ON THE TECHNOLOGICAL PROMISES AND CHALLENGES FACING E-BUSINESSES IN NIGERIA

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ABSTRACT
This paper attempts to address the technological promises and challenges facing e-business in Nigeria. E-business represents a major opportunity for developing nations that can access it effectively and a threat to those that cannot. E-business holds great promise and challenges for Nigeria in ten areas: what is really e-business, potential benefits of the internet in Nigeria, the development context in Nigeria, e-business: towards a conceptual understanding, strategies to encourage the ICT infrastructure in Nigeria, technology requirements and components for e-business in Nigeria, technology services, the challenges faced by Nigerians in the use of e-business, the policy challenge for Nigeria and finally, the impact of information technology upon productivity in Nigeria.

Keywords: E-business, Developing Countries, Internet, B2B, ICT, E-commerce.

1. INTRODUCTION

During the last few years, the world has experienced a revolution that is affecting several industries. It is changing the way relationships between business partners are made. The last 20 years have seen rise of computing power per dollar by a factor of more than 10,000. The internet is growing at a phenomenal pace (Evans et al, 2000). Emerging digital mobile terrestrial services and technologies are bringing data services to hundreds of millions of users worldwide. Some industrialised countries are already providing 2.5 G mobile terrestrial services and are in the process of building their infrastructure for 3G mobile (Evans et al, 2000). As early as 2001, handheld digital mobile devices on 3G mobile networks and the communication and application environment for handheld devices provided by Wireless Application Protocol (WAP) will provide high-speed Internet access.

Internet appliances and pervasive computing are reducing the technical requirements for networks services and are creating direct relationships between business and consumers (IBM, 2000). While mobile network operators are providing e-payment services to their consumers, and threatening traditional financial institutions (such as credit card companies), digital TV is emerging as a new channel for distributing products and services to end-consumers. New economic leaders are emerging from companies that did not exist a few years ago (IBM, 2000). The main questions being asked today is not "what business you are in?" but "what is your business model? The digital revolution is bringing down geographical and time barriers. It is bringing together companies from the financial, computer networking, broadcasting and telecoms sectors to form alliances and create new types of services (IBM, 2000). A global electronic economy is being created where changes in one part of the globe affect many other parts. E-business commerce is one of the main factors driving the digital revolution. It is creating new business models in industrialised countries and at the same time, presenting very new challenges to developing countries that still lack some of the basic technologies, policies and legislatives framework to part of this revolution (Jorgenson et al, 1995).

1.1 E-Business

E-business is the use of advance information and communication to create new business relationships enhance existing ones and increase the efficiency of business flow process without the constraints of time or geographical barriers. The digital revolution knows no boundaries, but equally it presents enormous opportunities to developing countries because it levels the playing field and has the potential to empower developing and least developed countries as global players in the e-revolution (Kwon et al, 1995).

1.2 Potential Benefits of the Internet In Nigeria

According to David (1998) it is expected that the internet will have a fundamental impact on how business is conducted in Nigeria, on firm behaviour and on industry structure. It is claimed that e-business technologies are a critical source of value creation in the information economy, mainly because of:

- The pay-off in productivity
- Speed
- Lower cycle times
- Advance supply chain management
- Better planning
- Reductions in inventories
- More efficient logistics
- More efficient and effective customer service
- Lower purchasing, sales and marketing costs
- New sales opportunities

The internet creates the possibilities for firms in Nigeria to communicate, transact and collaborate with enhanced flexibility and at a lower cost. Through the use of intranets, companies link their employees, providing them with a new communication platform and a new way to access up-to-date information that is relevant to them (David, 1990). The next step would be to establish an extranet, in which suppliers and business partners have access to real time and relevant information by linking into an enterprise's internet system thus making it easier for the company and its constellation of suppliers, customers and partners to work together more effectively (David, 1990). The firm focuses on its distinctive capabilities and then forms strategic alliances with other firms in the overall value chain. Increased dependence upon suppliers and customers thus becomes a requirement of the firm and has a major impact on the buyer-supplier relationship (Gordon, 2000).

2. THE DEVELOPMENT CONTEXT IN NIGERIA

IT change has been hallmark of economic development, especially over the last three decades. The rapid evolution of the internet as a global information and communication medium is an important aspect of that technical change process (The US Department of Commerce, 1999). The emerging Digital Economy (1998) highlights a strong positive correlation between IT and national prosperity. Econometric studies also show a close statistical relationship between the diffusion on IT, productivity and competitiveness for industries and firms (Helpman, 1998). Theoretically, then, the internet has much to offer to the less developed companies LDC, like Nigeria, intent on following an export-oriented, industry-centred and market-driven development trajectory (Helpman, 1998).

The internet is the most visible manifestation of the shift to a networked economy and has the potential to revolutionise the way in which companies function and compete in Nigeria. Theoretically, the internet provides Nigeria with the requisite connectivity to become a global player through worldwide marketing and sourcing. The internet is based on an open network system and offers opportunities, in theory, Nigerian manufacturers for catch-up and forging ahead types of development (Kagami et al, 2001).

According to Panagariya (1996) given the cost savings offered by internet technology and relative ease with which it can be provided, they (i.e. LDCs) can now skip several stages of technological development through which developed countries had to go (IBM, 2000). Stated differently, Nigeria is much farther inside the current technological frontier and therefore, have larger potential benefits from moving to IT. The new imperative for Nigeria is to connect to global value chains or face marginalisation, or in extreme cases even be excluded from the mainstream of economic development (IBM, 2000).

The policy challenge for the Nigerian manufacturers is, therefore, how to leverage, consolidate and deepen their links with the global economy and how to take advantage of the potential of globalisation (Womack et al, 1990). In the era of trade liberalisation and global production systems that operate through ICT-dominated cross-border, inter-firm networks, the concordant effects of marginalisation and exclusion are likely to be a combination of deeping poverty, high unemployment, widening inequality, a weak and rapidly eroding export base and low and even negative growth rates(Castells, 1996). Incorporation of Nigeria into global-scale value chains is therefore, of paramount importance to foster rapid economic development through access to leading-edge technology, business practices and markets. Inclusion in global value chains alone is, however, no guarantee to poverty reduction (Castells, 1996).

For instance, adverse forms of inclusion may produce immiserising growth and increase in poverty (Kagami et al, 2001). This notwithstanding, industrial development options for Nigeria hinge increasingly on leveraging ICTs to become internationally competitive in more knowledge-intensive sectors and simultaneously become more fully integrate into the global production system (Kwon et al, 1995).

At present, the geographical distribution of connections to the internet and the diffusion of ICTs, heavily favours the highly industrialised countries. By November 2000, an estimated 407.1 million people were using the internet. Of these, 167.1 million were in Canada and the USA, 113.1 million in Europe, 104.9 million in Asia/Pacific, 16.5 million in Latin America, 3.1 million in Africa and 2.4 million in the Middle East (Evans et al, 2000). Mansell (1998) states that Africa has a similar number of hosts on the internet as Latvia, which has a population of 2.5 million, compared to Africa's 780 million. This is exacerbated by the fact that Africa has only 1% of the world's telephone main lines and just 1.2 % of the personal computers. It appears as if the opportunities for taking advantage of e-business (Castells, 1996).

2.1 E-Business: A Conceptual Understanding

Although the precursor of the internet appeared in the late 1960s, e-business is primarily a product of six significant transformations in the global economy:

(a) The globalisation of markets
(b) Shift towards an economy based on knowledge and information
(c) The growing prominence of ICTs in the economy
(d) Innovations in business organisation and practice
(e) Technological innovations such as e-mail, the World Wide Web, internet browsers and the expansion in the volume and capacity of communication networks.

The six factors are closely linked to the emergency of e-business. The term e-business has no widely accepted definition. In a very broad sense, it means doing business over the internet. We define e-business as any form of commercial or administrative transaction or information exchange that takes place via an internet based, computer-mediated network. E-business thus entails the application of the internet to the complete value chain of business processes. E-business places a premium on openness, transparency and trust. With e-business the prime lever is not the technology itself, but people, intellectual capital and relationships. The internet offers a wide spectrum of potential commercial activities and information exchange in Nigeria (Evans et al, 2000).

2.2 Strategies To Encourage The Ict Infrastructure In Nigeria

According to Johnson (1996) the strategies to encourage the ICT infrastructure in Nigeria is to target the business in the supply industry with trading partners in industrialized countries where there is an adequate ICT infrastructure and payment services. These businesses have the highest potential for reaping the benefits of e-business. Reduce the requirements for participating in e-business by separating the trust, secure transaction from the network payment services (Helpman, 1998). The result is an asymmetrical model where the trust and secure transaction services are setup in both Nigeria and industrialised countries and while the network payment services will only be available in the industrialised countries.

Based on the business objectives and the technical specifications, build a scalable e-business commerce infrastructure that would be shared by multiple independent business and integrate this infrastructure into existing ICT infrastructure in Nigeria (Helpman, 1998). Provide a mechanism to enable the transfer of e-business technologies and increase public awareness so that local human resources are used to setup, run and maintain the e-business services and decision-makers are made aware of the necessary policies and regulatory framework for e-business (Mansell et al, 1998).

3. TECHNOLOGY REQUIREMENTS AND COMPONENTS FOR E-BUSINESS IN NIGERIA

The infrastructure needed to provide e-business services in Nigeria includes trust, secure transaction and e-payment components. The faceless nature of e-business requires that transactions between two parties be secured. Some of the technology requirements will be further elaborated by separating them into e-security and e-payment components. The poor banking services, inadequate information and communication technology (ICT) infrastructures and absence of legistrative and regulatory framework for e-business in Nigeria require a slightly different approach for implementing e-business (Gordon, 2000).

3.1 Technology Services

(a) Mutual Authentication: This involves making sure that the identities of the parties to a transaction can be established and verified. Authentication requires the use of digital certificates, password and electronic tokens that can be implemented using both hardware and software.

(b) Data Confidentiality: Provided through the use of encryption technology enables only the intended parties to be able to view the contents of the transaction. It scrambles the contents of the transaction using a combination of symmetric (private key) and public key cryptography.

(c) Data Integrity: It is fundamental that the contents of a transaction remain unchanged. Data integrity uses a combination of hash functions and public key cryptography to provide mechanisms to verify the integrity of the data. Any changes are detected and such data is rejected by the other party

(d) Non-repudiation: like in traditional business transactions, a mechanism needs to be put in place to ensure that transactions cannot be denied after their execution. Non-repudiation is achieved using a combination of both digital signatures and hash functions.

3.2 The Challenges faced by Nigeria in the Use Of E-Business

The global nature of e-business provides Nigeria with a unique opportunity to compete in market places that were beyond their reach. It has the potential to reduce physical trades obstacles increase market access and trade efficiency and could provide a competitive stimulus for local producers and entrepreneurs in Nigeria (IBM, 2000). The poor ICT infrastructure, low income, lack of awareness on e-business issues, inadequate legal and regulatory framework, absence of trust, network payment and secure transaction services present enormous challenges to developing countries like Nigeria (IBM, 2000).

While Nigeria are just getting aware of e-business, the industrialised countries have started defining appropriate strategies, adopting policies, establishing the legal and regulatory framework and building their infrastructure. With the current handicaps and challenges faced by Nigeria, how can business and entrepreneurs take advantage of the benefits of e-business? What strategies must be adopted to leverage on the potential for e-business? In addition to other requirements, and based on the features considered by many experts to be part of e-business, there is a need for trust, secure transaction and network payment services. On the basis of these considerations, one can argue that the lack of adequate banking infrastructure is one of the main technological barriers for building e-business infrastructures in Nigeria (David, 1990).

4 THE POLICY CHALLENGE FOR NIGERIA

The setting of policy is risky and particularly vexing when one is dealing with a dynamic phenomenon that is evolving and changing rapidly. This underscores the need, therefore, for policies to be crafted very cautiously. The development policy agenda is briefly discussed below, with the caveat that given the dynamic nature of the internet, policy issues offered at this stage can only be preliminary. Nigeria is currently striving to:

- Raise their international competitiveness
- Connect and deepen their links, to global value chains
- Upgrade their position within global value chains
- Restructure their operations in order to become world-class manufacturers
- Progressively capture and harness upstream, high value-added activities and
- Chart a more knowledge-intensive industrial development trajectory

All this is happening in the midst of a technological revolution propelled by digital processing. New ICTs based on microelectronics, telecommunications, computers and network-oriented software provide the digital nervous system for the information economy to operate and have moved computer networks to the centre of the international economic infrastructure. ICTs now form an integral part of the accelerated pace of globalisation, linking together nation states into complex webs of transitional exchanges. ICTs are enhancing the drive towards globalisation and are polarising the business world into those companies which are tightly connected (i.e. at the centre) and those on the periphery of the global economy which are either not connected or are loosely connected.Essentially a form of technological apartheid is beginning to take shape although the financial costs of joining the global information economy are likely to be high, the economic costs of not joining are likely to be much greater (Kagami et al, 2001).

4.1 The Impact of Information Technology Upon Productivity In Nigeria

Information technology can affect aggregate labor productivity through two channels: *the production of IT* and *the use of IT*. Few questions that IT production has exhibited phenomenal productivity growth. This is probably best illustrated in the case of semiconductors. In the Gordon Moore (1960), the founder of Intel, predicted that microprocessor power would double every 18 months. The prediction was accurate enough that it becomes known as Moore's Law. Even accounting for R&D expenditures, the technological progress of the IT manufacturing sector has been remarkable and has contributed to the acceleration in labor productivity in Nigeria. In growth accounting terms, this contribution should appear as an increase in the TFP of IT – producing industries. The second avenue through which information technology has the potential to increase labor productivity in Nigeria is through its use.

The rhetoric of the new economy proponents often focuses on the efficiencies that will accrue to firms engaged in activities other than the production of IT but which nevertheless successfully integrate the use of IT could expect productivity gains for two reasons. First, the rapid decline in the price of computing power has spurred huge investments in IT. This investment, like any other form of capital spending, should raise the productive capacity of those firms that undertake it. Second, IT has the potential to allow firms to implement efficiency-enhancing in the way they do business (Mansell et al, 1998).

The distinction between production and use of IT has been critical in the debate concerning the impact of IT upon productivity. In a series of papers, Gordon (2000) has argued that IT's contribution to the acceleration in productivity experienced in the late 1990s has been solely through the more efficient production of IT. The use of IT, Gordon claims, has not added to the uptick in productivity. In a certain sense, this distinction is immaterial: nobody denies that productivity did accelerate in the period under question. In another sense, Gordon's interpretation, if true, would have certain implications about the sustainability of the new economy (Evans, et al, 2000).

The narrow concentration of productivity growth in one sector would make the economy's continued health vulnerable to disruptions in that sector. Furthermore, the efficiency gains in IT production, particularly semiconductors will eventually run into physical constraints, Moore's Law cannot hold indefinitely. Gordon's reading of the facts, however, has been controversial and as we will see shortly, several studies have found the use of IT to have made a substantial contribution to the productivity revival in Nigeria (Evans et al, 2000).

5. CONCLUSION

The transition to an internet connected, ICT- based economy presents both opportunities and challenges for Nigeria. The internet presents opportunities for Nigeria to improve productivity, support development and participate more fully in the world economy. To leverage these opportunities, Nigeria will need to raise the IT content of investments in infrastructure, physical capital, and education and training. Policy initiatives designed to promote technology transfer for firms interested in adopting internet technology, providing small business technical support, facilitating export development and promotion (via e-commerce) and facilitating the diffusion of e-business best practices in the private sector, are pressing priorities (Department of Commerce, 1999).

Finally, from development perspectives, a prime concern for Nigerian government is to focus policy geared to including potentially exclude social groups in the internet-based information systems. Otherwise, a widening digital divide between internet "haves" and "have-not" is likely to be the outcome. A coherent national strategy designed to close the digital divide is, therefore, warranted. Nigerian Government should maximise the efficiency dividend for the economy by removing barriers in the uptake of e-business in key sectors. Failure to raise their national IT capabilities and to construct and adhere to effective IT policies could put Nigeria at risk of marginalisation from international markets and global production networks. It will become very difficult to participate in international trade without e-business access.

E-business presents Nigeria with the opportunity to expand their markets through enhanced international trade via the internet. E-business is likely to transform the terms to competition in Nigeria economies in new and unpredictable ways. The internet is creating new value propositions in and between global value chains. The challenge for Nigeria is one of how to position themselves within these evolving internet-connected global supply chains in order to gain competitive advantage and capture value. E-business is still at a very early stage in its development and the notion that internet application may lead to a sustained higher level of economic efficiency is still very much at the level of theory and will need to be rigorously explored in practice.

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