

Impact of Technology on Selected Small Scale Industries in Damaturu Metropolis, Challenges and Way Out

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Abstracts: Technology has been identified to have good positive influence on the growth and survival of small scale industries. These desirable influences have not been adequately realized due to many problems: low awareness and skills, scarcity of technologies, costs and financial constraints, poor infrastructures, lack of supports and many others. Despite the various challenges, results of descriptive analysis indicates good assessment of impact of technology at about 70% , strong recommendation for further application at above 65% and strong future hope at 62%. Also, the interpretations of chi-square coefficients rejects null hypotheses, and thereby indicates that: technology has significance role to play in small scale business development, small-scale business has problem in acquiring and using modern technology, and technology has prospects in the future of small scale businesses in Nigerian economy. There is the need for conducive business environment in the form of provisions of infrastructures and tools availability, government must also provide additional enlightens/trainings and financial supports so that technology could be optimally utilized to the benefit of small-scale industry and the economy of the country as a whole.

Key words: Technology, small-scale industry, tools, equipment

Introduction

Technological supports play a very vital role in determining performance of small scale industries particularly the small scale manufacturers. Small scale industries make very large contributions to employment generation and economic development of a nation. Unfortunately their economic contribution is limited to subsistent employment, an indication that they could not fully move well with the requirements of time. Thus, in the face of fast labour force growth and limited employment absorption in other sectors, developing country governments have mounted efforts to improve productivity and earnings in these firms. (Romijn, 2001).

Technology is an essential tool that helps to facilitate effective performance of small scale business. Individuals, groups and authorities have laid emphasis on the impact of technology on the effective performance of small scale industries. Experiences of a significant number of developing countries indicate that the development and diffusion of domestic or improved technologies within the small scale industry sectors offers a lot in term of enterprise productivity, employment generation, and import substitution (the Economist, 1979 in El-Namaki, 1986).

Background Problems

Skills and technical know-how play a vital role in the survival of small scale business enterprises. The lack of general managerial skills and gross inadequacy of technologies have demonstrated in a high enterprise mortality rate in many developing economies. The World Bank , UNIDO, ILO, and multiple of research forums have explored many problems affecting small scale business and come with the conclusion that a major challenge is lack of managerial skills and a scarcity of technological inputs (El-Namaki, 2002)

Operations of small scale businesses have been characterize with perpetual smallness over time, low productivity, low patronage and low product quality. A peculiar feature of these small-sized industries is lack of modern tools and equipment necessary for basic operations. The archaic and obsolete equipment available could not offer services that generate value for the economy of today.

Therefore, there is the need for conducive technological environment so that problems of technological backwardness and lack of access to new technologies among small scale industries could be addressed. The timber and wood works, carpentry and furniture, and metal work industries are classical examples of small businesses where good improvement could be made with good use of technologies.

Objectives

- 1) Examining the nature and importance of technology to small scale businesses in the area of study.
- 2) Identifying problems facing small scale owners in their bids to acquire and use technology for their operations
- 3) Examining the prospects and make recommendation

Hypotheses

- Ho1 Technology has no significance role to play in small scale Business development.
- Ho2 Small scale business has no problem acquiring and using modern technology
- Ho3 Technology has no prospects in the future of small scale businesses in Nigerian economy

Scope and Methodology

This study covers some selected small scale industries among Timber and Wood Works, Carpentry and Furniture, Metal Construction Works. Both owners and employees are the targeted respondents so that a fair assessment could be achieved. For a sake of ease of clarification, assess to technologies available to respondents have been viewed from three stages; first stage of little awareness i.e. complete simple tools, the second stage of awareness with dare effort to acquire necessary tools i.e. improved tools and the third stage of advancement, i.e. modern tools.

The Study Area: Damaturu Metropolis

The town, Damaturu is situated along Maiduguri-Kano Road, about 132 KM west of Maiduguri, the Capital of Borno State. It is located on latitude 12 degrees north and longitude 11 degree east. It shares boundaries with Kaga and Magumeri (Borno) to the east, Gujba to the south and Tarmuwa to north, while Fune to the west. Damaturu lies in plain region that is covered by savanna (www.britannica.com). The physical featuses of Damaturu area is characterized with sandy soil and seasonal streams and ponds. Shrubs and few tropical trees like Baobab, Acacia and Tamarind are found in the area. Damaturu town became the capital of the newly created Yobe State, northeastern Nigeria in 1991. It’s a market town on the A3 highway and has an estimated 2010 population of 44, 268 (www.newstrackindia.com)

This is tabulated:

Stages/Tools	Tools	Tasks	Operations
1stage:Little Awareness/Simple Tools	Chisels, Hammer, Cutting/Ark Saw, Brush,Sand Papers etc	Cutting, Scooping, Painting	Manually Operated
2 nd Stage: Improved Tools	Jik Saw, Filing Machine, Spreading Machine	Cutting, Scooping (of difft sizes/shapes) Smoothing, Painting	Electric Powered, Generators / Fuel Engines with Compressors
3 rd Stage:Advanced /Modern Tools	Rotter Machines, Ozito Machines	Crafting difft designs Running Screws	Electric Powered And/some Battery (Chargeable) and replaceable

Stages of technology among Timber and Wood Works, Carpentry and Furniture, and Metal Works and Construction in the study area:

For ease of data collection, the metropolis is divided into 4 axes: Potiskum road, Gujba road, Maiduguri road and Gashua road. 30 questionnaires were distributed into each axis totaling 120 but, problems of responses and incomplete returns made the analysis based on 100 respondents.

Impliedly, the design is the survey type and selection of few samples to represent a whole made it a case study approach. Also, the choice of industries and respondents among the targeted groups are based on ease of accessibility but not by grouping or other approaches. Descriptive, simple percentages and chi-square analysis have been adopted.

Origin/ History:

Historically, the term technology, a combination of the Greek technē, “art, craft,” with logos, “word, speech,” meant in Greece a discourse on the arts, both fine and applied. (<https://en.wikipedia.org>). Around 17th century, the English interpretation was limited to discussion of the applied arts but, gradually these “arts” themselves came to be the object of the designation. In the early 20th century, the term has grown to covering a range of means, processes, and ideas in addition to tools and machines. And, by mid-century, technologies were such phrases as “the means or activities that changes or manipulatesman environment (www.thefreedictionary.com).

Imperative:

Howe (2015), small business everywhere have embraced technology to manage their businesses whether in scheduling appointments, creating correspondences, recording business operations, processing pay roll, tracking inventory and many more. And, the Writer, 2010 small business look to technology as a critical tool to increase efficiency and grow business networks which is particularly important now given the down turn economy. In the opinion of Karen, 2013, technology provides wide range of tools that entrepreneurs may employ to guide their companies through start-up to growth.

Creating Efficiency; Technology assist in the speed at handling issues, drawing up new businesses, making vital contacts, easy scheduling and customer relationship management etc. with great comforts.

- 1) Internet has become “must-have” for small scale businesses to be able to stand fit among established businesses. Technologies allow businesses an option to set up online stores, the popularity of online shopping increase with the variety of products and services.
- 2) Instant Connection with Customers: digital marketing as a modern phenomenon which enables a company to promote her products or services all over the world.
- 3) Resource Management and Globalization: organization resources management play crucial role in the success of a business. Technology assist in doing this, the IT has made it easier by automating the complex process through introduction of user friendly solutions (Afzal, 2015)

Technological Limitations to Small Scale Industries

The problems have generally, being identified to include the following among others:

---Poor financial situation and low capital base: Capital used for starting, sustaining or expanding a business enterprise comes from savings of the business owners (Uzoigwe, 2010). Despite that small business owners sources funds either from within or outside the business, inwards sources is simply personal funds ; the usual starting point for the small business entrepreneur is personal savings (Akinsola, 2015). The slim financial background makes it easy to engage in appropriate R&D Programmesnor embarking in economic technological innovation.

---Lack of access to Technological Information and Consultancy Services: Information technology is critical to operations of most companies and has the power to catapult growth when utilized effectively. Conversely, when this is not achieved it may quickly become frustrating and turn out to become expensive road blocks against achieving business objectives (www.accentonit.com, 2015)

--- Non availability of Technically Trained Human Resources and Lack of Professionalism: According to (Itodo, 2011), lack of adequate skillful personnel precipitate threat to the operation of business enterprises because most often “Drifters” or Relations that are employed are not necessarily qualified. Aminu, (2009)is of the opinion that entrepreneurs make mistakes of employing friends, relations, and close associates without necessary qualifications and skills for the job which sometimes lead to anarchy and failure.

--- Lack of Management Skills and Poor Adaptability to Changing Trade Trends: Entrepreneur as a leader, the Captain of a team need to be a very sound decision maker and to do this he must have good business acumen. Many causes of business failure in Nigeria and elsewhere point to poor management (Nwachukwu, 2005).

--- Associated to the above is dare desire to avoid risks. i.e. the lack of managerial skills manifest in poor adoptability to changing economic trends, an indication of risk avoidance.

--- Lack of Infrastructure: El-Namaki, (1986) summarily identified management and technological problems within primary /forest based small scale industry to include:

An ever-elusive technology; mean scarcity and high expenditure outlay of technologies versus scarce technological software). Reliance infrastructure support (i.e. by the government and other authority of the day within the economic level of development), and limited technological skills and resources for technological development

Data Presentation and Analysis (from Field Survey: 2017)

Variable	Frequency	Percentage
Business Duration		
0-5 Years	00	00
5-10 Years	34	34
10-15 Years	58	58
15 Above	08	08
Business Origin		
Through inheritance	22	22
Training and Apprenticeship	64	64
Business Curiosity	14	14
Equips at Business beginning		
Traditional/Self made	05	05
Simple foreign made	82	82
Advanced (high) modern tools	13	13
Tech. Awareness at earlier stage		
Yes	59	59
No.	41	41
Tech advancement today		
Strong advancement	30	30
Moderate	48	48
No/poor advancement	22	22
Factors of low technology		
Lack of awareness	15	15
Unavailability of equipment	38	38
Cost/financial incapability	47	47
Peculiar problem of entrepreneur		
Lack of adequate Skills	28	28
Problem of repairs/maintenance	32	32
Lack of govt supports/other facilities	40	40
Modern equip attain better performance		
Highly agreed	69	69
Fairly agreed	26	26
Not agreed	05	05
Impact areas of technologies		
In term of number/quantity produced	42	42
Improved quality	30	30
Easy of work/operation	28	28
Modern tech has its disadvantages		
Agreed	48	48
Not agreed	52	52
Probs. Areas of modern tech		
It make employee become lazy	45	45
Kills knowledge of craftsmanship	42	42
Others	13	13
Probs. Areas of Accessibility		
Lack of finance	52	52
Lack of govt supports	32	32
Poor infrastructures	16	16
Respondents recommendations		
Strongly recommended	65	65
Averagely/fairly recommended	23	23
No not at all	12	12

Govt gives assist./supports		
Strongly recommended	68	68
Averagely/fairly recommended	22	22
No not at all	10	10
Areas of govt. assistance		
Make equipment directly available	41	41
Provision of finance for technology	36	36
Trainings/skills acquisition	23	23
Future if business with tech. application		
Brilliant	62	62
Fair	27	27
Vague	11	11

Discussions

The percentage analysis above reflects that majority of small scale industrialists in the study area have been into the business for over 5 years, i.e. 34% between 5-10 years and 58% between 10-15 years. Only 8% have been into the business for over 15 years. And, in the last 5 years, there does not exist any new entrant indicating some peculiar challenges ranges from insecurity problems or other issues that may require expert attention for the sake of the future. Many, of them, above 88% come into the business through inheritance and training/apprenticeship, and only 14% come through entrepreneurial curiosity. Also, despite their high level of awareness of modern equipment (about 60%) at the early period of their business, 82% employed simple tools during those periods and till date, 30% have seen strong changes and 48% little changes while 27 witness no improvement in term of technology advancement. Nevertheless, majority of them (94%) foresee adoption of modern technology as powerful means of better performance.

The major challenges are none availability of equipment (38%), financial incapability and cost (47%); with regard to owners/employees peculiar problems, lack of skills (28%), maintenance and repairs (32%) and lack of supports and others (40%). Respondent's assessment of efficient- impact of modern tools on their activity is very high, above 90%, such areas of influence are higher productivity, 42%, improved quality, 30% and ease of operation, 28%. Less than half (48%) of them see some limitations of adoption of technologies including, making employees become lazy (45%), possibility of killing talents of craftsmanship (42%) and others (13%). With respect to the future, 62% see brilliant future, 27% sees a fair days ahead but 11% are hopeless. Accordingly, 65% strongly recommend application of technologies, 23% fair recommendation while 12% give poor recommendation.

Technologies accessibility is hampered due to lack of finance (52%), lack of government support (32%), and inadequate infrastructures (16%). Thus, the quest for government support (as high as 90%) in the areas of making equipment available 41%, financial assistance 36% and training and skills acquisition 23%.

Chi-Square Analysis

$$\text{Given that } \chi^2 = \frac{\sum (OF - EF)^2}{EF}$$

Σ = Summation

OF= observed frequency

EF= Expected Frequency.

Expected Frequencies:

$$\text{For High/Strong} = \frac{\text{Row total} \times \text{Column total}}{\text{Grand Total}} = \frac{100 \times 228}{500} = 45.6$$

$$\text{For Moderate/Ave.} = \frac{100 \times 171}{500} = 34.2$$

$$\text{For Low/Poor} = \frac{100 \times 101}{500} = 20.2$$

N.B: Expected Frequency calculated from tables below; given that (questions), 5, 7, 9, 13 &17 have been selected (from the sample questionnaires)to be relevant to the test of hypotheses:

Tables/Questions	Strong/High	Mod./Average	Low/Poor	Total
5	30	48	22	100
7	15	38	47	100
9	69	26	05	100
13	52	32	16	100
17	62	27	11	100
Total	228	171	101	500

Computed Value

Questions	Responses	OF	EF	(OF-EF)	(OF-EF) ²	$\frac{(OF-EF)^2}{EF}$
Q5	Strong/High	30	45.6	-15.6	243.36	5.34
Q7	“	15	45.6	-30.6	936.36	20.53
Q9	“	69	45.6	23.4	547.56	12.01
Q13	“	52	45.6	6.4	40.96	0.90
Q17	“	62	45.6	16.4	268.96	5.90
Q5	Mod/Ave	48	34.2	13.8	190.44	5.57
Q7	“	38	34.2	3.8	14.44	0.42
Q9	“	26	34.2	-8.2	67.24	1.97
Q13	“	32	34.2	-2.2	4.84	0.14
Q17	“	27	34.2	-7.2	51.84	1.52
Q5	Low/Poor	22	20.2	1.8	3.24	0.16
Q7	“	47	20.2	26.8	718.24	35.56
Q9	“	05	20.2	-15.2	231.04	11.44
Q13	“	16	20.2	-4.2	17.64	0.87
Q17	“	11	20.2	-9.2	84.64	4.19
TOTAL					106.52	

Degree of freedom:

$DF = (R-1) (C-I) = 4 \times 2 = 8$

At 5%, (0.05), Critical Value = 15.51 i.e. lesser than computed value, 106.52

Null Hypotheses are rejected (computed value, greater than the tabulated (critical) value). All the 3 null hypotheses are rejected. Therefore:

- Technology has significance role to play in small scale Business development,
- Small scale business has problem acquiring and using modern technology, and
- Technology has prospects in the future of small scale businesses in Nigerian economy

Recommendations

Specific recommendations towards prosperous entrepreneurship:

From the analysis, the following are recommended.

Government supports:

- i) Formulation of appropriate policies and programmes, and strict adherence to same for the purpose of sustained continuity. The new trends of the various governments in Nigeria are good indication for the future of entrepreneurship development in the country. The establishment of various institutions, the Loan Boards in the 1950s replaced with the Small-Scale Industries Credit Scheme (SSICS) after the independence, the Nigerian Bank for Commerce and Industry, later Bank of Industry, the Peoples Bank, Community Bank and in the recent time, the Micro-finance Banks are all to attend to financial needs of Small scale entrepreneurs. Also, with regard to technical and skills development, we have the Industrial Development Centre (IDC), the National Directorate of Employment (NDE), and other institutions as the Administrative Staff College of Nigeria (ASCON), the Federal Ministry of Industries (FMI), Centre for Management Development (CMD), and Centre for Industrial Research and Development (CIRD).

- Establishment of Economic Development Policies such as Employment Development Programmes (EDP), and National Economic Reconstruction Fund (NERFUND) were established to assist small scale business owners towards right footings.
- ii) Government has constantly encouraged partnership with the private entrepreneurs and of particular importance is her readiness to assist and support enterprises that are able to come up with new concepts and ideas. Thus, the current administration has engaged in cautious importation policy and Fiscal monetary regime that have made foreign currencies dearer so as to promote local industry development
 - iii) In the areas of innovations and technological capacity building: there has been encouragement of entrepreneur teaching in all higher institutions of learning in the country. Adequate funding and meticulous implementation of these educational programmes would go a long way to create local technologies for small scale industries.
 - iv) Infrastructural Development: power supply and good roads network, and creating enabling environment via provisions of social amenities would help in no small measure to facilitate small scale entrepreneurship development.

Prospects and Conclusion

Burgess, (2002) sees some success factors and possible ways out including the followings:

Investment of owners/managers in the implementation of technology, investment of users (employees) in the process of development and installation, training of users, appropriate selection of applications, adoption of disciplined planning methodologies in the process of setting up applications, and the role of external consultants and vendors among others.

Accordingly, there is the need to adopt appropriate technology, the term often very difficult to define because the nuance of appropriate technology varies between fields, and application. It is generally recognized as encompassing technological choice and application that is small-scale, decentralized, labour-intensive, energy efficient, environmentally sound, and locally controlled (Wikipedia, 2015). Appropriate technology has been said to be capable of addressing problems of extreme poverty, starvation, unemployment, and urban migration. Giving above recommendations among others, and careful attention paid to attract needed technology, the future of small scale industry and technology application is guaranteed.

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