer (2015) advanced that artificial intelligence has been reflected as the artificial representation of the human brain which tries to simulate the learning process to mimic the human brain power. Artificial intelligence can process organized and unstructured data at a rate and accuracy far above that of humans. It's a hot topic for businesses that are having trouble organizing their customer data. Marketers are utilizing machine learning's capacity to correlate data pieces to acquire insights into their consumer base (Attaran & Deb, 2018). These technologies can evaluate speech to extract sentiment from it, develop visual representations of social media trends, and process data to make projections (Kelleher et al., 2015).

The adoption of Artificial Intelligence (AI) in the labour market in Nigeria is a part of the larger digital wave occurring within the sector. The use and deployment of AI in consumer communication and back-end operations is varied across different stages of operations (Agidi, 2018). Artificial Intelligence is applied when a machine mimics cognitive functions that associate with other human minds, such as learning and problem solving to maximize the chance of successfully achieving project goals.

The rapid advancement of artificial intelligence technology has raised concerns about its impact on the labor market. Many experts predict that AI will displace millions of jobs, exacerbating income inequality and unemployment. However, others argue that AI will create new job opportunities and enhance productivity. Despite these differing opinions, there is a lack of empirical research on the actual impact of artificial intelligence technology on labour market dynamics. This study aims to fill this knowledge gap by investigating the relationship between artificial intelligence and labour market dynamics.

The main objective of this study is to examine artificial intelligence and labour market dynamics in the banking sector in Lagos, Nigeria. The specific objectives are to: eexamine the relationship between artificial intelligence and employment rates in the labour market; analyze the relationship between artificial intelligence and job types and occupations in the labour market; and investigate the relationship between artificial intelligence and worker skills in the labour market.

Artificial intelligence technology has been transforming industries and revolutionizing the way businesses operate. One of the most significant impacts of AI is on the labor market, where it has been changing the nature of work and employment. As AI systems become increasingly sophisticated, they are taking over tasks previously performed by humans, leading to concerns about job displacement and changes in labour market dynamics. This study aims to investigate the impact of Artificial intelligence technology on labour market dynamics and explore the implications for workers, businesses, and policymakers. It will provide valuable insights into the impact of artificial intelligence technology on labour market dynamics. The findings will inform policymakers, business leaders, and workers about the potential benefits and challenges of artificial intelligence technology adoption.

Management and policy makers can use the findings of the study as a starting point when making decisions on whether to employ artificial intelligence technology in recruiting labour. The findings could also be used alongside other studies for comparison to evaluate the artificial intelligence technology significant change for business seeking to recruit modern staff. The findings of the study could also be used as a reference point by other academic researchers and as a source of literature review for their studies on artificial intelligence technology and its implications for work and employment.

## 2.0 REVIEW OF LITERATURE

The phrase "artificial intelligence" refers to the capability of a machine to replicate cognitive functions typically associated with human minds, such as learning and problem-solving (Russell & Norvig, 2003). McCorduck (2004) notes that artificial intelligence emerged as a formal academic discipline in 1956 and has undergone various cycles of enthusiasm, followed by periods of disillusionment and funding reductions, commonly referred to as an AI winter. This has been succeeded by the introduction of new methodologies, achievements, and a resurgence in financial support. Frey and Osborne (2017) conducted a pivotal study, analyzing jobs across the U.S. economy, and estimated that approximately 47% of total employment was at risk of automation within the next two decades. Their research underlined the importance of understanding the skill composition of jobs to predict which roles are at higher risk of displacement, drawing attention to the “skills gap” that could emerge as demand shifts toward higher-order cognitive skills. Arntz, Gregory, and Zierahn (2016) challenge the notion of a wholesale job loss narrative, arguing that while tasks within jobs can be automated, many roles evolve in response to technological integration. They propose that the impact of AI is nuanced, leading to changes in the nature of work and prompting a shift towards more complex responsibilities that require human oversight and creativity.

This transformative aspect is echoed by Bessen (2019), who points out that technology increases the demand for skilled workers who can operate alongside AI systems. His findings suggest that while automation may reduce employment in certain sectors, it can also lead to job creation in tech-driven industries and boost productivity in existing roles. Chui, Manyika, and Miremadi (2016) have documented the varying impacts of AI across different sectors and demographics, noting that lower-income and less-educated workers are more vulnerable

to job losses. They advocate for broad-based educational initiatives and policies to support inclusive opportunities for those impacted by technological change.
Throughout its development, AI research has often been segmented into distinct sub-fields that frequently lack effective communication with one another. These divisions are influenced by technical aspects, including specific objectives (such as robotics or machine learning), the application of certain tools (like logic or artificial neural networks), or fundamental philosophical disagreements (Clark, 2015; Ford & Colvin, 2015; Gale, 2011). Additionally, social factors, including particular institutions or the contributions of specific researchers, have also shaped these sub-fields. As defined by Russell and Norvig (2003), Artificial Intelligence (AI), also referred to as Machine Intelligence (MI), represents the intelligence exhibited by machines, contrasting with the natural intelligence (NI) found in humans and other animals. It is characterized as any system that perceives its surroundings and takes actions aimed at maximizing the likelihood of achieving its objectives.

Gurpartap (2017) characterized artificial intelligence as the intellectual capacity of machines to interpret, comprehend, rationalize, and respond to external stimuli in a manner akin to living beings. This domain is relatively nascent within the realms of computing and automation, focusing on the development of machines capable of executing tasks that traditionally necessitated human cognitive abilities. Artificial Intelligence is endowed with the potential to replicate human intelligence, undertaking a variety of functions that involve analytical reasoning, learning, problem-solving, and decision-making (Shabbir & Anwer, 2015). AI has gained recognition for its proficiency in executing cognitive tasks, significantly enhancing individuals' dependence on this technology. Tools powered by artificial intelligence are adept at processing vast amounts of data and can extract and analyze information at remarkable speeds. Shabbir and Anwer (2015) posited that artificial intelligence serves as an artificial representation of the human brain, endeavoring to simulate the learning processes to emulate human cognitive capabilities.

According to Kaplan and Haenlein (1987), artificial intelligence (AI) refers to a system's capacity to accurately interpret external information, learn from it, and apply that knowledge to accomplish specific objectives and tasks through adaptable methods. AI focuses on creating computers that can perform cognitive functions akin to human thought processes, including learning, reasoning, and self-correction. This notion suggests that machines can be enhanced to exhibit capabilities traditionally associated with human intelligence, such as learning, adapting, and self-correcting. Just as mechanical tools historically extended human physical strength, the study of AI aims to enhance human intelligence through the effective utilization of computers, particularly by improving programming techniques.

Artificial intelligence (AI) is a branch of computer science focused on the development and analysis of computer systems that exhibit a form of intelligence. In essence, it encompasses systems capable of learning new concepts and tasks, reasoning, and concluding. This endeavor requires an understanding of human intelligence, as AI aims to explore the principles that enable machines to simulate traditional human responses by examining human capabilities such as intention, thought, and reasoning (Shukla & Vijay, 2013). Tuomi (2018) characterized artificial intelligence as a machine that can comprehend and interpret sounds and languages, address problems, diagnose medical conditions, navigate vehicles, engage in games like chess, and replicate impressionistic artworks akin to those of Van Gogh. By definition, artificial intelligence refers to a system that can execute tasks typically associated with living beings. Furthermore, Shi (2019) described it as a field of study that illustrates basic learning abilities similar to those of humans and investigates the capacity to respond to specific behaviors, commonly referred to as AI.

The swift progress in artificial intelligence and automation technologies poses significant challenges to labour markets. While these advancements can enhance the productivity of certain workers, they also can displace others and may fundamentally alter nearly all professions to some degree (Frank et al., 2019). The significance of artificial intelligence lies in its ability to employ methods akin to human reasoning to tackle complex issues, marked by synchronization, precision, and rapid processing of hypotheses, along with the capability to devise solutions for various problems and to handle non-digital symbolic data. As noted by Simin et al. (2013), preparing for this technology is challenging, as it necessitates the representation of vast amounts of specialized knowledge, to emulate human thought processes, behaviors, and responses, as well as fostering the generation of new, creative, and innovative ideas.

One of the foundational aspects of labour market dynamics is the processes of job creation and destruction. According to Davis, Haltiwanger, and Schuh (1996), "job creation and destruction is a fundamental aspect of the dynamic adjustment processes in labour markets, reflecting the changing structure of industries and economies" (Davis et al., 1996). Labour market dynamics refer to the changes and fluctuations within the labor market over time, influenced by various economic, social, demographic, and technological factors. Understanding these dynamics is crucial for policymakers, employers, and workers, as they impact employment rates, wage levels, job satisfaction, and overall economic growth.

Labour market dynamics also encompass worker flows, which include the movements of individuals between jobs, unemployment, and out of the labor force. According to Blanchard and Diamond (1990). labour market dynamics also refers to the movements and changes within the labour market, characterized by the continuous flow of workers between jobs, industries, and regions. This includes factors such as job creation and destruction, employee turnover, and the processes of hiring and unemployment. Labour market dynamics can be influenced by various elements, including economic conditions, technological advancements, government policies, demographic shifts, and organizational practices.

Labour market dynamics also pertain to the skill mismatch between employers' needs and the available skills of workers. According to Autor (2010), "labour markets are dynamic systems where workers must continually adapt their skills to meet the changing demands of the marketplace" (Autor, 2010). Labour market dynamics can also be influenced by institutions and policies that govern the labor market. Katz and Autor (1999) asserted that "labour market institutions, including minimum wage laws, unemployment benefits, and collective bargaining, play a critical role in shaping labor market dynamics" (Katz & Autor, 1999).

The labour market dynamics are constantly changing due to various factors such as technological advancements, globalization, demographic shifts, and economic fluctuations. Understanding these dynamics is essential for policymakers, employers, and employees to make informed decisions and maximize the efficiency of the labor market. In this conceptual review, we will explore the various factors that influence labor market dynamics and their implications on the overall economy.

Labour market dynamics are multifaceted, encompassing job creation and destruction, worker flows, skills adaptation, economic responsiveness, and the influences of institutions and policies. Understanding these elements is crucial for policymakers, researchers, and stakeholders aiming to foster a robust labor market that can adapt to changing economic conditions. This comprehensive perspective allows for better designs of interventions and policies aimed at enhancing labor market functionality.

## 2.1 THEORETICAL REVIEW

### Job Displacement Theory

Job Displacement Theory examines the effects of automation and artificial intelligence (AI) on employment, focusing on how these technologies can lead to the elimination of certain jobs while potentially creating new ones. This theory suggests that as AI systems become more capable of performing tasks traditionally done by humans, particularly in routine or manual labour, there is a risk of significant job displacement in various sectors. The key mechanisms of job displacement include:

**Automation of Tasks:** AI can automate repetitive and routine tasks across industries such as manufacturing, retail, and customer service, leading to job losses among those who perform these tasks (Brynjolfsson & McAfee, 2014).

**Skill Mismatch:** The demand for skills is shifting. Workers may find that their existing skills are no longer relevant in an AI-driven economy, leading to a mismatch between job seekers and available positions (Acemoglu & Restrepo, 2019).

**Economic Dislocation:** Regions heavily reliant on industries susceptible to automation may experience significant economic dislocation, increasing unemployment rates and exacerbating inequality (Bessen, 2019).

**New Job Creation:** While job displacement is a concern, AI can also create new jobs and industries, particularly in tech-related fields and roles that require human oversight, creativity, and emotional intelligence (Arntz, Gregory, & Zierahn, 2016).

Overall, the Job Displacement Theory posited that while AI has the potential to enhance productivity and economic growth, it also poses challenges that require policy interventions, such as retraining and upskilling initiatives, to mitigate the adverse effects on displaced workers.

### 2.2 Productivity Theory

The Productivity Theory in the context of Artificial Intelligence (AI) examines how AI technologies can enhance productivity and reshape labor market dynamics. The central premise is that AI can automate repetitive and mundane tasks, allowing human workers to focus on more complex, creative, and value-added activities. This transition can lead to increased overall productivity in various sectors. For instance, Bessen (2019) argued that AI adoption, by improving efficiency, can spur innovation and economic growth, thereby creating new job opportunities, even as it displaces certain roles. However, the impacts are not uniform; some studies suggest that low-skilled jobs are more susceptible to automation, leading to potential wage polarization (Arntz, Gregory, & Zierahn, 2016). Furthermore, Brynjolfsson and McAfee (2014) highlighted that while AI can enhance productivity, its benefits may not be equally distributed across the workforce, increasing concerns about income inequality. They advocate for policies that promote reskilling and upskilling to help workers transition to new roles created by AI technologies.

In summary, the productivity theory posited that while AI can drive productivity and economic growth, it necessitates a comprehensive approach to address its implications on labor market dynamics, ensuring that the workforce can adapt to the evolving demands of the economy.

### 2.3 Skills Obsolescence Theory

The Skill Obsolescence Theory is primarily attributed to economists and researchers in labor economics who have studied the dynamics of skills concerning technological changes and economic transformation. Notable figures include Dr. Richard L. Nelson and Dr. Sidney G. Winter, who explored technological change and its impact on skills in their seminal work

"An Evolutionary Theory of Economic Change" (1982). Other contributions can be attributed to various empirical studies, including those outlined by Lawrence Katz and Alan B. Krueger in their works on the effects of technology on labor market trends.

The Skill Obsolescence Theory was largely introduced through academic papers and textbooks that examined how rapid technological advancements can render certain skills outdated. One of the key papers that introduced and elaborated on the Skills Obsolescence Theory is "Technological Change and the Labor Market" by David Autor et al. This work illustrates the relationship between technological innovation and labor market shifts, focusing on how certain skill sets may lose value while others gain prominence. Similarly, Acemoglu's work on "Technical Change, Inequality, and the Labor Market" provides insights into the adaptability of the labor force and the implications of evolving skill demands.

At its core, skills obsolescence theory posits that as technology evolves, certain skills can become outdated while new skill sets emerge as necessary for obtaining and succeeding in employment. The main ideas of the theory include:

- Technological Change: As industries adopt new technologies, the skills required to perform tasks effectively can change rapidly.
- Labour Market Polarization: The theory suggests a bifurcation in the labor market, where demand surges for high-skill and low-skill jobs, but declines for middle-skill jobs that may become obsolete.
- Investment in Continuous Learning: Workers must engage in lifelong learning and skills upgrading to remain competitive, as static skills risk obsolescence.
- Implications for Education and Training: Educational systems and vocational training must adapt to prepare individuals for the changing landscape of job requirements.

The rise of artificial intelligence (AI) significantly compounds the relevance of Skills Obsolescence Theory. As AI and automation technologies advance, they create unprecedented shifts in labour market dynamics. The implications are that AI can perform tasks previously handled by humans, making certain jobs redundant and leading to skills obsolescence among those whose jobs can be automated. While some skills may become obsolete, new roles requiring AI-related competencies are emerging, leading to increased demand for data analysts, AI specialists, and software developers. To mitigate the effects of skills obsolescence, workers must adapt by acquiring new skills relevant to the evolving job market. This trend underscores the need for robust education and retraining programs; and policymakers must consider the implications of skills obsolescence in labour market strategies, emphasizing support for education, retraining, and social safety nets to protect those displaced by technological change.

Ultimately, skills obsolescence theory emphasizes the critical importance of adaptability in the face of rapid technological advancements, highlighting that individuals, educators, and policy-makers must proactively engage in skills development to navigate the complexities of an evolving labor market, particularly in the age of artificial intelligence. The ability to anticipate changes and invest in continuous learning is essential for both personal career success and broader economic stability.

## 3.0 METHODOLOGY

The research design for this study was survey design. This design is relevant for testing the objectives of the study by examining the relationship between the variables.

Population refers to the elements or people to be studied and from whom data is obtained (Keller and Warrack, 2003). The target population was one Hundred and Eighty-Five (185) staff of Zenith Bank PLC and Guaranty Trust Bank PLC, Lagos State.

The study population comprises of 185 staff of Zenith Bank PLC (98) and Guaranty Trust Bank PLC (87). Yamane Taro (1967) formula was adopted to determine the sample size which is given as:
$n=N/(1+Ne_2)$ Where:
n= Signifies sample size

N = Signifies population size

e = Signifies margin of error (it could be 0.10, 0.05 or 0.01)

n = 185/ (1+185 (0.05)2)
n = 185 /(1+185 (0.0025)
n = 185/ (1+0.46)
n = 185/1.46
n = 127.

**Thus the sample size is 127**
The representative samples of 127 were selected using simple random sampling.

Data were collected from primary source for this study. Primary data was employed in order to arrive at the best conclusion that will befit the study. The primary data was gathered through questionnaire developed by the researchers. The questionnaire was rated on a five-point Likert scale of SA = 5, A= 4, SD = 3, D = 2, UN= 1.

According to Hair et al., (2010), "reliability is the degree to which the scale or survey gives consistent output when surveying similar population". The questionnaire reliability was determined through a pilot study of 20 respondents from the population not under study was conducted. The aim was to correct inconsistencies arising from the instruments, which ensures that they measure what was required for the study. The Cronbach's alpha value is .894 as a rule of thumb; all items were accepted because their Cronbach's Alpha was above coefficients of 0.7

The questionnaire was administered to draw out responses from the respondents. A clear instruction on how to fill out the questionnaire was provided to the respondents by the researchers. The statistical method used for the analysis of data was Correlation analysis under the Statistical Package for Social Sciences (SPSS). Correlation analysis was used to determine the human resource management practices dimensions (Independent variable) on employee attitude (dependent variable).

## 4.0 RESULTS AND FINDINGS

**Table 1: Kendall's TAU-B Analysis**

| Research Hypotheses | Null Hypothesis ($H_0$) | Kendall's TAU-B | Significance (2sided) (p = .05) | Alternate Hypothesis ($H_1$) |
|---|---|---|---|---|
| Artificial intelligence has no significant effect on employment rates in the labour market | **Rejected** | .837 | .000 | **Accepted** |
| Artificial intelligence has no significant effect on job types and occupations in the labor market | **Rejected** | .802 | .000 | **Accepted** |
| Artificial intelligence has no significant effect on worker skills in the labor market | **Rejected** | .818 | .000 | **Accepted** |

## FINDINGS

The study findings are discussed thus: **Hypothesis 1 states that:** Artificial intelligence has no significant effect on employment rates in the labour market. The study revealed that the correlation test gives a positive figure of .837 and the probability value (p-value) of the relationship between artificial intelligence and employment rates is 0.000. Because the correlation test is positive and the p-value is 0.000, lower than the level of significance, it shows that artificial intelligence enhances employment rates. This means that artificial intelligence technology has a significant impact on employment rates in the labour market.

**Hypothesis 2 states that:** Artificial intelligence has no significant effect on job types and occupations in the labor market. The study revealed that the correlation test gives a positive figure of .802 and the probability value (p-value) of the relationship between artificial intelligence technology and job types and occupation is 0.000. Because the correlation test is positive and the p-value is 0.000, lower than the level of significance, it shows that artificial intelligence enhances job types and occupations. This means that artificial intelligence has a significant impact on job types and occupations in the labour market.

**Hypothesis 3 states that:** Artificial intelligence has no significant effect on worker skills in the labour market. The study revealed that the correlation test gives a positive figure of .818 and the probability value (p-value) of the relationship between artificial intelligence and worker skills in the labour market is 0.000. Because the correlation test is positive and the p-value is 0.000, lower than the level of significance, it shows that artificial intelligence enhances worker skills in the labour market. This means that artificial intelligence has a significant impact on worker skills in the labor market.

## 5.0 CONCLUSION AND RECOMMENDATIONS

Based on the summary of findings, the study has provided evidence and achieved its objective of examining the impact of artificial intelligence on labour market dynamics. It has shown that artificial intelligence has a significant impact on labour market dynamics (i.e employment rates, job types and occupation, and worker skills) in Nigeria's manufacturing industry. The study also concludes that automation has led to job displacement in some industries while creating new job opportunities in others. Workers need to develop new skills to adapt to changing job requirements.

Based on our findings, the study recommends the following:

- Businesses should prioritize upskilling and reskilling their employees.

- Employers can diversify their recruitment strategies, and adapt to changing market conditions to remain competitive and successful in the labour market.
- Collaborative effort between stakeholders is essential to ensuring a sustainable and inclusive labor market that benefits society as a whole.
- Policymakers should invest in retraining programs for workers affected by automation.
- Governments should implement policies to promote fair compensation for workers displaced by automation.

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