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E-business Adoption in Nigerian Small Business Enterprises

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Abstract— **Within the last decade, there has been a global increase in the use of e-business by both large and small companies. Today, it is generally acknowledged that e-business provides a range of opportunities for small businesses to operate and compete effectively; however, in developing countries such as Nigeria, there is very limited research on e-business adoption in the small business sector. This paper reviews existing literature on e-business adoption in developing countries, identifies key issues impacting upon e-business adoption and examines the use of e-business in four Nigerian small businesses using existing analytical models. The results indicate that Small Business Enterprises in Nigeria are indeed benefitting from e-business deployment, and key influencing factors affecting e-business adoption are identified. The study also concludes that different processes in different companies are affected by e-business, but that it is the customer facing processes in the main that have gained most from the adoption of e-business.**

Keywords- e-business; Nigeria; Small Business Enterprises; SBEs; process mapping; e-business models; critical influencing factors.

I. INTRODUCTION

Within the last decade, there has been a general increase in the use of e-business by both large and small corporations across the globe, and recent research suggests there has been an increase in the use of e-business technologies in Nigerian businesses [1]. In developing countries such as Nigeria, as a result of the increased use of the internet [2], and mobile networks penetration [3], current and potential customers of both large and small companies are not only equipped with desktop computers and laptops, but also with mobile devices such as iPads, smart phones and tablets. The demand for e-business capabilities in developing countries is on the increase, but very little research has explored the impact on smaller companies.

In developed countries, research has shown that both large enterprises and small businesses have successfully adopted e-business technologies and processes to gain competitive advantage [4], transform business models [5], and improve relationships with customers and suppliers [6] [7]. Various researchers have also pointed out that the motivation for e-business adoption varies from organization to organization, though it often encompasses reducing transaction costs [8], improved access to national or global markets [9], or increasing bottom-line profit performance [10].

Research conducted by the Organization for Economic Cooperation and Development (OECD) found that over 95% of companies in two thirds of OECD countries use the internet for various business activities [11]. The commercialization of the internet has brought about an increased use of information technology in businesses [12] and today, an increasing number of multinationals and large companies have automated all their business processes; even simple activities such as leave booking and room reservation have now been moved to online portals [13]. Empirical evidence has also shown that e-business adoption could be regarded as a strategy for organizations to compete and outperform competition [4] [5]. However, since developing countries often suffer from infrastructure and internet penetration issues [14], understanding the extent of e-business usage in smaller companies in developing countries has not been of research interest up until now. For the purposes of this research, we use the term Small Business Enterprises (SBEs), being defined as enterprises which employ fewer than 50 persons, while Small to Medium Enterprises (SMEs) are defined as enterprises which employ fewer than 250 persons [15] [16]. The significance of SBEs in many economies of the world is considerable. In Nigeria, SMEs contribute about 46.5% to Nigeria's GDP with SBEs making up 99% of these SMEs.

Using case studies of four Nigerian SBEs, this research investigates e-business adoption in a developing country context. The research utilizes process mapping and other existing frameworks to analyze the current situation in these companies. Following this introduction, Section II reviews relevant literature on e-business in developing countries and e-business frameworks, and positions two research questions for the study. Section III then describes the methodology employed in this study and Section IV presents and discusses the findings to date. Section V provides an analysis of these findings, and Section VI summarises results to date and addresses the two research questions. The final concluding section briefly outlines some future research directions.

II. LITERATURE REVIEW

In 1997, IBM first used the term "e-business" to mean "the transformation of key business processes through the use of internet technologies" [17]. E-business can be viewed as the integration of web technologies with business processes and management practices to increase efficiency and lower costs [18]. The adoption of e-business has been of interest to researchers for several years. In developed

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countries, numerous researchers [5] [7] [19]–[23] have explored various aspects of e-business, including factors affecting e-business adoption, challenges of adopting e-business, the development of e-business models, and critical factors in successful e-business adoption.

SMEs can contribute in various ways to a nation's economy, offering flexible employment opportunities [9], poverty alleviation [24], and supply chain flexibility [25]. Overall, their contribution to a country's overall GDP growth is significant [26], and e-business adoption in SMEs has been the focus of a number of studies in developed countries, including the UK [10] [27], the USA [28], Australia [19] and in Canada [29]. However, there is still considerable debate in the existing literature on the value and productivity gain e-business has to offer to SBEs [11] [13].

The following two sub-sections critically review, first, relevant literature regarding e-business adoption in developing countries, and, second, existing e-business models and frameworks.

A. E-business Adoption in Developing Countries

Research conducted on e-business in developing countries has identified factors responsible for adoption [30] [31], challenges and barriers to e-commerce adoption [32] [33] [34], the benefits of e-business and consumer attitudes to e-business adoption [35]. While several studies have been carried out in developed countries to investigate some of these topics, when results of such studies are compared with studies in developing countries, it becomes evident that the different environmental, infrastructural and cultural issues predominant in developing countries do not allow for all-encompassing generalizations, hence the need for country specific studies.

Kapurubandara and Lawson [34] investigated the barriers to ICT and e-commerce adoption in Sri-Lanka. Their research indicated that SMEs lag behind and are often skeptical about the uptake of e-business technologies. Their study also suggests that SMEs face unique and significant challenges in the uptake of e-commerce and these challenges could be broadly classified as internal and external barriers. Using data from exploratory pilot studies, surveys and existing literature, they identified nine barriers to the adoption of ICT and e-commerce in Sri-Lanka which include lack of skills, security, cultural and political barriers. Their research also proposed relevant support measures needed by SMEs in developing countries to overcome such barriers.

Quite similarly, Janita and Chong [33] also researched the barriers to B2B e-business adoption in SMEs in Indonesia, a country with the largest proportion of SMEs in South East Asia. Their research identified poor infrastructure, lack of owner or manager motivation, lack of power to influence partners and lack of online policies, as some of the key barriers to e-business adoption by SMEs. They proposed a conceptual framework which consists of six key indicators (Individual, Organisational, Technology, Market & Industry, External Support and Government Support) for analyzing the barriers of B2B e-business adoption in Indonesian SMEs.

More recently, Rahayua and Day [31] conducted a study on Indonesian SMEs to determine factors that affect e-commerce adoption. Their research, which was based on the Technological, Organisational and Environmental theoretical framework (TOE), surveyed 292 Indonesian SMEs and identified 11 variables as important factors that influence adoption of e-commerce in SMEs. These variables are further grouped into four, - technological factors, organizational factors, environmental factors and individual factors.

Hitherto, most relevant studies on Nigerian small businesses have focused primarily on e-commerce, i.e., the buying and selling of good and services online, neglecting the potential of e-business in transforming business processes and core operations in the more traditional "bricks and mortar" companies [8] [24]. In 2011, Olatokun and Bankole [36] investigated the factors influencing e-business technology adoption by SMEs in Ibadan, a city in south western Nigeria. Data was collected by structured questionnaires administered to key personnel in 60 SMEs (30 adopters and 30 non-adopters of e-business), and the results revealed that the age of SMEs was a significant influencing factor on whether e-business was used or not, while company size was of very little significance. It was the younger companies that constituted the majority of e-business users.

Agwu [30] also conducted an investigative analysis of factors affecting e-business adoption and website maintenance of commercial organisations in Nigeria. This case study research gathered information from six organisations based in three geopolitical zones of the country – North, West and East. Overall, 9 managers were interviewed and the results of the study indicated that consumer readiness, IT Skills shortage and internet connectivity are vital to e-business adoption and website maintenance in Nigerian businesses.

As a follow on to previous research, in 2015, Agwu and Murray [37] also researched the barriers to e-commerce adoption by SMEs in Nigeria. The research which was conducted in three states in Nigeria – Lagos, Abuja and Enugu - made use of interviews to gather information from SME owners, and their findings indicated that lack of an e-commerce regulatory security framework, technical skills and basic infrastructures are some of the main factors that hamper e-commerce adoption in Nigeria.

Recently, Erumi-Esin and Heeks [38] researched e-business adoption and use among African Women-Owned SMEs. Their study, which made use of both qualitative and quantitate methods of research, surveyed 140 SMEs in Warri - a commercial city in southern Nigeria. Using questions informed by the Unified Theory of Acceptance and Use of Technology Model (UTAUT), they examined factors that influence adoption in women-owned SMEs in sub-Sharan Africa. Their results indicated that perceived usefulness plays an important role in e-business adoption, market forces serve as drivers, while lack of infrastructure and resources serve as impediments to adoption.

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These research initiatives indicate both the current use and potential that e-business has in developing countries such as Nigeria, but no study has focused on Nigerian SBEs. This study aims to fill this research gap and provide insights into the key issues impacting upon e-business adoption in Nigerian SBEs. Rather than look at barriers, success factors or indicators, the research at this stage will attempt to identify the key influencing factors that are impacting the take-up and deployment of e-business in the Nigerian SBE sector.

B. E-business Models and Frameworks

To understand and extend the deployment of e-business in companies, researchers, governments and e-business consultants have developed several analytical and operational frameworks [39] [40]. Analytical tools such as process mapping and systems profiling have also been used in previous studies [10] [41].

The DTI Adoption Ladder constitutes one of the earliest e-business frameworks. It breaks down e-business adoption into five stages and suggests that organisations move through these stages in a sequential order [9] [42]. Levy and Powell [43] proposed the "transporter model" as an alternative non-linear e-business adoption model for SMEs. This model suggests that different types of SMEs will view e-business adoption in different ways and identifies four dimensions of e-business deployment in an SME - brochureware, business opportunity, business network and business support.

In order to determine e-business adoption at individual process level – rather than at overall company level - the Connect, Publish, Interact, Transform (CPIT) model was developed by the UK Department of Trade and Industry [44]. This model offers a 2-dimensional matrix to evaluate the impact of e-business technologies across an organisation's main business processes. When compared with the Adoption Ladder, the CPIT model offers a more in-depth assessment of the impact of e-business on SME operations [9]. The Stages of Growth for e-business (SOG-e) model [45] is the combination of a six stage IT maturity model with a six stage Internet Commerce maturity model. However, somewhat akin to the CPIT model, the SOG-e model recognises that it is possible for an organisation to have different levels of e-business maturity in different areas of a business. A related model is that of Willcocks and Sauer [46], who identified 4 main stages through which organisations will pass as they develop and apply the skills needed for successful e-business deployment. The organization gains increased business value from e-business as it attains the new capabilities required to advance to the next stage.

Research studies in developed countries have applied some of these methods and frameworks to evaluate e-business technology and process adoption in SMEs. However, in the context of Nigeria, no study has to date applied similar methods in the analysis of e-business adoption in SBEs. This research will attempt to apply some of these models to Nigerian SBEs, using, as a starting point, a simple top level process mapping technique that has been applied in similar studies [10] [47]. More specifically, it will address the following research questions (RQs):

RQ1. Can these mapping techniques and models of e-business adoption be usefully applied to SBEs in a developing world context?

RQ2. What are the critical influencing factors impacting upon e-business adoption in Nigerian SBEs?

III. RESEARCH METHODOLOGY

Research projects usually adopt a particular philosophical stance based on a research paradigm, for example post-positivism, pragmatism, interpretivism or constructivism [48]. This philosophical stance has a major influence on the choice of research methods and approaches to be used in order to obtain relevant findings [49]. For the purposes of this research, an interpretivist paradigm is adopted, and the research approach is qualitative, using multiple case studies.

The case study method of research has been selected because it is well suited for observations where the researcher aims to probe deeply and analyse with a view to making generalisations about the wider population in which the unit being studied belongs [50] [51]. Furthermore, the use of e-business is quite complex and will often vary from one company to another. According to Yin [52], the case study method of research is well suited for exploratory studies that aim to understand a phenomenon which will often result in the use and review of multiple evidences.

The four case studies (Table I) were selected from a cross-section of SBE industry sectors in Lagos – Nigeria's most populous city and its economic capital. The use of multiple case studies adds greater weight to the research and makes research findings more convincing [52]. Qualitative data was gathered through questionnaires and semi-structured interviews with key personnel in the company case studies. The case studies were identified through existing contacts with company owners and IT managers, and all organisations selected for the study had already attempted to apply e-business within their organisations.

The interview data was used to build a process map of each company, employing a simple technique used in similar studies [41]. Interviewees were also questioned

TABLE I. THE FOUR CASE STUDY COMPANIES

Company	**Date Founded**	**No. of Staff**	**Turnover 2014/15**
ABC Laundries	2010	7	£14,000
GPY Properties	2012	23	£76,000
KDE Energy	2012	10	£235,000
LTE Consulting	2007	7	£24,000

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about the functioning and capabilities of existing systems and technologies in each process area of the company concerned, providing the basis for a profiling of existing technology as either worthy of retention, in need of replacement or between the two, pending further evaluation (Fig. 1 to Fig. 4). This again builds on similar studies undertaken in small companies in the UK [54].

While this research is qualitative, exploratory and inductive in nature, some quantitative assessment of company turnover, number of staff and period of e-business usage was done. Necessary approval and consent from participatory organisations were sought and aliases have been used for company and individuals' names. Empirical evidence gathered from these organisations was developed and assessment made against selected models.

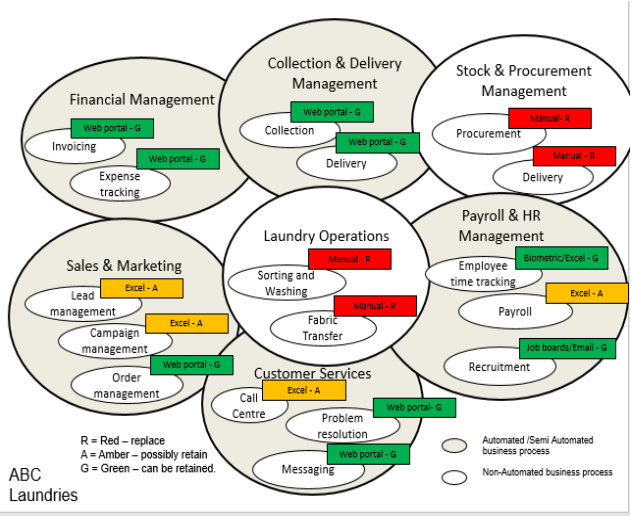

Figure 1. Main business processes and systems profiling at ABC Laundries

IV. FINDINGS

ABC Laundries is a family business founded in 2010. It originated as a home based operation, but has now expanded to become a budget laundry and dry cleaning service for people living in Lagos. The company provides a wide range of laundry and dry cleaning services to people living in the Lagos Metropolis from its locations in Yaba and Surulere (urban areas within Lagos). With its main operations office in Surulere strategically located within the Lagos University Teaching Hospital, ABC Laundries is able to offer its laundry services to students and staff at the hospital, as well as pickup and delivery services to companies, corporate services, and guest houses across Lagos State. Currently, the company turns over circa 6 million Naira (£14,000) per annum, and employs 7 staff. (Staff wages are very low in comparison with developed world norms, averaging less than £1000 a year for these staff). The current business plan is to further increase revenue by expanding the company's customer base and increasing market share.

The management of ABC Laundries view e-business as a key enabler of corporate growth and, to this end, invested in a bespoke web-based system in 2013, to handle its key Sales & Marketing and financial management processes. Prior to this, most business processes were handled by a combination of paper based receipts, Excel spreadsheets and open source accounting tools. However, this became difficult to manage with the opening of a new branch in 2012, and this was the catalyst for investment in a new web portal. The key objectives of this investment were:

1. To provide a system where orders can be captured in real time at both locations.
2. To provide a mechanism to allow staff and customers to track the status of a laundry order from pickup to delivery.
3. To enable top-level financial reporting in real-time.
4. To maintain a database of customers and contact details.

The web portal was implemented in phases, adding new functionality as the old support systems were phased out. The key objectives have been met, with the addition of a few functionality enhancements. The web portal was built using PHP and the MYSQL database. Integration with email servers as well as SMS gateways has enabled emails and SMS notifications to be sent to customers.

GPY Properties is a property development and marketing company founded in 2012. Given Nigeria's housing deficit and the acute absence of quality housing in the country, the company aims to help redress this imbalance through the provision of innovative, high quality and affordable homes.

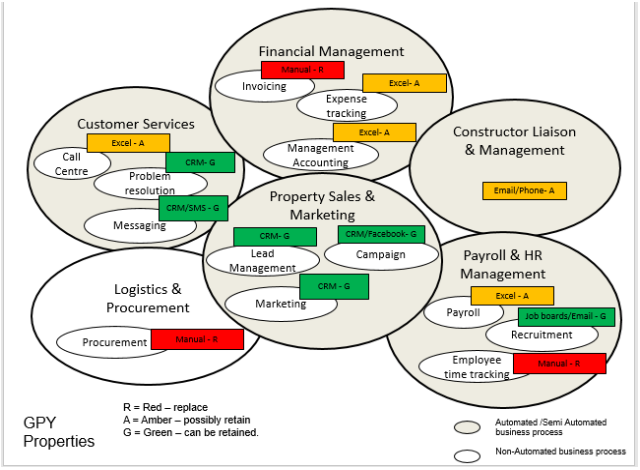

Figure 2. Main business processes and systems profiling at GPY Properties

The company originated as the property sales division of a larger consulting company called PYI Consulting Limited. However, as sales of developed properties increased, the owner decided to hive off the division into a separate corporate entity to focus on property development

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Sales & Marketing as its core business. In 2015, the company turned over about 32 million Naira (£76,000) and the forecast for 2016 is even greater, although considering the recent recession in the country, this might be quite ambitious.

GPY Properties maintains a website mainly for marketing properties and showcasing its ongoing projects to customers and potential customers. The company also maintains a cloud based Customer Relationship Management (CRM) system for maintaining and analyzing customer contact details. From time to time, the company also advertises on Facebook and various other property aggregator websites. Invoice generation and other accounting activities are currently managed by Excel spreadsheets, but plans are in place to subscribe to a cloud based accounting solution; the Wave Accounting and Xero Accounting packages are being considered as possible solutions. With three full time staff and twenty contract staff, the company has been able to automate most of its daily business activities concerning customer engagement, internal communication and product marketing.

KDE Energy is an energy solutions company established to meet the energy demands of Nigerians. By offering alternative energy solutions using solar technologies, the company has been able to provide cost effective solutions to both residential and commercial customers. Upon completion of a degree in Electronics in the UK in 2012, the founder returned to Nigeria and subsequently identified an opportunity in the energy sector in Nigeria.

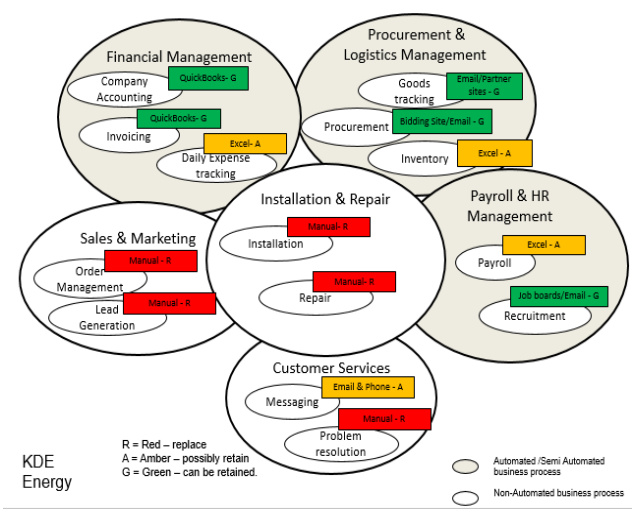

Figure 3. Main business processes and systems profiling at KDE Energy

Today, with only two full-time staff and about eight temporary staff, the company turns over 100 million Naira (£235,000) and has plans to increase this in the coming year. In 2014, KDE Energy invested in a website to provide information about its products and services to potential customers. This investment was part of the company's growth strategy as it intended to take on more commercial projects and having a website made the company look more professional. The company makes use of a cloud based accounting tool for its quarterly accounting and most of the day to day expenses are handled with Microsoft Excel. According the founder, the company is very aware of how e-business positively affects its operations, particularly with the sourcing of goods. However, they do not have a plan in place yet to take orders online or become very active on social media.

LTE Consulting is a training and consulting SBE based in Lagos, Nigeria. The owner founded the company in 2007 after a successful career in the civil service. The company turns over 10 million Naira (£24,000) and principally focuses on training and consulting in West Africa, but with Nigeria as its main focus point. The company offers standard or tailored in-house training, as well as open courses, particularly to the Nigerian financial sector. With staff numbering 4 full-time staff and 3 contractors, the company prides itself on offering quality training courses in customer service, agency marketing, life insurance and management.

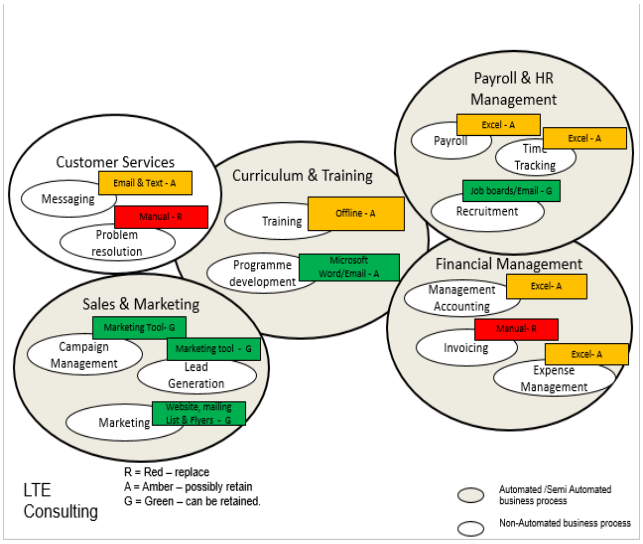

Figure 4. Main business processes and systems profiling at LTE Consulting

The company maintains a website that helps to keep its customers aware of upcoming courses and training. The company also allows bookings to be made on the website but the actual payment/sale is done offline. Furthermore, the company maintains a custom built customer relationship management (CRM) tool that it uses to keep in touch with its customers as well as previous course attendees. After a newsletter is sent out informing previous customers in the database of new course offerings, it is the norm that the company would receive at least 20 related inbound calls within a week. While LTE Consulting still sends out fliers via dispatch riders, the management considers that using the CRM system is cost effective and if their customer base was more IT enabled, they would consider halting their flyer distribution.

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V. ANALYSIS

Analysis of e-business deployment in the case study companies was undertaken through the combination of two techniques - process mapping and systems profiling (briefly noted in Section III), and two models - CPIT (a process based e-business model) and the Willcocks and Sauer e-business stage model. Previous research [5] [30] indicates that the use of simple stage based models alone to determine the level of e-business use in an organisation is not sufficient, as different processes may be at different levels. However, even with models that examine technology deployment at process level, such as the CPIT model, there is still the need to adapt these to a small business environment, as the process definitions may not be appropriate to newly-created SBEs. This combination of pre-existing techniques and models, derived and adapted from previous research [10], is used as the framework for analysis of the case studies.

Using data from the questionnaire responses and semi-structured interviews, seven core processes were identified in ABC Laundries (Fig. 1) - Laundry Operations, Financial Management, Sales & Marketing, Collection & Delivery Management, Stock & Procurement Management, Payroll & HR Management and Customer Services. At GPY Properties, there were six core processes (Fig. 2) that the organisation performs – Financial Management, Constructor Liaison & Management, Customer Services, Property Sales & Marketing, Logistics & Procurement and Payroll & HR Management. At KDE Energy, six processes (Fig. 3) were identified - Financial Management, Customer Services, Procurement & Logistics, Installation & Repair, Payroll & HR Management and Sales & Marketing; while at LTE Consulting, five processes were identified (Fig. 4) – Invoicing & Financial Management, Sales & Marketing, Customer Services, Curriculum & Training and Payroll & HR.

Systems profiling was applied to identify e-business systems currently in place in each process area. By employing a simple Red-Amber-Green assessment (Fig. 1 to Fig. 4), systems were assessed to indicate those in need of replacement, those that could possibly be retained and those that were deemed strategically and/or operationally sound. This procedure initiated the analysis of e-business systems at individual process level as well as indicating which processes are automated, semi-automated or non-automated.

A CPIT analysis of ABC Laundries (Fig. 5) provides a more detailed view of the impact of e-business systems at process level. This revealed that e-business systems have made significant impact in the financial management and customer facing processes. Decision-makers within the organisation are easily able to keep track of daily, weekly and monthly revenue from any of the two premises, or remotely, thus helping the organisation to plan effectively and take appropriate action when needed.

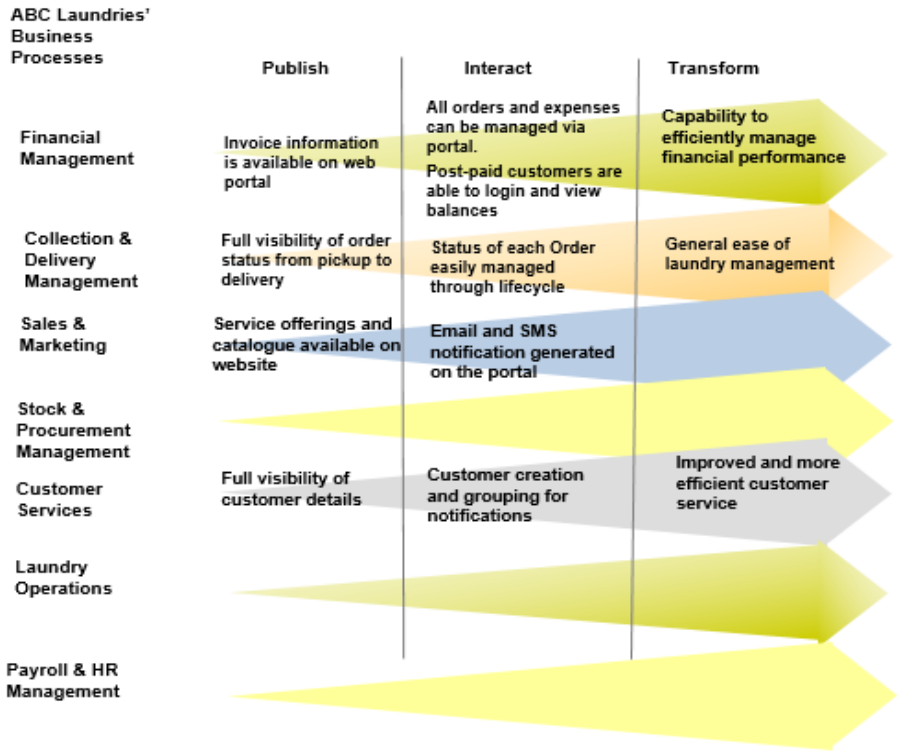

Figure 5. CPIT model applied to ABC Laundries

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The Sales & Marketing process has also been made more efficient with the ability to automate and notify selected groups of customer via SMS or emails. There remain further benefits to be gained by automating the communication of marketing information to customers and by making relevant information available across processes. This may allow, for example, special offers to be made to customers in specific geographic locations, with high frequency of delivery, with a mind to keep delivery cost constant and increase orders to be delivered. This type of further development, which is akin to what, in a larger organization, would be termed Business Intelligence, would arguably move the company into the transformation stage on the CPIT model.

GPY Properties has been able to adopt e-business technologies without the need to use in-house IT staff, as it has been able to utilise a cloud based CRM tool. The CPIT model for GPY Properties shows that its Sales & Marketing process is well supported by e-business technology. According to the company's managing director, the strategy to advertise online has helped the company gather new leads - often people with very busy schedules, who would not normally have time to visit the company's office - as well as reach different geographical locations with its advertisements. This year, without doing any advert campaign specifically targeted at the northern part of Nigeria, the company has been able to make two property sales to individuals who live in this location, and a number of further sales in this region are currently in the final stages of completion. One of the current subscribers to its flagship residential estate is a Nigerian who resides in Canada and who saw the advert on the company's Facebook page.

Nevertheless, Fig. 6 shows us that as of now, the deployment of e-business technologies at GPY Properties is restricted to the Sales, Marketing and Customer Service processes. The managing director has affirmed that the volume of data generated by the various departments in the other process areas does not justify further investment in e-business systems at present, although this may change as the organisation expands and takes up more construction projects.

KDE Energy makes use of QuickBooks to maintain its company accounts while day-to-day expenses are tracked using Excel. As can be seen from Fig. 3, the Financial Management, Payroll & HR Management and Procurement & Logistics processes are automated to some degree, while the other three processes are largely manual. The CPIT analysis of KDE Energy (Fig. 7) emphasizes this and clearly indicates that only the Financial Management and Procurement & Logistics processes are adequately supported by e-business technology. However, as indicated by the founder of the company, most of their income is made from transactions with other companies, and this normally emanates from discussions at management level, and therefore there is very little justification for implementing an e-ordering site as there is no demand for it at present. The company's customers do not require it and their competitors are not using it.

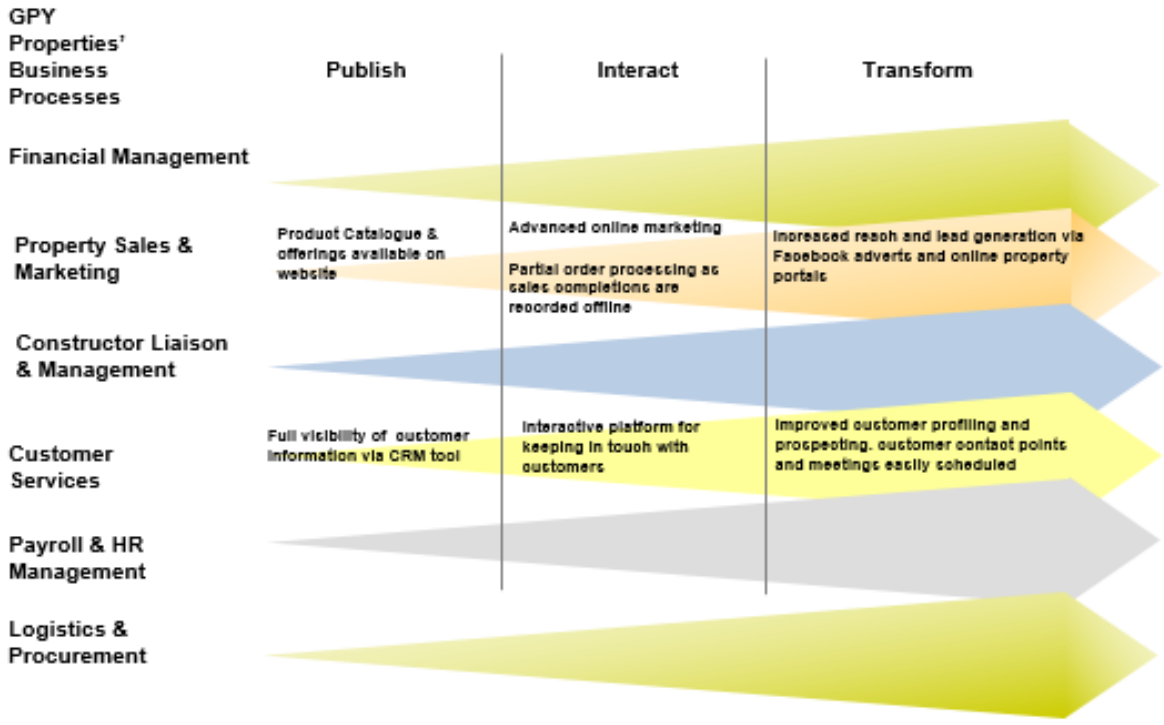

Figure 6. CPIT model applied to GPY Properties

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From the system profiling of LTE Consulting (Fig. 4), it can be seen that most processes are automated. The CPIT analysis (Fig. 8) of this company indicates that the business has gained significant value from their e-business deployment, notably in the Sales & Marketing process. The company is very focused on increasing sales, and since the company deals with individuals as well as corporate customers, they are required to constantly keep in touch with customers in order to get new businesses. Email newsletter automation has been cost effective so far.

If we now look at these four companies against Willcocks and Sauer's model [46], the analysis suggests they are all on or between stages 2 and 3 (Fig. 9), whereas other authors [54] have suggested that many small companies do not progress past stage 1 because they often do not see the benefit in investing in capital intensive e-business projects. This apparent contradiction is partly explained by the reduction in cost of e-business infrastructure in recent years, and, partly because of this, it has become a *de facto* norm to use e-business in the Sales & Marketing processes in many organisations, including SBEs. Moreover, in the case study companies investigated here, the management sees e-business as a key enabler to growth.

In ABC Laundries, in particular, their success with e-business to date can be attributed to the phased introduction of new e-business features which has helped the organisation derive value from relatively small scale, staged, expenditure. This has also allowed a phased upgrade in technology, accompanied by appropriate process improvement and staff training, before moving on to focus on another process. Similarly, at GPY Properties, the company has used cloud based systems that offer very low entry costs.

VI. RESULTS

In answer to RQ1 noted earlier in this paper, this research suggests that the e-business adoption models, developed to gauge the impact of e-business in the developed world over a decade ago, are of value today in a developing world context. Although the definition of e-business has evolved, the process mapping technique and the application of models like CPIT can give a clear framework and point of departure for the assessment of e-business in countries like Nigeria; and they clearly show that e-business technologies are bringing value to the studied SBEs, notably in the customer facing processes, which mirrors the early deployment of e-business in the developed world.

As regards RQ2, the analysis of data retrieved from interviews and questionnaires from these four SBEs in the Lagos Metropolis indicates eight *critical influencing factors* (CIFs) impacting e-business adoption in Nigerian SBEs.

A. Owner Perspective

Most SBEs in Nigeria are run by one individual or at most a partnership of two people. Most business decisions are by the owner and his/her perspective is thus critical. In the case of ABC Laundries and LTE Consulting, the company owners were very much in favour of IT and had a general belief that the careful introduction of new systems would make them more productive and profitable. For example, the owner of ABC Laundries made it explicit that he made most of the decisions in the organisation, and that if he had not promoted the use of e-business in his organisation, it would have been difficult for the company to fund the necessary investment, let alone overcome the various challenges the staff encountered as a result of e-business implementation.

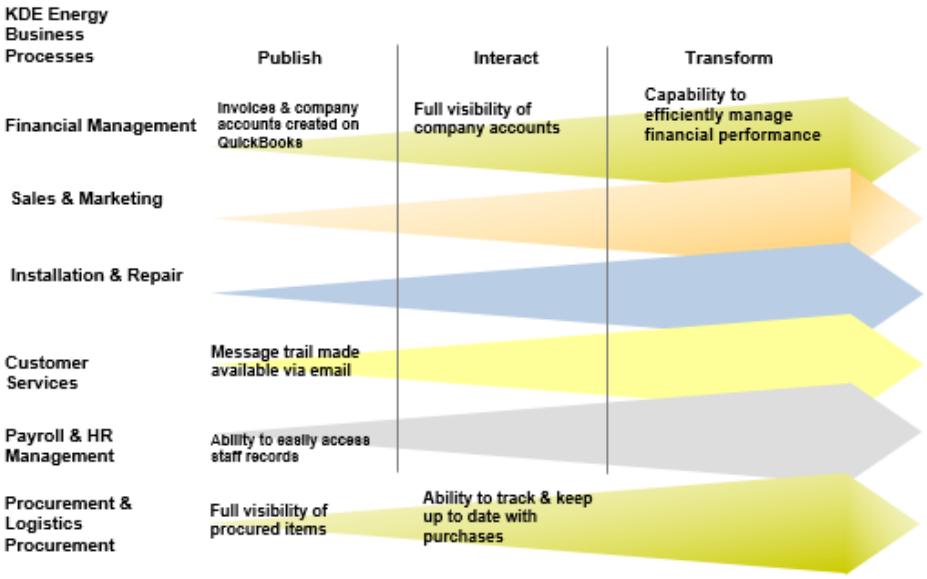

Figure 7. CPIT model applied to KDE Energy

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B. Customer/Consumer Perspective

Customer and consumer perspectives are important to most aspects of an SBE operation. Consumers often drive e-business usage in SBEs in Nigeria. In some industry sectors, notably those focused on retail sales, consumers are increasingly expecting a range of web-based services. But in other companies, for example, KDE Energy, the primary customers are other companies that are often not well advanced in the use of e-business themselves, and as such there is no great pressure from the customer side to introduce e-business into customer service processes.

C. Internet Penetration, Cost & Availability

For the purposes of this research, e-business is defined as the use of internet technologies in business processes. Thus, for SBEs in Nigeria to effectively take up e-business, the internet needs to be suitably available at their office and works locations, at acceptable cost. All four companies in this study attested to the importance of internet penetration in their areas. Although this is on the increase in Nigeria generally, it still remains one of the key issues affecting e-business adoption in Nigerian businesses; and with tight cost control often of paramount importance, internet costs are particularly relevant in an SBE environment.

D. Trust

Another key issue affecting e-business adoption in Nigerian SBEs is trust. Trust can be seen as a multifaceted factor as it relates to both staff trust and confidence in the e-business systems and processes, and also customer/consumer trust in online purchases in the Nigerian technology and regulatory environment. Lack of trust has impeded the progression of on-line order capture, as evidenced in these case studies.

E. Government Policies & Regulations

Currently in Nigeria, there are no government policies or incentives regarding the adoption of e-business by SBEs. As already identified in the literature review, this has been a key enabler in the adoption of e-business in the UK and Australia. The move to e-business in Nigeria could be promoted and progressed by Government subsidies for relevant investment, support for skills development and also by acting as an exemplar in using e-business in parastatal authorities and government ministries – for example, for online bidding for government contracts.

F. Investment Costs

As with any infrastructure project in an organisation, there is an initial cost associated with the uptake of e-business -cost of software, cost of hardware devices and general operational and maintenance costs. The average setup cost amongst the four SBEs studied was about 500,000 naira (£1,200). This may seem a relatively small amount, but when compared to the revenue of each of the company, it is a sizeable investment. SBEs also need to be confident regarding payback and benefits. Government incentives to invest in such technology would be of benefit, as would the encouragement of in-country production of appropriate hardware and software systems.

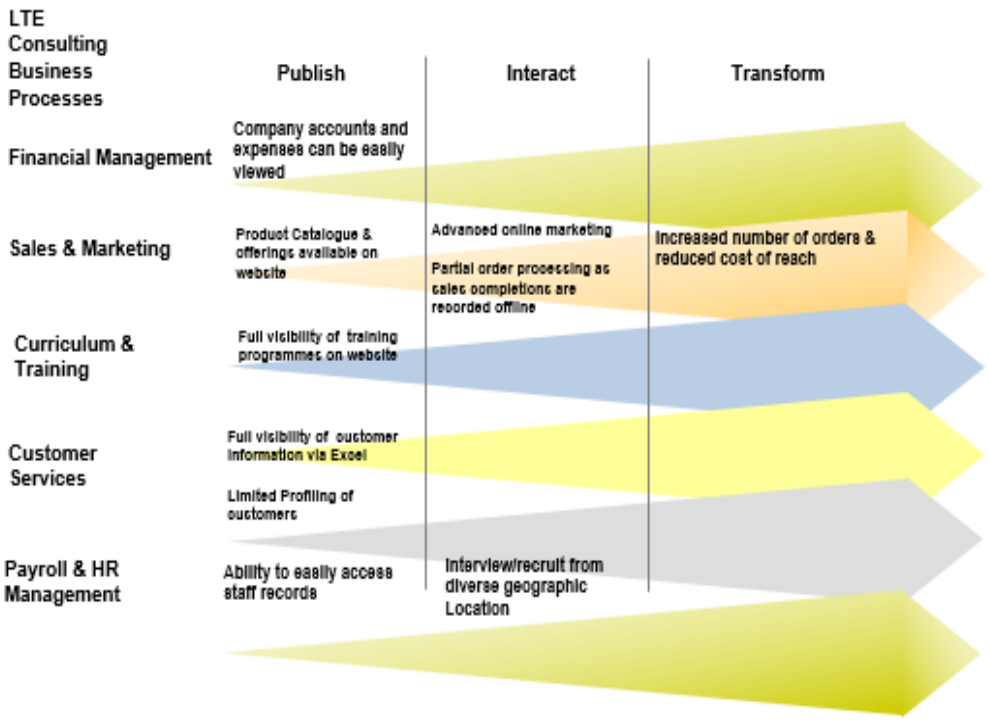

Figure 8. CPIT model applied to LTE Consulting

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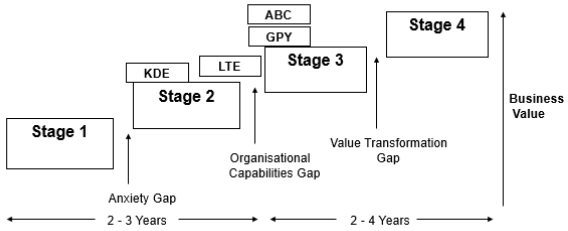

Figure 9. The Four Nigerian SBEs on the E-business Stage Model

Stage 1- Web Presence
- Develop presence
- Develop technology capability

Stage 2- Access Information and Transact Business
- Re-orientate business/technology thinking skills
- Build integrated approach with the web and business systems

Stage 3- Further Integration of Skills, Processes and Technologies
- Reorganise people/structures
- Reengineer processes
- Remodel technology infrastructure

Stage 4- Capability, Leveraging, Experience and Know-How to Maximise Value
- Customer-focused organisation

G. Power availability

Power availability is paramount amongst the key issues influencing e-business adoption in Nigerian SBEs. All the SBEs studied identified power availability as one of the main issues affecting e-business adoption.

On average, Nigerian businesses loose about 10 hours a week to power cuts. This has a major impact on businesses reliant on e-business and other IT systems, making it very difficult to work productively in these periods. Many companies have sought to source alternative sources of power, such as the use of generators, solar panels and inverters. All the companies studied have backup generators, but in two of the companies studied, they have resorted to the use of mobile apps and tablets with long lasting battery power. This can act as a more cost-effective backup than the use of generators in the event of power cuts, as was the case at ABC Laundries.

H. ICT Skills

For any SBE to effectively implement e-business, it will likely need access to third party IT professionals, whilst at the same time, some of its staff need to be proficient in the use of IT. This is problematic in many Nigerian SBEs, where 90% of staff are semi-skilled and have little or no ICT skills or experience. In the case of PYI properties, the company makes good knowledge of IT a pre-requisite for recruitment of most employees. ABC Laundries has a 'buddy' system whereby the more computer literate staff members train other staff for a couple of hours in a week. ICT skills remains a key influencing factor in the uptake of e-business in the SBE sector.

VII. CONCLUDING REMARKS

The study clearly shows that e-business technology adoption varies in focus and nature from business to business in Nigerian SBEs. The property and training companies focused on the Customer Services and Sales & Marketing processes, while KDE Energy focused more on

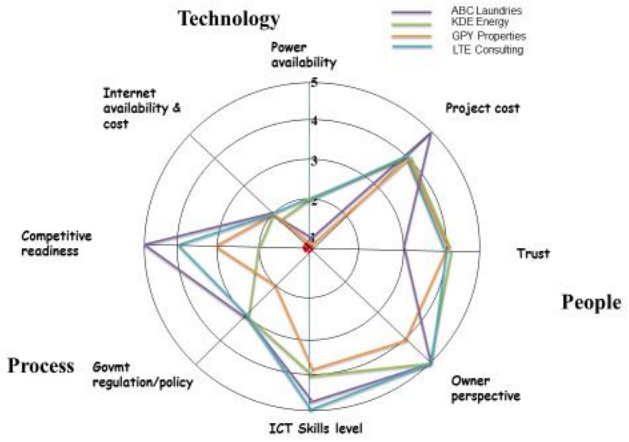

Figure 10. Critical Influencing Factors for the Four Nigerian SBEs

Financial Management and Logistics processes; and ABC Laundries' e-business activity spans the Customer Services, Sales & Marketing and Financial Management processes.

Future research will now build upon existing models to provide an enhanced analytical framework for understanding and progressing e-business deployment in Nigerian SBEs. In particular, the three dimensions of change - technology deployment, process improvement, and people skills enhancement – will be more closely examined to develop a new combined model of e-business implementation. The CIFs in the four case studies (Fig. 10) reinforce the importance of maintaining a balance between these three dimensions of change. These eight CIFs were assessed on a scale of 1-5 (from 1 = low/unacceptable to 5 = high/cost-efficient). Above all, this initial analysis points up the significance of power supply and internet availability problems in a developing country like Nigeria. In the western world, these are often taken for granted, and focus has thus shifted to process change and people skills issues, rather than being on the technology itself. But these case studies suggest that it was the commitment and determination of company owners and the aptitude and skills of the workforce that underpinned successful e-business developments *in spite of* major problems with basic technology support and enabling services. This puts a different perspective on e-business adoption, which has significant implications for the development of the implementation model and associated operational guidelines. The generally negative perception of government regulation and policy is another important finding. These critical influencing factors will be further researched as an integral component of a new implementation framework for e-business projects in a developing world context.

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