

Leveraging Economic Development with e-Business in West African Developing Countries

Adamou Toune Abarchi and Tang Bing Yong

Abstract—A significant amount of research work has been done about e-Business in West-African developing countries, yet the rate of e-Business adoption remains extremely low. Increasing this rate entails not only dealing with challenges related to the digital divide but also tailoring e-Business to become a viable solution for economic development. In this perspective, this paper has identified some common challenges such as insufficient information-technology infrastructure (ICT) infrastructures, logistics and banking systems and then based on what is already available as infrastructure, we proposed alternatives to be used in an e-business solution designed to help governments address crucial issues such as corruption and price fluctuations that continue to plague markets in those countries. The paper also tackles the e-business deployment challenge by recommending very affordable wireless technologies as alternatives to costly ICT infrastructures and therefore contributes to promote e-business adoption among developing countries in West-Africa.

Index Terms—E-Business, economy, developing countries, West-Africa.

I. INTRODUCTION

E-Business has been around for quite a while, however many developing countries in West-Africa are still struggling to understand how their economies can benefit from it. Also, the very fact that they seem to adopt an endless “wait and see” approach further slows down the adoption of e-business in West Africa. In order to avoid being left behind, these countries need to find a reliable way to embark on the digital era with e-business solutions that are adequately tailored to address critical economic issues.

II. LITERATURE REVIEW

A. E-Business Progress Too Slow in Developing Countries

A country's readiness for e-Business (also called e-Readiness) depends fundamentally on information-technology infrastructure (ICT), including narrow and broadband, and on costs of Internet access. As far as developing countries are concerned, the main factors that prevent them from adopting e-business include the scarcity of ICT infrastructures as well as unfavorable political,

economic, social and technological conditions. As a result, many of them end up adopting a “wait and see” approach, i.e. they keep waiting until they reach the “optimum level” in terms of ICT infrastructures (internet, computers, etc.) and other e-business related aspects (e-Payment, logistics, etc.) before they would think to make e-business a major component in their economy. Yet another issue is the fact that many small and medium enterprises (SMEs) in developing countries do not see the great benefits in e-business and therefore do not commit all their efforts to it. The question remains whether there is sufficient information on the web of value to the average developing country entrepreneur to warrant the investment in Internet access, not to mention that most SMEs in developing countries serve local markets and rely mostly on locally generated information [1]. For some of the SMEs that have taken the step to launch their e-business, issues related to trust becomes a major obstacle to expansion within populations of developing countries.

B. The Digital Divide, a Serious Economic Threat

Nowadays, the Internet has become a core feature of the global economy, affecting the way in which people communicate with each other, acquire information, learn, do business, and interact culturally. This gives poor countries and poor people access to markets, information, and other resources that would otherwise have been inaccessible [1]. However embarking on this digital economy requires certain conditions to be met and unfortunately, many developing countries, particularly those in West-Africa suffer from lack of sufficient ICT infrastructures or are not adopting information technologies even if there is a clear advantage in using them. As a result, the digital divide continues to deepen while reinforcing existing income and wealth inequalities within and between countries [1]. Also, companies that attempt to use the Internet to market in countries with emerging economies may face a number of challenges that are more pronounced than would be the case in developed economies [2]. Therefore, developing countries, like those in West African, need to find a reliable way to embark on this digital economy or face the risk of being left far behind other nations who did. The question remains to see but how viable e-business can be for these countries in their quest to improve their economies and the living standard of their populations.

C. The Gains from e-Business to Developing Countries

E-Business offers unprecedented opportunities to both developing and developed countries. Developing countries are far behind developed countries in terms of ICT. Given the cost savings offered by Internet technology and relative ease with which it can be provided, they can now skip several stages of technological development through which

Manuscript received November 4, 2011; revised December 14, 2011.

A. T. Abarchi is with Corebix, an information technology company based in Maryland (USA). He is also a Ph.D student at the Institute of Business and Management of Donghua University, Shanghai, People Republic of China (e-mail: adamoutoune@hotmail.com).

T. B. Yong is with the Institute of Business and Management of Donghua University in Shanghai, People Republic of China (e-mail: tangby@dhu.edu.cn).

developed countries had to go [3]. Currently, e-Commerce revenue in developing countries is miniscule in comparison to that found in the advanced economies [4]. Predictions are variable, but they tend to point to significant growth of Internet access among businesses and among consumers in many developing countries within the next five to ten years [5]. Therefore in the short run, the gains are likely to be concentrated in developed countries with better ICT infrastructures but, in the long run, developing countries have more to benefit because they can leap frog, skipping some of the stages in the development of information technology through which developed countries have had to pass.

D. Importance of e-Business to Small and Medium Enterprises (SMEs) in Developing Countries

For SMEs in developing countries e-commerce poses the advantages of reduced information search costs and transactions cost (i.e., improving efficiency of operations-reducing time for payment, credit processing and the like). Surveys show that information on the following is most valuable to SMEs: customers and markets, product design, process technology, and financing source and terms. The Internet and other ICTs facilitate access to this information. In addition; the Internet allows automatic packaging and distribution of information (including customized information) to specific target groups [6].

However, there is doubt regarding whether there is enough information on the Web that is relevant and valuable for the average SME in a developing country that would make investment in Internet access feasible. Underlying this is the fact that most SMEs in developing countries cater to local markets and therefore rely heavily on local content and information. For this reason, there is a need to substantially increase the amount and quality of local content (including local language content) on the Internet to make it useful especially to low-income entrepreneurs [6].

E. The Business-Government Context for e-Business

Fundamentally, businesses' gains can come from two sources: adding more value for customers, hence increasing revenue, and reducing production and operational costs. On the revenue or value side, a business can provide value to more customers or it can increase the value provided to each customer. Businesses may realize gains from using e-business techniques in only one or many of these processes. It is important not to assume that e-commerce need be a holistic approach, embracing all processes. In many cases, for example, small and medium size enterprises or SME's in developing countries will face constraints making it too costly to tackle several processes. Even SME's in developed countries have to figure out which processes are worth tackling first or at all. Further, an SME might consider e-business techniques in many processes, even if its product or service cannot be delivered electronically [7].

The government context for e-business affects businesses in three ways described as follow. The first addresses how the government itself uses e-business and the second and third address how government services, laws and regulations affect businesses trying to use e-business techniques.

First, in most countries, the government is one of the

largest buyers of goods and services. Many governments also make sure to buy a share of their goods and services from domestic SME's. If a government begins using e-procurement techniques to do so, it can provide an important incentive, an example, and training to these SME's [7]. Second, businesses turn to the government for a wide variety of services, from customs clearances to business licenses. The length of time needed to obtain these services and, in some cases, the lack of transparency in the process (and hence chance of corruption) can and often does thwart SMEs' efforts to compete locally and internationally. To the extent that governments in developing countries can improve the efficiency and transparency of these business services, the better its SME's can compete. Various "e-government" techniques can be used to achieve these ends by making services more easily accessible to small businesses via the Internet coupled with more transparent and efficient processing. More developing countries are recognizing this opportunity to help SME development.

Third, governments are beginning to focus on the regulatory and legal constraints facing businesses as they try to use e-business. For example, most laws governing commerce did not anticipate electronic transactions. Governments also have to clarify when and how electronic transactions and electronic signatures can be recognized as legal. Governments must also clarify legal jurisdiction in any disputes over electronic transactions: what laws govern such disputes? What jurisdiction has authority over them? Laws and regulations are also needed to address issues regarding data privacy, cyber taxation and how customs duties will be handled with such transactions. SME's in each developing country will face a different set of such constraints. It is critical to understand, though, that, despite these constraints, there will be opportunities to find anywhere [7].

Furthermore, government can also use e-business in the following ways:

- E-Procurement

Government agencies should be able to trade electronically with all suppliers using open standards-through 'agency enablement' programs, 'supplier enablement' programs, and e-procurement information systems.

- Customs clearance

With the computerization of customs processes and operations (i.e., electronic submission, processing and electronic payment; and automated systems for data entry to integrate customs tables, codes and pre-assessment), one can expect more predictable and more precise information on clearing time and delivery shipments, and increased legitimate revenues

- Tax administration

This includes a system for electronic processing and transmission of tax return information, online issuances of tax clearances, permits, and licenses, and an electronic process registration of businesses and new taxpayers, among others. More often than not, the e-commerce initiatives of government are a barometer indicating whether or not the infrastructure supports e-commerce use by private firms. This means that if government is unable to engage in

e-Procurement, secure records online, or have customs fees remitted electronically, then the private sector will also have difficulties in e-commerce uptake. Virtually, the benefits from e-Commerce accrue to the government, as the experiences of some countries reflect [6].

F. Current ICT Usage among SMEs in Developing Countries

Currently the Internet is most commonly used by SME firms in developing countries for communication and research; the Internet is least used for e-business. E-mail is considered an important means of communication. However, the extent of use is limited by the SMEs' recognition of the importance of face-to-face interaction with their buyers and suppliers. The level of confidence of using e-mail for communication with both suppliers and buyers increases only after an initial face-to-face interaction. E-mail, therefore, becomes a means for maintaining a business relationship. It is typically the first step in e-commerce, as it allows a firm to access information and record communications with its suppliers and buyers. This can then lead to more advanced e-business activities [6].

ICT usage patterns among SMEs in developing countries show a progression from the use of the Internet for communication (primarily e-mail) to use of the Internet for research and information search, to the development of Web sites with static information about a firm's goods or services, and finally to use of the Internet for e-commerce [6].

G. Existing Payment Methods in Developing Countries

In most developing countries, the payment schemes available for online transactions are the following [6]:

- Cash-on-delivery

Many online transactions only involve submitting purchase orders online. Payment is by cash upon the delivery of the physical goods.

- Bank payments

After ordering goods online, payment is made by depositing cash into the bank account of the company from which the goods were ordered. Delivery is likewise done the conventional way.

- Innovations affecting consumers

These include credit and debit cards, automated teller machines (ATMs), stored value cards, and e-banking.

- Innovations enabling online commerce

E-cash, e-checks, smart cards, and encrypted credit cards. These payment methods are not too popular in developing countries. They are employed by a few large companies in specific secured channels on a transaction basis.

- Innovations affecting companies

These pertain to payment mechanisms that banks provide their clients, including inter-bank transfers through automated clearing houses allowing payment by direct deposit.

H. The Growing Mobile Market in Developing Countries

Nowadays, wireless (or mobile) telephony has emerged as a potential solution to the rural telephone deficit. In many low-income countries mobile phones are diffusing rapidly, even in rural areas [1]. According to a report by Vital Wave Consulting, mobile penetration in emerging markets has

grown 321% compared to 46% in developed countries since 2002. It is clear now that developing countries are the primary growth opportunity for the mobile industry and with the right business model and there is already a growing trend among businesses to create e-services accessible via mobile phones [8]. Mobile phones have unprecedented reach in every market: One out of every two people in the world owns a mobile phone and subscribes to mobile service. If one subtracts children under ten and adults over 69 years of age (i.e., those who are unlikely to own a mobile phone), 67% of the remaining world's population owns a mobile phone. Therefore, mobile phones are one of the most efficient and accessible devices for reaching the world's masses. With access to many rural and low-income populations, mobile technology has the capability of providing information and services to individuals who would otherwise be excluded. These individuals are often eager for services such as banking and health education that cannot be provided profitably through traditional business models. With appropriately-designed applications, under-served populations will spend a greater portion of their family income to gain access to these services. Safaricom, a mobile network operator that allows users with special SIM cards to transfer money, is the most profitable company in Kenya and a leader in Sub-Saharan Africa [8].

One important thing to note here is that mobile technology can contribute to mitigate the impact of the digital divide in developing countries because more and more people in these countries are getting access to information through the use of mobile phones.

III. MAJOR OBSTACLES FACING E-BUSINESS IN DEVELOPING COUNTRIES OF WEST AFRICA

A. Lack of Sufficient ICT Infrastructures and Literacy

The most common e-business deployment basically consists of creating a website (or any network service) where consumers can find the products or services they need to buy, then choose and complete the payment and ultimately have the products or services delivered to them. What is to be noted here is that consumers must actually have the required infrastructures (internet, computers, etc.) available to them and it must be convenient for them to use those things (i.e. know how to browse a website for example). Many West African developing countries have low PC penetration rates and lack the telecommunications infrastructure necessary to take full advantage of the internet. Apart from a poorly developed telecommunications infrastructure, they also lack the availability of an inexpensive telephone service and regular power supply making internet access very expensive and unreliable. Furthermore, access to internet-based markets depends on the availability of a substantial pool of computer-literate population and this is often lacking in the third world.

B. Lack of Suitable Banking and Logistic Infrastructures

The banking system in West-African developing countries is still in its infancy. This is because almost all banks in these countries offer their services only in big cities where people

have better income and not in rural areas where most people have very low income and usually keep their money at home. Also unlike developed countries, the banking system is not expanding to cover a large number of the population; this constitutes a major problem for offering e-Payment services. In addition to this, logistics is also a serious issue in these countries and plays its part in hindering the development of e-Business solutions.

C. Trust Related Issues

Unlike the situation in developed countries like the United States and Europe, there is an extremely low rate of literacy in West-African developing countries and this contributes to create a population of “government followers” who see their government as the only institution they can trust. Therefore, the only way to make anything work in these countries is to get the government’s full involvement. This is especially true for e-business because of the possibilities of online frauds which are widely spread on the internet and has raised the awareness of consumers in the developed world as well as the developing world.

D. A Major Obstacle: lack of a Suitable e-Business Model

It could be fair to assume that many West-African developing countries regard e-business as a privilege for the developed nations and therefore they tend to implement their e-Business solutions the same way developed nations do. However, given their unfavorable conditions (poverty, low income, illiteracy) as well as the cultural environment, it is undeniable that an e-business model used in developed countries (Europe, USA) cannot create the same effects nor can it help the economies of developing countries. For West-African developing countries, a good e-Business model can be designed to address mostly their economic challenges and help boost economic development.

IV. MAKING E-BUSINESS BECOME A VIABLE SOLUTION FOR WEST AFRICAN COUNTRIES

Obviously, there are big challenges facing e-business in developing countries in general, and particularly those in West Africa. In order to find reliable ways in which e-Business can thrive in those countries, some important factors need to be taken into consideration. Any e-Business solution that doesn’t address a crucial issue in a developing country would have a greater chance to fail because there wouldn’t be a market big enough for it to prosper. Therefore we need to channel e-Business implementation to boost the economic development in West-African developing countries, let’s see in the next sections how this can be done.

A. Use e-Business to Leverage Economic Development

In West-Africa, many countries have been struggling to boost their economy to a satisfying level that can improve the life of their populations. Their governments have put in place strategies to address issues like the fluctuations of commodities prices, corruption, etc and e-Business can help execute some of the key strategies notably:

- Fighting price fluctuations and inflation

In West African countries, consumers suffer a lot from an uncontrolled fluctuation of the prices of products on the

market and it is very common to have an increase of 200% of basic commodities price on the market. This results in a deep inflation, hence increasing the existing poverty. With an adequate e-business platform, the government can make information about commodities prices available to the average consumer and reduce considerably the speculations that cause prices to fluctuate on the market.

- Fighting corruption and strengthening cooperation among local SMEs

Corruption is one of the biggest issues West African developing countries face almost at every level of their society. Major Transactions involving business activities of high importance are not recorded using information systems; this situation opens the door to corruption and business misconduct from local SMEs. Using a B2B or G2B, governments can have a centralized repository of all major transactions with SMEs and will thus require all business participants to refrain from bribing and corruption. Furthermore, by requiring all local SMEs to register on the platform, the government offers them the possibilities to establish reliable supply chains by exposing their products or services to other local enterprises that might need them.

B. Take Advantage of Existing Infrastructures

Developing countries can offer their e-business users alternatives to e-payment and e-logistics by using already available infrastructures such as the national post which provides mail and courier delivery as well as money order services. Using these alternatives makes sense in West African developing countries because only a tiny number of their people in have access to computers and those who do, may not have the required skills to complete a transaction on internet.

C. Get Strong Involvement from Government

The most important player in the economic engine of West African developing countries is the government, for most local businesses and services are either run by the government or under government supervision. Also, the government remains the biggest employer because private enterprises are not diversified enough to offer a broad range of economic sectors that can absorb a significant number of the working populations. Also, unlike developed countries, there is an extremely low rate of literacy in West-African countries and this contributes to create a population of “government followers” who see their government as the only institution they should trust. Therefore, the only way to make anything work in these countries is to get full involvement from the government. This is especially true for e-Business because of the possibilities of frauds which are widely spread on the internet and has raised the awareness level of many people in the developed world as well as the developing world.

D. Take Advantage of Wireless and Mobile Technologies

Since the cost of deploying a wired ICT backbone is too high, the best alternative is to use some new affordable wireless technologies such as 3G and WIMAX technologies. These technologies offer data transmission rates high enough to support the most demanding e-Services, making wireless data transmission technologies the most affordable solutions

for West African developing countries. On the other hand, the growing mobile market in West Africa suggests that the best way to provide e-business services to populations is via cell phones phone services which should be designed with an easy interface requiring the minimum interaction in order to provide users with information they need.

E. A Pragmatic e-Business Model

Given the current conditions in West African developing countries (poverty, low income, illiteracy) as well as the cultural environment, it is undeniable that an e-business solution based on a model from some developed countries (Europe, USA) cannot create the same effects nor can it help the economies of these countries. Also business regulations and practices are quite different from those in developed countries, so a model that matches the environment of West African countries is more than necessary. Taking into account all the factors mentioned previously, a pragmatic model can be designed to include the government at its core in order to direct and monitor most of the e-business transactions. The model includes a B2B platform for the small and medium sized enterprises (SMEs), a B2C platform where businesses conduct business with consumers and another C2C platform for the consumers' community as shown on Fig. 1.

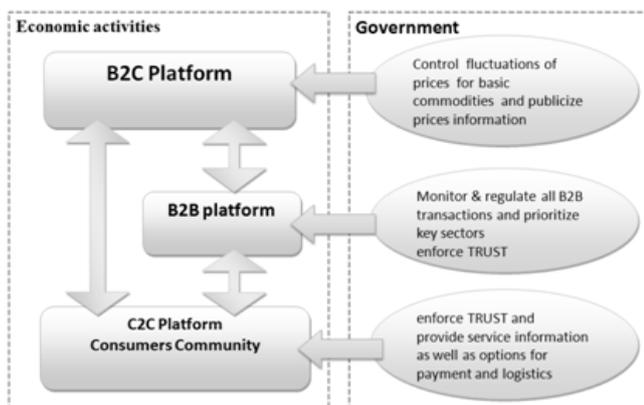


Fig. 1. Recommended e-business model for developing countries.

V. ADDRESSING ECONOMIC CHALLENGES

The model on Fig. 1 shows a significant involvement from the government because it is the most important player in the economic engine of West-African developing countries. The model also includes a B2B platform for small and medium sized enterprises (SMEs), a B2C platform where businesses conduct business with consumers and another C2C platform for the consumers' community. We see that at every level, the government intervenes with actions ranging from price control, trust and alternatives to e-payments and logistics. We are going see in the next sections, how using the e-business model presented in Fig. 1, can help address crucial issues.

A. Addressing Price Fluctuations

In many developing countries of West Africa, consumers continue to suffer from an uncontrolled fluctuation of prices on the market and it is very common to have a price increase of 200% of basic commodities in a short amount of time. This hurts considerably the low purchasing power of consumers

and results in a deep inflation, hence increasing the existing poverty. With the proposed e-Business model, the government will have up-to-date information regarding market prices and can act accordingly to avoid fluctuations that would hurt the economy even further with huge inflation. Therefore the average consumer will have their purchasing power protected by the government and have more control over their income.

B. Address Corruption by Tracking Major Business Activities

Corruption is one of the biggest issues that governments in West African countries face at almost every level of their economy. But because of lack of information tracking systems, transactions in business activities of high importance are not recorded; instead they are just made on papers which are stored in huge piles at the national archives. This opens the door to corruption and business misconduct from many SMEs in order to obtain government favors for their businesses. The platform based on this model will allow the government to have a centralized and uniform repository of major transactions with SMEs and will require all business participants to "come clean" in their business activities and transactions.

C. Create and Strengthen Cooperation among Local SMEs

By requiring all local SMEs to register on the platform, the government offers them the possibilities to expose their products or services to other local enterprises that might need them. This will eventually lead to strong supply chains being established and can increase trade with foreign companies as well. Also trust will be strengthened because the government will serve as mediator in case disputes arise between participants on the B2B platform.

D. Alternatives to e-Payment and e-Logistics

On the consumers' community platform, the government can offer consumers some alternatives to e-Payment and e-Logistics by using already available institutions like the national post which provides mail and courier delivery as well as money order services. Using these alternatives makes more sense in developing countries because only a small number of people in those countries have access to computers and those who do, may not have the required skills to complete an online transaction. Also SMEs can benefit from these alternatives because they will have a better way to deliver their products to their customers and also a way to get their payment made through money order.

E. Protecting Consumers against Fraud and Enforcing Trust

Most people in developing countries in West Africa are illiterate and see their government as the only institution that protects their interests. From the proposed model, we see a strong involvement of the government in order to ensure that the consumers are receiving updated information about the business or other consumers with whom they conduct business transactions. Also there will be a mean to report any abuse or fraud committed by either side. This is somehow different from a standard e-Business implementation in developed nation but we should keep in mind that consumers

in developing countries will not trust any service that does not involve their government, therefore making the government the key player in building trust among the different participants is the only and best option for those countries.

VI. CONCLUSION

By its nature, e-Business presents not only challenges but huge opportunities for developing countries to improve their economies. These include simplifying the execution of some of their key economic strategies in order to reduce poverty and address many other issues that contribute to hinder their economic development. Our recommended e-Business model helps address some common economic issues in West-African developing countries and can serve as a guideline for e-Business implementation in those countries. Furthermore, using the boom of wireless technologies like cell phones, we can ensure that a large number of their

populations can have access to those e-services and take advantage of the benefits being offered by their government and local businesses.

REFERENCES

- [1] A. Goldstein and D. O'Connor, *E-commerce for Development: Prospects and Policy issues*, 2000.
- [2] S. Hawk, *A Comparison of B2C E-Commerce in Developing Countries*, 2004.
- [3] A. Panagariya, "E-Commerce, WTO, and Developing Countries," *World Economy*, vol. 23, no. 8, 959–979, 2000.
- [4] T. Hoffman, "UN: Global E-Commerce Challenges Abound," *Computerworld*, vol. 34, no. 28, pp.12–14, 2000.
- [5] B. McConnell, "Risk E-Business: Seizing the Opportunity of Global E-Readiness," *www.mcconnellinternational.com*, pp.1–21, 2000.
- [6] Z. R. Andam, "*E-Asian Task Force*," UNDP-ADPIP Report, 2003
- [7] J. E. Payne, "E-Commerce Readiness for SMEs in Developing Countries: A Guide for Development Professionals," *Learnlink Academy for Educational Development*, 2005.
- [8] Vital Wave Consulting, "10 Facts about Mobile Markets in Developing Countries," 2008.