



An Exploratory Study on Design and Lithographic Printing for Sustainable Vocational Development in Nigeria

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ABSTRACT

Printing Technology in recent times has become a major economic landmine across continents especially now that printing is a critical driver of communication in a globalised economy. From graphic design to photography, technology has enabled roadside printing artisans to afford printing devices for minimal quantity of printing job productions as a result of miniaturization of devices of printing. To this end, entrepreneurial development in the printing trade is becoming a rallying point for the youth in recent history. The city of Ibadan is strategically positioned as one of the printing hubs in Nigeria while it has grown significantly to salvage the unemployment challenge being faced by a teeming population of graduates and semi skilled labourers. This study examined the influence of new techniques of printing development on some selected publishing industries in Ibadan Nigeria as well as interface with existing printing innovation in order to achieving world-class printing quality. It will also examine the need to sustain and provide job opportunities for the ever increasing number of the unemployed in the labour market, especially the youth. Survey research design has been adopted for the study. The study revealed that the quality of print in Nigeria especially from Ibadan can be improved if the government will support small scale printers with financing and critical equipments to facilitate the growth of the industry especially by creating opportunities for the young graduates to acquire printing skills for economic sustenance.

Keywords: Lithographic Printing, Vocational development, Ibadan printing hub, Equipments, labour, Labourers, Sustainable development.

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1. INTRODUCTION

The subject of Design and Printing over the years has been very strategic means of communication across continents, especially at the wake of the industrial revolution. It is not an understatement however, that printing in Nigeria, is scored below average and yet suffering unspeakable backwardness when compared to the global standard of publishing and the trend of computer technology.



Moreover, it is an open fact that most publishing outfits in this nation are plagued with the problem of outdated printing equipments as well as poor quality prints. This could be as a result of the economic downturn which had rendered most printing service seekers incapable to pay for quality prints or lack of proper orientation of press officials (Alimi, 2009).

Indigenous printing companies evolved to break the monopoly of foreign based printers, and were able to compete favorably despite several challenges confronting the printing industry. Some of these challenges include Quality Control Problem, Poor Orientation, Poor Lighting System, Test and Experimentation (Research), and Power Outage. Later, the chartered institute of professional printers (CIPPON) was established by an act of parliament to regulate, manage and control the practice of printing and other related matters. The regulation of the industry by the body of professionals brought tremendous impact in the expansion of the industry as it has opened the opportunities of employment to several young graduates to pursue a career in Design and Printing trade as a source of income to complement their academic disciplines.

Aside from the age long letter press printing technique, lithographic or offset printing has been a major type of printing that is commonly practiced in recent times. Other forms of contemporary printing techniques are Direct Image, Screen Printing, and Computer to Plate (CTP) among others. It is significant to note that printing craft is essentially becoming attractive to the youth of this generation because of the ease of production made possible by the miniaturization of printing devices in modern times.

According to Kasdorf (2007:1), the printing industry is in the middle of a revolution. Most books and journals being printed today are switching over to the electronic printing. The journals have been quite adventurous, from hard setting of moveable metal type to Linotype setting. Monotype setting, lithographic offset printing, word processing, desktop publishing and direct imaging. The rapidity of the changes has created opportunities and challenges.

Lithography to a large extent will continue to thrive in the Nigerian printing market because of the job opportunities it creates for the labour market. Nigeria does not seem to have the structure that will enable e-printing or digital printing for now especially in most rural areas and in certain underdeveloped urban cities in the country. With lithographic printing, plate makers that are locally fabricated will be in demand by artisans in the printing market and this will boost the microeconomic value of the nation as a principal driver of wealth distribution. As the printing industry is evolving, it is evident that Nigerian printers may need to be reoriented on the basics of electronic printing to enhance their skills. There is the need to provide access to state of the art printing equipments in order to encourage quality prints and enable effective learning of the trade by several unskilled youths.

The history of printing in Nigeria dates back to 1848, about the time when European missionaries in what later became Nigeria, established community newspapers to propagate their message. The business was expectedly dominated by the British Colonialists, but the trend began to change five years after independence, when an American and a British teamed up with two Nigerians to set up Academy Press in Lagos in 1965. The initial desire of the founding fathers of Academy Press was to



set up a printing company that would break the monopoly of European printers, which hitherto was responsible for corporate and educational printing in Nigeria”.

This has since been achieved, with the printing industry now fully in the hands of Nigerians and Academy Press as the flagship. The industry has witnessed steady growth, especially since the Nigerian civil war of 1967 to 1970; the country moved from letterpress to offset printing in 1971, when printers started improving lithographic equipment and Gestetner 201 printing machines. Therefore, things changed quickly, with the introduction of the one colour Kord 64 printing machine. Kord64 by MAN and Heidelberg proved to be the favorite and has remained so ever since because of its durability. Printing machines from Germany were preferred to that of China. The same is true across West Africa and beyond such as places like Ghana, Burkina-Faso and Cameroon. The trend of procuring fairly used machines was brought about as a result of the economic tumble in the mid 80's following the introduction of the second tier foreign exchange market by the military government (during the Babangida administration). The most sought after of all the German machine is kord 64 which is far cheaper.

Over time the printing industry has grown to be indifferent to the need to improve the scheme of things. The Nigerian governments do not seem to be realizing the huge potentials of the industry and the need to reposition it to meet the twenty-first century challenges. Although, in 2007, the government bowed to the pressure from the printing sector and stakeholders and established the chartered institute of professional printers (CIPPON) by an act of parliament to regulate, manage and control the practice of printing and other related matters in the country. The act requires that all printers be registered as members of CIPPON and all printing presses be licensed by the institute. To become a member of CIPPON, one is required to be a trained printer and must have been in practice for five years before the CIPPON Act was enacted. So far, about 1,000 persons have registered as members of the institute and have been presented with certificates (in the case of individuals) and licences (in the case printing houses). These represent a small fraction of those operating in the industry and no one expects a phenomenal growth in CIPPON membership in the near future in view of the preponderance of barely educated printers and press owners in Nigeria.

Lithographic process in Book Production invented around sixteenth century has become a monument and a widely accepted technique in modern day printing. It will be a sheer absurdity to discuss lithography outside printing technology. Printing is a dynamic technological method in the world of communication that has more effectively aided information dissemination than any other method in the history of communication. However, it has been tremendously improved upon over the years. Before the discovery of lithographic method of printing by Alois Senefleder (1771-1834), Relief or letterpress printing was the oldest method of printing by which printing is made from a raised surface. (Cogoli, 1973). Gravure or intaglio printing on the other hand involves printing from a recessed surface of the plate to the paper, a process developed by Karl Kleitsch in 1879.

In spite of the several techniques of printing available in the printing industry, the quest for a more effective, less strenuous and quick method of communication by print gave birth to offset lithography otherwise called Planography, which describes the method of printing from a flat surface by which the image area and the non-image area are on the same plane. Lithographic process of printing is based on the principle of natural disagreement of grease and water. Lithographic plates could be



made from thin sheets of paper, plastic or metals (zinc or copper). The image areas of the Lithographic plates are grease receptive and water repelling. They attract oil-based inks and repel water. Non-image areas are water receptive and grease repellent.

Non-image areas attract water and repel oil based inks. The development of Lithographic process in printing had greatly facilitated effective book production with the use of offset printing machines, thus, alleviating the tasking nature of printing found in its old printing techniques (Walker 1980). Meanwhile, the printing industry today, particularly in a developing economy like Nigeria, has not been able to effectively harness the potentials of Lithographic process via the use of the plate maker in printing production that can measure with the standard of the present day technology. It is pertinent to note at this instance that the end result of any printed matter is basically determined by the effectiveness of its lithographic process. It is the proficiency of the lithographer, in the way he handles the camera work, retouches and strips films, expose and develop plate that will ultimately determine the end-product of printing. This paper also reflected on the rudiments of lithographic process in printing as well as the principles guiding the development (Fabrication) and use of the plate maker technology. It is hoped that this will create vocational skills for the Nigerian people.

1.1 Problems Confronting Printing Process in Nigeria's Printing Industry

Lithographic process in printing Production in Nigeria has been increasingly effective and resourceful to the communication world as a result of its improved technological equipments. But the use to which its potentials are being put has brought grave setback to the development of printing business in Nigeria. Besides, a large number of small scale printers do not have access to needed equipment (plate maker) especially because of the exorbitant price placed on it by foreign manufacturers. It has also been discovered that the financial inadequacies resulting from the economic downturn in Nigeria has handicapped most of the small scale printers in sourcing for and acquiring materials that can locally be used in fabricating plate maker for the printing industry. Other visible problems inhibiting perfect production of books in the printing industry in Nigeria are:

1.1.1 Quality Control Problem

Most presses that make use of plate makers are plagued with quality control problem; this is sometimes caused by inefficiency of press supervisors or lack of standard procedures. The expediency of adequate supervision of the Plate making procedures from the stage of turning the final artwork to an exposed plate is being disregarded today by most presses. Before the emergence of positive plates, during stripping, it is necessary to block all pinholes in as much as they are not part of the artwork on the negative film. This is called Opaquing. Almost all negatives have pinholes caused by dust on the film either in manufacturing or in the darkroom. If a press manager fails to check meticulously every bit of the flat after the lithographers opaquing exercise, the company may run at a loss if some pinholes are found on the plate or on finished copy after printing. The plate must be treated with its manufacturer's recommended (chemical) solution to enable it function well for a better output.

1.1.2 Poor Orientation

Inadequate or poor orientation of lithographers on the basis or underlying principles guiding the art of Lithography is posing not a little threat to the printing industry in Nigeria. Most Lithographers across printing presses in today's industry are not skilled; hence they lack the professional expertise and techniques of lithographic printing. This has consequently been yielding poor finishing output in

book production. It is needful at this juncture that an in-house training for Lithographers be developed or the Nigeria Association of Master Printers entrench an institute to see to the development and upgrading of Lithographers' skills.

1.1.3 Test and Experimentation (Research)

Further research work is always needed in sustaining quality production. Printers must ensure that experimentation efforts are geared towards the trend of technological advancement in printing. If the experimentation of newly manufactured materials like chemicals, films and plates are neglected, it can cause adverse effects on printing output of presses.

1.1.4 Power Outage Phenomenon

Nigeria is still grappling with epileptic power supply which had hampered varieties of businesses including the printing industry. An average printing press in Nigeria cannot survive without a generating plant to provide power for the running of the printing businesses. However, the technological advancement which brought about digital printing is changing the scheme of things more profoundly. This is because the cumbersomeness of lithographic process is being edged out at the wake of the proliferation of digital technology initiative.

1.1.5 Types of lithographic offset machines available to Nigerian printers in Ibadan



Plate 1: Title: Half Kordz Machine Source: Mokola, Ibadan



Plate 2: Title: 201 Machine Source: Google



Plate 3: Title: 201 Machine Source: Oke Ado, Ibadan



Plate 4: Title: 201 Machine Source: Mokola, Ibadan



Plate 5: Title: 201 Machine Source: Mokola, Ibadan

1.2 Statement of the Problem

Vocational Education is a critical indicator for entrepreneurial development especially in a Third World country like Nigeria. If the imperatives of vocational job training especially in design and printing occupations is not sufficiently engaged and made an integral part of development strategies, its impact on human resource development, productivity and economic growth becomes elusive. In spite of the visible contributions of vocational and technical job opportunities on our national life, the government does not seem to give it the required attention it deserves.

This study intends to examine the challenges and prospects of design and printing and its impacts on vocational skills in the industry for sustainable development. Although, there are few technological innovations in printing technology today that have improved the outlook of our printing, yet there seems to be a major gap between quality expected from our printing professionals and the outcome from most amateurs or unskilled operators within the industry in Nigeria. This is as a result of the failure of government at all levels to promote career paths along the printing profession so as to drive vocational education among undergraduates and provide sufficient motivation for entrepreneurial skills development among the unemployed. This research will endeavor to investigate the impacts of design and print practices as modern forms of craft and communication and how it can be strategically positioned especially in Ibadan where the trade of printing is a major craft among students as well as the unschooled.

Despite huge technological training around the world which had led to quality production of printed matters, lithographic printing has not given Nigeria any pride of place in the printing world. This is evidenced by printing Tourism opened by most leading world publishing presses. Design is a lucrative trade that can be encouraged in a world driven by computer technology among the youth.



Lithography is an old printing technique with the use of films and plates to develop images in printing stock. Printing however has left the stage of film separation and manually developed plates. The possibilities by digitalization of images brought about by innovations like Computer to Conventional Plate (CTCP), Computer to Plate (CTP) and Direct Image (DI), which offers more acceptable print images in recent times. This research will also seek to investigate the problems associated with printing development in Nigeria and interface with opportunities offered by other printing innovation in the printing industry with the view to encouraging a formidable trade that will create sustainable entrepreneurial platforms for the teeming population of youths and grow the nation's economic prospects. It is hoped that poor quality production will be reversed, jobs will be provided and competence will be attained in the publishing industry.

1.3 Theoretical Framework

This paper is predicated on Classical themes of change. This theory, sometimes referred to as descriptive or normative theories is considered passive. It explains and describes the naturalistic process of change or diffusion of innovation. The diffusion of innovation theory describes how potential adopters' perceptions of the attributes or characteristic of an innovation influence diffusion. The stages of this theory include knowledge (becoming aware of innovation), persuasion (developing positive attitudes towards innovation, decision (making cognitive decision to adopt the innovation); implementation (using the innovation) and confirmation (continuous use of the innovation). With this theory, printing is an innovation that is progressive in discovery and practice.

From the Stone Age to letterpress, lithography and the most recent digital innovation, there have been consistent evolutions of printing processes that are designed to add tremendous values to information dissemination through mass reproduction of publishing materials. Meanwhile, it is necessary to upgrade the printing innovation in Nigeria in order to maximize the potentials of recent discoveries, raise the bar in job creation, as well as achieve quality print production through Computer to plate (CTP) and Direct Image (DI) procedures.

2. LITERATURE REVIEW

Lithographic process in Book Production invented around sixteenth century has become a monument and a widely accepted technique in modern day printing. It will be a sheer absurdity to discuss lithography outside printing technology. Printing is a dynamic technological method in the world of communication that has more effectively aided information dissemination than any other method in the history of communication (Lathrop and Kurst, 1979). However, it has been tremendously improved upon over the years. Before the discovery of lithographic method of printing by Alois Senefleder (1771-1834). Relief or letterpress printing was the oldest method of printing by which printing is made from a raised surface. (Cogoli, 1973). Gravure or intaglio printing on the other hand involves printing from a recessed surface of the plate to the paper, a process developed by Karl Kleitsch in 1879. In spite of the several techniques of printing available in the printing industry, the quest for a more effective, less strenuous and quick method of communication by print gave birth to offset lithography otherwise called Planography, which describes the method of printing from a flat surface by which the image area and the non-image area are on the same plane.



Lithographic process of printing is based on the principle of natural disagreement of grease and water. Lithographic plates could be made from thin sheets of paper, plastic or metals (zinc or copper). The image areas of the Lithographic plates are grease receptive and water repelling. They attract oil-based inks and repel water. Non-image areas are water receptive and grease repellent. Non-image areas attract water and repel oil based inks (Kolo, 2003). The development of Lithographic process in printing had greatly facilitated effective book production with the use of offset printing machines, thus, alleviating the tasking nature of printing found in its old printing techniques (Walker, 1980).

Meanwhile, the printing industry today, particularly in a developing economy like Nigeria, has not been able to effectively harness the potentials of Lithographic process via the use of the platemaker in printing production that can measure with the standard of the present day technology. It is pertinent to note at this instance that the end result of any printed matter is basically determined by the effectiveness of its lithographic process. It is the proficiency of the lithographer, in the way he handles the camera work, retouches and strips films, expose and develop plate that will ultimately determine the end-product of printing Cogoli (1973). The study will centre on the challenges and prospects of lithographic process in printing as well as the principles guiding the development (Fabrication) and use of the platemaker technology as well as determining the possibilities of creating job opportunities through the printing production processes. It is expediently needful however, to reiterate that Nigeria's printing industry will in no little way be profitably revolutionized if the potentials of the lithographic platemaker could be appropriately harnessed to ensuring that quality prints are restored in our society and thereby provide more opportunities for job creation..

3. METHODOLOGY

Survey research design was adopted. The questionnaire and interview schedules were the major research instruments. A total of 550 subjects participated in the study. Using the purposive sampling technique, 330 respondents were drawn from the professional practitioners of the Printing trades across Ibadan metropolis, covering the eleven local government areas while 30 respondents were drawn from each of the eleven local government areas within Ibadan metropolis. 220 subjects were further drawn from the semi literate roadside artisans across the eleven local government areas across the city of Ibadan with 20 subjects from each local government. The local government areas in Ibadan that formed the scope of this study are: Ibadan North, Ibadan North west, Ibadan North East, Lagelu LG, Ido LG, Egbeda LG, Ibadan South East, Ibadan South West, Oluyole LG, Ona Ara LG and Akinyele LG areas. Results were converted to frequencies and percentages.

3.1 Data Analysis and Presentation of Results

Demographic characteristics of participants revealed that 241(45.5%) of the respondents are between ages 21 years to 30 years, which makes them to be higher than the respondents within ages 31 to 40 that are 169 (31.9%). This implies that the youth are predominant in the printing trade. Again 309 (56.1) that forms the larger percentage of the participants are male while 221 (43.9) are female. Lithographic printing, from this research has been found to be a male dominated vocation. A higher percentage of respondents are 397 (74.9) are single. This suggests why many young and energetic people are involved in the printing vocation.



Table 1: Means Response of the Extent of the Use of Lithographic Printing in Print Production in Nigeria

ITEMS	SA	A	U	D	SD	\bar{x}	Std
1. Lithographic printing is usually preferred as a method of print production more than other techniques of printing in Nigeria	204 (38.5)	158 (29.8)	37 (7.0)	95 (17.9)	36 (6.8)	3.82	1.008
2. Lithographic printing is not usually preferred as a method of print production more than other techniques of printing in Nigeria	54 (10.2)	50 (9.4)	69 (13.0)	213 (40.2)	144 (27.2)	2.24	1.103
3. Print production does not reflect effective use of lithographic printing technique in the Nigerian publishing market.	37 (7.0)	124 (23.4)	60 (11.3)	139 (26.2)	170 (32.1)	2.15	1.139
4. Use of lithographic printing technique dominates the book production industry in Nigeria and works more effectively than other techniques.	172 (32.5)	194 (36.6)	54 (10.2)	90 (17.0)	20 (3.8)	3.78	.987
5. Lithographic offset printing process has not been well utilized by printers in Nigeria because of obsolete printing machines available and inaccessible spare parts.	92 (17.4)	86 (16.2)	59 (11.1)	170 (32.1)	123 (23.2)	2.75	1.261
6. Lithographic printing is considered an outdated technique that no longer meets the print production needs of Nigerians.	81 (15.3)	61 (11.5)	27 (5.1)	218 (41.1)	143 (27.0)	2.95	1.095
7. Lack of adequate funding has prevented students who are interested in learning modern printing to adopt lithographic printing as vocation.	221 (41.7)	188 (35.5)	34 (6.4)	62 (11.7)	25 (4.7)	3.27	.919
8. Lithographic printing machine maintenance engineers are very scanty in the Nigeria printing industry.	125 (23.6)	199 (37.5)	38 (7.2)	86 (16.2)	82 (15.5)	3.91	1.139
9. Non-inclusion of printing as trade subject in secondary school curriculum, over a long time, has discouraged vocational development along lithographic printing line.	203 (38.3)	199 (37.5)	47 (8.9)	53 (10.0)	28 (5.3)	3.35	.962
10. Poor training and deficient requisite skills of printing operators has not enabled quality print production in Nigeria.	19 (3.6)	214 (40.4)	125 (23.6)	72 (13.6)	100 (18.9)	2.96	1.200
Weighted Average: 3.11 Threshold: 3.0							



Table 1 shows the means response of the extent of the use of lithographic printing in print production in Nigeria. It reveals a weighted average of 3.11 which is higher than the threshold of 3.0. This implies that participants' use of lithographic printing in print production in Nigeria is high. According to this study, 218 (41.1) did not agree that lithographic printing is an outdated process of printing in Nigeria. The respondents rather agreed that lithographic printing is still a major driver of the publishing trade in Nigeria. 203 (38.3) strongly agreed that non-inclusion of printing as trade subject in secondary school curriculum, over a long time, has discouraged vocational development along lithographic printing line.

This further revealed that students from secondary school will be better empowered with the printing vocation if it is actually covered in their curriculum early enough. 214 (40.4) of respondents also agreed that poor training and deficient requisite skills of printing operators has not enabled quality print production in Nigeria, but notwithstanding, the printing trade, especially the lithographic printing process has continued to thrive because of the availability of materials and second handed equipments that can encourage informal learning, especially in the Ibadan printing hub.

Table 2: Means response of perception of vocational sustainability of lithographic printing by the practicing printers and learners of the trade in modern Nigeria economy.

ITEMS	SA	A	U	D	SD	\bar{x}	Std.
1. Lithographic printing is accepted as a vocational trade in the present Nigeria economy.	139 (16.2)	152 (28.7)	0 0	137 (28.7)	102 (19.2)	3.43	1.160
2. Lithographic offset printing is capable of stimulating the interest of unemployed population of today's youth.	265 (50.0)	99 (18.7)	20 (3.0)	68 (12.8)	78 (14.7)	3.05	1.243
3. Printing of books and posters are better achieved by the use of lithographic offset machines especially for mass production of printed materials.	135 (25.5)	150 (28.3)	20 (3.8)	128 (24.2)	97 (18.3)	2.89	1.164
4. Modern Printing operators are more familiar with offset printing than direct image or screen-printing technique.	268 (50.6)	132 (24.9)	20 (3.8)	81 (15.3)	29 (5.5)	3.68	.928
5. Offset printing with the use of Presensitized positive plates is more attractive to printers because it creates more jobs for lithographers.	166 (31.3)	165 (31.1)	19 (3.6)	81 (15.3)	99 (18.7)	2.86	1.157
6. Lithographic book productions enable the publishing process to create jobs for book binders, guillotine operators and paper suppliers.	136 (25.7)	147 (27.7)	6 (1.1)	119 (22.5)	122 (23.0)	2.50	1.133
7. The line of jobs and business prospects in lithographic trade, offers economic values to the seekers of vocational trades in today's Nigeria.	150 (28.3)	145 (27.4)	7 (1.3)	92 (17.4)	136 (25.7)	3.61	1.174
8. Lithographic printing as a vocational trade will be sustainable and viable if public and private printing presses are revived to attract younger and prospective learners to the trade.	246 (46.4)	222 (41.9)	0 (0.0)	45 (8.5)	17 (3.2)	3.32	.761
Weighted Average: 3.17 Threshold: 3.0							



Table 2 shows the means response of the perception of vocational sustainability of lithographic printing by the practicing printers and learners of the trade in modern Nigeria economy. It reveals a weighted average of 3.17 which is higher than the threshold of 3.0. This implies that participants had positive perception of vocational sustainability of lithographic printing by the practicing printers and learners of the trade in modern Nigeria economy. 400 (75.5) strongly agree that modern printing operators are more familiar with offset printing than direct image or screen-printing technique, while 130 (24.6) were either undecided or disagreed. This, however, is not significant enough to invalidate the position of the majority of respondents who agreed at varying levels that lithographic printing is preferred to other forms of printing. Moreover, 295(55.7) considered the line of jobs and business prospects in lithographic trade as having more prospects and offers economic values to the seekers of vocational trades in today's Nigeria.

This is evidenced by the 468 (88.3) that forms significant majority of respondents that agreed with the position that lithographic printing as a vocational trade will be sustainable and viable if public and private printing presses are revived to attract younger and prospective learners to the trade. Printing machines from Oke Ado and Mokola on Plates, 3, 4 and 5 revealed the inglorious state of printing equipment that has not enabled effectual printing output in the lithographic production in Nigeria. This suggests, that the printing industry may contend with poor production quality for a while until the policy makers are able to support the industry in terms of funding and policy formulation that will support excellent entrepreneurial development in the critical printing sector..

4. CONCLUSION AND RECOMMENDATIONS

The data presented in this study clearly indicates that lithographic work is essentially important to drive vocational skills at a time when Nigeria's economy is distressed. Although the printing trade is challenged by poor and obsolete equipments as well as power outages that has become endemic to a terribly impoverished society like Nigeria that depends largely on such equipments for their economic survival. This study further affirms that lithographic printing as a vocation is predominantly occupied by the youth and will continue to thrive in years to come because of the access they have to spare parts that enables easy servicing of the obsolete equipments. It is however recommended that new innovation of printing be introduced to harness the potentials of the new trends in the printing industry and as well promote further development strides in our publishing industry in Nigeria.

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