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# **E-commerce Readiness in Ethiopia: A Macro-level Assessment**

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## **ABSTRACT**

This study is a work in progress that sets out to measure the readiness for e-commerce of an aggressively developing economy in East Africa – Ethiopia – a nation that has a significant historical and geo-political status at the horn - in order for it to be able to compete in the global information economy. The paper initially embarks on explaining the distinction among the fundamental concepts of e-commerce, e-readiness and e-commerce readiness. It then reviews some of the major e-commerce readiness studies conducted and models developed both at the regional and international level. From among such models, the Asia-Pacific Economic Cooperation (APEC) self-assessment tool is selected as an appropriate instrument for adoption and development of a measure for e-commerce readiness in Ethiopia. Apart from identifying the nation's standing regarding its e-commerce readiness, customizing existing instruments and developing a new version, is believed to add value to the contemporary knowledge capital in the specific domain.

## **KEYWORDS (REQUIRED)**

E-commerce, E-readiness, Information Communication Technology, E-commerce readiness, global economy

## **1. INTRODUCTION**

With the advent of globalization, the implementation of Internet-based technologies has become common and a very important trend. ICTs play crucial role in achieving business targets as well as inspiring development to such an extent that most of the changes in our lives would have been impossible without them (Castells, 1999). Each and every country, depending on the penetration of ICT into its business and the different legal and policy environment factors affecting it, stands at its own unique position in the global world. Thus, it is essential to identify what position a nation has in the global digital economy and assess its readiness to adopt such innovations.

One such innovation is electronic commerce or e-commerce. It is a general concept covering any form of business transaction of information exchange executed using Information and Communication Technologies (Huosong et al., 2003). It includes electronic trading of goods and services, transaction among auctioneers who create marketplaces for bidding and relates to a

variety of business dealings conducted online. E-commerce systems generally can be classified by application types as electronic markets, electronic data interchange, and internet commerce (Meza, no year).

Ethiopia is one of the African countries at the horn that has a significant historical and geo-political status. Nevertheless, mainly due to its fast growing population and other natural calamities, its social and economic development indicators regrettably reveal that it is lagging behind the rest of the world. It is expected that the nation's available resources can be efficiently used for rapid development and economic growth using new technologies. So also, many leaders in governments, businesses and social organizations around the globe have considered how best to harness the power of ICT for development.

Thus this study sets out to assess what standing the country has in terms of its readiness to benefit from the provisions of e-commerce readiness in order to be able to compete in the global information economy. Knowing the readiness level will help the country to design strategies relevant to the implementation of e-commerce in order to be competitive in the fast changing global economic context.

## **2. RATIONALE OF THE STUDY**

The benefits of the information technology revolution are still unevenly distributed between the developed and developing countries, and within societies themselves. While investment in ICT infrastructure in Africa has improved dramatically in recent years (Kabanda, 2008), there is a need to ensure that the huge potential of ICT and the promises of the information societies are geared towards poverty reduction and improving the quality of life for all. Particularly, in the contemporary information age, the continuing expansion of e-business and e-commerce provide opportunities for improved business processes.

Any government in power has the duty to make sure that the ICT revolution is not driven by technologies but by people's needs. Governments of developing economies need to rise up to the challenge of providing environments that can facilitate harnessing of ICT's potential for social and economic development as well as strengthening of good governance and citizens' participation. And to be able to do this, they need to make informed decisions as a result of research outcomes that IS specialists make. As the implementation of e-commerce requires certain input from the environment, knowing the current status of readiness at the macro-level would enable policy makers to facilitate such desirable conditions. The competitiveness of a country in the emerging global economy depends on its e-commerce development and it is a must for a nation to make the necessary preparations to successfully assimilate e-commerce, one such preparation being measuring e-commerce readiness (Bui, et al., 2003).

## **3. Objective of the Study**

**3.1 General Objective** - The general objective of this research is to assess the level of e-commerce readiness in Ethiopia to identify gaps for its eventual implementation all over the country; and explore potentials of the existing key organizational capabilities for e-commerce system.

**3.2 Specific Objectives** - The specific objectives of this study are to:

- assess the national level readiness for e-commerce so that strategies can be set to improve positioning for the digital economy;
- explore the challenges and opportunities of e-commerce implementation in the country;
- set baseline data at the macro level for the adoption of e-commerce in Ethiopia;
- provide advice to the government on a set of actions for implementation of e-commerce to create the necessary changes that are relevant for the local business environment.

## **4. LITERATURE REVIEW**

This section presents conceptual definitions of terms/phrases, and key terminologies used in the domain. It also reviews the various models available to measure e-commerce readiness and briefly discusses some of the relevant research works at national and international level.

#### **4.1. E-commerce, E-readiness, and E-commerce Readiness**

E-commerce and e-readiness are phrases often discussed in association with e-commerce readiness. The following subsection gives an explanation on the distinction among these basic concepts.

##### *4.1.1. E-commerce*

Electronic commerce or e-commerce has been defined in several ways. Kalakota and Whinston (1997:7) broadly define e-commerce as “a modern business methodology that addresses the needs of organizations, merchants and consumers to cut costs while improving the quality of goods and services and increasing the speed of service delivery.” They view e-commerce as a production process that converts digital inputs into value-added outputs through a set of intermediaries. The most comprehensive and widely used definition that has been found suitable for this study is the one provided by the Organization for Economic Cooperation and Development (OECD): e-commerce as “the electronic exchange of information that supports and governs commercial activities including organizational management, commercial management, commercial negotiations and contracts, legal and regulatory frameworks, financial settlement arrangements and taxation” (OECD 2001:21).

Some others have also defined e-commerce at its grass root level, describing it as an electronic method of doing business, typically over the Internet. It can be said that the definition of e-commerce is one that can be viewed from different angles (Kosiur, 1997). From a communications perspective, it is the delivery of information, products/services, or payments via telephone lines, computer networks, or any other electronic means. From a business process perspective, it is the function of technology toward the automation of business transactions and workflows. From a service perspective, e-commerce is a tool that addresses the desire of firms, consumers and management to cut service costs while improving the quality of goods and increasing the speed of service delivery. And from an online perspective, e-commerce provides the capability of buying and selling products and information on the Internet and other online services. World Bank (2009) uses a more specific definition of e-commerce by OECD as: “commercial transactions occurring over open networks, such as the Internet. Both business-to-business and business-to-consumer transactions are included.” This paper uses this definition of e-commerce for simplicity and clarity.

There are some considerable advantages that the spread of electronic commerce introduces into market functions (Bui and Sankaran, 2003). Primarily providing producers with improved access to distant markets at the cost of reduced time taken to supply those markets is a major benefit. Producers and consumers can communicate directly, without the intervention of the traditional intermediaries such as importers, exporters, wholesalers and retailers. As a result of such a direct communication between producers and consumers, some of the frictions of the marketplace are reduced. This is a step further in economic activities to come closer to some of the ideals of perfect competition: low transaction costs and improved access to information for the consumer. However, e-commerce at the same time introduces with it new issues related to: speed, in terms of time to market, cross border jurisdiction, security and the creation of global markets. These themes are also related to concerns about nations’ ability to regulate electronic commerce and governments’ capability to maintain tax revenue, the growth of telecommunications infrastructure with sufficient speed to cope with the demands of e-commerce, protection of consumers’ privacy, protection of intellectual property and the like.

##### *4.1.2. E-readiness*

The information society has affected all aspects of social and economic life. Every economy, regardless of its level of development, has a readiness profile on the global stage, based on its national policies, level of technology integration, and regulatory practices. A framework study report on e-readiness by Bui and Sankaran (2003:6) gives six different definitions for e-readiness to show the various perspectives of the concept. The same study mainly expounds the concept as follows:

“the aptitude of an economy to use Internet-based computers and information technologies to migrate traditional businesses into the new economy, an economy that is characterized by the ability to perform business transactions in real-time – any form, anywhere, anytime, and at any price.”

This definition presupposes that important application of ICTs offer interconnectivity between governments, businesses and individual citizens. There are sets of fundamental political, social and legal provisions that any nation needs to incorporate into its system to successfully adopt technological innovations, and subsequently benefit from them to remain competitive in the global market. Thus, e-readiness covers a wider scope and can include readiness for all the electronic potentials (like e-education, e-government, e-commerce, e-health,...e-everything).

#### *4.1.3. E-commerce Readiness*

The measure of the availability of necessary preconditions to adopt e-commerce can be referred to as e-commerce readiness. Oxley and Yeung (2001) and Molla and Licker (2005) discuss some fundamental technological, political, social and legal factors that allow or inhibit the development of e-commerce progress: the pace of technological change, acceptance by consumers and businesses, and the response of governments. Several studies in developing countries have also emphasized the influence of such contextual impediments as major determinants of e-commerce adoption. E-commerce readiness of a country is, therefore, an indicator of where that country stands in availing the requirements to successfully implement e-commerce. E-commerce readiness can be viewed as having a narrower scope than the generic e-readiness, focusing on measuring the requirements for conducting business transactions electronically through intranets and extranets or over the global internet. However, successful e-commerce can take place if and only if there are robust foundations of e-readiness (Choucri et al., 2003).

It is important that every country identifies, as much as possible, what is happening, as well as what is not, for the purposes of strategic planning for growth and development (ISCR, 2005). To this effect, various models of measurement for e-commerce readiness have been used by different nations and regions. One such frame that gives major measurable aspects of e-commerce is the one developed by the Asia Pacific Economic Cooperation (APEC) in 2002. According to this model, there are three main issues that can be assessed in relation to e-commerce:

- Readiness - in terms of potential usage and access and technology/socio-economic infrastructure;
- Intensity - in terms of transaction/business size and nature of transaction/business); and
- Impact - in terms of efficiency gains and employment/skill composition; work organization, new products/services, new business models, contribution to wealth creations and changes in product/value chains.

A similar study, by Esselaar and Miller (2001), focuses on three African countries - Rwanda, Namibia and South Africa. These countries have large and relatively impoverished citizens mainly located in rural areas, where the benefits of ICT have not been felt though there are major differences in the sizes of their overall economies. A comparative study of Tanzania and Ethiopia on ICT and e-commerce showed that Ethiopia appears to have more Internet entrepreneurs emerging although Tanzania had a better physical e-commerce infrastructure (Lake, 2000).

There are also studies related to ICTs in general and e-commerce in particular, in Ethiopia. A background study on ICT access in Ethiopia shows that the Internet service was introduced in 1996/97 with 1042 subscribers and has increased to 6487 in the first five years (Demeke and Birru 2002). Coverage of Internet services has expanded to 12 major towns but about 96% of the total subscribers are from the capital - Addis Ababa. It is also stated that the Internet bandwidth is very small i.e., the bandwidth from ISP to the Internet backbone is only 4Mb for uploading and 10Mb for downloading. The maximum bandwidth from user to ISP is 56Kb for dial-up access and 64Kb for leased lines. In line with this, the total number of local web-sites, out of which a significant number belong to private commercial firms, increased from 68 in 2000/01 to 88 in 2001/02 and it was projected to rise to 100 in 2002/03. Another baseline study has also been conducted in relation to e-commerce in Ethiopia, sponsored by Ethiopian ICT Development Agency - EICTDA (Demeke et al 2008). As the general objective of this comprehensive study was to propose a road-map for the development of e-commerce in Ethiopia, it did not particularly address the issue of readiness for e-commerce adoption.

The use of the internet for SMEs (Small and Medium-sized Enterprises) was also studied (Admassie and Taye 2007). It has been indicated that SMEs in Ethiopia have started showing interest in using Internet services amidst multitudes of challenges relating to products/ services not being suitable for sale via the Internet; customers not being ready to use Internet purchases; absence of provision for online payment system; lack of legal framework for electronic commerce; logistic problems with the delivery network; and the low-level ICT skills available. In general, the level of awareness and knowledge of the ICT technology, among SMEs, does not encourage them to anticipate the apparent possibility of utilizing e-trade as an alternative way of doing business globally. The above mentioned studies contend that, among the areas that challenge the development of e-trade/e-commerce in Ethiopia, the major ones are the inadequate telecom infrastructure available in the country, the constraining regulatory framework, lack of skilled human resource and key technologies.

The general assertion (Admassie and Taye, 2007, Demeke et al., 2008, Demeke and Birru, 2002, and Fekadu 2006) depicts that E-commerce is at its infant stage in Ethiopia and there are only few organizations that use ICTs in business transactions. These organizations use ICT for online advertisement, selling Ethiopian music, film and food mainly to the Ethiopian diaspora, and providing e-mail services including selling electronic products to local customers. The studies reiterate that lack of conducive environment for e-commerce activities in Ethiopia is characterized by the following major constraints:

- a) Absence of e-banking system in Ethiopia which forces the companies that sell products and services outside the country to use the foreign account of a person they know living abroad;
- b) Lack of appropriate legal framework for electronic commerce;
- c) Monopoly of the telecommunication industry (the fact that the Ethiopian Telecommunication Corporation is the only provider) which results in lack of competitive ICT service provision;
- d) Limited internet service the corporation provides which caters for an unreliable, continuously failing and expensive connection that hardly meets the demands of a shallow user base.

Although e-commerce in Ethiopia is at its early stage, the business environment is rapidly changing. Thus, from the foregoing review of literature, it can be observed that e-commerce readiness in Ethiopia is not yet measured despite the upcoming importance of doing so.

#### **4.2. Models to Measure E-commerce Readiness**

Over the last few years, a number of e-readiness assessment methods and tools have been developed. Each tool gauges how ready a society or economy is to benefit from the information technology and electronic commerce. Among different readiness measurement models, some focus on measuring the general e-readiness (covering wider perspective than measuring ecommerce readiness). Some others do the same with narrower perspectives (limited to infrastructure and manpower readiness) while others take a wider perspective (with comprehensive ecommerce readiness indicators).

This section briefly describes the various measurement tools that are available and what they measure particularly, to foster informed decisions about approaches to e-readiness assessment, as national governments consider their information technology policies and undeletable development initiatives.

Kirkman et al (2002) used the Networked Readiness Index (NRI) which has two components and several micro-indexes measured through 65 variables. This model is upgraded and used by Dutta and Mia (2009) which ranked the NRI of 134 countries. Instead of the two components of NRI, Dutta and Mia used three components - Environment, Readiness, and Usage. Both of these models focus mainly on technological (infrastructural) requirements to adopt e-commerce; they do not include other enabling factors like the human, economic, and cultural elements.

The Brazilian e-commerce readiness and diffusion model is about the diffusion and impacts of e-commerce in Brazil (Tigre, 2004). It discusses a number of questions related to early predictions about the Internet and e-commerce development. This model mainly focuses on measuring the impacts of e-commerce. It focuses on identifying what stage Brazil has reached in adopting e-commerce which in fact results from fulfilling the necessary requirements for its adoption.

As per ISCR (2005), OECD countries developed 11 e-commerce indicators which generally fall under two categories: either relating to telecommunications infrastructure available in a country, or to skills and training of the population using the infrastructure (IBID). Thus, in relation to the objective that this paper tries to achieve, this model is not comprehensive enough to measure other e-commerce readiness factors than manpower and telecommunications (such as policy, economic, and cultural issues).

The Asia-Pacific Economic Cooperation (APEC) E-Readiness is a self-assessment tool for use by developing economies to assess their e-commerce readiness. Eight Broad indicators of e-readiness are developed into a series of questions that provide direction as to desirable policies that will promote e-commerce and remove barriers to electronic trade. Each of the 52 indicators was rated using a 5-scale effectiveness rating. Table 1 lists the eight major factors and their 52 indicators used by APEC for calculating e-readiness.

Knowledgeable Citizen	Access to Skilled Workforce (Supply Skills)
Adult literacy Rate Secondary Enrollment Tertiary Enrollment 8th Grade Achievement in Science MGMT Education Available in first-class Business Schools Flexibility of People to Adapt to New Challenges	Public Spending of Education as % of GDP University Education Meets the Needs of Economy Well-educated People do not Emigrate Abroad Extent of Staff Training Research Collaboration Companies/Universities Number of Technical Papers per Million People
Macro Economy	Digital Infrastructure
Trade as % of GDP Adequate regulations & Supervision of Financial Institutions Protection of property Rights Tariff and Non-tariff Barriers Soundness of Banks Local Competition Regulatory Framework Government Effectiveness Political Stability Press Freedom Rule of Law Control of Corruption	Telephone per 1000 people Internet Hosts per 10000 People International Telecom, Cost of Call to US Investment in Telecom as % of GDP Computer Processing Power (worldwide MIPS) E-government ICT Expenditure as % of GDP Freedom on the Internet
Industry Competitiveness	Culture
Technology Achievement Index Gross Tertiary Science & Engineering Enrollment Ratio Admin. Burden for Start-ups Patent Applications Granted by USPTO Private Sector Spending on R&D as % of GNI High-tech Exports (% of Manufactured Exports)	National Culture is Open to Foreign Influence English Language  Percentage of Urban Population Percentage of Population 65 Years or Older
Ability, Willingness to Invest	Cost of Living and Pricing
Composite ICRG Risk Rating Availability of Venture Capital Entrepreneurship among Managers FDI as % of GDP	International Cost of Living based on \$100 US Inflation Rate-CPI in % GDP per Capita in US\$

Table 1: The 8 factors and their 52 measures for calculating e-readiness

Thus, despite the availability of many existing models in the literature, some of which are very particular to the context they are developed in, the APEC model will be the most suitable to customize for this study considering its comprehensive nature. The comprehensiveness of the selected model will create an opportunity for assessing every element related to e-commerce. Besides, the APEC e-commerce Readiness Assessment Guide is chosen in this study due to the relative similarity in level of economic development between the APEC countries and Ethiopia.

**5. SCOPE OF THE STUDY**

E-commerce readiness can be done at different levels – macro, intermediate and micro; however, this study focuses on the e-readiness assessment at the macro level, given the presumed level of ICT penetration and use in the business sector in Ethiopia. Besides, the macro level, which deals with infrastructural and institutional support issues, including public awareness, would add value to the quality of the study.

**6. METHODOLOGY**

The study would employ a descriptive survey of e-commerce readiness at the macro level. Specifically, the study will be a facility-based cross-sectional survey which will make use of both quantitative and qualitative study methods. The study will

be conducted at the capital city (Addis Ababa) since all of the federal bureaus of the various sector of the economy are located at the capital.

### **6.1. Variables/ Indicators**

As the APEC e-commerce Readiness Assessment guide is selected to be used in this study. The 52 variables to be measured are categorized under the 8 broad groups: Knowledge citizen; Macro-economy; Competitiveness; Ability and willingness to invest; Access to skilled workforce; Digital infrastructure; Cost of living and pricing; and Culture.

### **6.2. Target Data Sources**

Relevant data to measure each of the variables listed above will be gathered from appropriate sources. The monopolistic nature of businesses in Ethiopia has led to the concentration of data solely on specific government organizations. Thus, such organizations will be identified to collect data as there are no other organizations with relevant data to the study. Some of these organizations which are found to be the sole owners of information relevant to measure each of the variables are Ethiopian Telecommunication Corporation, National Bank of Ethiopia, Ministry of Education, selected Public and Private Higher Educational Institutions, Ethiopian ICT Development Agency, Ethiopian Chamber of Commerce, Ministry of Capacity Building, Ministry of Finance and Economic Development and Science and Technology Agency. The fact that data on a single variable can be obtained from two or more sources helps to cross check its verifiability.

### **6.3. Instrument**

To get quantitative data, a 52-item questionnaire of APEC E-commerce readiness assessment tool will be adopted and distributed to about 50 appropriate officials. The findings from the questionnaire will be supported by data from relevant documents. Moreover, to complement the quantitative data gathered from the questionnaire, and to see the issues from the key decision-makers point of view, qualitative data will be generated through in-depth interview with key informants from the selected organizations.

### **6.4. Data collection procedures**

To collect the quantitative data, the adapted questionnaire will be pre-tested for correctness and clarity. Frequent follow-up will be made to get the questionnaires returned. As to collecting the qualitative data is concerned, the interview guide will be checked for completeness and logical flow; the respondents will be briefed about the objective of the study and, as much as possible, the interview will be conducted based on the convenient time of respondents. When appropriate, related and useful documents will be assessed. The collected data will be referenced against measures in the models used for the study.

### **6.5. Data Entry and Analysis**

The quantitative data from the questionnaire will be analyzed using descriptive statistics. Regarding data from the interview, first, the data will be organized by breaking down large bodies of text into smaller units, perhaps in the form of sentences, or individual words. Then, particular attention will be paid to the entire data set several times to get a sense of what it contains as a whole. In the process, few memos will be jotted down that suggest possible categories or interpretations. Following this, general categories or themes, and perhaps subcategories or sub-themes will be identified, and then classify each piece of data accordingly with the objective of getting a general sense of patterns – a sense of what the data mean. Finally, the data will be integrated and summarized for the readers.

## **7. EXPECTED BENEFICITS OF THE STUDY**

The fact that there are different models, with some common variables, available for different countries shows that there is no one standard measure of e-commerce readiness. In fact, it would be ideal for countries to identify e-readiness factors that would best align with their strategies as there is no single magic formula of measuring it (Bui, et al., 2003). Thus, e-commerce readiness in Ethiopia can be measured by developing a new model as a result of customizing the existing models, or by preparing the one that seems most suitable for Ethiopian conditions. Hence, this baseline research is believed to gauge readiness and show directions of adoption of such innovations for a nation to be part of the global digital economy.

This Research can be used by government policy makers to identify gaps in technology concerning facilities and address the pressing need of facilitating online commerce. Practitioners, research institutions and academics working on e-commerce in particular and IS in general could also draw potentially valuable information and data from it in the effort they are continuously making to harness the use of ICT for economic advantage.

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