INFRASTRUCTURAL AND ORGANIZATIONAL FACTORS ENABLING E-BUSINESS IN SUB-SAHARAN AFRICA: A CASE-BASED RESEARCH PROPOSAL

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ABSTRACT

This research proposal uses a case study approach to investigate the pertinent factors affecting e-business in SSA from the perspective of national infrastructure and organizational factors. I present a general framework that explains what pertinent factors affect e-business in Sub-Saharan Africa (SSA). The primary dependent variable is E-business Outcomes, consisting of both E-business Capabilities and E-business Value. The predictor variables are Information and Communication Technology (ICT) Policies (consisting of General ICT Policies and E-business Policies), Government Institutions, the Commercial Environment, and ICT Transfer Implementation. Based on an action research methodology, the research will specifically focus on eight representative cases in Ghana and study these cases intensively to understand how the predictor variables in my framework affect e-business outcomes in these organizations. In this research program, I expect to demonstrate that e-business capabilities and e-business value, while related, are distinct in their nature and in their contributing factors, in addition to developing a model of how environmental infrastructure—technological, political, and commercial—produces effective e-business outcomes in SSA. Finally, two important elements of this model have not been previously studied empirically, particularly not qualitatively with rich description: the institutional and commercial environment in which businesses operate; and a distinction between general policies on information and telecommunication technologies and those specifically tailored to e-business.

INTRODUCTION

E-business is an important benefit that the Internet can bring to Sub-Saharan Africa (SSA). E-business stands out from other Internet applications in that it generates income from economic activities for citizens of a developing country who are engaged in commercial enterprise. Moreover, it provides employment and generates government revenues in taxes. Thus, e-business has the potential to be self-propagating and self-sustaining, the holy grail of development researchers and organizations on their quest for sustainable development, that is, "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (UNDSD 2003). By fostering internal and external trade, e-business might create and attract wealth that could be used to develop structural infrastructure such as roads, telecommunication networks, and dams; and social infrastructure such as hospitals and schools.

This research program uses a case study approach to investigate the pertinent factors affecting e-business in SSA from the perspective of national infrastructure and organizational factors. Based on an action research methodology, this research will specifically focus on eight representative cases in Ghana and study these cases intensively to understand how the predictor variables in my framework affect e-business outcomes in these organizations, based on a general framework of e-business outcomes in SSA.

In order to conduct an intensive study, it is necessary to thoroughly understand a particular organizational environment. Unfortunately, this requires focusing very specifically, considering the need to thoroughly study the legal, infrastructural, and commercial environment. My various readings and previous experience have indicated that Ghana is one of the SSA countries with the most progressive ICT policies and

competitive environments. Since e-business is currently so limited in SSA, it is necessary to begin by looking where it would be most likely be found. In August 2004, I visited Ghana in West Africa and conducted a number of interviews with business practitioners, government officials, an NGO officer, and academics. This visit confirmed my suspicions, as I found that the e-payment infrastructure, software and Web development community, and Internet backbones are growing at a considerable pace, compared to other SSA countries.

THEORETICAL FRAMEWORK

Drawing from the different research streams of e-business frameworks, ICT diffusion, and ICTs in developing countries, I have developed a general model that explains what pertinent factors affect e-business in Sub-Saharan Africa. In my model, the primary endogenous (dependent or predicted) construct is **E-business Outcomes**, indicating the practice of e-business. This construct has two dimensions: **E-Business Capabilities**, the specific business functions that e-business is used for, and **E-Business Value**, consisting of measures of the benefits of using e-business.

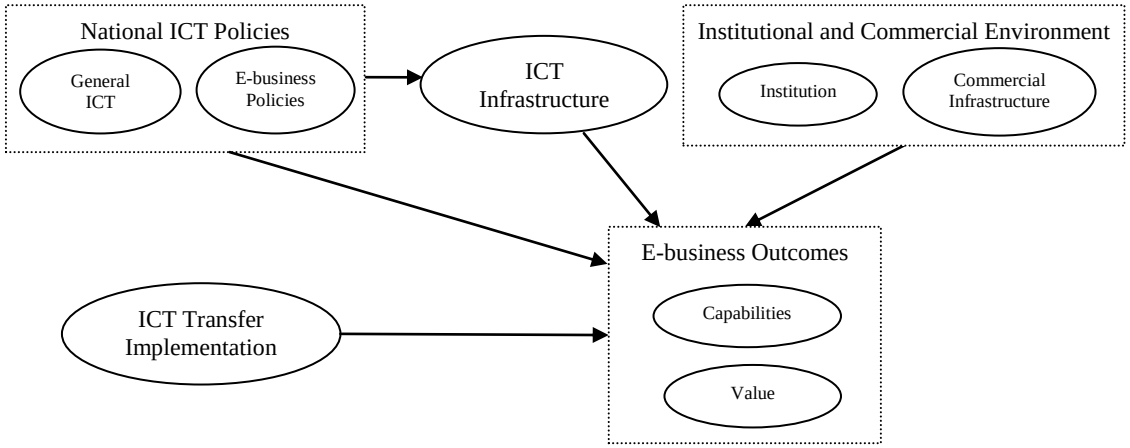

Figure 1. Model of e-business outcomes

The model has four predictor constructs postulated to directly affect e-business outcomes: **ICT Policies** reflect the aspirations of government policy makers to prioritize ICTs for national development. This construct reflects both **General ICT Policies** (King et al 1994) and **E-business Policies** (Jarvenpaa and Tiller 1999), that is, those specifically tailored to e-business. **ICT Infrastructure** is the telephone, wireless, and telecommunications infrastructure in a country that facilitates data communications (Mbarika, Byrd and Raymond 2002). I postulate that both ICT Policies and ICT Infrastructure have a direct effect on e-business outcomes, and that ICT Policies also have a direct effect on ICT Infrastructure. Next, the **Institutional and Commercial Environment** affects the practice of business in general, and here, e-business in particular. These factors include the effectiveness of governance in the **Institutions** dimension (Sachs and Warner 1997), and the conduciveness of the traditional commercial environment in the **Commerce** dimension (Travica 2002). At the organizational level, **ICT Transfer Implementation** affects the effectiveness of the process of adopting ICTs in general, and e-business tools and practices in particular (Bingi, Leff, Shipchandler and Rao 2000). All the factors in the model assert a positive influence on the construct they affect.

OBJECTIVES OF THE STUDY

Based on this theoretical model, there are a number of important questions that are still unanswered, mainly involving a more in-depth analysis of e-business in Sub-Saharan African than has been thus far conducted:

1. Considering the present state of ICT infrastructure in SSA, what are the current possibilities for e-commerce? The ICT infrastructure might grow once useful applications are developed and used. Thus, we need not assume that e-commerce would be viable only if the sort of infrastructure present in developed countries were available in SSA. What is possible now?
2. E-commerce in SSA will be based on the foundation of traditional commerce in SSA. We expect that to some extent e-commerce would be able to extend the traditional practice of commerce in SSA, but that it would also provide some disruptive new models of commerce that fit in the socioeconomic context of SSA. Although disruptive, some of these new models should prove economically beneficial to the entrepreneurs that adopt them (otherwise they will be phased out). What are the e-commerce practices that would be extensions of traditional SSA commercial practices, and what are the beneficial disruptive policies?
3. What forms of e-commerce practices in SSA have the most potential for implementation in a period of three to ten years for maximal economic benefit? Although long-term sustainable development is the goal, there is also the desire for rapid effectiveness. Some practices might be more feasible for rapid implementation, which would lay an economic base for further e-commerce adoption and innovation. It would be beneficial to identify these rapidly feasible practices for priority in adoption.
4. What practicable recommendations can be made for economic policy for viable and beneficial e-commerce in SSA? Much of the infrastructure required for e-commerce is beyond what entrepreneurs or businesses can implement on their own. What physical, legal, and economic infrastructural developments and policies should governments and non-governmental organizations focus on to establish an environmental context amenable to e-commerce in SSA?
5. What practicable recommendations can be made for managerial strategy for viable and beneficial e-commerce in SSA? Individual businesses need guidance as to what strategies they should follow in employing e-commerce to their SSA-based businesses. What strategies can be borrowed from the practices in developed countries? What novel strategies are necessary for the unique socioeconomic context of SSA?

RESEARCH METHODOLOGY

In-depth country case studies would shed much light on the specific effects of the identified factors, more so than a broad-based, quantitative survey. In fact, only such a qualitative methodology could give meaningful answers to the kinds of research questions posed in the previous section. In my interviews of software developers and ICT consultants in Ghana in August 2004, there was a repeated cry for the need for cases of successful e-business implementations within a Ghanaian context that could serve for others to follow. There are a few such cases, but they are not widely known. In this research program, I plan to identify and study existing SSA businesses that successfully use the Internet, particularly those that use innovative business models that uniquely fit the African context. Such studies would provide richer understanding than what is possible from a broad survey, using broader studies as a foundation that give specific directions of inquiry and focusing attention on the most relevant questions to investigate in interviews.

I propose here a research program that progressively attempts to answer these kinds of questions. The guiding research methodologies for this plan are an **action research** framework using interviews, qualitative study of policy documents and news reports, and intensive interaction with pertinent people in organizations. Action research is high-relevance approach to building scientific knowledge by intervening in a real case to influence outcomes based on theoretical predictions. It is similar to the experimental method, except that real-life scenarios are identified that meet the scientist's research criteria, and interventions are made with real impacts to the subjects. *MIS Quarterly* recently published a special issue on action research (September 2004) that showcased exemplars of such research in information systems. The researcher benefits from creating knowledge based on real (as opposed to hypothetical or experimental) cases, thus with proven effects; the organizations that participate benefit from expert advice that is based on rigorous scientific theory. The field of information systems benefits from research that is highly relevant. This is an appropriate

approach for carrying out this research program, as it will help me answer my questions, and give real value to the organizations with which I will work.

CONTRIBUTIONS OF THE RESEARCH PROGRAM

This proposed research program should offer a number of unique contributions to information systems research. It will distinguish between e-business capabilities and e-business value, and show that these related outcomes are distinct in their nature and in their contributing factors. Prior research has always either focused solely on capabilities, or confused the two into one construct. This program develops a model of how environmental infrastructure—technological, political, and commercial—produces effective e-business outcomes in concrete businesses in SSA. Two important elements of this model have not been previously studied qualitatively: the institutional and commercial environment in which businesses operate; and a distinction between general policies on information and telecommunication technologies and those specifically tailored to e-business. This study will investigate the process by which organizations in Sub-Saharan Africa, representing different business and public sectors, adopt, implement, and leverage e-business, and help explain the benefits that motivate them and challenges that frustrate them. Thus, it extends beyond existing knowledge by studying unique factors in e-business diffusion, and in studying both new and traditional factors in a context not previously studied at this depth of analysis.

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