



An Evaluation of the Impact of Integrated Business and Information Solutions (IBIS) on the Growth of Small and Medium Sized Enterprises (SMEs) in Nigeria

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ABSTRACT

The Small Scale and Medium Sized Enterprises (SMEs) have been credited with enormous contribution to the growth of the developed economies of the world. In the same vein, the Information and Communications Technologies (ICT), and particularly the Internet have played their own part in those economies. In this paper, we explore how the Small and Medium Sized Enterprises (SMEs) in the developing economies can achieve their own growth through the adoption of the concept of Integrated Business and Information Solutions (IBIS). While we acknowledge that the SMEs can contribute to the expansion of these economies, we also affirm that the level of this contribution increases with a commensurate increase in the level of investment on IBIS. A pilot study of 40 Nigerian SMEs from across 5 industry sectors confirmed the hypothesis that increased investment in IBIS results in increased growth. The paper concludes with a discussion of the issues, prospects and problems surrounding the adoption of this concept, as well as suggestions on the way forward.

1. SMES AND THE ECONOMY

1.1 Introduction/Background

The Small and Medium-Scale Enterprises (SMEs) form the bedrock on which any country's economic growth and stability rests. The American economy, the largest economy in the world, depends largely on the success of SMEs for "innovation, productivity, job growth and stability" [16]. Small businesses represent more than 99% of all employers, employ 51% of private-sector workers, employ 38% of workers in high-tech occupations, provide about 75% of new jobs of the private sector output and represent 96% of all exporters of goods" [18].

In 1999, the American economy grew dramatically, adding almost 2.8 million new, private-sector jobs. Of these new jobs, the SMEs created about 75 percent with the services sector topping the list with about 1 million, followed by manufacturing, finance and insurance [16]. The same story emerges in every other economy. The differences lie in the magnitude of impact and the indices for measuring them.

In the United Kingdom, for instance, there are 3.7 million active businesses, according to the UK Small Business Service (SBS). Small and medium-sized businesses, including those without employees, account for over 99% of UK businesses, and account for 50% of total UK turnover (£1 trillion), compared with 49% of turnover from the 7000 largest businesses [17]. In Canada also, the SMEs deliver 60% of the country's economic output, generate 80% of national employment and 85% of new jobs [9].

The role of the SMEs in developing countries like Nigeria is of equally strategic importance. As evidenced by the rapid transformation

of the "Asian Tiger" countries of Malaysia, Indonesia, Taiwan and Hong Kong, the SMEs are a major catalyst to any country's economic development. With a Gross National Product (GNP) of some \$41.2 billion and a World Bank estimated population of 126.9 million, Nigeria is one of the largest economies in Africa [3]. This being the case, the economic success or failure of Nigeria can affect not only the country but the whole of sub Sahara Africa. This is why any effort geared towards understanding how the SMEs make use of emerging technologies in improving their products and services which ultimately reflect on their growth potential is worthwhile.

A study conducted in Nigeria by the Federal Office of Statistics shows that over 97% of all businesses in Nigeria employ less than 100 employees. This therefore means that about 97% of all businesses in Nigeria are SMEs [1]. The Federal Government of Nigeria initiated and actualised some policy measures, like the setting up of Small and Medium Industries Equity Investment Scheme (SMIEIS), in the expectation that improved funding would facilitate the achievement of higher economic growth.

There is considerable evidence to suggest that the introduction of new technology into organisations of all kinds and sizes has a major impact on the structure and functioning of the organization [18]. The adoption of what Varian et al (2002) called the "Internet Business Solution" in the United Kingdom, France and Germany for instance, has resulted in a current, cumulative cost savings of E9 billion (9 billion Euro) to the organisations deploying them" [19].

Earl (1988) advances four reasons why every organisation that wants to survive must commit itself to a great deal of investment in these technologies: a) To gain competitive edge; b) To improve productivity and performance; c) To facilitate new ways of managing and organising; and d) To develop new businesses [6]

2. THE CONCEPT OF IBIS

2.1 Introduction

The impact of Information and Communication Technologies (ICTs) on organisations has engaged the attention of a lot of social scientists and commentators over the years. Preece et al (1994) identified two main theoretical approaches: the Technological Determinist and the Social Action models. The former asserts that technology like the ICT is the single most important factor in determining the success of an organisation; while the latter sees technology as enabling rather than deterministic [15].

A third model called the "Integrationist Impact" model, has also been identified. It seeks to conceptualise the links between context,

process and human action and to highlight the mechanisms through which such impacts evolve. This model, propounded by Kimble and McLoughlin (1995) introduces a very important concept in looking at the ICTs and their impact on SMEs. It stresses the need for the inclusion of the "human input" in the whole setup [7].

This need for the inclusion of the "human input" has been highlighted by a large number of reports. In the United Kingdom, there is the DTI (1996) report which observes that most Research and Development programmes, as necessary as they are, "are insufficient since their focus has tended to be on technical rather than human capabilities [5].

It is in recognition of the premium position the "human input" occupies in the new technologies that forms the basis of the Integrated Business and Information Solutions (IBIS) concept. We believe that any organisation that does not recognize or accord the "human" input its right of place would not realise the expected benefits from these new technologies. This belief is echoed by a DEIS (Developing Employment in the Information Society) study conducted in Wales in 1998 which observes that ICTs are merely the tools to be utilised by the people who are trained to exploit them to the benefit of the organisation [4].

There has been a general shift in IS research away from "technological" to "managerial" and "organisational" issues. This also underlines our interest in looking at the "impact" on SMEs of the use of ICTs by these organisations [8]. The "impact" of ICTs is not a single, stable and predictable outcome, but a non-linear, ongoing process that changes and evolves over time as the actions of individuals and groups within an organisation are not wholly determined by outside forces: people can and do react to, and shape, systems in different ways [7].

In [14], the impact of Integrated Business and Information Solutions (IBIS) was introduced in an attempt to encapsulate the new technologies and approaches into a composite framework.

IBIS as a concept is therefore, concerned with the utilisation and maximisation of the potential of human resources and the technologies of information and communication in achieving business growth. 'Information and Communications Technologies' (ICT) deal with both the IT/IS Infrastructure and Strategies. Additionally, 'human resources' is all about the know-how and the ability of managers to 'manage' and 'maintain' existing business resources, as well as to 'plan' the acquisition of the unavailable ones [11]. IBIS contains two components: Business Solutions and Information Solutions. The two components also contain further sub-components each of which in turn has subdivisions (see Appendix).

2.1 Business Solutions

These are concerned with the formulation and implementation of Management decisions and the Business Strategies of an organisation. They entail the efforts being made by the Management of the organisation in marrying its Business Strategies with its Information Solutions in achieving the organisation's targets.

2.2 Information Solutions

These deal with the needed IT/IS Infrastructure and the Strategies designed to achieve Growth. The IT/IS Infrastructure comprises both the Hardware and the Software sub-components, while the IT/IS Strategies include the Strategies aimed at enhancing the Competitive Advantage, Improved Productivity, New Products Development (NPD) and Database Management Strategies (DBMS) as well as any other bespoke ICT initiatives the organisation might have.

2.3 Organisational Growth

Growth is very essential to the organisation for many reasons: to attract and keep quality managers, to stay economically healthy, to enhance its competitive edge; to meet customers' demands and needs; and increase market share [3].

Growth refers to an increase in the size of an organisation. We look at 'Growth' from four distinct indices: 'Level of Achieved Benefits', 'Level of Achieved Business Targets', 'Level of Achieved Performance', and 'Level of Reduced Effects of Operational Problems' on an organisation's performance [11]. Since the 'Effects of Operational

Problems' constitutes a negative index on Growth, they are therefore deducted from the sum of the other three indices. This can be summarized in the following equation: $\text{'Growth'} = [\text{S(Achieved Benefits)} + \text{Achieved Targets} + \text{Achieved Performance}] - \text{S(Effects of Encountered Problems)}$. (Ref: Table 2).

3. DISCUSSION OF FACTORS AFFECTING IBIS IMPLEMENTATION IN NIGERIA

The Nigerian National Policy for Information Technology (NNPIT) acknowledges that ICT is the bedrock for national survival and development in a rapidly changing global environment [10]. Some teething problems tend to cripple the country's efforts at realising the full benefits of IBIS, especially in the SME sub-sectors of the economy.

One of the major problems is Irregular/Inadequate Power Supplies. Nigeria has approximately 5,900 megawatts (MW) of installed electric generating capacity, in the form of three hydro-based stations and five thermal stations. There is a serious energy crisis due to declining electricity generation from domestic power plants resulting to a situation where "only 10% of rural households and approximately 40% of Nigeria's total population have access to electricity" [12].

The National Electricity Power Authority (NEPA), the body fully responsible for the provision and distribution of electricity in the country, plans to boost this share to 85% by 2010. Until that happens, however, the painful truth is that the unacceptably low level of power availability in the country has terribly affected the operations of the SMEs and other businesses.

There is also the problem of incessant fuel crises which result to some commercial cities like Lagos not having enough petrol to service the demands of increasing car users in the city. Fuel crisis affects the operations of the SMEs as some key staff cannot get to work either on time or sometimes at all. This becomes more worrying given that Nigeria is one of the world's largest oil exporters. In fact, in 2002, Nigeria was the fifth largest supplier of crude oil to the United States. The country's economy is heavily dependent on the oil sector, which accounts for 90-95% of export revenues, over 90% of foreign exchange earnings and nearly 80% of government revenues.

Another major problem has to do with telecommunications. The country's telecommunications infrastructure is believed to be very "primitive" and grossly inadequate. The country's teledensity of 0.004 (making it a ratio of 250 people to one telephone line) makes Nigeria one of the lowest in the world [13]. This situation has given rise to all sorts of problems for the SMEs in their use of the Internet, telephones, faxes and other telecommunications facilities. It is hoped however, that with the recent launching of its telecommunications satellite, Nigeria's teledensity would be enhanced [14].

There is also the problem of Industrial Unrest in the country. The last strike action embarked upon by the Academic Staff Union of Universities (ASUU) lasted between December 2002 and June 2003. During this period, all Nigerian universities were closed.

There is also the constant devaluation of the country's currency, the Naira, making it practically impossible for some SMEs to import the machineries need for their operations from Europe and America [11].

Then, there is the issue of cost. As the country's currency is devalued, the costs of equipment procurement, service provision and emolument increase dramatically. This all amounts to an increased overhead and increased costs of acquiring and maintaining the IT infrastructure.

No less damaging are the effects of the other problems such as Government Policies, especially with respect to duties being paid on the imported technologies and stock; Economic Instability (with very high inflation eating deep into the profits of these SMEs); and concerns relating to data and property security.

4. NIGERIAN SMES PILOT STUDY

4.1 Research Methods

This study revolves around the people and the ICTs they use in achieving growth. An understanding of the people, the ICTs they use, and the social and cultural contexts within which they work is very important [8]. The Qualitative Research Method was used for this study

because it aimed to evaluate the impact of IBIS on the growth of SMEs. The primary data used in this study was captured through a Questionnaire which is believed to be one of the best methods for data collection in this area. [2]. There is also the additional use of the Structured Interview method in throwing more light and further insights into some of the answers received from the Questionnaire.

4.2 Results of Pilot Study

In total, 40 SMEs from across 5 sectors (Health Care; Wholesale/Retail; Manufacturing/Construction; Banking/Finance; and Education/Training) were surveyed covering the period from 1997 to 2001. Closed questions provided structured instrument for capturing the data. Follow-up interviews were based on open questions giving the opportunity to respondents to express views, feelings and even biases.

Indicative examples of the results are presented in Tables 1 and 2, but a full set of the results can be found in [11].

Table 1 shows that as the Levels of Investment increase, there are also noticeable increases on the Levels of Achieved Benefits, Achieved Targets and Achieved Performance. Conversely, the Level of the Effects of Encountered Problems decreases.

In order to test the degree of Correlation between 'Investments' and 'Growth', the data in Table 1 are rearranged as shown in Table 2 below.

Table 2 shows that as the levels of Investments on IBIS increase, the Growth levels are also increasing. With the Pearson's Correlation Coefficient of 0.978, it is clear that a very strong relationship exists between the levels of Investments made on IBIS and the levels of Growth the organisation achieves. The extremely high values of Pearson correlation coefficients provide strong evidence that our hypothesis is born out. However, these values will be moderated downwards once the inflation trends and figures are taken into account. This is part of our planned future work.

5. DISCUSSION AND CONCLUSIONS

This study set out to evaluate the impact of the Investments made on IBIS has on the Growth of the SMEs in Nigeria. The study reveals that there is a strong link between the levels of Investments made by the SMEs and the Growth of such organisations. As the study further demonstrates, the more an organisation increases its Investment in both its Business and Information Solutions, all other things being equal, it would record an appreciable and noticeable increase on the level of Growth.

Table 1: Showing Data Collected on Investments and Growth

Year	INVESTMENTS	GROWTH			
	IBIS	Achieved Benefits	Achieved Targets	Effects of Encountered Problems	Achieved Performance from Staff Devt
1997	760	3640	1960	1880	3120
1998	890	3930	2200	1760	3360
1999	1040	4160	2360	1360	3480
2000	1320	4520	2600	1080	3600
2001	1520	4680	2680	920	3600
Total	5530	20930	11800	7000	17160

Table 2: Showing the Scores for Investments and Growth

Year	Investments on IBIS	Growth
1997	760	6840
1998	890	7730
1999	1040	8640
2000	1320	9640
2001	1520	10040
Total	5530	42890

For Growth to be achieved by an organisation, the damaging effects of the Encountered Operational Problems must be reduced to a manageable level. Such problems as irregular and inadequate supply of electricity can be taken care of by using alternative source of power, like generating plants. This way, the power surges which can destroy some IT/IS infrastructure, can be avoided.

Furthermore, organisations should set targets to increase the performance of their operations. One way of doing this is by investing in good managers. This involves recruiting qualified staff and giving them quality training from time to time to make them understand the systems they work with.

6. LIMITATIONS, RECOMMENDATIONS AND INDICATIONS OF FUTURE WORK

One major limitation to this study is the fact that the period covered by the study is limited to only five financial years. The years are from April 1 1997 to March 31, 2002. The reason for this was to enable the researchers make meaningful analysis of the data generated.

Another limitation has to do with the number of sectors covered by the study. In all, five sectors were looked into by the study. This number would have been increased had enough time and financial resources been available.

The other limitation is financial in nature. This made it imperative to limit the period covered by the study to just five years. It also meant that fewer organizations were covered as it would not have been possible to increase the number and geographical spread of the organizations without over stretching the researchers' financial resources.

The concept of IBIS in Nigeria is still in its infancy. We recommend that more research be carried out to develop this concept to the level of national and international acceptance. There is also the need for further research in the area of the impact of IBIS on not just SMEs but businesses in general, particularly in the developing economies of the world. Such efforts would help policy makers in both government and commerce to plan more positively for the general good of the society.

Finally, now that it has been established that IBIS helps an organisation to grow, it is recommended that every SME should integrate this concept into their business practices and operations. It makes more sense to use the much your circumstance and financial capabilities can accommodate than shying away from taking advantage of these emerging technologies. The future survival of every business venture rests squarely on its ability to marry its human resources with its ICT resources.

REFERENCES

1. Ariyo, D., "Small Firms are the Backbone of the Nigerian Economy", *African Economic Analysis*, 2000, URL: <http://www.afbis.com/analysis/small.htm>.
2. Cornford, T., and Smithson, S., "Project Research in Information Systems: A Student's Guide", Palgrave, 1996, p.97.
3. Daft, Richard L., "Organisation Theory and Design", International Thomas Publishing, 1998, p.162.
4. DEIS (Developing Employment in the Information Society) Report on "SMEs and the Information Society in Wales", 1998, URL: <http://www.toucan-erurope.co.uk/deis/docs/docu1.html>
5. DTI, "The Information Society Initiative Report on Market Review and Consultation", HMSO, London, 1996.
6. Earl, M.H., "Information Management", Clarendon Press, 1988, p.32.
7. Kimble, C., and McLoughlin, K., "Computer based Information Systems and Managers' Work", from *New Technology, Work and Employment*, Vol 10(1), March 1995, pp.56-67.
8. Myers, M.D., "Qualitative Research in Information Systems," *MIS Quarterly* (21:2), June 1997, pp.241-242.
9. Net Impact Study Canada: The SME Experience, November 2002, URL: http://cebi.ca/410/net_impact.pdf.
10. Nigerian National Information Technology Policy, URL: <http://www.nitdu.gov.ng/nigeriaitpolicy.pdf>.

11. Ojukwu, D., "An Evaluation of the Impact of Integrated Business and Information Solutions (IBIS) on the Growth of Small and Medium Sized Enterprises (SMEs) in Nigeria", an MSc Thesis, Middlesex University, London, 2003.
12. Onojovwo, D., "Prince of Darkness", *The Punch*, Friday, January 28, 2000, URL:<http://www.nigeriatoday.com>
13. Ovia, Jim, "Financing Nigeria's Digital Revolution Via SMEs", a lecture delivered at a CTO Symposium in Lagos, Nigeria, 2001, URL: <http://www.thisdayonline.com/archive/2001/05/31.html>.
14. Pitman, T., "Nigerian Satellite Blasts into Orbit", September, 2003, URL: <http://msnbc.msn.com/Default.aspx?id=3088074&p1=0>.
15. Preece, J., Rogers, Y., Sharp, H., Benson, D., Holland, S., and Carey, T., "Human-Computer Interaction", Pearson Education Ltd, 1994, pp. 188-191.
16. Small Business Administration, Office of Advocacy-funded Report, 1997, URL: <http://www.sba.gov/opc/pubs/fs40.pdf>
17. Small Business Service (UK), "Small and Medium-sized Enterprises Statistics for the UK", 2000, URL: http://www.sbs.gov.uk/content/research/bb_chap1.pdf
18. Twist, K., "Small Business Slowly Adjusts to an Expensive and Complex New Economy", Benton Foundation, URL: www.digitaldividentwork.org/content/stories/index
19. Varian, H., Litan, Robert E., Elder, A., and Shutter, Jay, "The Net Impact Study: The Projected Economic Benefits of the Internet in the United States, United Kingdom, France and Germany", 2002, URL: http://cebi.ca/410/net_impact.pdf.

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