Connecting the Dots Between Openness, Networking, Partnerships and Innovation Within a Cluster: Otigba Nigeria as a Case Study

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Abstract

The study investigated the role openness, networking and partnership on production and innovation within the Otigba ICT cluster in Nigeria. It also established the grade and prevalence of innovations within the cluster. Questionnaire were administered on two hundred (200) purposively selected owners/employees of informal ICT microenterprises in the cluster, The purposively selected enterprises were those having employee size of less than ten and offering ICT-related technical services. The results showed that there were competition and co-operation within the cluster with means of 4.64 and 4.10 respectively. Modes of openness within the cluster were by exchanging information and sharing experience with other technicians with means of 3.45 and 3.20 respectively. Firms were majorly (70%) involved in process and marketing innovations (30%). Openness, networking and partnership played a very significant role on access to information, customers, new domestic market, tools/technology, suppliers of raw materials and inputs among the enterprises. Majority (95%) of the respondent enterprises which exhibited cluster attributes were involved in one form of innovation or the other. The study concluded that openness, networking and partnership had engendered growth among the enterprises.

Keywords: Clustering, Openness, Networking, Partnership, ICT, Nigeria

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1.0 INTRODUCTION

1.1 Innovation, Clustering and the Informal Economy

The term innovation has been variously defined and described in extant literature. Perhaps one of the oldest definitions was given by Schumpeter (1934) who described innovation as the introduction of a new good, a new method of production, the opening up of a new market, or the use of a new source of supply of raw materials or new ways of organising industries. It includes the creation of novel or advanced products, processes, or services perceived as new and desirable by the market (Van de Ven, 1986; Woodside & Biemans, 2005). It requires the conversion of knowledge into new products, processes, and services as well as the successful diffusion of these inventions into the market (Kline & Rosenberg, 1986). Edquist (1997) states that innovations are new creations of economic significance while Li *et al.* (2008) views innovation from the indigenous perspective. They describe indigenous firm innovation as developing and introducing new products and processes indigenously. According *to* the Oslo Manual (OECD, 2005) the minimum requirement for an innovation is that the product, process, marketing method or organisational method must be *new (or significantly improved) to the firm*. Innovations constitute an indispensable component of the corporate strategies for several reasons such as to apply more productive manufacturing processes, to perform better in the market, to seek positive reputation in customers' perception and as a result to gain sustainable competitive advantage (Gunday *et al.*, 2011).

Weaver *et al.* (2000) identified two basic types of innovation – Schumpeterian and Usherian. The Schumpeterian innovation is radical and trend – breaking. It refers to the achievement of a technological breakthrough and its first commercial introduction as an entirely new technological solution. Usherian innovation, on the other hand, is gradual and incremental. This latter thread of argument is supported by Adeoti (2002) which noted that innovation in a less developed country would refer not only to the narrow definition of the commercial application of an invention, but also includes the adaptation and improvement of existing innovations.

The Oslo Manual (OECD, 2005) identified four types of innovation (Innovation Typology) at the firm level. These are product innovation, process innovation, marketing innovation and organisational innovation. First, product innovation is the introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses. This includes significant improvements in technical specifications, components and materials, incorporated software, user friendliness or other functional characteristics. Second, process innovation is the implementation of a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software. It also includes new or significantly improved methods for the creation and provision of services. Third, marketing innovation is the implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing. It is aimed at better addressing customer needs, opening up new markets, or newly positioning a firm's product on the market, with the objective of increasing the firm's sales. Fourth, organisational innovation is the implementation of a new organisational method in the firm's business practices, workplace organisation or external relations. The distinguishing features of an organisational innovation compared to other organisational changes in a firm is the implementation of an organisational method (in business practices, workplace organisation or external relations) that has not been used before in the firm and is the result of strategic decisions taken by management.

Traditional indicators of innovative activities such as R&D expenditures and patents often fail to capture the innovative performance of small firms adequately if at all they do. When small and medium size enterprises (SMEs) carry out their innovative activities they often do so without specific financial and managerial resources and, in particular, without formalised procedures (Santarelli and Sterlacchini, 1990). Thus SMEs tend to undertake a significant amount of innovative activities in their design, production and sales departments though they may not have R&D departments. However, when an output indicator such as the number and the nature of the innovations introduced by firms of different size is used, it emerges that small firms have introduced mainly incremental rather than major innovations (Santarelli and Sterlacchini, 1990). In essence, innovation in the informal economy would include incremental innovations that are new to the firm or new to the country (De Beer, Fu and Wunsch-Vincent, 2013). In addition, Daniels (2010) revealed the adaptive innovative nature of the informal sector within sub-Saharan African region. De Beer, Fu and Wunsch-Vincent (2013) suggest that there is more adaptation and imitation than original invention in the informal economy.

Measurement of innovation has been of much concern to academics and researchers worldwide since the 1980s (Bloch, 2007). Much progress has been made in the Western world, Europe in particular, especially with the development of the Oslo Manual. The first edition of the Oslo Manual, published in1992, was a synthesis of the experiences from a broad group of innovation surveys in the late 1980s, providing a standardized framework for collecting firm-level data on technological product and process (TPP) innovation in manufacturing industries (OECD, 1992). The second edition of 1997 filled the gap in the first to include innovation in service sectors. The third edition of 2005 broadened our understanding of innovation to include marketing and organizational innovations; a much expanded coverage of knowledge flows and the role of linkages in the innovation process (Bloch, 2007). Similarly, following the same trend of argument, the Bogota Manual was developed for the Latin American economies. However, innovations in the African context, especially sub-Saharan Africa, within the informal economy cannot be measured with the conventional metrics of patents and intellectual properties. It therefore behoves us to establish an applicable method or system of measurement for the African continent.

It has been established firmly in literatures that innovation drives economies. There is an increasing awareness of this also among developing economies. Compared to developed nations, there is a lower level of science and technology (S&T) in these countries due to infrastructural deficiencies, lack of human/knowledge capital, instability, corruption and lack of political will among others. S&T activities are mainly funded by national governments and international donors while foreign companies prefer to import R&D from their parent companies. There is thus a lack of applied research, a deficit of trained engineers and scientists, and weak technological capabilities in these economies (De Beer, Fu and Wunsch-Vincent, 2013).

Brusco (1992) cited by Oyelaran-Oyeyinka (1997) defines cluster as "An industrial district which is a set of companies, located in a relatively small geographical area, that the said companies work, either directly or indirectly, for the same end market, that their shared range of values and body of knowledge is so important that they define a cultural environment, and that they are linked to one another by very specific relations in a complex mix of competition and co-operation". Madsen *et al.* (2003) on the other hand, define industrial clusters as groups of firms on the same location composing a production system with spill overs that can be vertical or horizontal. This has been corroborated by Rosenfeld's (2001) assertion that industrial or business clusters are based on physical proximity of firms in one area or region. It has been observed that many communities that have developed certain strong informal

networks share and diffuse knowledge and innovations with each other (De Beer, Fu and Wunsch-Vincent, 2013). With this in mind, firms in the informal economies (IE) tend to operate in clusters or "agglomerations" (Livingstone, 1991). Clustering activities of firms lead to a number of advantages such as diffusion of information, rapid transfer of skills and knowledge, sharing of facilities among others (ILO, 1992).

According to Oyelaran-Oyeyinka (1997), hardly will there be two clusters sharing the same attributes, but Pyke, Becattini and Sengenberger (1990) observed some general organizing principles in clusters such as; first, the existence of strong networks of small firms sharing division of labour through subcontracting and specialization; second, clusters have geographic bounds but networking may exist far beyond territorial space; third, willingness to co-operate: this does not affect rivalry and healthy competition; four, widespread entrepreneurial dynamism: this can come as a response to relatively easy access to capital; five, flexibility: this is associated with highly skilled, specialized and trained workforce in contrast to the largely unskilled or semi-skilled workers of the mass market production lines; and sixth, trust and cultural affinity: this refers to trust and communality. There is cooperation between employees and employers rather than rigidity and antagonistic tendencies.

Technological learning is a common feature exhibited by industrial clusters. In his study of Nnewi clusters, Oyelaran-Oyeyinka (1997) observed that all the firms studied had acquired product capability to copy foreign designs. Apart from this, the firms had also acquired vital elements of process technology such as quality control, maintenance and industrial engineering. The general mechanism for technological learning was the external training of new staff in Taiwan or on-the-job. Akinbinu (2001) similarly observed that in the auto-mechanic clusters studied in Ibadan, the entrepreneurs made efforts to improve their skills through technological learning. It has been noted (Oyelaran-Oyeyinka, 2006) that learning-by-doing is an important component of non-formal learning in the African small firms which are rooted in crafts apprenticeship. Other scholars have similarly observed that learning and innovation in the informal economy are often based on apprenticeships where senior or master artisans train younger ones (Zeng, 2008; Kawooya, 2012). This is usually done out of generosity to help a dependent relative or friend who would otherwise depend on them. It is a symbiotic relationship whereby the apprentices who are eager to learn tend to provide cheap labour for the master craftsman. Once they master the art or particular skills, the senior or master artisan will subsequently assign them to specific tasks. The senior artisan's role is then limited to supervising them or dealing with complicated tasks that require new ways or ideas for dealing with certain problems (De Beer, Fu and Wunsch-Vincent, 2013).

There are some characteristics of innovation in the informal economy as observed by scholars. De Beer, Fu and Wunsch-Vincent (2013) revealed that large amounts of constraint-based innovations take place under conditions of survival, scarcity and constraints in the informal economy. Innovations are primarily demand-driven to satisfy the needs of less-affluent customers by focusing on and exploiting local resources and markets. Daniels (2010) identifies certain characteristics of the Jua kali in Kenya. These are small business size (less than 5 workers), low start-up capital and ease of entry, labour-intensive nature of work, non-protection by social contract or law, skills transfer by informal apprenticeship, affordability of items to local consumers, unreliable power supply and insecure premises, limited funding, adaptability to market conditions, and efficiency through coordination among businesses. Aubert (2005) also posits that innovation climates in developing countries are hampered by weaknesses of key elements of knowledge-based economies such as levels of educational attainment, the business environment and the information infrastructure. In addition to all those general problems mentioned above, SMEs in less developed countries face further barriers, such as; lack of technological and policy infrastructure, the low degree of innovativeness, bad location and inappropriate firm size for the market (Demirbas, 2011).

1.2 Openness, Networking and Partnership

Open innovation can be described as an innovation paradigm shift from a closed to an open model (Chesbrough, 2003). Two types of open innovation have been described; inbound open innovation and outbound open innovation. The former is the practice of attracting discoveries outside the company instead of relying entirely on in-house R&D while the latter is the practice of looking for an external organization that can commercialize a discovery through bringing it to the market (Chesbrough and Crowther, 2006). In this model, firms are thus expected to purposively use inflows and outflows of knowledge to accelerate internal innovation, and to expand markets for external use of innovation, respectively (Chesbrough 2006). It is generally agreed that sourcing of external knowledge for innovation is a critical process of a firm's inbound open innovation activities, where external knowledge flows into the organization (Chesbrough, Vanhaverbeke, and West, 2006; Dahlander and Gann, 2010; Brunswicker and Vanhaverbeke, 2014). Open innovation is no longer restricted to high tech industries alone; there are now several organizations outside the high tech industries that have adopted the concept. The primary driver responsible for the adoption of this concept is the search for growth in revenues and new products (Chesbrough and Crowther, 2006).

Networking and innovativeness are two major characteristics of industrial clusters (Eraydin and Armatli-Koroglu, 2005). Networks fall into two principal categories: inter-organizational networks and inter-personal networks (O'Donnell, Gilmore, Cummins, & Carson, 2001). Eggers, Kraus and Covin (2014) in their study of manufacturing SMEs found a positive link between networking and innovativeness. However, in a study by Giuliani and Bell (2005), it was reported that firms within the same cluster, all equally characterized by geographical proximity, displayed very different interaction patterns when it came to knowledge sharing. Some firms were observed to share ties within the same cluster while others had little or no ties with other firms (Balland, Boschma and Frenken, 2014). Thus, knowledge networks within clusters have been observed to be 'uneven and selective, not pervasive and collective' (Giuliani, 2007). This suggests that geographical co-location is neither sufficient nor necessary for knowledge to be transmitted between enterprises within a cluster (Balland, Boschma and Frenken, 2014). These different perspectives call for further look into the subject matter.

Partnership can be defined as a cooperative relationship in which resources are shared and exchanged in the pursuit of mutual objectives (Das and Teng, 2000). It enables firms to access new and unique information that gives rise to new product development and innovation (Smith-Doerr and Powell, 2005). It also leads to the transfer of existing knowledge from one firm to another (Dyer and Nobeoka, 2000; Meyskens, and Carsrud, 2013). It has been observed (Yamada and Yamashita, 2006) that partnership provides competitive advantages for entrepreneurial activities and engenders the amalgamation of other elements necessary for innovation. They posit that innovation emerges along with the formation of partnership and depends on the characteristics of the partnership. Partnership has become popular as many universities in the USA, Europe, and Japan have sought to proactively increase their industrial partnering activities. The eagerness to partner is due to the understanding that collaborations with industry can be symbiotic with both partners benefitting (Kleyn, Kitney and Atun, 2007).

2.0 METHODOLOGY

The research was carried out by developing and administering survey instruments designed to measure different types of innovation in the Otigba Computer Village, Nigeria. Questionnaire were administered on two hundred (200) informal ICT microenterprises in the

cluster, the main target being owners/employees of the microenterprises. The purposively selected enterprises were those having employee size of less than ten and offering ICT-related technical services. The results of the survey were used to carry out quantitative analyses germane to the objective of the study. The information gathered was supplemented with additional information from published sources such as reports and journals. Data collected were analyzed using descriptive statistics such as percentages, frequencies, means, bar charts and pie charts. The Standard Package for Social Scientists (SPSS 20.0) was used for the statistical analysis.

3.0 RESULTS AND DISCUSSION

3.1 Nature of Openness in Otigba Cluster

Table 1 shows the nature of openness at the Otigba market cluster. Since open innovation is a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as the firms look to advance their technology, majority of the enterprises in the cluster strongly agreed that while there was "competition within the computer village" (Mean = 4.64) "cooperation within the cluster" was fully embraced. This was in tandem with an earlier work by Pyke and Sengenberger (1992) which specified that cooperation, healthy competition and trust are some of the organising principles of a cluster.

Table 1: Nature of Open Innovation in the Cluster

	N	Min	Max	Mean	Std. Dev
There is competition within the computer village	200	1	5	4.64	.576
There is cooperation within the computer village	200	1	5	4.10	.857
There is mutual trust within the computer village	200	1	5	3.43	.894
Valid N (listwise)	200				

Scale

Strongly Agree = 5

Agree = 4

Undecided = 3

Disagree = 2

Strongly Disagree = 1

Table 2 further reveals the nature of the cluster. All of the firms reported that they usually exchange information with other technicians, share experience with other technicians, engage technicians from other firms, and share tools and equipment with other technicians, though none of them had a joint purchase of expensive equipment and importation of inputs. The reason for this disparity could be to avoid the conflict that comes with joint venture. Also, the cluster placed more emphasis on sharing what they had than combinational effort.

Table 2: Modes of Open Innovation Mechanism in the Cluster

	N	Min	Max	Mean	Std. Dev.
Exchanging information with other technicians	200	0	4	3.45	.855
Sharing experience with other technicians	200	0	4	3.20	1.130
Engaging technicians from other firms	199	0	4	3.17	1.172
Sharing tools with other technicians	200	0	4	3.07	1.354
Sharing equipment with other technicians	200	0	4	3.03	1.398
Joint purchase of expensive equipment	197	0	4	0.32	.644
Joint importation of inputs	194	0	4	0.14	.529
Valid N (listwise)	193				

Scale

Always = 4

Usually = 3

Occasionally = 2

Rarely = 1

Not at all = 0

Additionally, more than half (65.5%) of the enterprises claimed that they considered it safe to share only small knowledge with their colleague within the cluster in order to still remain

competitive (Table 3). Only about 26.6% of the respondents saw no competitive threat when they all shared their knowledge with their colleagues, while only a few (7.5%) saw sharing knowledge with colleagues as a competitive threat (Table 3). These findings corroborate the work of Uriarte (2008) which reports that organizations that share knowledge grow stronger and become more competitive. This means a cluster will grow and remain competitive if it shares knowledge. No wonder the Otigba market is one of the biggest clusters in West Africa. Definitely, one of the reasons for this growth is knowledge sharing. To support the outcome that knowledge sharing is a propeller to the growth of a cluster, Table 4 shows that over half of the firms (51.8%) claimed that they could volunteer complete technical information to a colleague in the cluster while only a few (3%) affirmed that they could not volunteer to share any form of technical knowledge with their colleagues.

Table 3: Knowledge Sharing amongst the firms in the Cluster

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None at all	15	7.5	7.5	7.5
	Small	131	65.5	65.8	73.4
	All	53	26.5	26.6	100.0
	Total	199	99.5	100.0	
Missing	System	1	.5		
Total		200	100.0		

Table 4: Level of Technical Information Sharing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None at all	6	3.0	3.0	3.0
	A little	90	45.0	45.2	48.2
	Completely	103	51.5	51.8	100.0
	Total	199	99.5	100.0	
Missing	System	1	.5		
Total		200	100.0		

Table 5: Level of Knowledge increase from Sharing Technical Knowledge

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None at all	4	2.0	2.0	2.0
	Small	78	39.0	39.0	41.0
	Very much	118	59.0	59.0	100.0
	Total	200	100.0	100.0	

Table 5 shows that well over half of those that have acquired shared technical knowledge within the cluster claimed that they have gained very much from the shared knowledge. This shows that knowledge diffusion is evident in the cluster. Barth (2000) asserts that the diffusion of knowledge is an important factor for competitiveness.

Figure 1 also illustrates that majority of the firms reported that there were informal associations guiding knowledge dissemination and diffusion in the cluster. They affirmed that the associations that existed were CAPDAN and COPTON as shown in Figure 2. These associations regulate knowledge dissemination amongst them. Majority of the firms had two to four apprentices in the last five years as shown in Figure 3. This shows that there is a learning process taking place in the cluster as the apprentices tend to enjoy the knowledge diffusion that is taking place within the cluster.

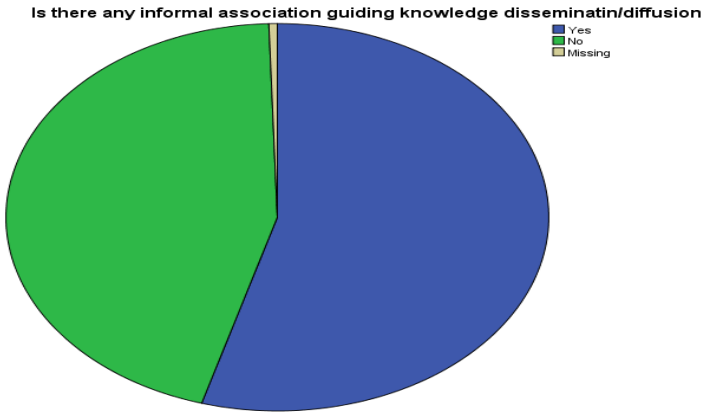

Figure 1: Informal Associations Guiding Knowledge Dissemination in the Cluster

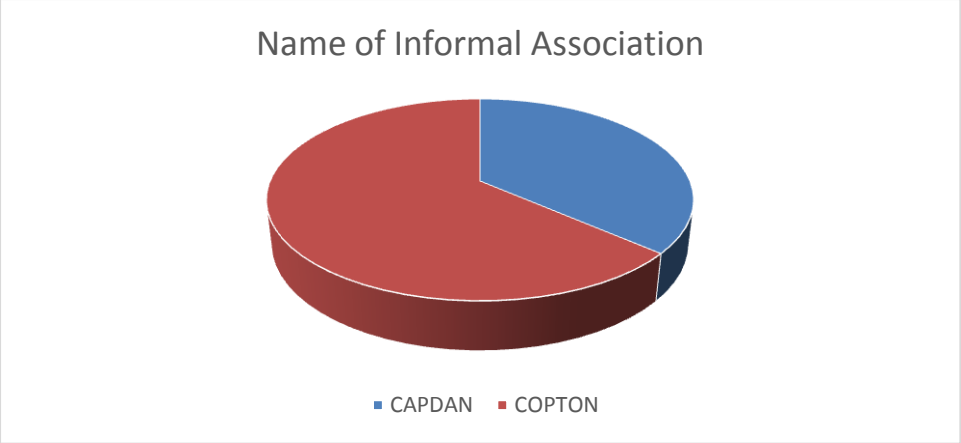

Figure 2: Names of Informal Associations Guiding Knowledge Dissemination in the Cluster

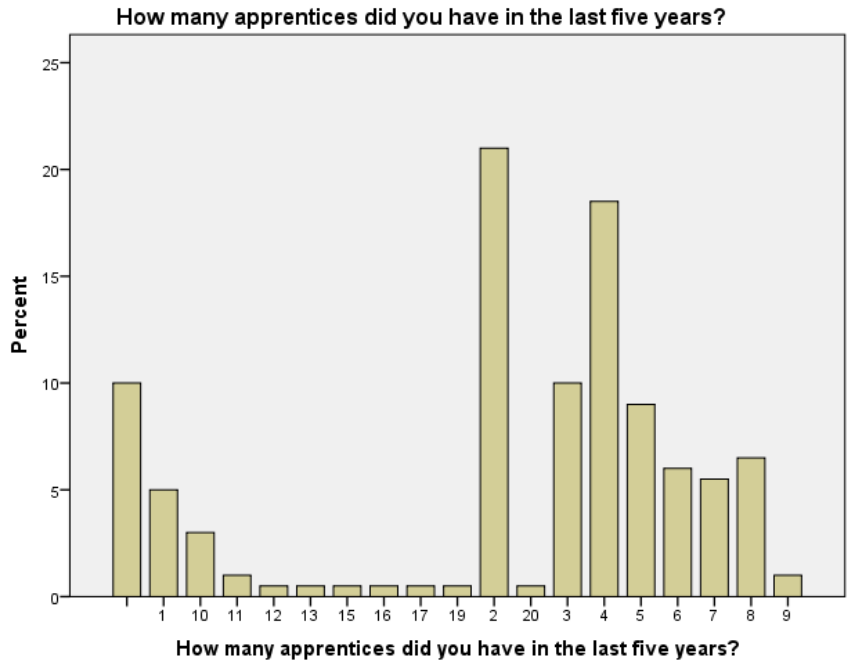

Figure 3: Number of Apprentice in the last Five Years

3.2 Prevalence and Nature of Innovations

Firms were majorly (about 70%) involved in process innovation followed by marketing innovation (about 30%) but their product innovation was low (Figure 4). According to the Oslo Manual (2005), process innovations include new or significantly improved methods for the creation and provision of services. They can involve significant changes in the equipment and software used in services-oriented firms or in the procedures or techniques that are employed to deliver services. Thus, the firms might have improved on the techniques used to

deliver their services over the years, but they might be low on product innovation due to the fact that they are not the producers of the products *per se*.

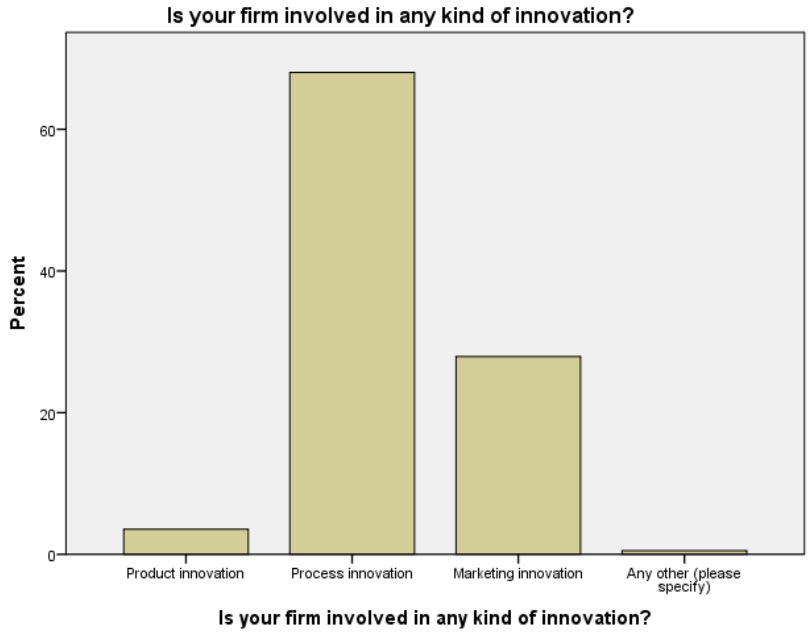

Figure 4: Kinds of Innovations Firms Were Involved In

Four kinds of innovation were identified in the cluster. These were product, process, marketing and organisational innovations in line with the Oslo Manual (2005) categorisation. Organisational innovation was the most prevalent among the firms with 46.2% being adaptive and 53.8% being adoptive (Table 6). This is rather curious since the firms studied were essentially indigenous. Marketing innovation was more adaptive than adoptive and this may not be unconnected with the fact that the firms are operating within their own national environment. However, product and process innovations were found to be mainly adoptive. The above may be due to the fact that the trade items were imported into the country and the firms had little or nothing to add to them.

Table 6: Kind of innovation carried out by firms

Innovation type	**Nature of innovation**	
	Adaptive (%)	**Adoptive (%)**

Product innovation	0.5	60.0
Process innovation	4.5	69.0
Marketing innovation	24.5	6.5
Organisational innovation	46.2	53.8

3.3 Role of Openness, Networking and Partnerships on Production Processes and Innovation within the Cluster

Openness plays a very significant role on access to information, customers, new domestic market, tools/technology, suppliers of raw materials and inputs but plays only slight significant role on finished products acquired beyond the shores of Nigeria with a mean of 2.40 (Table 7). The role of networking upon access to information, tools/technology, customers, suppliers of raw materials and inputs, and new domestic market was reported as very significant (Table 8) whereas its role upon access to international market (finished products) was only slightly significant. This agrees with earlier studies in the literature on networking advantages.

Also, partnership plays a very significant role on access to customers, information, new domestic market, tools/technology, suppliers of raw materials and inputs, but has slight significance on finished products sourced from abroad with a mean of 2.35 (Table 9). Networking plays a very crucial role in clusters worldwide. In Otigba computer village, networking and openness impacted on production processes to a large extent (mean 3.00) at the enterprise level while the impact of partnership on acquisition of technical knowledge within the enterprise was small (Table 10). Similarly**,** openness and partnership impacted on innovations carried out within the enterprise to a large extent but the extent of networking on innovations carried out was small with a mean of 2.25 (Table 11). However, on a general basis in extant literature, strong network is a common attribute among clusters (Pyke, Becattini and Sengenberger, 1992; Oyelaran-Oyeyinka, 1997; Oluwale, Ilori and Oyebisi, 2013).

Table 12 presents a cross tabulation of cluster attributes against extent of innovation. It shows that above 95% of the respondent enterprises which exhibited the attributes were involved in one form of innovation or the other.

Table 7: Role of Openness within the Cluster

	N	Min	Max	Mean	Std. Dev
Role of openness on access to information	200	3	3	3.00	.000
Role of openness on access to customers	200	1	3	2.99	.141
Role of openness on access to new domestic market	199	1	3	2.99	.142
Role of openness on access to tools/technology	200	1	3	2.93	.285
Role of openness on access to suppliers of raw materials and inputs	200	1	3	2.92	.366
Role of openness on access to international market (finished products)	200	1	3	2.40	.756
Valid N (listwise)	1				

Scale

Very Significant = 3

Slightly = 2

Not Significant = 1

Table 8: Role of Networking within the Cluster

	N	Min.	Max.	Mean	Std. Dev
Role of networking on access to information	197	2	3	2.99	.101
Role of networking on access to tools/technology	198	1	3	2.93	.286
Role of networking on access to customers	198	1	3	2.96	.234
Role of networking on access to suppliers of raw materials and inputs	198	1	3	2.92	.354
Role of networking on access to international market (finished products)	198	1	3	2.39	.771
Role of networking on access to new domestic market	196	1	3	2.92	.384

Role of networking on access to others (please specify)	1	2	2	2.00	.
Valid N (listwise)	1				

Scale

Very Significant = 3

Slightly = 2

Not Significant = 1

Table 9: Role of partnership within the cluster

	N	Min	Max	Mean	Std. Dev.
Role of partnership on access to customers	186	1	3	2.98	.164
Role of partnership on access to information	186	2	3	2.98	.126
Role of partnership on access to new domestic market	183	2	3	2.97	.163
Role of partnership on access tools/ technology	186	1	3	2.90	.368
Role of partnership on access to suppliers of raw materials and input	185	1	3	2.90	.397
Role of partnership on access to international market (finished products)	185	1	3	2.35	.774
Role of partnership on access to others (please specify)	0				
Valid N (listwise)	0				

Scale

Very Significant = 3

Slightly = 2

Not Significant = 1

Table 10: Impact of networking, openness and partnership on production processes and acquisition of technical knowledge

	N	Min	Max	Mean	Std. Dev.
To what extent has networking impacted on your production processes within your enterprise?	2	3	3	3.00	.000
To what extent has openness impacted on your production processes within your enterprise?	2	3	3	3.00	.000
To what extent has partnership impacted on your acquisition of technical knowledge within your enterprise?	200	1	3	2.31	.733
Valid N (listwise)	2				

Scale

Large Extent = 3

Small Extent = 2

Not at all = 1

Table 11: Impact of openness, partnership and networking on innovations within the enterprise

	N	Min	Max	Mean	Std. Dev.
To what extent has openness impacted on innovations you carry out within your enterprise?	195	2	3	2.86	.346
To what extent has partnership impacted on your production processes within your enterprise?	3	2	3	2.67	.577
To what extent has networking impacted on innovations you carry out within your enterprise?	194	1	3	2.25	.713
Valid N (listwise)	3				

Scale

Large Extent = 3

Small Extent = 2

Not at all = 1

Table 12: Association between Cluster Attributes and Extent of Innovation

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Exchanging information with other technicians * Is your firm involved in any kind of innovation?	197	98.5%	3	1.5%	200	100.0%
Sharing experience with other technicians * Is your firm involved in any kind of innovation?	197	98.5%	3	1.5%	200	100.0%
Sharing tools with other technicians * Is your firm involved in any kind of innovation?	197	98.5%	3	1.5%	200	100.0%
Sharing equipment with other technicians * Is your firm involved in any kind of innovation?	197	98.5%	3	1.5%	200	100.0%
Engaging technicians from other firms * Is your firm involved in any kind of innovation?	196	98.0%	4	2.0%	200	100.0%
Joint purchase of expensive equipment * Is your firm involved in any kind of innovation?	194	97.0%	6	3.0%	200	100.0%

Joint importation of inputs * Is your firm involved in any kind of innovation?	191	95.5%	9	4.5%	200	100.0%

4.0 CONCLUSION

Most of the enterprises surveyed at the Otigba ICT cluster started-off as micro enterprises, but some have crossed the margin to become small-scaled and medium-scaled enterprises. Knowledge sharing played a major role in the phenomenal transformation of enterprises within the cluster. The enterprises within the cluster were relatively innovative – with process innovation ranking strongest. Openness, networking and partnership played a very significant role on access to information, customers, new domestic market, tools/technology, suppliers of raw materials and inputs among the enterprises. In extant literature, it is a known fact that clustering, with its various attributes, supports innovation and innovativeness. Majority of the respondent enterprises which exhibited these attributes were involved in one form of innovation or the other. Conclusively, knowledge sharing has become a source of collective advancement to enterprises within the cluster without limiting the growth of individual enterprises.

5.0 POLICY RECOMMENDATIONS

The success story of the Otigba computer village coupled with its phenomenal growth has shed more light on the practice of open collaboration and what could be achieved by enterprises through it. To replicate this, it is recommended that clustering be encouraged in other sectors of the informal economy especially at the enterprise level. As knowledge is shared willingly within the cluster and constitutes one of its major strengths, enterprises can be encouraged to share information with greater fervour by rewarding originators of useful information. This can be done by cluster unions/associations creating awards for deserving members either annually or on a seasonal basis.

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