

12-13-2015

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Recommended Citation

Uwamariya, Marthe; Cremer, Stefan; and Loebbecke, Claudia, "ICT for Economic Development in Rwanda: Fostering E-Commerce Adoption in Tourism SMEs" (2015). *GlobDev 2015*. 1.
<http://aisel.aisnet.org/globdev2015/1>

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ICT for Economic Development in Rwanda: Fostering E-Commerce Adoption in Tourism SMEs

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Research-in-Progress

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ABSTRACT

Small and Medium Enterprises (SMEs) in the Rwandan tourism sector are slow in adopting information and communication technology (ICT) and especially e-commerce applications (Nibigira 2014). In the effort to pinpoint the drivers promising more extensive EC roll-out and thus economic and societal ICT-driven improvements in Rwanda, we firstly show some ongoing initiatives that of deploying ICT and e-commerce Rwanda. We then investigate more specifically the key determinants of EC adoption in the context of Rwanda. To that end, we adopt the *Perceived E-Readiness Model (PERM)* developed by Molla and Licker (2005) and apply it to e-commerce adoption in Rwandan tourism SMEs. From better understanding what accelerates or impedes ICT and e-commerce adoption in the Rwandan tourism sector, we hope to derive arguments for further fostering ICT roll-out in general and the e-commerce roll-out in particular in Rwanda – first throughout the Rwandan tourism sector and subsequently throughout other SME-based business sectors – and thus to contribute to the country's economic and societal development along the lines of many Information and Communication Technology for Development (ICT4D) studies (Heeks 2006, Heeks and Molla 2007, Zelenika and Pearce 2013).

Keywords: Rwanda, global development, electronic commerce, technology adoption

1 Introduction

This study investigates the adoption of Information and Communication Technology (ICT) and especially e-commerce, understood as the process of selling, buying, exchanging products, services and/or information using computer networks including the Internet (Loebbecke and Huyskens 2007, OECD 2004, Turban et al. 2006) in the Rwandan tourism sector, which the Government of Rwanda has identified as a priority sector in its Vision 2020 Program trying to eradicate poverty in the country. The Rwandan tourism sector is dominated by small and medium-sized enterprises (SMEs), which are expected to drive the country's economic and societal development as they are able to promote e-commerce faster than larger firms (Jahanshahi et al. 2011; Nibigira 2014).

In Rwanda, the use of ICT in general and of e-commerce in particular has been recognized as crucial for companies for competing and surviving in the global tourism economy (Ndekwa 2015). e-Commerce offers the opportunity for tourism firms to make information accessible to

tourists and foster communication between suppliers, intermediaries, and end-consumers in this industry (Bethapudi 2013) and thus can help local Tourism SMEs to remain competitive vis-à-vis large international tourism firms entering the market (Karanasios and Burgess 2008, Reynolds 2006). However, Tourism SMEs face impediments to the adoption of e-commerce technologies, such as business owners' and employees' preference of doing business 'the traditional way' and a lack of implementation-related and usage-related know-how (Karanasios and Burgess 2008, Kenneth et al. 2012).

Rwanda has experienced significant progress in the deployment of ICT infrastructures that connect the country to global networks. The existing national fiber optic backbone network connects Rwanda to international sea cables and thus provides for affordable access to Internet across the country. Legal and regulatory tools have been developed following governmental initiatives to diffuse ICT and e-commerce-related technology among Rwandan large and small companies. Focusing on SMEs, Rwanda has received a variety of governmental and non-governmental initiatives to foster ICT and e-commerce usage. However, SMEs still face limitations especially with regard to system standardization and payment solutions (NICI 2015).

Rwanda's tourism industry lags behind other sectors in terms of ICT usage as it limits itself to the rudimentary use of social media (Nibigira 2014). While ICT promises to be significant for transforming the tourism industry as a largely consumer oriented sector (Bethapudi 2013; Set 2014), the actual roll-out of ICT and e-commerce throughout Rwandan Tourism SMEs is still limited (Foster and Graham 2014).

In this context, we firstly ask about the status of e-commerce adoption in Rwanda's tourism sector. Then we investigate what affects e-commerce adoption among Rwandan Tourism SMEs. We assume that wider e-commerce adoption fosters at least economic and societal development (Avgerou 2008, Formunyuy and Neneh 2013, Heeks et al. 2008, Jensen 2007, Walsham 2010), as one development facet besides others such as human development, human rights, environmental sustainability (Comim 2015, Heeks 2010, Kleine and Unwin 2009).

2 Research Context: Rwanda

Rwanda is a densely populated and landlocked country in East Africa, south of the equator, covering 26,000 square kilometers (Government of Rwanda 2014), thus similar to the size of Macedonia or Israel. The Rwandan population amounts to more than 10 million people with a growth rate of 2.6% p.a., one of the highest in Africa (National Institute of Statistics of Rwanda 2012). 85% of the Rwandan population lives in rural areas. The three official languages are Kinyarwanda, English and French.

The major economic sectors are tourism, mining and agriculture. Its main export products are tea and coffee. GDP per capita was estimated USD 721 in 2014 (Global Finance 2015).

In Rwanda, as in many developing countries, SMEs are the engine of the economic growth. The SME sector, including formal and informal businesses, comprises 98% of companies and accounts for 41% of all private sector employment (Ministry of Trade and Industry 2010). Due to this economic significance, the Government of Rwanda put in place strategies to boost the growth and competitiveness of SMEs top of its agenda, making the environment for ICT diffusion generally favorable (Musahara et al. 2014). A number of large organizations have invested in installing computer systems to exploit the existing ICT infrastructure and thus expand their business. However, SMEs so far – likely due to lacking awareness of the ICT-based business potential – do not use ICT extensively yet – with the exception of mobile phones for business calls (Musahara et al. 2014).

In tourism, many Rwandan SMEs use the Internet primarily for simple communication purpose like sending or receiving mails, but not for delivering products and services. That is, so far online services which allow SMEs to better reach to customers have had limited success (Foster and Graham 2014). Nevertheless, the Government of Rwanda is determined to deploy e-commerce technologies in order to improve the economic situation of Tourism SMEs, and then in return the overall economic and societal development of Rwanda.

ICT Deployment in Rwanda

Rwanda has a target to transform the country into a middle-income country and transition its agrarian economy to an information-rich, knowledge-based one by 2020. In 2000, the

Government of Rwanda adopted and implemented the ICT for Development policy commonly known as *National Information and Communication Infrastructure Program (NICI) Program*. The key objectives of this program are to transform the country into an IT-literate nation, promote and encourage the deployment and utilization of ICTs in each sector, improve the private and public services delivery, and improve the ICTs infrastructure in order to make Rwanda a regional ICT hub (NICI 2005, 2010, 2015). It is divided in four stages to be implemented within the 20-year time-frame of Rwanda's 'Vision 2020':

- NICI I, lasting from 2001 to 2005, focused on the liberalization of the telecommunication industry and led to licensing private telecom companies and Internet Service Providers (ISPs) to operate within the country.
- NICI II, targeting 2006 to 2010, focused on deploying an ICT infrastructure throughout Rwanda. In 2010, the National Backbone Network Project led to a 3,000 km fiber optic backbone network. Kigali Metropolitan and Wireless Broadband Networks, the National Data Center and a Digital Broadcasting Network projects were launched.
- NICI III, scheduled to last from 2011 to 2015, focuses on developing skills and knowledge.
- NICI IV, planned for 2016-2020, should consolidate previous results towards the overall goal of Rwanda's Vision 2020, that is to turn Rwanda into an "a middle-income, information-rich knowledge-based society and economy by modernizing its key sectors using ICT" (Government of Rwanda 2000).

Rwanda analyzes its success along three ICT key performance indicators, *Availability of Mobile & Fixed Telephone Services*, *Internet Penetration*, and *Broadcasting Availability*.

- *Availability of Mobile & Fixed Telephone Services*. Rwanda's mobile telephone subscribers grew from 6.4 million as of June 2013 to 7.2 million as of June 2014, increasing mobile penetration from 61% to 68% (Rwanda Utilities Regulatory Authority 2014). This growth has been accredited mainly to increased competition on the market, which resulted in a continuous decrease of retail mobile telephone services tariffs coupled with a number of promotional packages and daily packs offered by licensed telecom operators. Rwanda has only one fixed telephone service provider with 47,000 subscriptions (0.44% penetration rate). In August 2012, Rwanda inaugurated its

'International Gateway Traffic Verification System', which enables the monitoring and management of national and international interconnections of telecommunication / ICT networks. With the system, the regulator (RURA) is able to: (1) control national and international traffic calls, (2) monitor international gateways, (3) conduct accurate billing and collection of taxes and contributions, (4) real-time monitor the quality of service indicators of international and national communication traffic, and (5) detect and manage telecommunication frauds.

- *Internet Penetration.* Rwanda has nine Internet Service Providers (ISPs) and one Network Service Provider (wholesaler). In 2014, the country counted 3.7 million Internet users (36% penetration rate). Of those, 55% use the Internet with mobile devices, 32% in cyber cafe and tele-centers, 10% in their institutions, and 3% at home via a fixed line (Rwanda Utilities Regulatory Authority 2014).
- *Broadcasting Availability.* Rwanda has fifteen Digital TV broadcasting stations and thirty FM radio broadcasters. In July 2015, all analogue transmitters were switched off migrating Rwanda completely towards digital TV.

In terms of ongoing ICT and e-commerce projects, the implementation of the National Information and Communication Infrastructure Program (NICI) Program has had positive effects across several economic sectors and in public administration.

- *ICT in Education.* The Government of Rwanda has initiated and implemented numerous ICT projects in education. The three most popular projects are: One Laptop per Child (OLPC)¹, Rwanda research and Education Network (RwEdNet)² and Knowledge Lab (kLab)³.

¹ One Laptop Per Child (OLPC) aims to enhance education by introducing ICT to primary schools. In particular, the project targets the development of pupils' computer skills. With an initial target to deliver one million XO laptops before 2017 (OLPC Rwanda Blog 2012), only 200,000 XO Laptops covering 407 primary schools had been delivered by December 2013 (Ministry of Youth and ICT 2013). The relatively high production cost of USD 181 (more than half of the yearly average income of Rwandans; Wadhams 2010) was identified as one of the major problems.

² The Rwanda Research and Education Network (RwEdNet) aims to interconnect Rwanda's institutions of higher education with global education system and research networks. A major challenge has been the lack of clear ICT strategies within RwEdNet members.

³ The Knowledge Lab (kLab), launched with the help of both Korean International Cooperation Agency (KOICA) and Rwanda Development Board (RDB), provides them with free Wi-Fi, workspace and mentorship from

- *ICT in Health.* A core project is TRACnet. Replacing a largely paper-based system, since 2005, the TRACnet system is designed to collect, store, display and disseminate medical information, as well as to manage drug distribution and patient information related to the care and treatment of HIV/AIDS (Cishahayo 2011). Results from blood tests can be obtained much faster. HIV/AIDS physicians can monitor Anti-Retroviral (ARV) therapy drug stocks in real time and hospitals can send urgent requests to the central retroviral drug stocks in case of stock shortage. To tackle the insufficient number of physicians in the country, the plan has been to build five telemedicine centers to allow physicians and medical students exchanging medical information for personal training and career development, and facilitate physicians' interaction with other medical specialists around the world. By mid-2015, three centers have been established. However, the of lack broadband connections and qualified personnel, led to more or less abandoning the ICT systems deployed in the centers (Nchise et al. 2012).
- *ICT in Agriculture.* The 'eSoko' project, implemented in 2010, aims at transforming the Rwandan agribusiness. Through the use of mobile and Internet networks, the system allows local farmers and traders to access information related to the prices of agricultural products and to provide statistics to support planning. However, the adoption of the system suffers from a high degree of illiteracy among farmers and traders in Rwanda (Akinyemi 2013).
- *ICT in Governance.* The ongoing National ID and driving license project aims to establish a habitant register and subsequently issue a secure digital national identity card and digital driving permit. Already 95% of the Rwandan population has acquired a national digital identity card (Ndahiro 2009). A newly introduced smart card (e-ID) serves as travel document within the East Africa Community; it combines the data from the current ID card, driving license, and passport. The e-ID also stores biometric data such as digital picture, electric fingerprint and signature and helps the holder to carry just one card for several services (Nyamulinda 2014).
In 2009, a Financial Management System (FMS) has been installed to harmonize the government's budget preparation and facilitate execution and financial reporting across

academic experts in ICT with the idea to encourage young graduate students to share their ideas, learn from each other, develop innovative ICT solutions and startup ideas.

the government entities. In 2010, more than 80 government institutions were connected to and via the system – enhancing transparency and reducing corruption (Ministry of Finance and Economic Planning 2011).

In 2013, the Government of Rwanda introduced the document tracking and workflow management system 'e-Mboni', which is installed in 55 government institutions and on which 4,000 government employees have been trained. The idea is to register all incoming and outgoing mail and documents and to ease tracking and long term storage of the documents through streamlined and automated processes.

Despite significant progress along ICT KPIs and at some island system implementations, many projects were less successful than anticipated. Only 11% of the projects met their goal in due time (Felicien 2009) due to (1) lacking qualified human resources, (2) insufficient electricity, (3) insufficient financial resources, (4) high communication cost in comparison to neighboring countries, (5) lack of awareness about ICT and its related benefits, (6) high rate of illiteracy and (7) insufficient international bandwidth.

Especially in tourism, efforts got stuck. The Rwanda Tour and Travel Association in collaboration with Rwanda Development Board in 2012 launched a tourism portal in order to diffuse Rwanda-related tourism information and facilitate online transactions within the tourism industry; however the adoption remains behind comparable governmental initiatives and ICT roll-outs in other sectors.

Therefore, in this research, we aim to shed light on what else than governmental initiatives drives SMEs to adopt ICT and e-commerce especially among small and medium size tourism enterprises in Rwanda.

3 Literature Brief

Our work on e-commerce adoption in Rwandan Tourism SMEs roots in three theoretical literature streams: First is the *Diffusion of Innovation Theory* (Oliveira and Martins 2011; Rogers 1962) which seeks to explain the spread of new ideas and innovations through a social system over time. Second is the *Technology-Organization-Environment Framework* (Tornatzky and Fleischer 1990), which emphasizes three aspects that impact technology adoption: technology,

organization (scope, size, and managerial structure), and environment. Third is the *Perceived E-Readiness Model (PERM)* provided by Molla and Licker (2005), which explores factors that affect e-commerce adoption in developing countries and considers innovational, managerial, organizational, and environmental characteristics. The model builds on the Theory of Planned Behavior (Ajzen 1991) and the Technology Acceptance Model (TAM) proposed and discussed in the literature (e.g., Davis 1989; Venkatesh and Davis 2000; Venkatesh et al. 2003).

Concerning e-commerce adoption in a variety of SMEs, Hashim (2007) notices that level of IT skills possessed by managers of SMEs is the main factor that affects technology adoption. Agboh (2015) shows that internal capabilities, high cost of ICT implementation, poor infrastructure, financial issues, lack of information about appropriate ICT solutions are top challenges for SMEs adopting ICT. Zaied (2012) finds that lacking Internet security is the highest barrier with regard to e-commerce adoption in SMEs. Irefin (2012) and Nduati et al. (2015) notice that business size and cost are major barriers, that hinder the e-commerce adoption. In contrast Jeon et al. (2006) noticed that those factors are not affecting the implementation of e-commerce in SMEs. Akbari and Pijani (2013) found external barriers like weak governmental supports, shortcomings of the legal environment, no pressure from suppliers and customers to adopt e-commerce, and culture acceptance to be the main factors impeding Internet adoption by SMEs.

Some studies investigate e-commerce adoption specifically in tourism SMEs. Mbatha (2011) points to the high costs associated with the implementation of ICT technologies and limited technical know-how as the main factors that hinder ICT adoption in Tourism SMEs. Karanasios and Burgess (2008) investigate ways for small tourism enterprises in the developing world to mitigate Internet adoption obstacles such as the inadequate and unreliable telecommunications infrastructure, the cost of the technology, and a lack of knowledge and skills. Hinson and Boateng (2007) identify top management support, perceived strategic value of eBusiness and organization readiness as the critical factors that affect e-commerce adoption in Tourism SMEs. Abeysekara (2011) finds lacking a business strategy prior the e-commerce adoption to be the main barrier that hinders e-commerce adoption in Tourism SMEs. According to Kilangi (2012) perceived relative advantage, ICT infrastructure, human capital, top management support, competitive pressure contribute to the adoption of ICT in Tourism SMEs.

With regard to research based African countries, Kenneth et al. (2012) notice that a good number of SMEs in the Nairobi, Kenya, have adopted EC. In contrast, Mutua et al. (2013) find a very low adoption rate of EC in their study of Kenya. Ndewka (2013) found that relative advantages and system compatibility determine the decision to adopt EC in Tanzania. Rumanyika and Mashenene (2014) and Kabanda and Brown (2015) work on EC adoption in Tanzanian SMEs. They identify insufficiencies in security systems, telecommunication infrastructure, e-readiness, and experienced IT staff to hinder e-commerce adoption. Shemi and Proctor (2013) conducted a study on Tourism SMEs in Botswana and point to the low Internet, suppliers' and customers' preferences for doing business via fax telephone and e-mail, and a lacking regulatory framework to be the main inhibitors.

For the case of Rwanda, Foster and Graham (2014) and Musahara et al. (2014) evaluated the linkage between the Internet adoption and tourism firms. They found that high speed connectivity is available, but tourism firms are not deploying it, so that actual Internet usage in Rwandan Tourism SMEs low is. Lack of staff trained in ICT and e-commerce systems limits adoption in Tourism SMEs (Nibigira 2014).

4 Onsite Investigation

To study ICT and in particular e-commerce adoption among Rwandan Tourism SMEs, we decided to adopt the *Perceived E-Readiness Model* developed by Molla and Licker (2005), which presents a multi-perspective approach combining managerial, organization-internal and organization-external contextual dimensions and thus allows for a sufficiently holistic analysis in this early explorative stage of our study (Heeks et al. 2011). As the model regards initial adoption and institutionalization as main dependent variables, it qualifies for a dynamic investigation of e-commerce adoption, capturing different adoption stages.

Following Molla and Licker (2005), our research model comprises two dependent variables *Initial Adoption* and *Institutionalization*, which we regard as two adoption-level variables on a single scale. Initial adoption refers to an organization's attaining of an interactive e-commerce status. A firm is considered to have adopted e-commerce if it has obtained an interactive e-commerce status. On the other hand, a firm with just phone or e-mail connection (without a

website) would not be considered as an adopter. Institutionalization refers to the extent of an organization's utilization of e-commerce and the organizations attainment of an integrated status.

With those dependent variables, we differentiate between two adoption levels – Initial Adoption and Institutionalization:

➤ Initial Adoption

- (1) Static e-commerce website with basic company information without any interactivity
- (2) Interactive e-commerce that accepts queries, emails, and form entries from users

➤ Institutionalization

- (3) Transactive e-commerce – online selling and purchasing of products or services, including customer services
- (4) Integrated e-commerce – the website is integrated with suppliers, customers and other back office systems allowing most firm's business transactions to be connected electronically.

As independent variables, we differentiate between *Perceived Organizational E-Readiness (POER)* and *Perceived External E-Readiness (PEER)*.

Perceived Organizational E-Readiness is defined as managers' perception of the degree to which they believe that their organization has the awareness, resources, commitment, and governance to implement e-commerce (Molla and Licker 2005). It is operationalized via Awareness, Resource (human, business and technology), Commitment and Governance. Awareness refers to an organization's perception, comprehension and projection of the benefits and risks of e-commerce (Dada 2006). Human Resource points to the availability and accessibility of employees with adequate experience and exposure ICT and other skills that are needed to adequately implement e-commerce initiatives and projects. Business Resource stands for a wide range of capabilities and most of the intangible assets of the organization including the openness of organizational communication, risk taking behavior, existing business relationships, and funding for e-commerce projects. Technology Resource is related to the flexibility of existing systems and experience with network based applications. Commitment reflects support for e-commerce from all corners of an organization; governance refers to the organization's strategic, tactical and operational models which are in place to manage e-commerce initiatives and projects (Halawani et. al 2013).

Perceived External E-Readiness refers to environmental dimensions including Government E-Readiness, Market E-Readiness, and Support Industries E-Readiness, assessed from the organization's perspective (Molla and Licker 2005). E-Readiness has been described as the readiness to obtain opportunities from available technologies (Hartman and Sifonis 2000). Government E-Readiness refers to governmental support of e-commerce in terms of the regulatory environment and policies. Market E-Readiness refers to suppliers' readiness to adopt e-commerce. Supporting industries E-Readiness refers to the institutions, whose activities might affect the e-commerce initiatives in the countries (Boteng et al. 2009; Halawani et al. 2013; Molla and Licker 2005).

The following Figure 1 summarizes the research model:

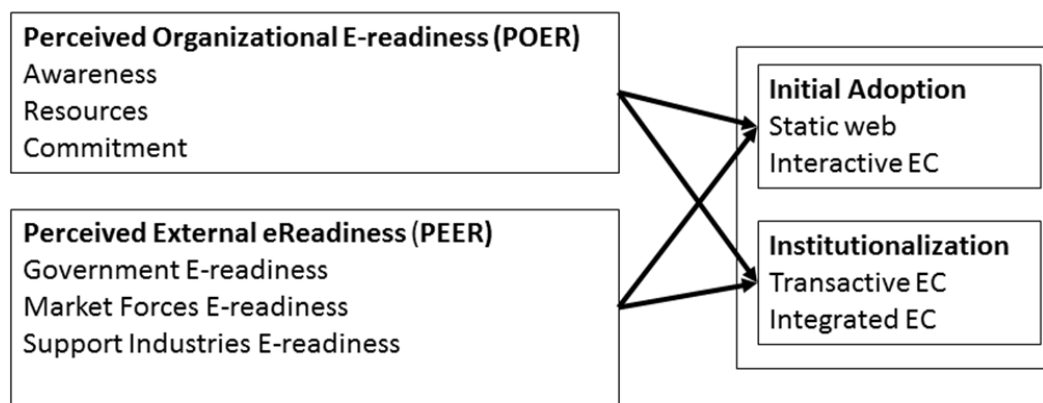


Figure 1: E-Commerce Adoption among Rwandan Tourism SMEs (Molla & Licker 2005)

In line with Molla and Licker (2005), we hypothesize:

- H₁: *Perceived Organizational E-Readiness* positively affects the initial adoption of e-commerce in Rwandan Tourism SMEs.
- H₂: *Perceived Organizational E-Readiness* positively affects the institutionalization of e-commerce in Tourism SMEs of Rwanda.
- H₃: *Perceived External E-Readiness* positively affects the initial adoption of e-commerce in Tourism SMEs of Rwanda.
- H₄: *Perceived External E-Readiness* positively affects the institutionalization of e-commerce in Tourism SMEs of Rwanda.

As target population, we draw on all 41 Rwandan 'Tour and Travel SMEs', who are members of the Rwanda Tours and Travel Association. First, following Molla and Licker (2005), we ask the companies in the sample for a self-assessment (see Table 1). Based on their self-assessments, we distinguish companies between *Adopters* (companies that fall into one of the four adoption categories *Static E-Commerce*, *Interactive E-Commerce*, *Transactive E-Commerce*, or *Integrated E-commerce*) and *Non-Adopters*.

E-Commerce Adoption

- Which one of the following best describes your current e-commerce status? Please choose only one option.
- Not connected to the Internet, no e-mail
- Connected to the Internet with e-mail but no web site
- Static Web, that is publishing basic company information on the web without any interactivity
- Interactive web presence, that is accepting queries, e-mail; and form entry from users
- Transactive web, that is online selling and purchasing of products and services including customer service
- Integrated web, that is the web site is integrated with suppliers, customers and other back office systems allowing most of the business transactions to be conducted electronically

Table 1: Instrument for Self-Assessing one's E-Commerce Adoption Level (Molla & Licker 2005)

In addition to the sample data, we collect data on the tourism portal operated by the Rwanda Tour and Travel Association in collaboration with Rwanda Development Board; those data could help us to interpret our data.

Next, we collect data on *Perceived Organizational E-Readiness (POER)*, i.e., managers' perception to what degree their organization has the *Awareness*, *Human Resources*, *Business Human Resources*, *Technological Resources*, *Commitment*, and *Governance* to implement e-commerce (see Table 2), and on *Perceived External E-Readiness (PEER)*, that is E-Readiness, Market E-Readiness, and Support Industries' E-Readiness (see Table 3). While the three dimensions of *Perceived External E-Readiness*, namely *Government E-Readiness*, *Market Forces E-Readiness* and *Support Industries E-Readiness* are expected to be consistent from perspective company-external perspective, as they refer to the government, the whole market, or support industry respectively, we expect their values to vary across companies when it comes to

the companies' assessment of these dimensions and their variables. All items are measured on a Likert scale from 'strongly agree' to 'strongly disagree'.

<p>Awareness</p> <ul style="list-style-type: none">- Our organization is aware of e-commerce implementations of our partner organizations- Our organization is aware of our competitors' e-commerce and e-business implementations- Our business recognizes the opportunities and threats enabled by e-commerce- Our organization understands e-commerce business models that can be applicable to our business- We understand the potential benefits of e-commerce to our business- Our organization has thought about whether or not e-commerce has impacts on the way business is to be conducted in our industry- Our organization has considered whether or not businesses in our industry that fail to adopt e-commerce and e-business would be at a competitive disadvantage <p>Human Resources</p> <ul style="list-style-type: none">- Most of our employees are computer literate- Most of our employees have unrestricted access to computers <p>Business Resources</p> <ul style="list-style-type: none">- Our people are open and trusting with one another- Communication is very open in our organization- Our organization exhibits a culture of enterprise wide information sharing- We have a policy that encourages grass roots e-commerce initiatives- Failure can be tolerated in our organization- Our organization is capable of dealing with rapid changes <p>Technological Resources</p> <ul style="list-style-type: none">- We have sufficient experience with network based applications- We have sufficient business resources to implement e-commerce- Our organization is well computerized with LAN and WAN- We have high bandwidth connectivity to the Internet- Our existing systems are flexible- Our existing systems are customizable to our customers' needs <p>Commitment</p> <ul style="list-style-type: none">- Our business has a clear vision on e-commerce- Our vision of e-commerce activities is widely communicated and understood throughout our company- Our e-commerce implementations are strategy-led- All our e-commerce initiatives have champions- Senior management champions our e-commerce initiatives and implementations
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Table 2: Dimensions & Items of Perceived Organizational E-Readiness (Molla & Licker 2005).

Governance

- Roles, responsibilities and accountability are clearly defined within each e-commerce initiative
- e-commerce accountability is extracted via on-going responsibility
- Decision-making authority has been clearly assigned for all e-commerce initiatives
- We thoroughly analyze the possible changes to be caused in our organization, suppliers, partners, and customers as a result of each e-commerce implementation
- We follow a systematic process for managing change issues as a result of e-commerce implementations
- We define a business case for each e-commerce implementation or initiative
- We have clearly defined metrics for assessing the impact of our e-commerce initiatives
- Our employees at all levels support our e-commerce initiatives

Market Forces E-Readiness

- We believe that our customers are ready to do business on the Internet
- We believe that our business partners are ready to conduct business on the Internet

Government E-Readiness

- We believe that there are effective laws to protect consumer privacy
- We believe that there are effective laws to combat cyber crime
- We believe that the legal environment is conducive to conduct business on the Internet
- The government demonstrates strong commitment to promote e-commerce

Supporting Industries E-Readiness

- The telecommunication infrastructure is reliable and efficient to support e-commerce and eBusiness
- The technology infrastructure of commercial and financial institutions is capable of supporting e-commerce transactions
- We feel that there is efficient and affordable support from the local IT industry to
- Secure electronic transaction (SET) and/or secure electronic commerce environment
- (SCCE) services are easily available and affordable

Table 3: Dimensions & Items of Perceived External E-Readiness (Molla & Licker 2005).

Collected data will be processed in SPSS; descriptive statistics will be presented in the form of frequency tables, means, standard deviations, etc. For inferential statistics, we will employ chi-squared tests on contingency tables.

5 Early Findings and Expected Contribution

The government of Rwanda has emphasized the role of the Rwandan tourism industry as one with high potential to contribute to the country's economic and societal development (Nibigira 2014, Rwanda Development Board 2013). In order to leverage that potential, the government expects deploying ICT in general and e-commerce in particular to play a major role. Here we would like to make a contribution.

While our findings are still limited at this early stage of a longer project, we appreciate that our ongoing efforts in the country and from abroad have led to the opportunity to investigate almost the complete Rwandan tourism sector with the support of the relevant governmental authorities.

A first set of explorative interviews conducted with representatives from Rwandan government authorities between May and July 2015 shows first and foremost that governmental expectations have been barely met so far. In July 2015, the tourism portal, which was launched in 2012 by the Rwanda Tour and Travel Association in collaboration with Rwanda Development Board, provides only limited information related to hotels, restaurants, or tour and travel companies. Online transactions are barely feasible as often the related software functionalities have not been sufficiently implemented yet. Nevertheless, at this explorative stage of our work, we acknowledge the government's achievements and we follow for instance Ebikabowei and Endouware (2013) and Karanasios and Burgess (2008) who also recognize the economic and societal development potential arising from efforts in building and extending ICT- and e-commerce infrastructure to trigger more widespread ICT and e-commerce adoption by Tourism SMEs in developing countries.

Here we envisage our study to be helpful: By investigating the factors that drive e-commerce adoption among Tourism SMEs in Rwanda, we not only expect to improve our own understanding of the potential of Information and Communication Technology for Development (ICT4D) in countries like Rwanda. We hope that our work will also raise further interest among the managers and owners of Tourism SMEs into the potential impact of ICT and e-commerce and generate significant interest in the Rwandan government. This in turn would allow us spreading our insights among Rwandan authorities and companies. Building on the widely accepted assumption that ICT and e-commerce foster economic and societal development (Avgerou 2008, Formunyuy and Neneh 2013, Heeks et al. 2011, Walsham 2010), such diffusion of ICT- and e-commerce supportive research insights among relevant players in Rwanda would firstly help promote e-commerce offerings and usage – and ultimately foster economic and societal development in the country.

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