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Gig Sector in the African Economy: Frameworks, Challenges and Prospects

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Abstract

Remarkably, Africa countries have enjoyed relatively strong economic growth for the past years (decade) mainly because of impressive global demand for primary commodities. Unfortunately, Africa's economic growth had failed to generate many good jobs and thus postponing the benefits of the demographic divided of a large working-age population. Consequently, digital (online) gig work is rapidly increasing new form of work that poses tough challenges and trade-offs for African governments. Essentially, these gig jobs could be a stepping stone to better-quality jobs for young or low-skilled workers by way of assisting them to learn critical digital skills that closes the digital divide. However, gig workers are not usually protected by labour regulations against unfair practices or abuse or injuries at work.

Therefore, this paper argues that given the low levels of implementation of labour laws in African countries, future polices should consider various stakeholders in the gig ecosystem (from both supply and demand sides) as well as digital platforms operation. In other words, as several continents have made the transition to technology-enabled platforms for services; Africa should not be left out of the digital boom for the sake of prosperity and sustainable development.

Keywords: gig work, digital work, Africa, digital platforms, digital currency, gig supply, labour laws development, economic growth.

JEL Classification: J21, J46; O55; J83; L86.

Introduction

As the second largest of the earth's seven continents, Africa had high hopes of rapid development at independence. In fact, as at 1961, the overall economic growth in sub-Saharan Africa were impressive and the pace quickened after 1967. But as the 1970s advanced, Countries began to stumble while as by the 1980s output actually declined. However, aggregate annual growth initially rose but generally declined within these periods (excluding oil economics). Specifically, Africa's poor performance was reflected in weak growth in the productive sectors, poor export performance, mounting debt, deteriorating social conditions, environmental degradation as well as increasing decay of institutional capacity. Notably, both domestic and external factors contributed to the disappointing overall performance. However, all Countries in the region were confronted with deep-rooted developmental constraints (such as rapid population growth, low human capital development and inadequate infrastructures.

Furthermore, ethnic conflicts, political instability, adverse security conditions and protracted civil wars aggravated the economic performance of several Countries. Structurally, inappropriate policies which resulted in relative price distortions in most of the key sectors adversely affected economic incentives and production.

Therefore, these price distortions combined with the severe external shocks of the 1970s/1980s including declining terms of trade, drying up of foreign capital inflows and rising world interest rates weakened many economics of sub-Saharan Africa (Elbadawi, et al., 1992; Gura & Hadjimichael, 1996). However, the failure of many Countries throughout these periods to accommodate the adverse effects of negative external shocks compounded the negative impact of the observed shocks.

Consequently, as at early 1980's, many African Countries realized the urgent need for economic policy reforms to address their short terms balance of payment crisis as well as long term productivity improvement. Thus, the World Bank structural adjustment programs were designed to enable countries reforms their policies in order to boost the structure of incentives and raise the profitability of the various sectors without unduly high reductions in consumption per capital. Even though many African Countries vigorously pushed through their adjustment programs, economic growth declined.

Therefore, scholars have argued that adjustment programs placed Africa on a slow growth path, undermined efforts to diversity economically as well as eroding the continents industrial base. Clearly, by the end of the 1990s, the international financial institutions started to reconsider their approaches while the United Nations System was setting the Millennium Development Goals (MDG) targets. As was indicated, for Africa to be a global growth pole, its economy should have been large and its growth high and sustainable for a reasonable long period unfortunately, the size and consistency of growth required for significant poverty reduction were not fully realized. Specifically, for the years 2000 – 2010, average growth (aggregate and per capital) fell short of the required rate in each African sub-region as shown in Table 1 (World Bank, 2011; United Nations, 2012).

However, as at 2013, Africa was the world's fastest growing continent and GDP was expected to rise in the subsequent years. Yet, for many economics across the African continent, the widespread and rapid increase in inflation which prompted monetary policy tightening around the world; meant slowing external demand, higher domestic interest rates, elevated sovereign spreads and massive exchange rate pressures.

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In addition to high debt levels and deep structural challenges, these factors have combined to reduce access to external funding. Consequently, growth in Africa is expected to continue to decline since COVID-19 pandemic as shown in Table 2 and Table 3 (IMF, 2023; ADB, 2023).

Table 1: African regional GDP growth rates: actual vs required

S/N	Subregional Africa	Per capita Growth Required (%) (2000 - 2010)	Per Capita Growth Required (%) (2000-2012)	Aggregate Growth Required (%) (2000-2010)	Aggregate Growth Actual 2000 – 2010 (%)
A	B	C	D	E	F
1.	North Africa	3.60	3.09	5.60	4.91
2.	West Africa	4.71	2.66	7.61	5.31
3.	Central Africa	3.90	2.15	6.70	4.67
4.	East Africa	5.40	2.89	8.1`2	5.72
5.	Southern African	3.80	2.58	6.20	4.58

Table 2: African countries: comparative real GDP growth rates

S/N	Country	Sub-Regions	2011-2019 (%)	2020 (%)	2021 (%)	2022 (%)	2023 (%)	2024 (%)
A	B	C	D	E	F	G	H	I
1.	Algeria	North Africa	2.6	- 5.1	3.4	3.2	3.8	3.1
2.	Angola	Southern Africa	2.0	- 5.6	1.2	3.0	1.3	3.3
3.	Benin	West Africa	5.1	3.8	7.2	6.3	5.5	6.3
4.	Botswana	Southern Africa	4.1	- 8.7	11.9	5.8	3.8	4.1
5.	Burkina Faso	West Africa	5.7	1.9	6.9	1.5	4.4	6.4
6.	Burundi	East Africa	1.9	0.3	3.2	1.8	3.3	6.0
7.	Cape Verde	West Africa	3.0	- 19.6	6.4	17.0	4.4	4.5
8.	Cameroon	Central Africa	4.4	05	3.6	3.8	4.0	4.2
9.	Central African	Central Africa	- 0.7	1.0	1.0	0.5	1.0	2.5
10.	Cahd	West Africa	2.4	- 2.1	- 1.2	3.4	4.0	3.7
11.	Comorus	East Africa	3.1	- 0.2	2.1	2.6	3.0	3.5
12.	Congo Rep.	Central Africa	5.9	1.7	6.2	8.9	6.7	4.7
13.	Congo Rep.	Central Africa	0.3	- 6.3	1.1	1.7	4.0	4.4
14.	Cote D'ivoire	West Africa	6.5	1.7	7.0	6.7	6.2	6.6
15.	Djibouti	North Africa	6.1	1.3	4.5	3.2	5.0	6.0
16.	Egypt	North Africa	3.8	3.6	3.3	6.7	4.2	3.6
17.	Equatorial Guinea	Central Africa	- 2.7R	- 4.8	- 0.4	3.2	- 6.2	- 5.5
18.	Eritrea	East Africa	4.6	-	-	-	-	-
19.	Eswatini	Southern Africa	2.5	- 1.6	7.0	3.6	3.1	3.3
20.	Ethiopia	East Africa	9.5	6.1	6.3	6.4	6.1	6.2

S/N	Country	Sub-Regions	2011-2019 (%)	2020 (%)	2021 (%)	2022 (%)	2023 (%)	2024 (%)
21.	Gabon	Central Africa	3.7	- 1.8	1.5	3.0	2.8	2.6
22.	Gambia	West Africa	2.5	0.6	5.3	4.9	5.6	6.2
23.	Ghana	West Africa	6.5	0.5	5.1	3.1	0.2	2.7
24.	Guinea	West Africa	6.2	4.7	5.0	4.3	5.7	5.6
25.	Guinea Bissau	West Africa	3.4	1.5	6.4	4.2	4.5	5.0
26.	Kenya	East Africa	4.7	- 0.3	7.6	4.8	5.0	5.3
27.	Lesotho	Southern Africa	1.5	- 3.9	1.8	2.1	2.1	2.3
28.	Liberia	West Africa	2.8	- 3.0	5.0	4.8	4.6	5.3
29.	Libya	North Africa	2.5	- 29.5	28.3	- 9.6	12.5	7.5
30.	Madagascar	Southern Africa	3.2	- 7.1	5.7	4.0	4.0	4.8
31.	Malawi	Southern Africa	4.1	0.9	4.6	0.8	1.7	3.3
32.	Mali	West Africa	4.3	- 1.2	3.1	3.7	4.5	4.8
33.	Mauritania	North Africa	4.5	- 0.9	2.4	6.5	4.5	5.3
34.	Maurtius	Southern Africa	3.7	- 14.6	3.4	8.7	5.1	3.8
35.	Morocco	North Africa	3.5	- 7.2	8.0	1.3	2.4	3.6
36.	Mozambidue	Southern Africa	5.5	- 1.2	2.4	4.2	7.0	5.0
37.	Namibia	Southern Africa	2.8	- 8.1	3.5	4.6	2.8	2.7
38.	Niger	West Africa	5.9	2.5	1.4	11.9	4.1	11.1
39.	Nigeria	West Africa	3.0	- 1.9	3.6	3.3	2.9	3.1
40.	Rwanda	East Africa	7.1	- 3.4	10.9	8.2	6.2	7.0
41.	Sao Tome and Principe	South Africa	3.6	2.6	1.9	0.1	0.5	2.4
42.	Senegal	West Africa	5.0	1.3	6.5	4.0	4.1	8.5
43.	Seychelles	East Africa	6.8	- 8.5	2.5	8.7	4.2	3.3
44.	Sierra Leone	West Africa	5.0	- 2.0	4.1	4.0	2.7	4.7
45.	Somalia	North Africa	3.2	- 2.6	3.3	2.4	2.8	3.7
46.	South Africa	Southern Africa	1.6	- 6.0	4.7	1.9	0.9	1.8
47.	South Judah	East Africa	- 5.3	- 6.5	5.3	0.5	3.5	4.2
48.	Sudan	North Africa	- 0.9	- 3.6	0.5	- 2.5	- 18.3	0.3
49.	Tanzania	East Africa	6.7	4.8	4.9	4.7	5.2	6.1
50.	Togo	West Africa	5.5	2.0	6.0	5.8	5.4	5.3
51.	Tunisia	North Africa	1.8	- 8.8	4.4	2.5	`1.3	1.9
52.	Uganda	East Africa	5.3	- 1.2	5.7	6.4	4.6	5.7
53.	Zambia	Southern Africa	4.3	- 2.8	4.6	4.7	3.6	4.3
54.	Zimbabwe	Southern Africa	4.6	- 7.8	8.4	6.2	4.1	3.6

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Table 3: African regions: comparative real GDP growth rates

S/N.	Classifications	2011-2019 (%)	2020 (%)	2021 (%)	2022 (%)	2023 (%)	2024 (%)
(A)	Africa (General)	3.6	- 1.7	4.8	3.9	3.2	3.8
(B)	Africa (Northern)	3.3	- 1.9	5.0	3.8	3.0	3.5
(C)	Africa (Sub-Saharan)	3.8	- 1.6	4.7	4.0	3.3	4.0
(D)	Africa (Resource Intensive)	3.0	- 3.6	4.7	2.7	2.4	3.3
(E)	Africa (Non-Resource Intensive)	4.4	0.9	5.0	5.5	4.34	4.4

In fact, the African continent still faces a range of dauting challenges to economic stability over the near term while the continent's future resilience and longer-term prosperity depend critically on certain difficult structural reforms. Again, recent environmental challenges in some parts of Africa are stark reminders of the devastation that can ensure from sudden natural disasters and weather-related events. Yet, a number of other risks could materialize and these include commodity price volatility as well as slowdown in African's trading partner countries which reduces world demand with adverse consequences for the continent.

Notably, inflation is still too high and subject to risk. Although these rates are trending down for most Africa's economics, inflation is still double digit and thereby adding to the cost-of-living challenge faced by the continent's most vulnerable. Furthermore, public debt vulnerabilities remain elevated. Therefore, many African counties are expected to continue struggling to generate the sustained inclusive and job rich growth needed to recover lost ground from the recent multi-year crisis or keep pace with the continent's expanding population. Again, the recent examples of political instability with several coups in the Sahel region underscore the worrying implication of persistent fragility in the continent.

Consequently, two dynamics are central for Africa's future development:

- The region's on-going demographic shift and
- The globally unfolding fourth industrial revolution clearly the first digital technologies have positively swept across Africa. In other words, mobile phones, text-based applications and early stages of internet penetration had profound effects on African jobs. Yet, these initial information and communication technologies (ICTs) are just a small precursor to the newer types of fourth industrial revolution technologies (FIRTs) that have just began to emerge. Essentially, FIRTs are the board confluence of new innovations that reinforce one another. Basically, some are powered by machine learning and artificial intelligence, based on big data sets.

Similarly, others are3 the result of a tipping point at which increased global connectivity and platform economics change the face of societies. Structurally, these innovations may change some sectors of a given economy more than others (Melia, 2019; Diamardis & Kotler, 2020). Again, these influences may go far beyond production processes given the capacity to change all facets of life. Specifically, many of Africa's menial jobs in the informal and rural economy may initially remain less affected. But globally, these new tools are changing the factor compositions of every sector by way of augmenting or automating most existing job tasked as well as creating new openings for more productive (and more fulfilling) jobs in areas that are non-existing.

Therefore, this situation poses both threats and opportunities for Africa's future labour markets. In other works, this brings a distinct angle to the question of how new and better jobs could be created in Africa Even though exporting agricultural commodities or extractive resources and serving domestic markets will all remain important, this paper focuses on establishing critical sectors that are particularly promising for Africa (as entry barriers are low and employment effects potentially large). Specifically, the growing digitization of all aspects of life as well as the growing connectivity across continents are creating more work tasks in IT-enabled services. And as the spectrum of digital work task will continue to grow over the course of emerging revolutions this research paper examines the relevance of digital services exports as a particular avenue for creating future-oriented jobs in Africa. Therefore, the rest of the paper is structured as follows:

After the introductory section, section two provides an overview of the emergence of the digital economies section three examines the digital labor market Networks while section four explores the gig sector performance in Africa as well as the challenges of the African gig sector. The future prospects with policy options are presented in section five and section six concluded the paper as appropriate.

1. Digital Economy Emergence

Historically, modern computing began in 1945 with the commercialization of technologies developed during World War II. Over time, storage technology, software and hardware improved so that information processing and reproduction became widespread.

Thus, software and hardware industries also grew rapidly (Ceruzz, 2003, Gold ford and Tucker, 2019). However, limited communication between computers limited their effect on the economy. Subsequently, with the rise of the internet, the representation of information in bits began to have a measurable effect on multiple markets. Technically, this rise was built on key inventions that define internet communication: Transmission Control Protocol (TCP) and Internet Protocol (IP). Essentially, these technologies have enabled increased collection and data usage (Greenstein, 2015).

Therefore, as data transmission became a key aspect of digital technology, the question of net neutrality becomes a central research and policy focus. In other words, research on digital economics examines whether and how digital technology changes economic activity. More fundamentally, digital economics explores how standard economic models change as certain cost full substantially and even approaches zero.

Basically, this shift in cost can be divided into five categories: lower search costs, lower replication costs, lower transportation costs, lower tracking costs as well as lower verification costs.

Indeed, search costs are lower in digital environment and thus enlarging the potential scope and search quality. Again, digital goods can be replicated at zero cost which implies that they are often non-rival. Similarly, the role of geographic distance changes as the cost of transportation for digital and information is approximately zero. And while digital technologies can make it easier to track any individual's behaviour; digital verification can also make it easy to verify the reputation and trustworthiness of any individual firm or organization in the digital economy clearly each of these cost changes draws on a different set of well-established economic models (such as search models, non-rival goods models, transportation cost models, price discrimination models and reputation models).

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Consequently, digitization has become one of the most important economic themes of the future (affecting both the economy and society as a whole). Thus, digitization can be defined as the conversion of signals and media objects (such as documents, images or sounds) into digital form that are processed stored and transmitted via digital devices and networks due to the adoption of digital technologies with the use of systems built on them. On the other hand, digitalization is the organizational process or business process of the technologically-induced change within industries, organizations, markets and branches.

Specifically, the following effects are observed:

- Digitalization of industries has enabled new production processes such as the internet of things, industrial internet, industry 4.0, machine to machine communication, artificial intelligence and machine vision.
- Digitalization of business and organizations has induced new business models such as freemium, new e-government services, electronic payment office automation and paperless office processes (using technologies such as smart phones, web application, cloud services, electronic identification, block chain, smart contracts, crypto currencies) as well as business intelligence using Big Data.
- Digitalization of education has also induced e-learning and MOOC courses.

However, digital transformation is described as the total and overall societal effect of digitalization. In other words, digitization has enabled the process of digitalization which resulted in opportunities to transform and change existing business models, consumption pattern, socio-economic structures, legal and policy measures, organizational patterns, cultural barriers as well as the whole society digitality. Therefore, it is anticipated that digitization (technical conversion), digitalization (business process) and digital transformation (effect) will accelerate and illuminate the various observed horizontal and global processes of change in the society.

Specifically, many digital businesses or services are using a platform or two-sided market model which match buyers with sellers or a service user with a provider. In a ride sharing service, the platform automatically matches drivers and passengers (innovation) while the driver takes advantage of a flexible income earning activity not otherwise accessible (inclusion). Similarly, the passenger benefits from greater convenience and often however prices (efficiency) while crowd funding, job matching, room sharing operates in the same manner (World Bank, 2016). Consequently, the benefit of digital technologies filter throughout the economy as shown below:

(A) For businesses, the new technologies promote inclusion of firms in the world economy by expanding trade, raises the productivity of capital; and intensities competition in the market place (which in turn induces innovation).

(B) For households, it brings opportunities by creating jobs, leverages human capital and produces consumer surplus.

(C) For governments, it enables citizens to access public services, strengthens government capability as well as serving as a platform for citizens to tackle collective action problems.

2. Digital Labour Market Networks

Traditionally, firms have operated within business. However, physical presence is no longer a prerequisite to doing business in a given market (especially in the digital economy) where intangible product is replicable at little or no cost. In other words, the confluence of two digital forces may dramatically reshape tomorrow's workplace; leading to a sharp reduction in the traditional employer-employee relationship as identified below:

I) New platform, allow economic activity to be organized in ways that shift much of what was traditionally accomplished by full-time workers within an organization to a crowd of individual entrepreneurs and on-demand workers.

II) Emerging economy that increasingly relies on short term freelance relationships rather than on full-time employment.

III) Artificial Intelligence and robotics-enabled technologies are getting increasingly better at the cognitive and physical tasks that comprise much of today's work: presaging the automation of complex human activities and disrupting a range of occupation.

Therefore, the confluence of these factors may lead to a labour market in which full-time jobs may be broken-up into tasks and projects. In other words, this was making it easier to substitute capital in the form automation technologies for human labour and talent. Yet, despite the importance of large firms in driving economic growth the advent of digital platform has changed the scenario specifically, digital platform is replacing the brick-and-mortar malls; connecting shoppers with different brand stores; creating efficiencies for brands as well as generating revenue for platform owners. Again, some platform expands the supply of labour by increasing opportunities for new (flexible types of work that complement traditional forms of employment in the gig economy). However, the additional income may reduce income fluctuations for secondary earners. Yet, the flexibility inherent in platform work also enables more women to participate in the labour force. Although flexibility is a benefit in some cases; this raise concerns around income instability as well as protections connected with standard employer employee relationships (such as person plans, health insurance and paid leave).

Notably, the rise of digital platform firm (existing principally in the cloud and generating income from external capital base) marks a shift in the potential nature of firms. In fact, most regulations are not yet adapted to these changes. Thus, platform firms often operate in regulatory grey areas. Yet, minimum standards of quality, prudence and safety (as well as other policy goals) should be upheld by digital businesses.

Essentially, the rise of platform marketplaces allows the effects of technology to reach more people more quickly than ever before. Here, individuals and firms need only a broadband connection to trade goods and services on online platform. Clearly, this scale without mass brings economic opportunity to millions of people (beyond their geographical residency) as well as experiencing changing demand for skills. Basically, some of the observed changes are numerous as highlighted below:

(A) With technology blurring the boundaries of the firm, platform companies often generate value by creating a network effect that connects customers, produces while facilitating interactions in a multisided model.

(B) While the demand and for less advanced skills that can be replaced by technology is declining; the demand for advanced cognitive skills, socio-behavioural skills as well as skill combinations associated with greater adaptability is rising.

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(C) The idea of robots replacing workers is striking a nerve and thus, the threat to jobs from technology may be exaggerated. Notably several forces are increasing the demand for industrial products and hence the demand for labour in the industrial sector.

(D) In some developing countries, informality has remained remarkably stable despite economic growth or the changing hg nature of work.

Practically, online outsourcing or freelancing platforms match firms and workers to perform work online. Essentially, they can reduce contracting costs and the time it takes to match employers are employees. With interest and innovations in monitoring and feedback systems, online labour markets are becoming global. Notably, there online job platforms increase the pool of talent for firms (especially for smaller enterprises) and provides the opportunity to monetize skills that may not be in sufficient demand in local economy. In other words, digital labour market networks make labour markets more efficient by connecting a larger pool of individuals and firms at lower cost. Specifically, platforms like. Indee.com, Monster.com and elempleo.com are international platforms that aggregate job vacancies from different sources and allows firms to post job openings. On the other hand, workers apply for jobs and post resumes in the same platforms as designed and posted.

Similarly, online job boards, social media and matching platforms can improve labor market efficiency especially in the informal sector (where information failures are large). Notably, online job matching is cheaper and faster than traditional methods. In fact, online tools and platforms has the capacity to address many labour market frictions even though their potential remains unrealized. Again, digital labour networks can bring women and new entrants into the labour market (such as in white-collar occupations) and thereby allowing people to work on different schedules or from different locations.

Although digital labour networks can generate new opportunities for employment and earnings; these are some associated risks. Perhaps, a major risk is related to the speed of labour market changer and destruction of jobs. Here, nonstandard forms of work and shorter job tenures are likely to become more common among youth. However large-scale automation can also accelerate job destruction as well as automation of logistics and processing digitalization and self-service. Eventually, these changes are good for aggregate productivity but can create challenges for individuals in the transition to new jobs. And beyond skill up-grading, the main challenge is to ensure that labour regulations facilitate and do not impede those transitions while social protection systems support workers when they are between jobs or not working regularly. Yet, another risk relates to the changing nature of work and the quality of internet enabled jobs such as micro work or jobs in the on-demand economy. Basically, these new forms of work provide workers and firms with flexibility as well as improve efficiency in the use of resources. However, it may also come with a possible erosion of workers bargaining power and lack of benefits such as unemployment, health insurance or severance pay perhaps, the biggest risk from technological change is that of widening income inequality. Even though technologies are becoming widespread, the economic pay off, are not. Here, the poor almost exclusively use only mobile phones not connected to the internet. And even where they had access to the internet; some may lack the skills to use them productively.

Consequently, the import of digital technologies on jobs depends on the type of tasks and how technology either complements or substitutes workers in those tasks. Practically, a job comprises many tasks and each characterized by the skills most used to perform it (such as cognitive, socio emotional or manual) as well as by how amenable it is to automation or codification. Therefore, the fundamental question is to what extent are different occupation and countries labour markets affected by skill-biased and labour-saving digital technologies?

Critically, beyond foundational cognitive skills (such as basic literacy and math) a well-educated worker in a modern (digital) economy needs to develop the following working skills as identified below:

(I) *Non-routine and higher order cognitive skills*: This is the ability to understand complex ideas deal with complex information processing adapt effectively to the work environment, learn from experience, engage in various forms of reasoning as well as overcoming obstacles by critical thought. Practically, this cluster include skills such as unstructured problem solving, critical thinking, learning and reasoning.

(II) *technical skills plus information and communication technology (*ICT*) skills* essentially, technical skills are those abilities needed to carry out one's job. These include the knowledge to operate a machine for a worker at a factory or the knowledge to work with a software for a person at a bank. Technically, ICT skills refer to the effective application of ICT systems and devices ranging from ICT socialist (who have the ability to develop operate and maintains ICT system) to ICT users (who are competent users of the mainstream tools needed in their working place such as emails, excel, outlook, power point, word, etc.).

(III) *Non-routine interpersonal and socioemotional skills:* Often, these are called soft or noncognitive skills which encompass a broad range of malleable skills, behaviours attitudes and personality traits that enable individuals to navigate interpersonal and social situations effectively. Operationally, these include grit or the perseverance to finish a job or achieve a long-term goal working in teams, punctuality organization, commitment, creativity as well as honesty.

3. African Gig Sector: Performance and Challenges

Indeed, jobs are crucial for individual wellbeing as they provide a livelihood and a sense of dignity. Again, they are crucial for collective wellbeing and economic growth. However, over the past years, technology has fundamentally shifted traditional work patterns by creating new ways in which work is contracted, performed, managed, scheduled and remunerated. Consequently, new business models (known as digital platform firms) are allowing the effects of technology to reach more people more quickly and hence bringing economic opportunity to millions of people who do not live in industrialized countries or even industrial areas.

In other words, technologically, they are provided access to broad band with digital device (World Bank, 2019, 2023).

Essentially, digital labour platforms are anticipated to play a role in the process of structural transformation by way of triggering organizational and occupational transformation. That is by enhancing labour productivity and formalization in service sectors (Nayyar, et.al., 2021, Eurobound, 2020).

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Conceptually, the term gig can be understood as a one-off job for which a worker is paid for a particular task or for a defined period. Here, the type of gig work considered is that mediated through interest platforms in which the worker is not an employee of the enterprise that operates the platform. Rather, the platform acts as an intermediary between the gig worker and the person or business that needs the work done. Specifically, the paid tasks (or gigs) could be food delivery, care work, photo tagging, data entry, translation, design, software development, etc.

Technologically, the supply (gig worker) and the demand (business or person seeking for job done) are matched through either a mobile app or website. Here, the platform provides a participative infrastructure for such interactions that includes governance structures and rules for the work to be carried out (which is enabled by an algorithm).

Essentially, a gig worker is usually paid on a project, piece rate or hourly basis and basically there are various types of platform-based gig jobs as identified below:

(A) *Location based gig jobs*: Digital platform allocate work that is tangible and delivered to a client in a physical location such as transport, delivery, domestic care and home services.

(B) *Online gig jobs:* This include tasks or work assignments such as image tagging, data entry, website design or soft development that are performed and delivered online.

(C) *Online free lancing:* Called e-lancing tends to involve larger projects that are performed over longer times; which typically includes complex tasks targeting more intermediate or high-skilled workers such as soft development, graphic design, digital marketing.

(D) *Microwork***:** This involves projects and tasks that are broken down into small subtasks that can be completed in seconds or minutes by remote workers through online platforms. Practically micro workers are usually paid small amounts of money for each completed tasks which can often be performed with basic numeracy and literary skills. Notably, these tasks include image tagging, text transcription and data entry.

Comparatively, micro work has lower barriers to entry them online freelancing and thereby making it on attractive income generating opportunity for unemployed and underemployed individuals with few or no specialized skills. Appendix 1 shows task classifications of different online gig works similarly in Table A and Table B show the overview of operational platforms found in African region.

Operationally, these online gig work platforms usually rely on a combination of fees and subscription plans to generate revenue. This revenue usually comes from the fees charged on the demand side or supply side or both. It may also come from subscription plans that grant additional features to the online gig workers or clients who subscribed to them. Notably, these plans can attract more workers and clients. Basically, the commissions charged to the workers generally range from a minimum flat fee to twenty percent. However global platforms tend to charge progressive commissions based on the lifetime earnings of the worker as well as additional fees like transaction or withdrawal fees (associated with certain payment mechanisms) and optional fees. Essentially, the optional fees can enable freelancers to access special features such as the ability to promote their offer or bid featured offers, or the ability to pass tests on the platform to prove competencies. On the client side, the service varies and the charged fee is usually less than five percent of the transaction value.

For the purpose of digital work payments (online services) *Stablecoins* are form of crypto currency which remains stable in value. Essentially, these coin work for peer-to-peer transactions, cross-border payments and savings. In fact, they do not require an intermediary for transactions Rather, they can be linked to smart contracts which are self-executing contracts that use block chain technology to carry out agreements given that operational term is met without the need for a human intermediary. In other words, these contracts automatically make payments related to completing a job such as micro work task. Specifically, these tasks might involve image labelling, receipt, transcription and product categorization that contributes to artificial intelligence training (AI) data for private companies.

Consequently, the participants or micro workers can receive stable coins crypto currency and cash-out earnings using M-PESA. In other words, on task completion, gig workers can decide whether to keep their money in a mobile crypto wallet (Volora) or off-ramp their earnings to their M-PESA accounts. Indeed, the adoption of stable coins payment mechanism has the capacity to reduce the cost and frictions of sending and receiving cross-border micropayments as well as increasing take-home earning potential. Therefore, in order to link program beneficiaries to international online gig opportunities, teams (facilitators) can explore direct partnership agreements with platforms. Essentially, these agreements can be structured to include platforms involvement in project outreach and curriculum design as well as collecting beneficiary data to monitor projects impact.

Again, operational platforms might provide project beneficiaries with preferential profiles to increase their visibility. Even though the online platforms may not directly give work opportunities to program beneficiaries; they are often able to identify prospective beneficiaries of such partnerships on their platforms (via badges and certificates of completion). Essentially, these can give the beneficiaries an edge during their bids for online jobs. In fact, this action is critical for the young (first time) online gig workers who may not have work history on the online gig job platforms (as applicable to most African workers).

Indeed, the surprising size and diversity of online labour in Africa suggest that it could become a viable sector for future-oriented job creation across the continent in the coming decades. However, if the online labour (gig sector) is to become a driver of African country's export-led growth strategy; the two foundational pillars are literacy levels and widespread access to the internet. Unfortunately, on both accounts, most African countries are far behind. In fact, without a laptop or reliable internet connection or basic communication skills, online work or gig works or micro works remains out of reach for most African youths (population). However, these two pillars (skills and connectivity) are so important and foundational for development. Thus, most African governments are working hard to enhance them.

Operationally, there are growing pains within the online labour industry that need to be tackled from various sides as appropriate:

(A) Even though platforms have the strongest incentive to regulate the supply side of online labour, most participants reports that it is imperative to buy accounts given that some platforms have regional restrictions as well as client having biases against African online workers. Again, several participants have experienced fraudulent sellers such as cases of buying an account only to found that the login password was changed after concluded transactions. Regrettably, much of these illegalities takes place on ghost-writing platforms which facilitates transactions that cannot be held accountable for their treatment of online (gig) workers in Africa.

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(B) Similarly, on the demand side of online labour, explicit discrimination exists in terms of not accessing certain popular platforms from African countries. Furthermore, on certain platforms, online workers with accounts registered in non-native English-speaking countries often have difficulty in receiving their first platform tasks. Specifically, many participants have warned of some platforms with a reputation for fraudulent requests such as where completed works are often not paid for.

(C) Again, in terms of intermediation, some participants have lamented that arduously built-up reputation via positive ratings are platform-bound which implies that they are not transferable to other platforms which might be lost if a given platform ceases to exist. Therefore, labour arbitrage can pit online workers (account holders) against one another in a virtual bidding race to the bottom as well as harsh timelines (such as work posted late at night that needs to be completed by morning) or disturbing tasks (such as reviewing graphic footage) can cause workers' undue strain.

Unfortunately, of the many young job seekers in Africa; only a small minority possesses the skills needed to be competitive or even to get started as online (gig) workers. Perhaps, this observed situation is clearly worse in some African countries where education levels are very low. In other word, the main banner for African counties to complete with other developed or developing countries, is that African skill levels are (on average) not high enough to compete. Therefore, whether online labour can spur a period of rapid growth in Africa compared to emerging economies will depend on several critical factors as follows:

(1) Need of lowering entry barriers to the sector. That is, a critical mass of young Africans needs to be trained to enter digital services. In other words, the sector cannot be only available to tertiary educated youths.

(2) Need to secure global demand. That is the critical mass of global demand (even though steadily growing) should be made accessible to Africans.

(3) Need to stimulate upward mobility within the online labour subsector so as to engage in more complex and creative tasks.

(4) Need to have elite services so that African innovation can be generated at the highest rungs of the value ladder.

(5) And need to address gender equity if the sector is to take off as planned.

Notably, across various online platforms, micro, small and median enterprises drive the demand for gig workers. In fact, not only are smaller businesses more likely to hire gig workers, they usually outsource a large share of work through platform than larger firms.

However, regarding tasks, firms hiring through regional platforms are more likely to outsource information technology, writing, business and sales tasks than those hiring through global platforms and by looking at historical trends overtime, the demand for clerical and data entry tasks have very much increased compared to other types of tasks (World Bank, 2023). Yet, the growing adoption of artificial intelligence (AI) in different industries (sectors) is increasing the demand for micro (gig) workers. Technically, artificial intelligence producers create machine learning algorithms to develop applications ranging from chat bots and hands-free vocal assistants to automated medical image technologies, self-driving vehicles and drones. Indeed, developing these algorithms requires the preparation of quality big data. Consequently, it generates demand for micro tasks such as *tagging photographs, sorting items in a list, adding labels, providing sample audios, a1 predictions verification, etc.*

Basically, these tasks could be confirming the correctness of image classifications or checking that a virtual assistant understand users communications as appropriate (Tubaro & Casilli, 2019). Again, developments in big team are playing important role in creating new types of micro tasks. In other words, as companies work to create more-accurate VOIP systems; nuances such as country specific accents are very critical in creating a trend toward inclusive tech. This has therefore created demand for simple micro tasks such as *Reading*, *Translating* or *Transcribing* a sentence in a particular language which is clearly an important avenue of regional platforms demand. Appendix 2 shows the various productive tools of artificial intelligence applications.

Perhaps, access to a wide range of talent may be the key reason that firms turn to platform networks. In other words, in a knowledge-based economy, companies usually create value from ideas, innovation, research and expertise; and thus, finding the right talent is crucial. Yet, firms often find it challenging to nurture and keep the best talent in highly specialized and professional services. Therefore, digital platforms can potentially bridge the gap by eliminating several geographical barriers. Specifically, online freelancing platforms can allow firms to access workers with diverse skill sets, cultural backgrounds and work histories. Certainly, this will act as an important enabler for knowledge exchange, innovation and peer learning.

Here, instead of seeing knowledge flows across organizations as a threat; firms now make strategic use of it. Clearly, this allows them to accumulate knowledge, innovate and adopt faster to environmental challenges (Manika, et.al. 2015; Corporal, et.al., 2017).

Operationally, gig workers offer flexibility to firms which may take various forms:

(A) *Functional flexibility:* to allocate different types of tasks across the available workforce.
(B) *Numerical flexibility:* to employ varying numbers of workers to meet the fluctuating demand for labour.
(C) *Financial flexibility:* to allow businesses to easily adjust wages.

Indeed, the short-term assignments (while not providing job security for the gig workers) allow companies the flexibility to easily meet the changing demand for labour. Again, the majority of firms hire gig workers once a month or less which indicates that gig workers may be hired for ad hoc tasks (ILO, 2021a).

Financially, given the growing supply of gig workers using online platforms, the pay rates vary and thus allowing firms to choose less or more expensive services. However, it is important regarding how much firms pay as well as how they pay. In other words, many firms are hiring gig workers because online platforms provide more flexible costing options such as ability to pay per task, per hour of work or per image tagged than traditional employment. Even where it was more expensive to hire through online platforms; some firms have argued that the extra cost was offset by the value platforms. Yet, regional platforms seem to be most attractive to firms that are looking for gig workers with similar cultural backgrounds or in the same time zone. This implies that some of the demand for online gig work is usually driven locally. Essentially, this might be as important engine for development. Here, phantomization may serve as a vehicle to pull informal workers into formal or semiformal work arrangements. And yet, other ways in which platforms may have contributed to African development include reducing the time required to hire a person for a task or project because of the use of sophisticated algorithms.

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Empirically, Table C from Appendix 2 shows the online labour index 2020 (OLI, 2020) as an economic indicator that provides an online gig economy which measures the supply of online freelance labour across African countries (Stephany, et.al, 2021; Kassi, et.al. 2018). As an experimental economic indicator that approximates the conventional labour market statistics, (online labour index (OLI) measures the utilization of online labour across countries and occupations by tracking the number of projects and tasks posted on major online gig platforms in near-real time so as to provide a solid evidence base for future policy and research. As presented here, the online labour platforms are platforms through which buyers and sellers of labour or services transact fully digitally. In other words, we require that the worker and employer are matched digitally. Similarly, the payment is conducted digitally via the platform and the result of the work delivered digitally. Basically, the index is based on tracking all projects and tasks posted on a sample of platforms (using API access and web scraping).

However, occupational classification is a difficult process that can be subjected to criticisms of its reliability. Nevertheless, it is evident that some operational classification is required to facilitate comparisons across countries, companies, time or online labour market platforms. Thus, the classifications are outlined in Appendix 3 revealed that the main continental supply is in the software development and technology skills as well as creative and multimedia works, other areas of continental supply include clerical and data entry as well as writing and translation. Perhaps, the relative prominence of software development and technology supplies in the online labour market can be explained by the relative long history of the outsourcing and off shoring of information technology services (ICT) as well as the standardized processes associated with it. However, the use of online labour services for repetitive clerical tasks such as data entry similarly follows on the footsteps of conventional business process outsourcing (BPO) practices. But here, the work is being sent directly to individual online workers rather than to BPO firms with conventional offices and employees. Yet as observed, the relatively small number of professional services being contracted on the gig platforms could be explained by the fact that those services often require a high level of trust and taut communication that may not be as easily achieved through online communication.

Indeed, as presented, the OLIK will be a useful tool for policy markets, researchers and investors trying to make sense of how the African platform economy is developing as well as where its effects are being felt.

4. African Gig Sector: Policy Options and Prospects

Clearly, in addition to acting as a market place to hire gig workers, online labour platforms have started playing as active role in recruiting and staffing online workers for medium to long term projects for client companies. In fact, some real sector firms have hired gig workers for longer than three months in recent times. Here, platforms firms play a project management role in which they vet freelancers for the job, ensure quality control and manage client-freelancer relationship. Notably, the main reason for the observed shift is that the flexibility and speed offered by platform in acting as staffing agencies for exceed those of conventional staffing and sourcing channels. Yet, some platforms also help manage the projects themselves (which is a related but different business model).

Therefore, we expect the demand for gig work to continue to rise in the future. Even though demand was generated largely by micro, small and medium enterprises in developed countries; majority firms in the developing world (such as Africa) have started to use digital labour platforms recently. Essentially, awareness of the local context is a necessary prerequisite for some tasks outsourced through online platforms. Therefore, rising demand in developing countries (such as Africa) implies that more people will benefit from work opportunities generated through online platforms. Specifically, the growing demand for transparency in government (as well as provision of digital services and information by government) can be a source of demand for digital and gig work for African growths. In other words, digitalization of government records can offer micro work opportunities to relatively low-skilled people from African countries. However, the role of government in contributory and non-contributory social insurance (S1) programs and other forms of social protection for gig workers such as cases of private innovations and market making approaches remain critical.

Basically, social insurance (SI) systems seek to smooth consumption and prevent poverty through two instruments: risk-pooling mechanisms and saving arrangements (Winker, et.al. 2017). Here, risk pooling mechanisms allow individuals and employers to contribute to collective fund to finance transfers to those who face a negative shock. On the other hand, saving arrangement enable individuals to save money in individual savings account to pay their expenses during periods of negative shock. Notably, the non-traditional nature of the GIG economy implies that gig workers (usually treated as self-employed or independent contractor) lacks employer to co finance insurance contributions. Therefore, to the extent that gig workers are classified as self-employed, the application of social insurance (SI) provisions to gig workers is clearly part of a larger challenge of extending SI in African countries (where self-employment and informality predominates). Currently, most online gig workers do not receive any insurance coverage from platforms. In other words, there is usually no contractual employer-employee relationship between gig workers and the platforms where they obtain tasks. Consequently, gig workers have to contribute to public or private social insurance programs outside their operational platforms.

The question of how platform workers could be classified has attracted critical debates and triggered several count cases. However, classification is not yet an issue in Africa. In fact, unlike the application of gig work in developed economies, the dialogue on gig work in many African countries are yet to focus on classification challenges. Specifically in Kenya, Ethiopia and Tanzania; there is no operational legislation in place that mandates platforms to provide digital gig workers with welfare or social security protections (Aventimi, et.al, 2022). Furthermore, mercy corps (2020) found that under Kenyan law; there was no specific employment legislation for digital gig workers.

Consequently, gig workers under such a contract were not entitled to protection such as paid sick leave, annual leave, health insurance or pension protections (Mercy Corps, 2020) indeed, the classification of gig workers has implications for labour laws, taxes and social welfare programs. Although this poses challenge for gig workers to access social insurance; the labour market realities in African countries are characterized by high degrees of informality and diverse nonstandard forms of work with large populations not covered by labour regulations. In other words, in African countries (where informal self-employment is the standard) the more significant challenge to social insurance coverage is the general lack of programs for self-employed individuals. Even at the country level, there are no clear patterns

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in how gig workers self-classify. Yet, there may be some evidence to suggest that welfare status and labour market experience plays a role. However, the bigger issue in the context of African countries is the under coverage of social insurance for genuinely self-employed and informal workers. As a policy response, the gig platforms can be leveraged to extend coverage to the informal economy. Specifically, digital technologies can enable formalization of informal gig work. In other words, by capturing identifying information gig-enabling platforms can serve as intermediaries for social registries. This in turn, link eligible individuals to existing social protection programs.

Again, collective action by gig workers can be an important pathway to better working conditions for geographically dispersed workforce. But like most self-employed workers, gig workers typically lack collective bargaining rights because they tend to work informally or that such bargaining would entail; a violation of competition law. Therefore, as the platforms economy evolves, the peculiar nature of platform topology may have engendered new ways and structures for workers representation and collectivization. Operationally, attempts to develop union-inspired structures and activities are beginning to manifest across the economy with predominating initiatives in all types of gig work (ILO, 2019). These actions to support organized workforce are shown below:

(I) clearly, using the very mechanism of ratings used by platforms to rate workers reporting on the platforms could be an effective way to incentivize platforms to protect workers.

(II) Leveraging of technology to scale access and impact. As an operational illustration, Amazon mechanical Turk (AMT) is a website and service operated by Amazon as a meeting place for clients requesting help with large volumes of micro tasks as well as workers wanting to do those tasks (for monetary payments). Basically, AMT brings stopgap, short terms jobs to potential workers. Unfortunately, many workers still find themselves working in a system with little remedy when faced with wage theft or clients disciplining Consequently, Turkopticon came out of engagements with workers to articulate hypothetical Bill of Rights with the following themes: uncertainty about payment, unaccountable and seemingly arbitrary rejections (or non-payments), fraudulent tasks, prohibitive time limits, pay delays, uncommunicative clients and administrators costs of employer errors borne by workers as well as low (poor) pay, Strategically, Turkopticon functions alongside crucial worker forums to bridge the worlds of workers and employers (given the convenient distance between them). Turkopticon interrupts the dynamic of human computation on demand by offering workers, evaluation support and work request refusal capability. In this regard, Turkopticon has become a stable and sustainable gig worker-tool.

(III) Notably, self-initiated groups on Facebook, Reddit, We Chat or WhatsApp are bringing gig workers together from different continents of the world. Therefore, isolation and anonymity can be addressed through social media platforms that bring gig workers together to share information develop a collective identity as well as providing support.

(IV) Again, platform cooperatives can be seen as alternate option to address the precarity and economic dependence of gig workers. Technically, platform co-ops combine the online infrastructure of a platform to mediate social and economic interaction with the collective ownership and democratic governance of a cooperative enterprise. Here, as owners of platform co-op, gig workers can create the conditions for better pay and job security (Bunders, et.al., 2022).

Notably, they decide on commission rates and surplus value while legal issues concerning their self-employed status could also be solved equally. Yet, in principle, gig workers can either continue to do their work as self-employed workers in a producer cooperative) or as employees (in a worker cooperative).

Table 4 shows an overview of cooperative types as applicable. As presented and whichever way, the issues that arise in the regular platform economy about employment conditions and social protection benefits; would still be in the hands of the platform co-op members.

Table 4: Platform ownership Nd member employment: Cooperative types

S/n.	Topology	Self-employed members	Employees members
(a)	Cooperative non-owned	A producer cooperative that neither offers labour rights to gig workers nor operates a matchmaking platform.	A worker cooperative that gives gig workers labour rights but doesn't run a matchmaking platform.
(b)	Cooperative owned	Producer cooperative that does not provide gig workers with labour rights but does own a matchmaking platform	Worker cooperative that does provide gig workers with labour right and does own a matchmaking platform

However, free lancers could be motivated to join co-ops because of the additional services provided such as filing taxes and acquiring social security benefits, training programs mentorship programs, etc. consequently, the following reforms should be activated:

(1) Workers must identify compelling common cause that will sustain their interest in participating in a collective effort.
(2) Governments and collective bargaining organizations need to reform labour market governance institutions such as giving online gig workers a participatory role since they have different interests but one voice.
(3) Need to continue to modernize institutions that acknowledges new forms of work.

Yet, beyond traditional benefits that accompany formal employ6ment; gig workers desire access to training as well as access to credit or loans to buy operational equipment (such as laptops and internet access). However, policies adopted in advanced countries cannot be transplanted to developing countries such as Africa. Therefore, some possible policy options for African economies include the following:

(A) That a more concerted effort to extend social protection coverage such as social assistance and active labour market programming to self-employed workers in the informal sector is the more effective policy to ensure that gig workers are protected.
(B) Since gig workers in African countries typically fall in the missing middle of social protection; government efforts to close the coverage gap for all informal and vulnerable workers will certainly benefit gig workers.
(C) And by establishing a foundation floor, African countries will avoid the risk of segmenting the labour market and adopting policies for those diverse set of workers outside labour regulation
(D) African governments should adopt a regulatory sandbox to test and experiment with different models that paperless regulate but apply to the labour market realities of their economies. Specifically, these governments can experiment with behavioural

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interventions to encourage uptake of pensions and social insurance programs that are available to self-employed workers as well as leveraging innovations in behavioural science to design micro products that are best suited for the gig worker profile.

(E) Again, African governments could explore models of possible partnership with digital platforms. Perhaps by generating a digital record of transactions (that is, gig platforms document information that was previously informal and unrecorded). Essentially, this offers the possibility of augmenting social registries through which safety net system can be accessed by gig workers.

(F) Similarly, African governments can partner with platforms in outreach efforts to increase enrolment and contributions to government social security plans. Here, short-term social insurance programs such as savings plans could serve as a crucial entry point to link with workers as well as broadening their scope

(G) Since digital gig work is rapidly changing African governments need to develop their capacity to collect vast amounts of data being generated. This will enable then to systematically track and understand the emerging (new) form work. In this regard, labour force surveys can greatly assist.

(H) As partnership engagement, African countries can leverage platforms to work toward the expansion of social registries so as to facilitate gig worker access to social programs for which they are eligible.

(I) As training for low-skilled disadvantaged workers and women, platforms and their partner service providers can work with governments to provide financial inclusion services and skills upgrading.

(J) African governments can leverage the platform work model of digital gigs which offers an opportunity to augment the social protecting toolbox via digital public works that leverage digital platforms, providing income-earning opportunities as well as building digital skills among the poor.

(K) Indeed, to ensure that gig workers are protected, collective bargaining is critical to fill the regulatory vacuum that exists for such workers. Therefore, new models of collective bargaining (such as those using third-party ratings and crowd ratings to align platform incentives with worker and policy incentives) should be promoted.

Clearly, new ways to stimulate digital jobs is critical for low-skilled, vulnerable youth (often with limited schooling and in countries with limited opportunities in formal private sector jobs), jobs for women as well as people with disabilities facing mobility constraints. Therefore, online gig platforms constitute a growing source of work opportunities for African countries. Consequently, programs enabling vulnerable population to access online gig jobs can support social and economic inclusion in a rapidly changing world of work which contributes to closing the digital divide across continents and countries. Essentially, such programs could be used as short-term instruments and need to be designed along with adequate measures to address the risks associated with online gig work. Table 5 presents the design and implementation phases of a prototype. Online gig project as shown below (World Bank, 2023). However, the following recommendations are suggestion on ways to maximize the benefits as well as addressing the risks (downsides) of the online gig work in Africa countries.

Table 5: Online Gig projects: Design and implementation *Phase D Policy*

S/N.	Phases	Tasks
(1)	Program strategy development	(i) Aiming to accelerate digital adoption or addressing lack of domestic jobs or respond to crisis. (ii) Identifying local supply and demand challenges as well as competitive advantage of the country (iii) Involving eco system stakeholders during implementation as trainers, job providers, etc. (iv) Identifying a reliable government agency to initiate, sustain and scale the program. (v) Collaborating with online platform to identify potential demand. (vi) Starting with a pilot project as a phases strategy
(2)	Gig workers development pipeline	(I) Identifying demographic target that determines relevant online task as well as accessing the need for access to devices and internet (II) Designing well-defined preassessment and scoring strategy so as to build participant trusts. (III) Designing clear (transparent) communication strategy so as to increase awareness about the program as well as the potentiality of gig work using appropriate methods
(3)	Training program design performance	(I) Consideration of skill types during training: Technical, socio-emotional and freelancing skills; (II) Checking whether short-term or longer-term training is more suitable; (III) Providing hands-on training for new gig workers
(4)	Infrastructural access and payment options	(I) Leveraging existing public infrastructure to lower costs as well as providing access to the internet using data stipends. (II) Increasing access to payment options as well as exploring appropriate payment options such as P2P payment channels mobile money accounts, bank account and crypto currency.
(5)	Demand opportunities and program beneficiaries' linkages	(I) Linking beneficiaries with opportunities by working closely with platforms; (II) Stimulating local demand for online gig workers; (III) Digital public works exploration

A: Digital Skills Building with People Support for Extra Income

Policy makers should use the emerging new form of flexible work to increase access to a wider variety of income-earning opportunities for a wider variety of people (especially the disadvantaged) so that they can equally build critical digital skills in the process.

B: Digital Infrastructure Investment and Devices Access

Operationally, affordable access to digital information and communication technologies (such as internet, mobile phones, mobile money, etc.) for all citizens including disadvantaged groups (such as youth and women) is urgently critical. As policy response, internet cost should be reduced as well as bringing broadband connectivity to rural areas, poor neighbourhoods and groups in need. Notably a potential gig worker requires access to three basic working tools: reliable internet connection (mobile or fixed broad band); internet enabled device (smart phone, tablet or computer) as well as reliable energy source (electricity)

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C: Jobs And Infrastructural Agenda Integration

While access to infrastructure and digital connectivity is critical; policymakers should be intentional about integrating a jobs agenda into the digital infrastructure expansion agenda. In fact, integrating a jobs lens into digital infrastructure projects will maximize the economic impact on local livelihoods as well as creating job opportunities closer to home for vulnerable youths and others.

D: Platforms Engagement to Enhance Social Protection Coverage for Informal Workers

African governments should work with digital platforms to promote coverage of informal workers in social security programs. By offering some level of organization to the unorganized sector, the digital platforms have the technological capacity to conduct massive outreach activities (even individually tailored framing and messaging) through automatic enrolment payment reminders as well as enabling small frequent contribution deductions. In other words, innovative partnership models with platforms could help create win-win solutions. Therefore, policy makers should find innovative ways of partnering with platforms to provide support and training for persons from vulnerable and disadvantaged backgrounds. And by requiring mobile payments and identify information, platforms could be important partners to African policy makers to increase uptake of government social insurance plans.

E: Inactive Social Insurance Experimental Models

Notably, online gig jobs are often project bused and exhibit more income volatility than traditional jobs overtime. And by building consensus for an international governance system to ensure minimum rights and social protection for platform work might take several years. Therefore, experimenting with different pilots and methods (depending on the local context) is highly relevant.

Consequently, current pilots and interventions initiated by African governments and platforms as well as their collaboration should continue with encouragement. Specifically, these governments should establish social protection floors to ensure that platform workers are protected in the event of covariate and idiosyncratic shocks. Other actions should include the following:

(I) Expanding social registries in partnership with gig work platforms to facilitate gig workers access to social programs for which they are eligible.

(II) Facilitating the accreditation of gig workers as well as creating a regulatory sandbox to test how behavioural tools that promote pension savings can be successfully deployed at scale.

(III) Supplementing social protection programming with digital public works interventions that leverage digital platforms on a pilot basis and given the nascent nature of digital public works.

(IV) Exploring partnership with private insurers to offer benefits to freelancers or linking gig workers to existing, publicly provided social security programs

(V) Subsidization (in the form of either matching contributions or direct contribution subsidy) as well as allowing more frequent payment of contributions in smaller amounts can make retirement program more appealing to gig workers in Africa.

F: Creating New Digital Work Opportunities Via E-Government Model

Notably, many African countries are digitizing records and putting them online as e-governance strategy. Therefore, ways in which governance can drive demand include programs to digitize achieves, public records, court files and to transcribe public health information and government services. Certainly, all these tasks will require digitally trained workers. Again, there are growing opportunities for tele health for public hospitals, transcription of public health information and government communications as well as digital cultural preservation.In this way, big government contracts can create substantial demand for online gig workers and digital platforms in Africa.

G: Creating New Digital Work Opportunities Via E-Government Model

Need for government programs that work on increasing the capacity of local micro, small and medium enterprises (MSMES) and start-ups so as to encourage them to use digital tools for productivity, improve quality as well as overcoming constraints in accessing skilled talent. However, most regional and local platforms struggle to establish themselves as a profitable business. Hence, the need for interventions from development organizations that works to promote entrepreneurship, start-up ecosystems and firm growth (that are vital for the creation of good jobs in African economies).

Generally, African countries and governments need to establish data safeguard standards as well as ensuring transparency in how platforms use data to match tasks in order to address discrimination embedded in the algorithms (such as geo fencing). Furthermore, there should be documented due process for decisions affecting gig workers so that they can be able to appeal decisions affecting themselves as well as being clearly informed. However, for African governments to address any risks associated with the emerging gig works; there is critical need to understand the size, scale and scope of gig work before regulatory designs in African countries. Yet, to be able to understand the emerging nature of gig work in Africa, their governments need reliable data and capacity or ability to monitor trends in real time.

Consequently, labour force surveys need to adapt to as well as measuring these new forms of work. In other words, given the non-negligible and increasing share of online gig workers, standard labour force surveys need to adapt the questionnaires as well as agreeing on the standard ways to define digital gig works while collecting relevant labour market information. Despite International labour organization initiatives, African governments should frame appropriate measures to enforce standards of data sharing by platforms.

Finally, Table 6 summarizes those policies that can reap the benefits and avoid the risks of digital gig work in African countries (World Bank, 2023; Nwaobi, 2019)

Table 6: Digital gig works: Benefits and risk avoidance policies

Digital gig economy	Digital gig workers supply	Digital platform	Digital gig workers demand
Policy and regulatory environment	Building digital skills	Promote crowd ratings and third-party accreditation	Leverage e-governance reforms to create demand
	Promote labour market inclusion	Strengthen capacity to collect systematic data from platforms	Promote growth of local private social ecosystem
	Enhance social protection coverage	Experiment with innovative social protection models	

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Digital gig economy	Digital gig workers supply	Digital platform	Digital gig workers demand
		Support new models of collective bargaining	
		Avoid algorithmic biases and ensure transparency	
		Improve digital connectivity	
		Embedding job agenda into the infrastructure agenda	

Conclusion

Indeed, the African Union and the rest of the world has been experiencing disruptions that were once considered to be at the edge of plausibility. Notably, the COVID-19 pandemic disrupted the normality of life as we know it. Again, the Russian invasion of Ukraine, the Israel–Gaza war, the military aggression and hybrid threats raise geopolitical questions about the post-World War II economic order. Similarly, several continents have experienced multiple extreme weather events such as devastating floods, wildfires and violent storms at an unprecedented scale. Therefore, the global economy is currently showing its vulnerabilities (Muench, et.al. 2022).

Consequently, digital transition has the potential to transform dominant practices in the economy and in society. Specifically, digitalization can change how people communicate, receive information or learn. In other words, it can change how businesses create value as well as how supply chains are managed. Essentially, it is driven by the vast new opportunities that can be created as well as helping to solve crucial challenges of today's society. In other word, the digital transition is an ongoing process that is shaping the future of societies and economies such as Africa. Here, these changes trigged by the digital transition have the potential to increase prosperity as well as solving many societal challenges. Yet, at the same time, increasing digitalization entails many risks as observed.

However, as the transitions progress, increasing return from economies of scale and scope for digital technologies could create new markets. And with digital technologies becoming more widespread; they can open up new development paths that lead to more innovation industry networks which can expand activities around a digital solution via supply chains, infrastructure and complementary technologies. Essentially, platforms play a critical role in the digital economy (with data emerging as an exceptionally valuable asset for them). Similarly, technology companies (along with the availability of open source and software service solutions) have played a crucial role in the widespread adoption of smart devices. As innovative development, it has facilitated the development of digital platforms that have penetrated various sectors of the economy as well as offering diverse uses and services. Operationally, these platforms can be categorized into three groups: search engines or social media platforms, business to business platforms and digital labour platforms.

Typically, the digital labour platforms act as intermediaries connecting gig workers with consumer clients (ILO, 2021; Cook and Rani, 2023). Based on where labour transactions take place digital platforms can be categorized into two main types: Online labour platforms (comprising freelance, micro task and talent platforms) and location-based platforms (comprising tax, delivery, care and domestic services) clearly, the distinct characteristic of the digital economy lies in its ability to outsource tasks or projects globally through online labour

platforms as well as facilitating work through digital applications. Therefore, this trend holds the potential to bring about a structural and productive transformation within African economies. However, the implication of the ongoing phantomization of work for the development process of African countries are numerous. In fact, the availability of cheap labor has attracted some venture capital investments that has led to the emergence of some platforms in Africa country markets. While this has led to some job creation, it is usually concentrated in low-skilled and low-paid tasks. Perhaps, this could lead to limited skill development. Therefore, it is imperative for African countries to regain control over the digital economy and shape them according to their specific development goals. Basically, this calls for a proactive exploration of how emerging technologies can be harnessed to drive productive transformations through leveraging a highly skilled and qualified workforce that contributes to economic development as well as enhancing ranking on the human development index.

In other words, by reclaiming agency in the digital economy, African countries can forge a path towards inclusive and sustainable development while ensuring that the benefits of technological advancements are distributed equitably as well as contributing to long term prosperity. Thus, in order to develop a strategy for an online gig jobs program in any country or local context, some important preconditions are essential. Here, practitioners need to possess clear motivation; assess readiness in the local context (including stakeholder); identify a reliable government agency for implementation and sustainability as well as developing a phased strategy that will enable pilots, learning and scale. Since access to digital infrastructure is key, African policymakers should find innovative ways to partner with platforms and other sector players so as to provide support and training fort the vulnerable populations. However, these programs should ensure that appropriate protections are in place as well as informing potential beneficiaries of the short term and volatile nature of gig jobs. Yet, for African policymakers, regulating the gig work is a complex task. In other words, overregulation or poor regulation is risky. In fact, while there have several regulatory and legal initiatives in advanced economies, those efforts have limited relevance in African countries context which cannot be simply transplanted. Therefore, it is important to African governments to build the capacity to collect and monitor data through labour force surveys.

Operationally, the governments of African countries can use the potential of digital gig work to build human capital, develop African digital skills as well as providing opportunities to supplement household income of Africans. Again, promoting access to digital infrastructure is critical while digital devices such as laptops, smart phones and tablets can open new doors to work. Essentially, under social protection coverage for all types of informal workers is the best way to protect African gig workers without segmenting the labour market.

Therefore, African countries should experiment with different pilots and methods to establish effective social protection and insurance for emerging African digital (online) gig workers. Clearly, the time to act is now.

Credit Authorship Contribution Statement

Nwaobi, G.C., is the sole author of this paper and was responsible for all aspects of the research and manuscript preparation. He conceived the idea for the study, developed the theoretical framework, and conducted a comprehensive review of relevant literature. He also performed the data analysis, interpreted the findings, and wrote the full manuscript.

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The author declares that they have no financial or personal conflicts of interest that could influence the results or interpretations presented in this article. No external funding sources were received for the conduct of this research.

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Appendix 1

Table A: General online gig works: Tasks classifications

S/N	Task Category	Tasks	Task Description
(1)	Business and professional management	(A) Management consulting	Management and organization analysts
		(B) Professional accounting such as preparing and organizing financial statements for an organization	Accountant
		(C) Human resource management	Personnel and careers professionals
		(D) Protect management	Management and organizations analyst
		(E) Lawyer	Lawyers
		(F) Teaching, training and tutoring	Office teaching professionals
		(G) Quantitative analysts	Mathematicians' actuaries and statisticians Advertising and market
		(H) Marketing strategy	Professionals
(2)	Business and professional support	(A) Accounting support and bookkeeping	Accounting associate professionals
		(B) Paralegal services	Illegal and related associate professionals
		(C) Market and customer research	Survey and market research interviewers
		(D) Lead generation	Information and communication technology user support technicians
		(E) Display advertising	Web technicians
		(F) Email and marketing automation	Information and communication technology operations technicians
(3)	Data entry administrative and clerical tasks	(A) Completing surveys	General office clerks
		(B) Data entry and cleaning	Data entry clerks
		(C) Customer support and service	Contact center information
		(D) Virtual assistant	Secretaries
		(E) Database administration	Computer network and systems technicians
(4)	Design multimedia and creative work	(A) Architecture	Building Architects
		(B) Art and illustration	Visual artists
		(C) Graphic design: logo or UI/UX design or other multimedia designs	Graphic and multimedia designers
		(D) Product design	Product and Garment designers
		(E) Voice talent	Actors
		(F) Voice over (reading aloud sentences)	Actors

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S/N	Task Category	Tasks	Task Description
		(G) Video and animation	Graphic and multimedia designers
		(H) Audio production	Broadcasting and audio-visual technicians
(5)	Sales And marketing	(A) Influencer marketing such as advertising a product on your social media account.	Artistic, cultural and country associate professionals
		(B) SEO, SEM, social media marketing such as monitoring, social, media platforms, writing social media posts	Advertising and marketing professionals
		(C) Brand identity and strategy	Advertising and marketing professionals
		(D) Public relations	Public relations professionals
		(E) Copywriting (review blog posts or other writing).	Advertising and marketing professionals
		(F) Marketing consulting	Advertising and marketing professionals.
(6)	IT software development and technology	(A) Desktop software development	Software developer
		(B) Game development	Web and multimedia developers
		(C) Machine learning	Applications programmers
		(D) Network and system administration	System administrators
		(E) Product management	ITC operations technicians
		(F) Scripts and utilities	Applications programmers
		(G) Testing apps, websites and software	System analysts
		(H) Website and app development	Web and multimedia development
		(I) E-commerce development	ITC operations technicians
		(J) Web scraping data from websites	Applications programmers
(7)	Writing and translation	(A) Academic writing and research	Authors and related writers
		(B) Article and blog writing	Authors and related writers
		(C) Creative writing	Authors and related writers
		(D) Editing and proofreading	General office clerks
		(E) Grant writing	Authors and related writers
		(F) Other writing	Authors and related writers
		(G) Resumes and cover letters	Authors and related writers
		(H) Technical writing	Authors and related writers
		(I) Translation	Translators Interpreters and Other Linguistics
(8)	Online microtasks	(A) Voice transcription	Data entry clerks
		(B) Image tagging	Data entry clerks
		(C) Image transcription	Data entry clerks
		(D) Geolocation tagging	Data entry clerks
		(E) Object classification	Data entry clerks

S/N	Task Category	Tasks	Task Description
		(F) Text annotation	Data entry clerks

Table B: African gig sector: operational platforms

S/N	Platform	Location	Description
(1)	Asuqu	Nigeria	This is an online freelancing platform aiming to connect online free-lance professionals offering creative and professional services with customers in Africa.
(2)	Booking Africa	Nigeria	This is a gig work platform featuring both location-based and web-based tasks. Currently active in Nigeria, Kenya and South Africa
(3)	Echarefa	Egypt	This is an online freelancing platform connecting online gig workers and clients in the Middle east and North Africa region
(4)	Findworka	Nigeria	This is an online freelancing platform connecting gig workers with client's overtime, it has also evolved into a recruitment and placement company that manages a pool of qualified workers
(5)	Jolancer	Nigeria	This is a dedicated market place for skilled African freelancers to register their profiles; post the services offered and did for projects in their line of expertise. Operationally, the platform has evolved beyond Nigeria and now being used by workers and clients in other countries.
(6)	M4jam	South Africa	This is a gig technology company enabling a variety of clients such as start-ups, MIMEs and large enterprises, to connect with millions of gig workers, on this platform, the tasks featured are predominantly location based but also have tasks that can be remotely conducted such as online surveys.
(7)	One Sha	Kenya	This is a local platform for online freelancing. Operationally, the platform aims to enable African freelancers to access work opportunities from anywhere in the worlds.
(8)	Wowzi	Kenya	This is an Online Gig Work Platform Specialized in Influencer Marketing. It Is Active in Several Other African Countries Such as Ghana Nigeria, South Africa, Tanzania and Uganda.
(9)	Microworkers	Global	This is a global micro work platform for online freelancing activities.
(10)	Terra Work	Nigeria	This is a local platform (gig) for online freelancing activities.
(11)	Pepework	Nigeria	This is a freelance platform to reduce unemployment Burden in Africa.
(12)	Upwork	Global	This is a general market place platform for all categories of online workers.
(13)	Kenya Ajira Digital Program	Kenya	This is government initiative driven by the ministry of ICT innovations and youth affairs to empower millions of young people to access digital job opportunities. Basically, the main objectives are to raise the profile of digital work, promote a mentorship and collaborative learning approach to finding digital work; providing access to digital work as well as promoting Kenya as a distinction for online workers.
(14)	Click-On Kaduna Pilot	Nigeria	World Bank's (Digital Jobs in Nigeria) pilot project team adopted various strategically to help vulnerable youth in conflict-affected area) to leverage employment opportunities in a digital economy. Basically, the pilot provided training for employed youths in

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S/N	Platform	Location	Description
			Kaduna State to pursue digital jobs including online freelancing and digital entrepreneurship.
(15)	Kenya Digital Freelancing Curriculum	Kenya	This is a platform that prepares unemployed or underemployed young persons to entry level middle skill jobs that feature either high scarcity or high turnover. Also, there is a pilot project or online freelancing that focused on transcription and virtual assistant skills with a target of large number of youths to be reached.
(16)	Skills For Virtual Gigs	Kenya	This is collaborated pilot research initiative that focused on equipping youth with the skills needed to succeed in virtual gigs as well as leveraging their new skills for future professional opportunities.
(17)	Stable Con Micropaymen ts for Digital Workers	Kenya	This platform promotes financial inclusion and reduces risks in adopting new technologies by running real-world pilot programs. One such pilot tested whether digital *stablecoins*, used as mobile crypto wallets, could ease cross-border payments for unemployed and underemployed youth completing micro-tasks.

Appendix 2:
Occupational Classifications

A: Professional Services
A1 = accounting; A2 = consulting; A3 = financial planning; A4 = legal services A5 = human resources.

B: Clerical and Data Entry
B1 = Project Management; B2 = Custome Services; B3 = Data Entry

C: Creative and Multimedia
C1 = Animation; C2 = Architecture; C3 = Audio; C4 = Logo Design; C5 = Photography; C6 = Presentations; C7 = Voice Acting

D: Sales and Marketing Support
D1 = AD Posting; D2 = Lead Generation D3 = Search Engine Optimization D4 = Telemarketing.

E: Software Development and Technology
E1 = Data Science; E2 = Game Development; E3 = Mobile Development; E4 = QA And Testing; E5 = Server Maintenance; E6 = Web Development; E7 = Web Scraping

F: Writing and Translation
F1 = Academic Writing; F2 = Article Writing; F3 = Copy Writing; F4 = Creative Writing; F5 = Technical Writing; F6 = Translation

Table C: Online Labour Index (OLI): African countries

S/N.	Countries	Occupation Share	Index
1.	Algeria	Creative and Multimedia	0.56
2.	Angola	Software Development and Technology	0.84
3.	Benin	Clerical and Data Entry	0.48
4.	Botswana	Creative and Multimedia	0.50
5.	Burkina Faso	Writing and Translation	0.54
6.	Burundi	Creative and Multimedia	0.99
7.	Cameroon	Software Development and Technology	0.53
8.	Capeverde	Software Development and Technology	0.82
9	Central Africa Republic	-	-
10.	Chad	Software Development and Technology	0.91
11.	Comoros	-	-
12.	Congo (Demo)	Software Development and Technology	0.65
13.	Congo (Rep)	-	-
14.	Cote Divoire	Software Development and Technology	0.61
15.	Djibouti	Wring and Translation	0.85
16.	Egypt	Creative and Multimedia	0.52
17.	Equatorial Guinea	-	-
18.	Eritrea	Writing and Translation	0.44

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S/N.	Countries	Occupation Share	Index
19.	Eswantini	-	-
20.	Ethiopia	Software Development and Technology	0.48
21.	Gabon	Creative and Multimedia	0.89
22.	Gambia	Sales and Marketing Support	0.58
23.	Ghana	Creative and Multimedia	0.36
24.	Guinea	Sales and Marketing Support	1.00
25.	Guinea Bissau	-	-
26.	Kenya	Writing and Translation	.0.69
27.	Lesotho	Creative and Multimedia	0.98
28.	Liberia	Writing and Translation	0.80
29.	Libya	Creative and Multimedia	0.78
30.	Madagascar	Creative Nd Multimedia	0.35
31.	Malawi	Software Development Technology	0.80
32.	Mali	Creative and Multimedia	0.98
33.	Mauritania	Writing and Translation	0.37
34.	Mauritius	Writing and Translation	0.82
35.	Morocco	Creative and Multimedia	0.41
36.	Mozambique	Software Development /Technology	0.52
37.	Namibia	Creative and Multimedia	0.28
38.	Niger	Software Development and Technology	0.84
39.	Nigeria	Writing and Translation	0.26
40.	Rwanda	Creative and Multimedia	0.38
41.	Sao Tome And Principe	-	-
42.	Senegal	Creative and Multimedia	0.94
43.	Seychelles	Creative and Multimedia	0.51
44.	Sierra Leone	Software Development and Technology	0.94
45.	Somalia	Professional Services	0.45
46.	South Africa	Creative and Multimedia	0.34
47.	South Sudan	Software Development and Technology	0.76
48.	Sudan	Software Development / Technology	0.65
49.	Tanzania	Sales and Marketing Support	0.30
50.	Togo	Software Development/Technology	0.96
51.	Tunisia	Creative and Multimedia	0.40
52.	Uganda	Software Technology Development	0.22
53.	Zambia	Creative and Multimedia	0.85
54.	Zimbabwe	Software Technology7 Development	0.757

APPENDIX 3

Artificial Intelligence Applications: Productivity Tools

S/N.	Topologies	Characteristics	Application areas
(1)	FLAIR AI	A Natural language pressing tool that offers a friendly interface for researcher and practitioners	An open-source tool that packs amazing features and fixes such as prototyping design system optimization, integration with other tools as well as work flow automation.
(2)	Auto draw	An artificial intelligence supported design and drawing dashboard which does not need prior knowledge or drawing skills to use the tool in other to simplify the process of creating images, AI design engine processes the work.	Several application features such as multimedia functionality, intuitive user interface as well as AI driven guessing.
(3)	IOWEB	Website builder created with AI assistant. It provides hosting services for World Press Websites that are AI powered by Google cloud.	Optimizes website with pages peed Booster to receive high speed score and improved website performance.
(4)	AKKIO	An automated machine learning tool that facilitates rapid development of AI models by developers	It facilitates rapid development, training and deployment of machine learning model without need for users to write code. It includes several capabilities such as the ability to quickly generate dashboard, report and generative visualizations.
(5)	REPLIT	Cloud-bused platform for software creation that enables programmers to use the power of AI to create websites from anywhere on any device	By making suggestions and automating repetitive processes REPLIT AI ASSISTANT enables engineers to produce better code more quickly. It also has the capacity to quickly generate reports and visualizations.
(6)	.DEEPCOD	An AI driven code review tools and software startup to improve developers coding by making suggestions and automating tedious activities	Using deep code platform and without generating codes, customers can ask questions, change their code and obtain insights quickly.
(7)	CONTENT EDGE	Assist in creating long-form website content that is mainly centered on marketing copy written to convert.	Using the GPT-3 language model to generate human text that truly interest readers as well as helping to elevate content MK strategy by writing website copy deal for audience and niche.
(8)	COPY AI	Copywriting tool that produces excellent marketing content for businesses. It uses machine learning to produce a variety of content types such as emails, social media posts, web copy blog headlines, etc.	Offers a variety of capabilities such as generative artificial intelligence which enables users to work more quickly and intelligently.

S/N.	Topologies	Characteristics	Application areas
(9)	MUTINY	Assist marketers in turning their top-of-funnel demand into income without need for programmers. It provides on AI web conversion platform that may assist in attracting and converting more B2B visitors to your website.	It employs-pre-built data connectors to categorize users based on their web activity, organization size, industry and funnel stage.
(10)	LAVENDER	An email coaching site that we can use to write effective emails father. It works by combining broad learning or email data with behavioural psychology	It is made of three main components which include an email coaching portal, personal assistant and email intelligence. Automatically, generate insights to work with ongoing email thread.
(11)	WARMER	AI powered innovate email writing tool that can help you generate productive emails and get replies in no time.	Sales person can site appealing emails for outreach and ameliorate their communication skills for better results
(12)	OCTANE	AI-powered platform that provides data collection, engagement quizzes, SMS automation and personalized Facebook messenger.	Octane tool is used by merchants to convert, connect and retain current customers by personalizing the customers journey and giving them confidence to purchase.
(13)	KAIZON	AI powered platform that offers insights and crucial steps to support client success as well as assisting businesses in keeping and expanding client base.	It provides a browser-based plug in that allows for effortless CRM system integration as well as integrates with sales force, service \now, MS Dynamics and other systems.
(14)	TASKADE	An AI-automation productivity tool that combines several potent features to boost team collaboration and productivity.	Automate activities; create dynamic work flows; create mind maps for brainstorming; communicate with AI assistant as well as visualizing notes and documents using the start-up.
(15)	TLVD	An AI automated meeting recorder that summarizes and translate calls with team members, clients and prospects. Technically, it includes capabilities like automatic call recording and transcription for zoom and Google meet, high – quality videos will audio capture as well as access to recordings	Operationally, With Speaker Recognition, The AI Meeting Transcription Function from TLVD can digitally record meetings in various different languages. And using TLDS's AI meeting note taker, one can quickly and easily search every word at any meeting, timestamp important meeting moments as well as summarizing important moments.
(16)	NOTION AI	A productivity and note taking tool that provides administrative capabilities including bookmarking, task management project monitoring, etc. Technically, it provides more offline function that is available as app on Android, MACOS, WINDOWS and IOS.	Operationally, numerous capabilities available includes text creation, automation of routine operations, as well as creation of fresh materials for linked workspace.