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Technology and Increasing Unemployment Rate in Ghana: The Focus on the Packaging Industry

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Abstract
An experiential survey shows the dawn of technology is driving many workers out of jobs in the packaging industry. The research seeks to examine the unemployment rate with the advent of technology and to assess the effects of technology on the Packaging Industry in Ghana. The study's main goal was to identify the effects of technology in the Packaging Industry, hence the needed solutions to the effects that will be evident from the study's findings. An in-depth literature review from various authors has been discussed. For this study, the Research Design employed were the qualitative and quantitative approaches to gather comprehensive views and experiences from respondents for a better understanding of technology and unemployment issues in the Packaging Industry. The methodology engaged for the study included using questionnaires and interviews to reveal significant findings from respective respondents in the Packaging Industry for practical analysis of the study. Through non-probability purpose sampling, an aggregate of 27 respondents to the study comprising 21 package design graduate workers and 6 Packaging Industry managers were selected. Consequently, the researchers' findings revealed that technology had rendered jobless some employable package design graduates in the packaging industry. It is apparent that most companies currently prefer working with a few packaging design workers to achieve more than otherwise considering the current economic hardship and the benefits technology offers the packaging industry.
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1.0 Introduction

In the 21st century, technology drives many economies at a faster rate. In many countries, technology has become the fuel for driving several economic activities to a higher level. Modern technology has become part of daily activities and is used to enhance production in many sectors of Ghana's economy. Many industries are embracing new technology for efficiency expediency. This includes the Packaging Design Industry which falls directly under the Graphic Design profession in Ghana. The influence of technology in the Graphic Design industry such as Printing, Advertising, Photography, Multimedia, Packaging and others, is enormous. “In the Graphic Design Industry, technology has made communication more accessible and effective compared to the era when technology was not so advanced”, (Al-Qudah, & Al Shari, 2020). For the past two decades, most Packaging design companies in Ghana have adopted new Packaging trends to provide better practices and services for their clients. Technology is one of the indispensable factors used for efficiency and effective delivery in today's world (Ghavifekr & Rosdy, 2015). It affects all spheres of life, such as the Medical fields, Academia, Trade and Commerce, Automotive Industry, Engineering, Entertainment, Tourism and others. The whole world may halt if technology is non-existence.

According to the European Commission (2021), a subsidiary of YouTube, technological advancement is the loss of jobs caused by technological change. Such change typically includes the introduction of labour-saving mechanical muscle such as automated machines. Just as vehicles came to replace the jobs of helpful animals such as donkeys and horses, technology has also replaced many aspects in the packaging industry. Some schools of thought assert that when it comes to employment, one needs to justify inclusion by striving to be the best in their areas of specialisation. According to Gregory M. et al. (2001), technology favours high-skilled workers. This was supported by Canova et al. (2007), who claim that technology increases unemployment, especially for those whose skills cannot meet the current job market requirements. The assertions propounded by these authorities, Gregory M. et al. and Canova et al., indicate that the unemployment rate will be on the ascendency in

all fields of endeavour, and the Packaging Design Industry is no exception.

The Packaging Industry in Ghana needs much assistance from the Ghana government to boost the local industry's efforts and thereby reducing the importation of finished packages into the country. Government supports will indirectly and directly enable the managers of the packaging industry to employ more packaging design graduates. Package designers have acquired the necessary skills and competencies from their respective universities yet are not finding jobs. Packaging Industry players are reluctant to employ more workers because of the constraints in Ghana's economy with high taxes, tariffs, transportation, levies and many others.

In Ghana, the Packaging Industry includes Packaging Officers, Packaging Designers, Quality Control Managers and Supervising Officers. In the western world, the dynamic and structured team in the packaging industry is quite different. According to Oladumiye (2018), due to the emergence of new technologies in the Packaging Industry, the following team members (Multidisciplinary design teams, Graphic Designers, information system designers, intelligent product distributors, packagers, intelligent product owners, advertisers, other tools and services, databases, web, and mobile access devices) could be employed to function efficiently and effectively. The industry also designs and produces packages with accessories to contain various products. Finally, the industry also designs and makes packages to communicate to the consuming public. The Packaging Industry, among other things, makes various packages with different materials (rubber, metals, glasses, wood, paper, leather, plastics etc.) to protect objects, items, valuables, products and others. With respect to the Packaging Industry, the researchers define parking as the safety applications to products; packaging, on the other hand, refers to "the attraction of customers to a product" (Pahwa, 2022).

According to Santarelli (2013), "The packaging chain is cross–functional in the industry". "The three levels of packaging include primary, secondary and tertiary. Although all three levels, in most cases, are integrated to achieve similar purposes, each level is crucial for safety and does not incur any cost. In all these levels of packaging, especially in the 21st century, technology is massively involved" (Levins & Benjamin, 2018). It could mean that if workers in this industry are technologically handicapped and lack the needed skills and competencies to function effectively, they could be laid off by their employees. Against this background, the researchers deemed it right to investigate and unearth the seeming trends associated with unemployment due to the advent of technology in the industry.

Numerous studies have been conducted on unemployment in Ghana and perhaps little in the packaging industry. The sporadic studies conducted underscored unemployment in other sectors of the economy. Nevertheless, not much pragmatic studies have been carried out on how technology is increasing unemployment in the Packaging Industry in Ghana. Hence, this research seeks to examine the Unemployment rate with the advent of technology in the packaging industry in Ghana and assesses the effects of technology on the Packaging Industry in Ghana.

Research Objectives

(a) To examine the unemployment rate with the advent of technology in the Packaging Industry in Ghana.
(b) To assess the effects of technology on the Packaging Industry in Ghana.

2.0 Literature Review

The Theoretical Context of Unemployment is vital to the study. The researchers adopted the theory of Structural Unemployment by Keynesians economic (Investopedia, 2022). Regrettably, there are several types of unemployment, with different theories elucidating the reasons behind the prevalence of unemployment in the Packaging Industry in Ghana's economy. This paper considers the theories of Unemployment by Keynesian economies. The theory asserts that voluntary and involuntary are types of Unemployment in some economies today. More so, other types of unemployment include Structural Unemployment, Frictional Unemployment and Cyclical Unemployment.

The Structural Unemployment Theoretical Framework is appropriate for this study. According to Keynesians economics (Investopedia, 2022), Structural Unemployment arises from the inability of the labour market to provide jobs for every member of the workforce. A mismatch of skills of the unemployed individuals and the skills required for specific jobs, or because of technological advancements. As a result, machines or their skills replace people who have become outdated because of their inability to keep up with the latest trends (Investopedia, 2022). The latter of this theory is crucial due to its content directly linked to the study. The packaging industry is filled with technological advancement-related issues. Therefore, managers and package design workers, in one way or the other, are affected in terms of massive production output in the industry due to austere challenges.

2.1 Definition of Technology

"When people think of 'Technology', they tend to think of human artefacts such as machines, electronic devices, scientific hardware, or industrial manufacturing systems. However, a formal definition (College Dictionary) of

technology indicates that it has a more general meaning which includes any "practical application of knowledge" or "manner of accomplishing a task". (Aytekin -İŞMAN, 2012).

In the view of Javed (2020), "technology can best be defined as the study and transformation of techniques, tools, and machines created by humans. Technology allows humans to study and evolve the physical elements in their lives". Moreover, the author accentuated the importance of technology as, "bringing skills, knowledge, process, technique and tools together to solve the problems of humans, making their lives secure and easier". Finally, Javed (2020) opines that, "technology is driving the world and making it better". To the researchers, without technology in the Packaging Industry in Ghana, the industry would have remained stagnant, and the means of rendering package designs and the skill of packaging items, products, and services would have also not seen any facelift and massive, sustained improvement.

"Technology is a body of knowledge devoted to creating tools, processing actions and the extracting of materials" (Sprando, 2018). In the words of Lane (2019), "Technology concerns itself with understanding how knowledge is creatively applied to organised tasks involving people and machines that meet sustainable goals". For the purpose of this paper, Industrial technology definition is crucial. "Industrial Technology is the set of knowledge (principles, tools, devices, etc.) from various areas applied to the industrial sector to make production more effective, faster, efficient, and productive" (Wikipedia, 2022).

2.2 Unemployment rate in Ghana

Unemployment is a problematic issue globally affecting a large population of the working labour force, mainly comprising the youth, especially in Africa, where Ghana is not an exception (Tornyezuku 2017)**.** Unemployment is, amongst other things, a serious labour market challenge in Ghana. The International Labour Organisation (ILO, 2018) defines the unemployed as persons or groups of working age who are ready and willing to work and have also attempted to obtain one but cannot find one within a specified time. It reveals the eagerness and aspiration of unemployed individuals to work and is a sign of the state of a country's economy.

In recent years, unemployment and its related issues have been given prime attention in the media. The issue has become alarming that there is now an Unemployed Graduates Association in Ghana. Several studies have been carried out to analyse the determinant of unemployment, using both time series and cross-sectional data. Different theoretical models have been proposed and used in analysing unemployment determinants. For example, Mortensen (1970) and Lippman and McCall (1976) used the job search model. This model showed that unemployment depended on "job offer and acceptance". Job offer or the ability to secure a job was a function of labour skills, education, work experience and demand conditions in the job-seeking environment. Other factors influencing unemployment were wages' inflexibility, trade unions' influence, and national labour laws (Acero, 1993).

Ghana's developmental performance has been remarkable since 1984, encouraging Leechor (1994) to express this sentiment, describing the country's economy as a leader in the economic reform process. In a related study by Baah Boateng (2013), he outlined that Ghana recorded about 5.2 per cent annual average growth between 1984 and 2010 and became a lower middle-income country after in its national accounts in 2006, which pushed the country's annual average growth to 8.5 per cent between 2006 and 2011. Around that time, Ghana's real GDP growth reached about 15.2 per cent when it began its commercial oil production in 2011. Despite this strong growth performance, employment generation remains a challenge. Ghana recorded a decline in employment elasticity of output from 0.64 in the 1990s to 0.4 during 2005–2008 (ILO, 2018).

In an article published about Ghana by Aaron O'Neill, he stipulated that in 2020, the unemployment rate in Ghana was approximately 4.50 per cent of the total labour force. The unemployment rate in Ghana increased to 4.51 per cent in 2020 from 4.10 per cent in 2019. O'Neil (2021) defined the unemployment rate as the percentage of a country's labour force without jobs but is available to work and actively seeking employment. He further specifies that, due to the nature of Ghana's economy and its population size of over 30 million people, Ghana's estimated GDP per capita amounts to just over 2,200 US dollars in 2018 and is forecast to rise continuously over the next few years. Almost half of the country's population works in the services sector and around 33% work in agriculture. The population is relatively young, with only around 3% of the total population aged 65 years or older.

Ghana continues to struggle with the high frequency of Unemployment and employment searches, particularly in its present times. Estimates from the 2010 Population and Housing Census indicate that 14 per cent of the country's working-age population was inactive outside the school system, while 633,994 people, representing 5.8 per cent of the labour force, were unemployed. Nonetheless, the 2020 population shows that the country's unemployment trend continues to rise. The figures from the 2020 census show that unemployment currently stands at 13.4%, up from 6% in 2010 (GSS, 2021).

According to Baah-Boateng (2015), unemployment as a result of the inability of individuals to obtain a job of their choice amid strong economic growth in Ghana suggests a weak employment rate or content of growth in the country. The inability of the unemployed to secure paying employment tends to create disaffection among

the unemployed. This may cause some who cannot exercise restraint, especially the teeming youth, to resort to social vices such as internet scams, robbery, prostitution, political unrest, online sports betting, stealing and so on.

Indeed, unemployment constitutes the underutilisation of human resources. Failure to prevent these resources from going to waste makes them vulnerable to poverty and a loss of potential income tax revenue to the nation, Baah-Boateng (2013). From the above assertions made by O'Neil and Baah-Boateng, respectively, the researchers defined unemployment as the untapped human resources wasted in a country's economy due to external or internal shocks beyond their control in all aspects of the labour professions amidst the world economic crisis.

2.3 Definition of Packaging

Soroka (1996) described packaging as a coordinated system of preparing goods for transport, distribution, storage, sale, and use. Lee & Lye (2003) also defined packaging as a science, art and technology artefact used to protect, preserve and identify products while facilitating handling, as well as helping successful commercialisation. Meyers and Lubliner (1998) look at packaging as "the technology and art of preparing a commodity for convenient transport, storage, and sale". Obeesi (2010) opines that packaging is an interface between the product and the consumer. Furthermore, Hanlon (1971) described packaging as any structure that contains or limits its content. Also, Hollins and Pugh (1990) defined packaging as "the art of preparing or making containers like boxes, metal can, bottles, wrappers, bags for storage or packaging of manufactured goods or products".

According to Paine (1981), Packaging is defined as a coordinated system of preparing goods for transport, distribution, storage, retailing and end-use. Here, the researchers allude that packaging encompasses an organised system that cuts across from the manufacturer to the end users or consumers. However, the European Federation (1994) defines packaging as all products made of materials to be used for the containment, protection, delivery and presentation of goods, from raw materials to processed goods. On the other hand, Klimchuk, & Krasovec (2013), “define packaging as a protective gear for goods from the manufacturing stage to the consumers' shelves”. As Lomartire et al. (2022) put it, “in the new dynamic fraternity of the 21st century, renewable, eco-friendly raw materials by and large are being used to replaced sustainable packaging of all kinds. Currently, smart packaging designs receive material usage far better as compared to those of the last three decades.” According to the new packaging innovation, materials include seaweed packaging, creating raw materials from waste, water-soluble packaging, 3D-printed packaging and cellulose-based materials. Paper used for cosmetics, moulded fibre printing, grass cardboard, plantable packaging, UV and EB curable Inks, packaging made from cow manure, biodegradable packaging, peanuts, oyster paper, corn plastics and others (Lomartire et al., 2022). The various definitions clearly display that there has been a departure from the old means of producing packages to technological methodology. In terms of the materials hitherto used have been enhanced in the industry over the last decade.

2.4 Effects of Technology on Jobs

According to Nakamura and Zeira (2018), the first time fear of mechanisation appeared was during the early days of the industrial revolution, in the rebellion of the Luddites in 1811-1817. There were mainly artisans who viewed in awe how the mills of the textile industry threatened their economic existence. They formed a resistance to mechanisation and were finally oppressed by a large British army sent to squelch this rebellion. Interestingly, the Luddites' famous machine-breaking was not their main activity. This issue occurred again during the 1920s, a period of rapid technological change. On February 26, 1928, Evan Clark, a reporter in the New York Times, published an article titled "March of the Machine Makes Idle Hands."

In this article, Clark claimed: "It begins to look if machines had come into conflict with men – the onward march of machines into every corner of our industrial life had driven men out of the factory, into the ranks of the unemployed." Recently, the issue came up again to public attention following the financial crisis of 2008 and the great recession that followed it. We live in a rapid technological change, mainly in computers, information technology (IT), robots and artificial intelligence (AI). Workers find it hard to adjust to this technological revolution, where the main effect is a significant widening of inequality.

According to Coovert & Thompson (2014b), technology can be used to enable or oppress people at work. It is fascinating to emphasise that the demands of the job markets are changing with time, and individuals need to adapt as they face off against the employment group. This has become imperative again because people are expected to upgrade their skills in whichever sphere of work they find themselves in. It suggests that the skills now demanded by employers do not match those of the existing labour force (ILO, 2020). This contention is reinforced by Keynesians theory of economics (Investopedia, 2022), “Structural Unemployment arises from the inability of the labour market to provide jobs for every member of the workforce. A mismatch of skills of the unemployed individuals and the skills required for specific jobs, or because of technological advancements.”

One reflection of this change is the simultaneous increase in job openings and unemployment relative to the

early 2000s (Elsby et al., 2010).

One explanation for this inconsistency is that advances in information and communications technology are destroying more jobs in developed economies than they are creating. Africa is not exempted from these job inconsistencies emanating from technological advancement. In short, technological progress eliminates the need for many jobs, leaving the typical worker worse off than before (Brynjolfsson & McAfee 2014, Rotman 2013).

2.5 Technology and Unemployment

Technology can be used to enable or oppress people at work (Coovert & Thompson 2014b). The effects of technology throughout human history are well documented (Beniger 1986, Bradley & Nolan 1998, Bradley et al. 2016). The growth and advancement of civilisation can be divided into three eras according to their respective core technological infrastructure: the agricultural era, the industrial era, and the digital era. Each of these eras has been profoundly affected by the ability to acquire new information and knowledge.

The Oxford Dictionary of Economics defines technological unemployment as "Unemployment due to technical progress. This applies to particular types of workers whose skill is made redundant because of changes in production methods, usually by substituting machines for their services. Technical progress does not necessarily lead to a rise in overall unemployment," (Black 2012, 405).

Unemployment related to technological advancement can be seen globally at various levels of the working sphere: at the degree of individual entertainers, organisations, productive areas, nations, or the worldwide economy. As workers adjust their skills and entrepreneurs create opportunities based on new technologies, the number of jobs will rebound. At the same time, we believe that human ingenuity will create new jobs, industries, and ways to make a living. Just as it has been doing since the Industrial Revolution (Mabry & Sharplin 1986, Smith & Anderson 2014; see also Bessen 2015 and Stiglitz & Greenwald 2014).

Humans will continue to enjoy a strong comparative advantage over machines in engaging and inspiring people to move in the same direction, empathising with customers, and developing talent. As one observer noted, "I have still never seen a piece of technology that could negotiate effectively, or motivate and lead a team, or figure out what is going on in a rich social situation, or get people to move in the direction you want" (McAfee, quoted in Kirkland 2014). In short, no computer will ever manage by walking around, but inspirational leadership will always be in demand.

2.6 The Effects of Technology on the Packaging Industry in Ghana

The Packaging Industry in Ghana comprises small, medium and large-scale companies with various specialties such as making raw materials, making packages, and designing packages. Packages in Ghana are mostly made from paper, cardboard, etc. Technology in the Packaging Industry in Ghana has resulted in Unemployment for Ghanaians. In recent times, due to the lack of raw materials and expertise in Packaging Technology, most raw materials for Packaging and Packages are imported for use in Ghana. For example, the Crown Cans Ghana Company supplies imported aerosol packaging, beverage packing, food packaging, metal closures and specialty packaging products from industrialised countries to consumers in Ghana. Driving the cost of packaging very high and depriving Ghanaians of employment opportunities. This is also because a locally owned packaging company such as the Aboso Glass Factory, which used to produce glass for packaging, collapsed for many decades. Hence, the glass has to be imported for packaging.

Examples of the role of technology in driving Unemployment in Ghana are due to several reasons, including the lack of raw materials, lack of technical expertise, lack of quality in made-in-Ghana products and timely delivery of products. According to Dean Du Toit (2019), CEO of uniPrecision Printing and Packaging Company Ltd, though the packaging sector in Ghana is very competitive, growing very fast and consumer-driven, their packages are mostly imported from India and the Middle East. He further explained that the challenge they face is raw materials; there are no raw materials in Ghana, so they must import from other countries to keep their businesses going. This practice implies that while we are growing other economies and creating jobs for them by importing packages from them, we are reducing job opportunities for Ghanaians and preventing the growth of our economy. In this situation, the researchers would like to know what the Government of Ghana can do to cushion the Package Design Industry regarding financial assistance and technical expertise to grow our own and thus reduce the importation of raw materials.

Besides the lack of raw materials in Ghana, labour is also an issue regarding local packaging manufacturing. Ideally, employing Ghanaians to operate these machines would have been cost-effective. Unfortunately, the expertise is not readily available in Ghana, and employing other nationals to work on the machines in Ghana also comes with a considerable cost. To prevent this and create employment for Ghanaians, institutions in Ghana need to collaborate with industries to ascertain their challenges and develop pragmatic solutions like training and investing in experts for the packaging industry to reduce production costs and create employment, especially for the youth. This is driving the importation of already-made packages for sale in Ghana.

Another challenge resulting in unemployment in the Packaging Industry in Ghana is the quality and

consistency of the packages. Due to technology, imported packages come with very high precision and quality, unlike our locally hand-made packages. Even those packages and labels executed with machines locally sometimes have challenges with the finishes. As a result of this, most large food and beverage companies, particularly multinationals, import packages since Ghanaians have a taste for quality products. To focus on quality, the Packaging Industry needs to ensure that they have the right resources from a human capital perspective and also from an equipment perspective. The human capital aspect is critical as machinery used in the multinational Packaging Industry in Ghana has very advanced technology and uses Flexo Printing which many Ghanaian-owned industries cannot afford. Since most local industries do not have the expertise, their only option is to source already-made packages from abroad. Many Ghanaian consumers buy into this easily because they are persuaded by what they see on the markets.

There is also the problem of timely delivery of packages from Ghanaian Packaging companies compared to the timely delivery of packages by their foreign counterparts, thus creating jobs for other nations while crippling job opportunities in Ghana.

2.7 The Positive Effects of Technology on Jobs in the Packaging Industry

Printing Technology increases productivity, reduces workers' burdens, and eliminates the burden of doing repetitive tasks. For this, workers need to learn some skills to stay employed. Workers should be given training for the newly created jobs. If the government takes care of the reskilling of low-skilled workers, we can take advantage of the impact of technology on jobs. Due to technology, demand for technically skilled youth is increasing, and hence more jobs are available for educated youth. There is the need, therefore, to train technically skilled youth to meet this demand. Technical universities should be retooled to take up this challenge. This can help resolve the problem of educated unemployment to some extent. It is worth noting that due to our ailing economy, managers of the various Packaging Industry are reluctant to expand by employing more skilled package design graduates into their industry.

As a result, the number of unemployed Graphic Design graduates specialising in Packaging skills keeps growing, hence a threat to national security. Technology helps in the growth of an economy. Companies that use technology will save money by replacing human labour with technological innovations, expanding their services and creating more jobs. More employees will be added to the economy, and more revenue by taxes will go to the government, hence economic growth. The government can utilise this economic growth to create more employment opportunities with better pay for its citizens. Till now, jobs with better pay are concentrated in urban areas where access to employment has become increasingly difficult. Technologies can create large-scale jobs in rural areas and address the issues of rural unemployment and migration to cities (Flora et. al, 2018).

2.8 The Negative Effects of Technology on Jobs in the Packaging Industry

The immediate result of new technologies will be job losses because some jobs will become redundant. Machines and automation are replacing low-skilled workers. If any company does not replace human labour with technology, it is susceptible to losses due to heavy competition from other companies which use technology. Therefore, it is inevitable for companies to catch up with the technologies. In this process, low-skilled workers will be the first to be removed from their jobs. As a consequence of that, income inequalities are further widening. "In short, technological progress is eliminating the need for many types of jobs, and leaving the typical worker worse off than before" (Brynjolfsson & McAfee 2014, and Rotman 2013).

Presently, in the view of the researchers, some skilled professions are going through some challenges due to the advent of new technologies. This can reduce the employment opportunities available for technically skilled persons just like those in the Packaging Industry. Technology apart from varying the nature of jobs also has come with a lot of positives. Even though some jobs will become redundant, technological advancement has the potential to create many more employment opportunities than it eliminated. From the data above, it is obvious that technology is gradually kicking many young graduates to lose their jobs or making them jobless by some Packaging industry managers.

3.0 Methodology

The study employed a case study approach with a combination of the relevant aspects of quantitative and qualitative research to gather comprehensive views and experiences from respondents. The face-to-face structured interview was used in terms of the research methods and approach. It targeted selected industry players and active graduate package design workers, and those who have lost their jobs in the packaging trade in collecting primary data for the study. The qualitative analysis took the form of interpreting specialised views and content analysis of interviews and documents. In contrast, the quantitative analysis took the form of descriptive statistics such as correlations, frequencies and percentages supported with relevant tables. The survey method was used to identify, evaluate, and adequately discuss the data collected to draw logical conclusions. According to Chadwick (2017), a population consists of objects or events of a certain type about which researchers seek

knowledge or information. The population was divided into two main groups: Graduate workers in the Packaging Industry and managers of packaging firms. The researchers randomly selected a sample of 21 package design workers and 6 managers in the Packaging Industry respectively, to represent the total population of 27 respondents to yield efficient and quality information. The raw data collected from the participants were edited and cleaned by checking for any inconsistencies. Pre-coding was already done for the closed-ended questions, whereas coding for the open-ended questions was done after data collection. The coded data were then entered into spreadsheets and analysed systematically using the Statistical Package for Social Sciences (SPSS). Also, the small number of questionnaires was analysed manually by counting. Ethical issues were dealt with accordingly with all respondents associated with the study.

4.1 Results and Discussion of Findings

This section presents analysis and findings for the study's objectives; to examine the unemployment rate with the advent of technology in the Packaging Industry and to assess the effects of technology on the Packaging Industry in Ghana with a focus on those situated in Greater Accra.

4.2 Presentation of Findings

The study's findings were based on the interviews and questionnaires administered to the workers/managers of the selected Package Industry and unemployed graduates in the sector. The findings of the study have been presented in two folds as regards the set objectives. (a) To examine the unemployment rate with the advent of technology in the Packaging Industry in Ghana and (b) To assess the effects of new technology and concepts on the Packaging Industry in Ghana.

To examine possible reasons for the increasing unemployment in the Packaging industry and the effect this has on Ghana's economy, 21 respondents were interviewed, including managers and packaging workers in the industry. Two broad themes which were supported by relevant quotations from the transcribed arduous interviews, emerged from the analysis of the interview data. They included graduates with packaging competencies losing their jobs due to technology and managers reluctant to employ more graduates with packaging competencies. These two major thematic areas are all related to respondents' perceptions and experiences of technology in the Packaging Industry.

4.3 Objective 1: To examine the unemployment rate with the advent of technology in the Packaging Industry in Ghana

4.3.1 Graduates with packaging competencies lose their jobs as a result of technology. Package design workers were very concerned about the advent of technology pushing them out of jobs. They bemoaned in some cases, managers did not assist them. Below is the thematic area of discussions held with respondents. It must be emphasised that the managers and selected graduate workers agreed to be interviewed on condition of anonymity.

Table 1: Quotes relating to why graduate workers with Packaging skills are losing their jobs as result of technology in the industry

Graduates	Illustrative Quotes
HND 1	"I worked for a Packaging company for 5 years and acquired experience. The Manager procured new machines with modern technology that print on various substrates and do the folding simultaneously. He gave me a dismissal letter after 2 months. That is why I lost my job".
BTECH 4	"The company acquired a new space in an industrial hub. It expanded its operations with ultra-modern state-of-the-art 21st-century technology and relocated. I was excited. Just before we moved, the HR officer told the 4 of us that the company does not need our services in the new location".
BTECH 1	"I got sick and went on leave for treatment for a while. I lost my job. When I returned, the manager employed someone with better skills and experience to operate machines''.
BTECH 2	"Due to the fast pace of technology in the packaging sector, I took leave to upgrade my skills and knowledge at the master's level. Three (3) years later, when I came back to the same company, the manager said he couldn't pay me the new salary I'm asking from the management".

Graduates	Illustrative Quotes
HND 2	At a meeting, an acting manager told us that things are becoming difficult to manage in the company, therefore soon some of us will be asked to leave the job. Truly, after a fortnight, we were handed dismissal letters without any compensation.
BTECH 3	"The manager of the company held a meeting with us. He realised that some of his clients were moving to other Packaging firms with high technology to get their numerous jobs done for them in no time. He can't access the bank's very high interest-rate of credit facility. More so, due to the country's economic hardship, he will lay off some workers. Unfortunately, I was one of those the company dismissed. To date, I am yet to find another job."

Source: Authors' fieldwork (2022)

One major point that runs through all the quotes is technology and its associated matters. The above quotes from respective respondents suggest that it is not all well with most packaging design workers in the Packaging industry. However, it is evident from respondent (HND 1) that it was due to his low level of understanding of the technology involved in the new machine that made him lose his job. The researchers believe this could have been dealt with if management of the company had taken it further by allowing the said workers to undergo some training. The evidence from the 2nd respondent (BTECH 4) indicates that he might have also had a low level of technological skills to operate the new machines acquired by the company in the new premises. Hence, the need to search for others with high competencies. If they do not get new jobs immediately, they increase unemployment. The occurrence is not good for a developing country like Ghana in the current economic predicament.

As regards the statement from the 3rd respondent (BTECH 1), it was obvious that the competency level of this respondent was quite low. Again, it could also mean that the management of that company wanted to replace him. When the opportunity came, they did so without hesitation. Due to the ailing economic environment, managers of the packaging industry are facing serious hardships in accessing credit facilities from the banks. Those who can have to pay a very high-interest rate. This is a disturbing phenomenon to the managers of the packaging industry.

The data from the 4th respondent (BTECH 2) is interesting. It was expected that after the respondent had upgraded himself, it should go with improved remuneration. Unfortunately, this did not happen. This indicates that even after the improved level of skills, the company, perhaps due to economic hardship, could not afford to retain that staff. It implies that if any other company do not absorb him or his family does not support him in setting up his own entrepreneurship, he will likely add up to the unemployment rate in the sector.

The assertion by (HND 2) is similar to the previous ones outlined earlier. It goes a long to affect the psychological thinking and morals of such packaging design workers in the industry. Even if they acquire a new job, their confidence level could be down because they do not know what will happen in the new job. A development which also increases unemployment in the country. An indication the unemployment in the country will rise and perhaps creates insecurity in the country soon. All stakeholders must expeditiously address this.

The response from BTECH 3 is fascinating. The respondent's affirmation reveals that the challenges faced by packaging managers in the industry are enormous. This means that if the said manager lays off some staff, it means a high unemployment rate. The defined views from the packaging design workers on the subject matter indicate more needs to be done by the stakeholders. Nonetheless, the researchers believe the current occurrences in the packaging industry may be peradventure similar to other industries.

Table 2: Quotes relating to why Managers are reluctant to employ more graduates with packaging design competencies

Managers	Illustrative Quotes
MG 1	"I have modern Packaging equipment with technology. Yes, the workers I laid off were good but I had to due to regular power cuts, exorbitant electricity tariffs and high cost of other operational inputs".
MG 2	"Three staff resigned unexpectedly within two months. Later, I learnt they have joined a new Packaging firm with improved technology".
MG 3	"High cost of operational logistics are impeding my ability to employ more hands into the business. Hence, my inability to employ more graduates to expand the business".
MG 4	"High cost of Preventive Maintenance, Loan repayment and Credit facility of printing inputs from suppliers "
MG 5	"Currently, I have ordered new machines from abroad with high tech. But I doubt, I will employ more skilled package design workers in the sector to augment the staff, I have now. Due to high cost of the equipment and its sophisticated nature and its ability to perform the tasks of 3 workers at the same time. I'm thinking of sacking some workers when they arrive and are installed here".
MG 6	"Yes, I agreed we needed to go digital. About 90% of our production needs to catch up with technology trends in the Industry. But wait! Unless Government intervenes by reducing high cost of doing business like oursin the country I can't employ more. Never!

Source: Authors' fieldwork (2022)

On the issue of why managers are unwilling to recruit more Packaging Design graduates, evidence from the studies suggests the economic situation of Ghana is contributing to more managers being unable to employ packaging design workers with competencies. This is evident in the following discussions.

The response from MG1 in Table 2 buttresses the point that all is not well with managers of Packaging Industry in Ghana. They are faced with numerous challenges. According to a manager, an indication they as managers of the industry, are trying their best to meet technology era, but hardships of the economy thwart their efforts. He lamented high electricity bills and constant power cuts which affect their productions, high expenditure coupled with high fuel cost, low-profit margins and sometimes cannot even break even on their productions. Ultimately, it will not help them maintain their employees or expand their operations to employ more package design workers.

An opinion by MG 2 reiterates the need for managers in the packaging design industry to abreast themselves with the trending technology era to maintain and possibly win more customers into their folds. The competition with technological advancement in designing, producing, manufacturing and printing graphic design content cannot be left off the hook or over-emphasised. The rift between unemployment and technology is evident from the strife by MG 2; hence, the gap between them keeps widening. Besides, this avowal further indicates that these packaging design graduates are willing to work with modern technology than restrict themselves to archaic ones.

Again, just like MG1's assertion, the response by MG3 is similar. The high cost of operational logistics to run the packaging industry pertains to managers in the other industries of Ghana's economy. These challenges constrain managers not to expand and to recruit more workers. It is believed that the government cannot employ all graduates from various public and private universities yearly in the current global economic crisis. This also affects private partnerships to help government grow the economy.

From MG4, it is also evident that some managers of the packaging industry are facing other constraints hence hampering them from expanding their businesses. As these managers lament the various high operational costs, it presupposes that they are running their business with a limited budget. The cost of inputs for the packaging industry is on the ascendency, coupled with expensive modern packaging machines, considering the present interest rate by the Bank of Ghana (BoG) being 26%, perhaps the highest in the sub-region. The existing rate deters some managers from assessing credit to expand their businesses. Due to the high risks involved with the repayment, some banks are currently unwilling to lend to these individuals and firms, and those in the packaging sector. Some who defaulted on repayment consequently had to fold down their businesses. Therefore, unemployment is on the surge.

If the trend continues, security in the country will also be under threat. The data from MG5, which suggests

that he is considering dismissing some workers in his firm, is quite worrying. If he carries out this threat, it means that the number will add up to the unemployment rate in the country since they might not be able to engage themselves with new jobs readily available. A solution to the problem is for government to assist these managers with interventions that will make their operations flexible. Either way, if the interventions are not sustainable for years, their quests to employ more packaging design workers will be a mirage. Thus, the unemployment rate in the sector will soar.

The response from MG6 is characteristic of MG5. In other developed countries, governments support most private firms so that they, in turn, absorb graduates into the industries. When this happens, it reduces the pressure on government to find jobs for the teeming youth. In Ghana, however, the situation and narrative is different. The packaging industry and other industries suffer in many ways. Therefore, they cannot employ more hands in the industry and the limited ones available are compelled to lay off staff.

The responses from the managers and graduate package design workers show that there is a major problem regarding the packaging industry's unemployment; if nothing is done about it, the joblessness trend will keep rising in the coming months. The concerns are where will these workers get jobs, and when? How are they going to support themselves and their families? Will the government be interested in assisting them with some finances to begin entrepreneurship and the like? These and other questions need to be addressed by the key stakeholders and government to assist packaging industry in expanding.

4.4 Objective 2: To assess the effects of technology on the Packaging Industry in Ghana

The evidence gathered from respondents in Tables 3 to 4 are summarised below based on the questionnaire sent. A total of 15(71%) males and 6 (29%) females participated in the study as far as the graduate package design workers of the Packaging Industry are concerned. This indicates that the sector is dominated by males, 71% by managers and the workforce. Regarding the educational background of the respondents in the study, 12 (57%) were trained at the then Polytechnic. In comparison, 6 (29%) had training from traditional Universities, whereas 3 (14%) had training from other sources related to Packaging Design. Data from the respondents chronicles their respective positions and roles in the firms in the 6 packaging firms captured in the study. They included Packaging officers 10(48%) responsible for ensuring that the products are well packaged for consumer use. Packaging Designers 6(28%) are responsible for designing for prints. Quality Control Managers 2 (10%) accountable for ensuring that all products that go to suppliers for packaging of products unto the markets are fit for consumers. On the other hand, supervisors 3(14%) are responsible for ensuring that the client's specifications are met accordingly. Thus, critical to maintain good relationships with clients constantly.

Table 5: How knowledgeable are you as regards the usage of technology in your packaging industry?

Responses	Frequency	Percentage (%)
Not at all	3	14
Averagely Knowledgeable	10	48
Very Knowledgeable	8	38
Total	**21**	**100**

Source: Authors' fieldwork (2022)

Evidence from Table 5 shows that 3 (14%) of the graduate workers affirmed that they do not know any technology in the packaging industry. On the other hand, 10 (48%) acknowledge being averagely knowledgeable in technology related to packaging accessories in the firm they work for. Moreover, 8 (38%) admitted being very knowledgeable about technology and its associated matters as regards the packaging industry. A quick look at the feedback from the respondents indicates that more than half of them are knowledgeable about the technology related issues in the packaging industry. This is encouraging in an industry grappling with challenges in terms of operational costs, default in repayment of loans, with no government subvention or subsidised raw materials imported for operations, and many others.

Table 6: How is your company coping with the new trends of technology in the Packaging Industry?

Responses	Frequency	Percentage (%)
By upgrading machines and training our Operators	8	38
Employing package design workers, when necessary, in our daily activities	4	19
In-service training is organised for us periodically but not on regular basis.	6	29
The company has employed IT specialist to help its staff to cope with the new trends as regards technology	3	14
Total	**21**	**100**

Source: Authors' fieldwork (2022)

The assertions by the respondents indicate that there are efforts by the managers of the packaging industry to embrace technology-related issues to run their businesses. Table 6 shows that 8 (38%) of the respondents can be achieved this by upgrading the machines and training their machine operators. More so, 4 (19%) believe it can be achieved by package design workers when necessary in day-to-day activities. Again, 6 (29%) believed that it could be achieved by introducing or taking them through in-service training organised for them periodically. Again, 3 (14%) believed that their companies had employed IT specialists to help their staff to cope with the new trends in technology-related issues in the industry. Indeed, an attempt to adjust to the new dynamics results from the trends globally in all professions.

Table 7: What is the fate of those who cannot use technology in the Packaging Industry?

Response	Frequency	Percentage (%)
Make sure the people are abreast with the changes happening in the industry	1	17
They are to be trained in the new Technology	1	17
They will lose their jobs	4	66
Total	**6**	**100**

Source: Authors' fieldwork (2022)

Evidence from Table 7 indicates that 1 (17%) stated workers are to get themselves abreast with the new technologies immerging in the industry. Similarly, 1 (17%) articulated the workers should be trained in the new technologies to keep them well-informed with the industry's current technological issues. In addition, 4 (66%) detailed that workers will lose their jobs if they do not embrace the new technology through training. It implies regardless of the competencies, experiences and levels of education if the graduate package design workers do not get abreast with the current trends in the industry, they will be rendered unemployed. This statement is supported by Coovert & Thompson (2014b), "Technology can be used to enable or to oppress people at work. It is fascinating to emphasise that demands of the job markets are changing with time, and individuals need to adapt quickly, lest they face off the employment group". More so, reinforced by the theory of Keynesians economics (Investopedia, 2022), "As a result, machines or their skills replace people who have become outdated because of their inability to keep up with the latest trends."

Table 8: Has technology caused unemployment in your industry?

Response	Frequency	Percentage (%)
Yes	18	86
No	3	14
Total	**21**	**100**

Source: Authors' fieldwork (2022)

Data in Table 8 above shows interesting feedback from respondents. As high as 17 (81%) conceded that technology had caused unemployment in the packaging industry, whereas 3 (14%) thought otherwise. The assertion is backed by Brynjolfsson & McAfee 2014, and Rotman 2013, "In short, technological progress is eliminating the need for many types of jobs, and leaving the typical worker worse off than before". It indicates the industry players should embrace themselves for more in the industry so far as technology is concerned. It behooves the industry players to ensure the workers are in tune with the new trends to maintain and if possibly recruit more workers into the industry. The trend keeps changing now and then. The present-day dynamics are

such that there is no way the archaic means of handling and working with machinery in the packaging industry will return.

Table 9: To what extent are workers affected with the influx of technology in the packaging industry as compared to manual production in the past?

Response	Frequency	Percentage (%)
It makes work easier	3	51
The company spends a lot training people on our new machine operations	1	16
To a greater extent	2	33
Total	**6**	**100**

Source: Authors' fieldwork (2022)

Evidence from Table 9 shows technology is improving operations in the packaging industry. As many as 3 (51%) admitted technology makes their work easier. In addition, 1 (16%) said that as regard technology, his company spends a lot of resources training staff on the newly acquired packaging machines and their operation. Additionally, 2 (33%) admitted that technology is helping their companies greatly. The trend is helping them to achieve a lot in the industry. However, they expressed fear they might not able to employ more graduates in the near future if the business environment keeps on to be unfriendly. Their production outputs have been very effective and efficient due to adoption of technology in their production lines. This claim is backed by, "Technology is one of the indispensable factors used for efficiency and effective delivery in today's world" (Ghavifekr & Rosdy, 2015).

Table 10: Mention some advantages or otherwise of technology in the packaging industry?

Response	Frequency	Percentage (%)
It helps us cut down cost	6	29
We are able to work faster and meet time lines	15	71
Total	**21**	**100**

Source: Authors' fieldwork (2022)

Data from Table 10 illustrates 6 (29%) said it helps them cut down costs, whereas 15 (71%) confirmed that they could work faster and meet deadlines. The assertion is upheld by, "Industrial Technology is the set of knowledge (principles, tools, devices, etc.) from various areas applied to the industrial sector to make production more effective, faster, efficient, and productive" (Wikipedia, 2022). The respondents' opinions signify that technology is positively impacting the packaging industry. It is an indication that the workers and managers are deriving better experiences from technology regarding work-related issues in the packaging industry. These revelations are positive indications for the industry and should be sustained. But the sustainability cannot happen if the government does not assist the stakeholders in the packaging industry. For example, the government can reduce taxes on the raw materials managers import, scrap nuisance levies and reduce electricity and water tariffs for the industry. These and others will go a long way to cushion managers to positively make use of the new technology abound in the industry for optimal growth.

Table 11: What should workers do to stay in the fast technological packaging industry?

Response	Frequency	Percentage (%)
Employees must learn new trends in the industry	4	67
Upgrade their skills with the new designs and machines	2	33
Total	**6**	**100**

Source: Authors' fieldwork (2022)

Table 11 above suggests 4 (66%) out of the 6 managers affirmed that due to the recent dynamics in the packaging industry, package designers and their affiliates must learn new trends to stay on the job. Besides, 2

(33%) stated that the designers should upgrade their skills with new designs and machines in the industry. They added that in-service training organised for workers in the industry is gradually becoming difficult due to financial constraints. Some managers do not have the resources to build the capacities of their staff. These and others are impeding the speedy development of the industry in recent times. They do not paint good picture for an already struggling industry contending with many setbacks. Packaging firms which have the means should also sponsor some staff with respect to the acquisition of technology competencies in recognized institutions to help boost the Packaging Industry.

Table 12: Do you have the right tools, equipment and a suitable environment for a successful execution of your work or production?

Response	Frequency	Percentage (%)
Yes	12	57
No	9	43
Total	**21**	**100**

Source: Authors' fieldwork (2022)

The evidence above displays mixed reactions to the item by the respondents. It shows that while 12 (57%) agreed that they have the right tools and equipment for working in their respective packaging firms, 9 (43%) believed they do not get the needed accessories to work with. It could imply that some packaging firms are facing logistical constraints in assisting human resources to boost output in the sector. It could also be deduced that the financial constraints in the sector prevents affected firms from acquiring and providing the needed logistical supports for staff to work with. It possibly will mean the economic hardship is responsible for managers' inability to procure the same for their staff for maximum output. These feedbacks are quite worrying, considering the era of digitisation the industry finds itself. The revolutionary in technology in the industry will not revert to the archaic means of doing things. It should as a matter of urgency compel the managers in the industry to strife hard to embrace and sustained technology in the packaging industry.

Table 13: What problems prevent the growth of the Packaging Industry since most of them rely on foreign package importation and use them here in Ghana?

Response	Frequency	Percentage (%)
Inadequate funds and duties on raw materials are expensive at the country's ports	3	50
Interest rate on access to credit is very high. Production is very high	1	17
The industrial machines are expensive to buy and import into the country	2	33
Total	**6**	**100**

Source: Authors' fieldwork (2022)

Data from Table 13 indicates that selected managers bemoaned the severe hardship in the packaging industry. The evidence of their feedbacks is shown in the Table, with 3 (50%) indicating that inadequate funds and duties on raw materials are expensive at the country's ports due to the high exchange rate. In addition, 1 (17%) argued that interest rates on credit access from banks are very high, coupled with production costs. This could cripple their businesses if the government does not take pragmatic steps and care for businesses such as the packaging industry. However, 2(33%) maintained that industrial packaging machines and their accessories are very expensive to buy and import. They cited the cedi's depreciation to the dollar from 2021 to date as skyrocketing. The researchers believe that managers are feeling the brunt of the increment and the exchange rate on their businesses in the prices of machines, raw materials for production and others. Presently, there is extreme hardship in the industry, and if nothing is done to address the situation in the coming months, some packaging firms could fold up. Therefore, the government is being urged to adopt practical measures to ensure the managers are incurring these abnormal costs to expand mitigated to serve the interest of the packaging industry. This will eventually enable the managers to maintain, employ and expand their production and thus reduce unemployment in the packaging industry.

Table 14: What is gradually causing unemployment in the Packaging Industry and how can this problem(s) identified be resolved?

Response	Frequency	Percentage (%)
The government is not supporting SMEs to survive	3	50
New technology and release of financial assistance in the form of loans to small to medium sized companies to expand	1	16.7
Poor economic management by successive governments to reduce duties on imported raw materials for packaging production.	1	16.7
The invading of already made packages in the Market	1	16.7
Total	**6**	**100**

Source: Authors' fieldwork (2022)

The feedback from respondents, as listed in Table 15, is fascinating, with divergent views from participants. It displays that 2 (33%) managers narrated that the government is not supporting SMEs to survive. Haplessly, the current government agenda to support SMEs to survive and expand has fallen short of its goals. In the current economy, most companies, including the packaging industry, are struggling to survive due to the ailing economy. Besides, 1 (16.7%) asserted that new technology and the release of financial assistance hamper the development of the existing packaging industry. Again, 1 (16.7%) attributed poor economic management by successive governments, which negatively affects the industry. Unfortunately, 1 (16.7%) lamented the invasion of already-made packages in the market. Scrutinising the various feedbacks from respondents, the researchers believe that the growth of the packaging industry will face severe challenges and impediments if government does not, as a matter of urgency, mitigate the hardship being faced by the players in the industry.

Table 15: What should the packaging managers do to sustain the unemployment rate in the industry as a result of technology in the sector?

Responses	Frequency	Percentage (%)
Organise in-service training for members from time to time	5	83
Should help ban the importation of package products into the country	1	17
Total	**6**	**100**

Source: Authors' fieldwork (2022)

Data suggest 5 (83%) of the respondents will want to organise in-service training for staff from time to time. One (17%) believe the government should help ban the importation of packaging products into the country. These claims by the managers of the selected companies indicate efforts are being made to augment workers to get themselves up-to-date on the technology of their newly acquired machines for production. The claim implies a wakeup to technology-related issues in the industry; managers are doing their best to catch up with the dynamics in the industry. On the other hand, a manager called on the government to sanction the importation of finished packages by some other companies and individuals. Their acts make the packaging industry struggle a lot due to the high volume of finished package designs and finishes imported mostly from developed countries. Thereby giving indirect jobs to other nationals while the local industry suffers. The feedback is also a revive call for government to help cushion the industry players by listening to their plea. It will go along to assist managers to employ package design workers in the industry.

Table 16: Is technology helping the Packaging industry?

Response	Frequency	Percentage (%)
Yes	21	21
Total	**21**	**100**

Source: Authors' fieldwork (2022)

Regarding item 16, all respondents 21 (100%) affirmed that technology is helping the Packaging Industry efficiently. For instance, "packaging automation is a new technology in its advanced form, disrupting the industry's human resource capacity but helping positively" (Schwab, 2017). This claim is reinforced by Keynesians economics (Investopedia, 2022), "As a result, machines or their skills replace people who have become outdated because of their inability to keep up with the latest trends (Investopedia, 2022)". Managers of the industry agree that the packaging automation machines or equipment are helping the industry to a large extent. Sadly, it is rendering some workers redundant. Thus, adding to the unemployment number in the sector. The assertion by respondents buttressed the point made by the researchers that technology is the way to go now in the 21st century. This phenomenon is also supported by Ghavifekr & Rosdy (2015), "Technology is one of the indispensable factors used for efficiency and effective delivery in today's world". The feedback from the respondents indicates that technology has come to stay and cannot be compromised. Therefore, managers and workers in the industry should keep to the recent trends in the industry.

Conclusion

The implication of this research is evidence from respondents' views as contained in the study findings with regard to the set objectives. As regards Objective 1, from the discussions of the analysis, it is obvious that unemployment in the packaging industry is alarming due to our economic challenges as a nation. Evidence, further indicates that joblessness is high due to the advent of technology in the packaging industry in Ghana. It is due to many factors, as the managers and packaging design workers alluded to. However, in terms of practice the evidence from the discussions on Objective 2, technology's effects on the industry are positive and add significant improvements in the industry. The revelation is palpable in the statement made by one of the managers in the interview, "Three staff resigned unexpectedly within two months. Later, I learnt they have joined a new packaging firm with improved technology". Evidence from both objectives spectacles both managers and package design workers are eager to work to promote growth in the industry. As the mangers indicated; in terms of practicality and efficiency, the benefits of technology in the packaging industry include cost reduction, extra productivity, fine precision and quality delivery (in designing, printing and packaging of clients' orders) which hitherto leaves much to be desired. The government should also make the country's economy environment-friendly by making the cost of doing business affordably. The government could as a matter of urgency hold stakeholders meeting where issues affecting the industry can be brainstormed. Besides, a proper policy guidelines aimed at addressing the current challenges in the industry can be documented and implemented. They may include waiver on various taxes, levies, and others affecting stakeholders in the industry. These will enable the managers of the packaging industry to expand their firms and employ more package design workers to reduce the unemployment rate which is already on the high. A future study may look into a different perspective to address the limitations encountered in the study. Suggested future works include carry out research in the Photography, Advertising, Printing industries which are already grappling with parallel technology and cumulative unemployment rate in Ghana.

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