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Research Paper

Harnessing artificial intelligence to transform informal labour and digital gig work in Southern Nigeria for equitable job creation

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ABSTRACT

The digital transformation of the workforce in Southern Nigeria underscores a significant shift towards the gig economy, driven by advancements in technology, particularly Artificial Intelligence (AI). While the rise of gig platforms has offered unprecedented opportunities for income and flexibility, it also exacerbates existing inequalities and precarity among workers, particularly in regions characterized by socio-economic challenges. This research aims to investigate these dynamics and propose a framework for "Inclusive AI," advocating for the design and implementation of AI systems that are equitable and responsive to the specific needs of marginalized workers. By engaging with gig workers' experiences, this study seeks to highlight both the potential benefits and pitfalls of current digital work models, ultimately aiming to transform informal labor into a source of dignified employment. Through a mixed-methods approach, this research will explore how AI can empower gig workers, address bias, and promote equitable job creation in Southern Nigeria.

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1. INTRODUCTION

The way of work is going through a huge change. The world is constantly changing and increasingly digital technologies are driving this. However, this shift goes beyond the digital platform market and this is the digital platform economy, which involves new ways of working in which tasks are mediated online on platforms and mobile applications, directly connecting customers and workers to join forces for a short-term work or "gig" [1]. This unique model disrupted the "work/workers" concept in a new way, offering a new and more flexible perception of work and workers. In the southern part of Nigeria, where urban youth are abundant and the informal sector is particularly large, this new method of operation has won the hearts of millions of young people and offered opportunities, yet, it has come with its own set of problems. Ride-hailing (Bolt, Uber, etc.) and food delivery (Glovo, etc.) platforms have made a huge difference in the lives of many in providing an essential source of income. The platforms provide opportunities and flexibility for those in a difficult economic climate, allowing them to work at their own speed and according to their own needs and situation [2]. But this flexibility is paid for: gig work is not covered by the same social protection as traditional jobs, meaning that gig workers have precarious working conditions. At the same time, Artificial Intelligence (AI)-machines or computers that carry out the tasks normally done by human intelligence have adopted an integral part in how these platforms are used to allocate gig workers to jobs or to review their performance, etc., broadly impacting on gig workers' work and life [3]. All the while, AI could make things more efficient, but it has significant implications for worker surveillance, bias and practices. Unfortunately, the technology that is supposed to empower, instead magnifies inequality, particularly in parts of the world, such as Southern Nigeria, where gig work is predominant. The algorithms which they utilize are generally one size fits all, designed for developed economies in the West, with no positive impact on the Nigerian working class in general, but instead having adverse effects on them [4]. A promise of opportunity is now being realized as a new form of exclusion, precarity and digital control. Hence, this research argues that there is a need to shift the consciousness towards the "Inclusive AI". Inclusive AI is about creating, building, and implementing AI that is fair, unbiased, and helps bring about positive change for everyone – particularly the least powerful or least represented groups [5]. The aim of this research is to look at how AI can be used to transform instead of exploiting informal and digital gig work and help create a new future of work in Southern Nigeria where everyone is included, secure and has dignity.

The development of gig platforms in the digital economy is an irony for Southern Nigeria. Although the platforms offer Nigerians flexibility in their earnings while giving young people a glimpse into the earning world [6] they are just reinforcing and expanding the disparity between people's social and economic status. Issues of unemployment and underemployment are already entrenched and experienced by a significant number of people, particularly young people, women and people from disadvantaged communities. Under these circumstances, gig work can be a reality of life, not a deliberate choice for empowerment. AI algorithms can be used to manage gig work, which may be a "black box" where jobs are assigned, rates are calculated and penalties are imposed without transparency, increasing workers' vulnerability toward algorithmic unfairness and the reproduction of past injustices [7], [8]. In addition, many algorithms are developed using foreign data sets that do not often capture the local context, resulting in a misalignment between the algorithms' predictions and the performance evaluation of workers in their respective local contexts, which can unfairly and wrongfully disadvantage workers. Workers are classified as independent contractors, granting them few social benefits, in particular, health insurance, pensions, and paid sick leave, which increases their precarity [9]. Without these protection, workers are vulnerable to economic shocks and compromise their job security in an already uncertain labor market. AI algorithms for these functionalities can be programmed to generate income based on profitability of the platform rather than the workers, leading to fluctuating pay and forcing workers to work harder to afford their essentials [10].

The digital gig is a framework that adds to inequalities, because of digital exclusion and algorithmic bias. Many low earning workers lack access to low-cost internet technology, use unreliable networks, or simply lack the device needed to access the internet; and AI systems that are trained on the data based on

historical societal inequities also discriminate against women and less skilled workers as well as against disadvantaged groups, sustaining inequities [11], [12]. What, then, is the issue with AI-powered gig platforms and applying the תwithin Nigeria, particularly in the South? So what is the problem for workers in Nigeria, especially Nigeria in the south, if you are going to use AI powered gig platforms or the AI application within the context of the worker in Nigeria?

2. RELATED WORK

This research is guided by three interrelated theoretical pillars that help to explain the phenomenon of AI, gig work and the development of equitable gig work opportunities in the South Western part of Nigeria. These lenses help to approach the holistic analysis of the convergence of technology, labor and social justice.

The precarity theory is a construct which understands the relationship between precarity and gig work. The lack of predictability regarding pay, no social security benefits, and the worker takes on all the risks of market fluctuation is what gig workers experience, as precarity can be transferred from striking algorithms to laborers [13], [10]. In this theory, gig workers lack greater protection against adverse shocks than workers in policy-encouraged formal work due to their feelings of insecurity based on the work's temporary nature. The point of difference is that the Capability Approach does not restrict the definition of work only to gain in terms of income but also in freedom and opportunities to live well. It considers if the 'gig economy' is beneficial or harmful for a person's health, safety, or independence and questioning the traditional belief that "work" is simply 'wage work', arguing that people in all forms of work need to think about what it does for their overall well-being, considering how to improve their ability to work – expand their capability [14], [15]. The Capability Approach focuses on how individuals can do things in their lives, thus avoiding the details of gig-work in society as a whole; it emphasizes the larger social dimensions of gig-work. Lastly, Structuration Theory emphasizes the mutual interaction of social structures and individual agency. Algorithms and Platforms can shape how workers act, however, workers adapt and resist this, suggesting the possibility of developing and utilizing Inclusive AI collaboratively that supports workers rather than exploits them [16], [17]. This theory inspires us to consider the gig workers not only as consumers of the platform, but also as players who can define the designs and policies of the platform.

The Conceptual Framework depicts how Inclusive AI can reshape the digital gig economy in Southern Nigeria, reducing precarity and empowering humans to be more productive eventually leading to creating fair opportunities to work. The framework can be a template for the implementation of solutions powered by AI that remain attended to the needs of the workers. The framework starts with Current AI Systems (CAS) that control tasks, ratings, pricing and deactivate workers using an opaque, biased, profit-incentivizing system, resulting in various negative outcomes including worker precarity, unstable incomes, lack of social security, opaque algorithms and workers' lack of power [7], [9]. Inclusive and adaptive AI is seen as a multi-dimensional solution through four principles:

1. **Human-in-the-Loop:** Job to explain decisions to correct errors by workers;
2. **Fairness & Equity:** Algorithms should work towards the same outcomes and access for all workers, actively working to decrease gender, regional and ethnic bias [12].
3. **Agency & Participation:** Workers need to be participatory in the design process, including some means for appeals and negotiation to ensure that they have some sense of ownership over, and control over their work [18], [19]. Well-being Orientation: The principle of worker well-being, such as their mental and physical health, as well as overall quality of their life, in addition to platform efficiency is based on [5].

Adoption of these tenets will increase human capital in terms of skills, their worth and financial health, health and safety, and collective agency [15] which will result in better working situations that are dignifying, safe and empowering.

This research aims to create a framework on how to use Inclusive AI in the digital gig economy to be used as a means of job creation in an equitable manner in the context of informal and gig economy in

Southern Nigeria. This study will take on a multi-layered approach to the topic of gig work through the carefully delineated goals and research questions.

2.1 Research Objectives

The purposes of this research are to analyze critically, the effect of the existing algorithmic management systems on the economy of digitized gig platforms on the economic security and well-being of gig workers in Southern Nigeria. The aim of this objective is to develop a basic knowledge about workers and jobs affected by the present systems. To

1. Specify specific cases of algorithmic bias and exclusion against gig workers that can be identified in Southern Nigeria with regards to gender, skill level and location. It will be important to understand these differences to create specific answers.
2. Discuss the principles of fairness, transparency and control that gig workers want, in terms of using AI in the gig economy. An understanding of workers' wants is crucial after that comes to an efficient and equitable platform layout.
3. Propose and test principles that lead to taking action towards developing and designing inclusive AI system for gig economy in the South of Nigeria. This will convey practical advice for the appropriate parties involved.

2.2 Research Questions:

1. What role can algorithmic management systems of digital gig platforms play in making gig workers in Southern Nigeria precarious and economically unstable?
2. How is algorithmic bias and digital exclusion associated to inequality in Gig work among gender, skill level and place in Southern Nigeria?
3. What attributes and values would Southern Nigeria's gig workers require of AI systems for them to be considered fair, inclusive and empowering?
4. What are some of the challenges when implementing a framework for Inclusive AI to boost human potential and create equitable employment opportunities to gig workers in Southern Nigeria?

3. METHODOLOGY

A sequential exploratory mixed-method approach will be adopted for this research because the use of Inclusive AI to the GIG has been under-researched and complex. This design will first involve a comprehensive qualitative component in order to get a nuanced, though basic understanding of the problem and the views of the workers, and then a quantitative component to determine if the results of the qualitative phase are representative of a larger population [20], [21].

3.1 Phase 1: Qualitative Exploration

a. **Data Collection Methods:** Data collection methods will be Semi-structured interviews and focus group discussions (FGD).
b. **Participants:** The sample will consist of about 25 - 30 gig workers who are drawn from the various gig sectors (ride-hailing, delivery, freelancing) of three major cities in the South of Nigeria (e.g. Lagos, Port Harcourt, Abuja) with the application of purposive sampling. Enlarging the heterogeneous FGDs (such as female freelancers, male drivers) will help to ensure a free discourse as well as the ability to investigate gender-related issues.
c. **Data Analysis:** Themes, patterns and narrative related to algorithmic management, precarity, bias and inclusiveness will be delicately coded using a thematic analysis from the transcripts of the interview and FGD data [22]. These themes will be used as a foundation for creating the measure of quantitative data collection.

3.2 Phase 2: Quantitative Validation

a. **Method:** Structured online survey will be developed to quantify qualitative findings.

b. **Participants:** The participants comprised a larger sample of 300-400 sectioned all over Southern Nigeria using the snowball and purposive sampling method [22] through Workers WhatsApp groups, online forums and Workers Associations.
c. **Instrument:** The survey will feature closed-ended questions and Likert scales that'll measure algorithmic transparency, income insecurity, bias experiences, access to social protection, development and support for the principles of "Inclusive AI".
d. **Data Analysis:** Descriptive analysis (frequencies, mean, standard deviation) of the data will be conducted to summarize the data while inferential statistics (correlation, regression) will be performed to examine the relationship between variables (e.g. correlation between perceived transparency with job satisfaction) [23]. This will give a general idea of the trends given in Phase 1.
e. **Ethical Considerations:** Informed consent will be obtained and anonymity and confidentiality will be assured with all participants. Participants will have the option to stop participating in the study at any time. Ethical approval will be sought from the recognised institutional review board before the research commences, following all standards of ethics. Table 1 displays the sample characteristics for both the qualitative and quantitative phases, listing variables, categories, and phases.

Table 1. Sample Characteristics (Qualitative + Quantitative Phases)

Variable	Categories/Level	Phase 1: N(N=30)	Phase 2:N (N=350)	% (Phase 2)
City	Lagos	18	180	51.4%
	Port Harcourt	7	85	24.3%
	Abuja	5	85	24.3%
Gender	Male	22	270	77.1%
	Female	8	75	21.4%
	Non-binary/other	0	5	1.4%
platform	Ride-hailing (Uber/Bolt)	12	160	45.7%
	Food delivery (Glovo)	10	120	34.3%
	Freelance platforms	8	70	20.0%
Primary income source	Platform-only	14	200	57.1%
	Platform + other work	16	150	42.9%
Average age group	18-24	6	50	14.3%
	25-34	15	190	54.3%
	35-44	7	80	22.9%
	45+	2	30	8.6%

Table 2. Living Wage Gap Analysis (Compared to World Bank/ Living Wage Benchmark)

City	Living Wage Benchmark(Monthly USD) (278 USD) (World Bank Living Wage 2025)	Mean Monthly Net Earnings from Platform (USD)	% of Living Wage Archieved	Average Monthly Hours Worked	Earnings Per Hour (USD)	Hours Required to Meet Living Wage
Lagos	250	165	66%	320	0.52	480
Port Harcourt	245	160	64%	300	0.45	545
Abuja	261	175	70%	340	0.60	435

Table 2 shows the living wage gap analysis using the World Bank living wage benchmark as a criteria for the calculation. Figure 1 depict the employment distribution in Nigeria by sector type (2022-

2025). Informal employment constitutes the vast majority, at 93.0% followed by self-employed jobs 87.30% then formal paid jobs 14.40% in Nigeria. The chart also indicates that Informal Economy activities account for 58.20%, while the Digital Economy makes up 14.0% of employment.

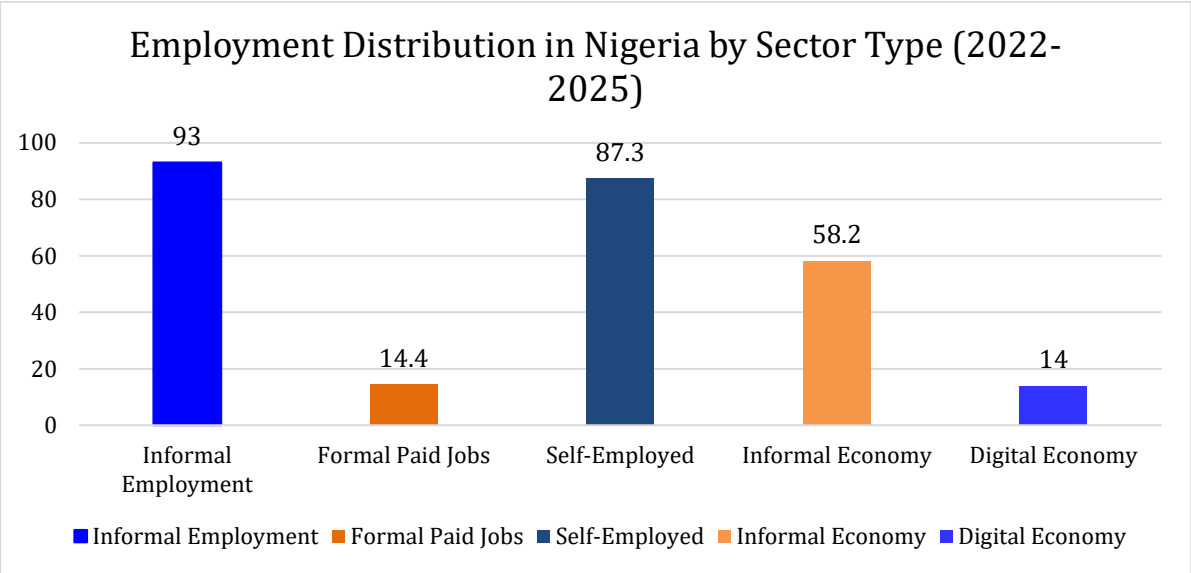


Figure 1. Employment Distribution in Nigeria by Sector Type (2022-2025)

4. RESULTS AND DISCUSSIONsss

Several key, actionable results are anticipated from this research based on the methodological approach. Secondly, qualitative data will generate substantial data that will contribute to a detailed taxonomy of current AI system harms and indignities rather than general concepts such as precarity, and, unlike such concepts, also includes the concrete actions such as processes of undeserved deactivation of accounts, demographic impacts of unfair ranking algorithms, and effects of algorithmic pricing on income [7]. Second, data will produce a tested list of Inclusive AI principles within the Southern Nigeria context, weighted and refined with quantitative information to highlight the areas of importance for workers themselves - transparency of payment breakdown, a clear mechanism for appealing unfair work allocations, fairness of job assignment, etc. [18]. The worker viewpoints are important so that any implemented framework is accepted. The discussion will focus on the argument that "context is key. Results will show: how the general AI solutions being developed in the Global North are unsuitable for Nigeria's economic conditions, thus needing contextually-appropriate designs that do take into account Nigeria realities; how inclusion cannot be bolted on after construction but must be at the centre of development from the outset; how losses of platform efficiency which at times are necessary (e.g., efficiency gains versus Work quality) and why sometimes algorithms don't need to be optimal and why some efficiency loss should be acceptable, with gains more significant for society and workers [5]. Finally, the conversation will suggest that the cost of platforms investing in an Inclusive AI practice, is really an investment in a workforce that will be committed, capable, and stable for the future.

4.1 Contribution and Innovation

This research has two key contributions to the ongoing discussion on AI and work in the Global South. Conceptually, it is a novel one as it connects Precarity Theory with the Capability Approach to critically engage with digital work, and to shift the focus from recognizing exploitation to rather imagining pathways towards fair and decent working. What value empirically: It further offers the inside story on the actual experience of labor in Southern Nigeria in the context of the AI and gig economy, which has been notoriously under theorized in the literature. It foregrounds the voice of the worker and to get to an understanding of the workers experience and voice about gig work in the South. On the practical side, the

novelty is that a practical, evidence-based framework for Inclusive AI is being collaboratively developed for policy makers, platform developers, worker unions to support creating gig work as job creation. Processing the development are multi-stakeholder approaches which guarantee translation validity and practicability of the outcomes.

5. CONCLUSION

In light of these expected findings, the study will make a strong call for a multi-stakeholder action away from the top-down perspective.

Given these anticipated outcomes, the study will call firmly for a multi-stakeholder effort to move away from a top-down approach. Platform companies will also be urged to deploy their respective operations under an Inclusive AI model that encourages co-design and the importance of equity when constructing AI they may be deploying on workers. Platform companies, too, will be asked to implement Inclusive AI principles within their operations, emphasizing the importance of co-design and equity in designing the AI they are deploying against the needs of workers.

Worker associations, lastly, will be called upon to use the research as an evidence base from which to argue for worker rights and negotiate with platform companies for improved working conditions in the gig economy. Ultimately, it is through utilizing AI technology toward the future of work that stakeholders will be able to effectively counter the obstacles toward inclusive work.

Acknowledgements

Hence the conclusion on Artificial Intelligence and southern Nigerian gig economy—exploring its broader implications and challenges, based on the study finding, it is evident that an inclusive AI, where all the stakeholders concerned, in particular the workers and the marginalized is necessary. Even as the gig economy offers a space for earning supplementary incomes, it further perpetuates inequality and the precarity of working conditions in society. This inclusive AI framework which has been developed is therefore, not only a blueprint but rather a necessary manual for the diverse actors – policy makers, AI driven platform developers and the gig workers- in transforming the reality of work in southern Nigeria.

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Author Contributions Statement

Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
Ifeanyi C. Emeto	✓	✓	✓	✓	✓	✓		✓	✓	✓			✓	✓
Etuk Enefiok A.		✓				✓		✓	✓	✓	✓	✓		
Barima P. Gbaranwi	✓		✓	✓			✓			✓	✓		✓	✓
Adamu A. Galadima		✓				✓		✓	✓	✓	✓	✓		
Emmanuel O. Atamatofa	✓		✓	✓			✓			✓	✓		✓	✓

C : **C**onceptualization
M : **M**ethodology
So : **So**ftware
Va : **Va**lidation
Fo : **Fo**rmal analysis
I : **I**nvestigation
R : **R**esources
D : **D**ata Curation
O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

Informed Consent

All subjects in this study have given their informed consent.

Conflict of Interest Statement

The authors of this manuscript do hereby claim that they have no financial conflicts of interest with regard to this research.

Ethical Approval

Neither humans nor animals were involved in this work; the entire study was conducted in line with the terms of all the national and institutional regulations and approved by the authors' institution.

Data Availability

Data underpinning the findings reported in this paper are available from the authors on reasonable request.

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