

# Assessing the challenges to e-commerce adoption in Tanzania

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A study of 100 managers at Information Technology and e-commerce companies in three districts of Dar-es-Salaam, Tanzania's largest city, identifies the principal factors impeding the spread of e-commerce in that area. These include budget constraints, poor Internet penetration, a low level of computer literacy, and a lack of skills and training. By addressing these issues, along with users' security and privacy concerns, organizational leaders can help foster the adoption of e-commerce technologies that can lead to increased efficiency, profits, and market reach.

## 1 | INTRODUCTION

Tanzania is ranked 107th of 193 nations in B2B e-commerce (United Nations Conference on Trade and Development, 2016). As of June 2017, only 13% of the population of 56,877,529 were using the Internet at home, and only 1% had a credit card (Internet World Stats, 2017). As **Exhibit 1** (page 44) shows, the number of secured Internet servers per 1 million people in Tanzania was a mere 1.5 in 2014 and only 2.04 in 2015. In 2016, Tanzania had only 2.1 secure Internet servers using encryption technology per million people (World Bank, 2017). In the East African Region, Tanzania trails only Kenya and Uganda in the use of Internet technology and is followed by Rwanda and Burundi, but this position isn't strong enough for Tanzania to compete in a global context or even among other African nations such as South Africa, Mauritius, Morocco, and Nigeria (United Nations Conference on Trade and Development, 2016).

Although the incorporation of e-commerce into business processes has become the norm throughout the world, even organizations in advanced economies continue to encounter e-commerce adoption problems (Seethamraju, 2006). In Tanzania, several constraints have prevented e-commerce from being broadly adopted, such as the low rate of Internet penetration and the high investment costs associated with investment in e-commerce (Kabanda & Brown, 2017). Unless stakeholders take action, Tanzania risks losing even the low level of competitive advantage it has in comparison to other developing countries that currently trail it in e-commerce implementation.

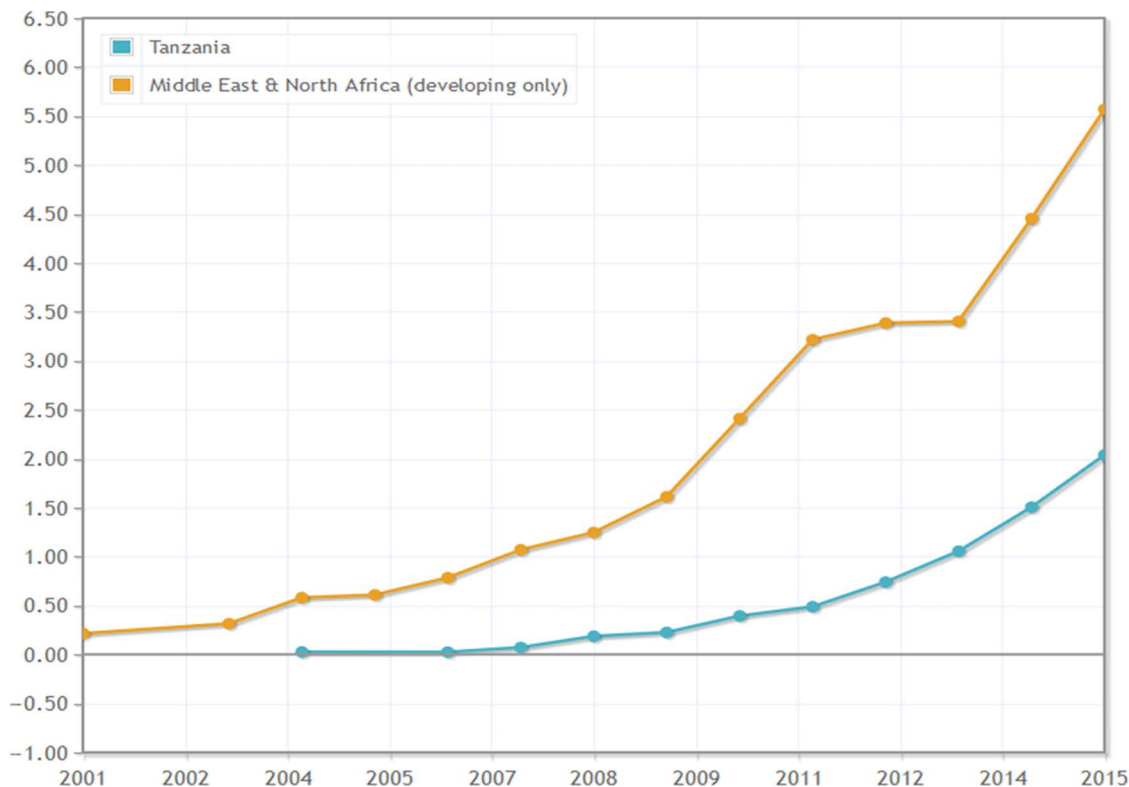
Barriers to the adoption of e-commerce technologies in Tanzania include fear and uncertainty on the part of business owners who prefer to stick with traditional practices and shun new solutions centered on e-commerce (Tanzania Communications Regulatory Authority, 2014). To date, the government has not played a significant role in promoting e-commerce absorption among businesses. The current drivers of e-commerce in Tanzania are private practitioners, but even they, given the absence of motivational factors, are slow to make the changes needed to fully take advantage of new technologies (Al-Alawi & Al-Ali, 2015).

To address this situation, it is important to:

- Identify the factors that are important to the adoption of e-commerce in Tanzania.
- Assess the significance of the factors that are important to the adoption of e-commerce in Tanzania.
- Determine the scope of e-commerce adoption in Tanzania and its impact on business processes.
- Define the impact of e-commerce adoption on business processes and the relationship between perceived values and risks and e-commerce transactions.

## 2 | FACTORS AFFECTING E-COMMERCE

E-commerce is typically defined as transactions in which goods and services are exchanged via the Internet and other digital media (Chaffey, 2002; Organisation for Economic

**EXHIBIT 1** Number of secure Internet servers (per 1 million people).

(Color figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com).)

Source: World Bank, World Development Indicators (2017); The lower line in the graph indicates results for Tanzania.

Co-operation and Development, 2016; Samiee, 2008; Siau & Shen, 2002; World Trade Organization, 2016). Such commerce entails acceptance and practice of digital technologies in conducting business and usually involves ordering and paying for goods or services electronically and tracking the progress of those transactions online. Like traditional methods of conducting business, e-commerce entails such processes as order placement, receiving, making payments, and delivery (World Trade Organization, 2016). Yet, because of certain existing systems, not all business processes can be carried out through e-commerce (Kalakota & Whinston, 1996). In addition, e-commerce requires a certain level of trust between buyers and sellers in the use of different types of digital payment technologies. Because e-commerce is a relatively young mode of doing business and can be perceived as complex, it has not been widely accepted in many areas, particularly in developing nations.

The adoption of innovation is related to the performance of business enterprises and numerous studies have attempted to identify the factors related to the appropriate adoption and performance of e-commerce. Some of these factors, such as top management support, financial resource, and organizational competence, are usually within an organization's scope. Others, however, such as environmental factors and government regulations, may lie beyond it and, therefore, present challenges.

In a study on factors affecting e-commerce adoption in Nigerian banks, Aghaunor and Fotoh (2006) identified the influence of top management support, organizational support, Information Technology (IT) capability, perceived benefits, perceived compatibility, perceived complexity, supporting industries, and market and government readiness. Other researchers expanded on this to include perceived relative advantage, perceived compatibility, manager's/owner's knowledge and expertise, management characteristics and external change agents as influencing adoption (Paul et al., 2014). Additional research identified 11 variables that influence small and medium-size enterprises (SMEs) in adopting e-commerce, and grouped them into four categories: technological, organizational, environmental factors, and individual. Among them were perceived benefits, technological readiness, owners' innovativeness, owners' IT ability, and owner's IT experience (Rahayu & Day, 2015).

Some researchers have found that e-commerce adoption is affected by the model of the organization; its technological, environmental, and other aspects of its business environment; and its use of information and communications technology and Web applications (Al-Alawi & Al-Ali, 2015). Others have noted the importance of such factors as customer-based open systems and electronic data interchanges (Kumar & Raheja, 2013), as well as the impact of managerial characteristics (Shemi, 2013).

Others factors that have been identified as important to the adoption of e-commerce include the availability of personnel who are skilled in information communications technology, the availability of high-speed Internet, the cost of setting-up and maintaining Internet applications, and ease of access to payment facilities (Alkhalaf, Nguyen, & Drew, 2010). Organizational culture, supplier and customer preferences, security concerns, the local business environment, government role's as a customer, the state of global economics, and the relative strength of the enterprise (AlGhamdi, Nguyen, Nguyen, & Drew, 2012), as well as compatibility issues, organizational readiness, managerial characteristics, and security concerns can also influence how readily a firm adapts to e-commerce (Shah Alam, Ali, & Jani, 2011).

In developing countries, several organizational and individual factors, both internal and external, have been identified as obstructing the acceptance of e-commerce (Lawrence & Tar, 2010; Shemi, 2013). These factors include lack of understanding (Farhoomand, Tuunainen, & Yee, 2000), government policies regarding the IT and financial sectors (Watson, 2009), lack of qualified staff (Awa, Ojiabo, & Emecheta, 2015), and privacy and security issues (Kabanda, 2013; Oreku, Ojiabo, & Emecheta, 2011). Cross-group analysis has shown that organizational culture is positively correlated to flexibility and adaptability among SMEs and their level of e-commerce adoption (Senarathna & Wickramasuriya, 2011).

### 3 | GAUGING TECHNOLOGY ADOPTION

The technology acceptance model (TAM) can be used to analyze the attitudes, behaviors, and intentions that affect the acceptance of information technology (Davis, 1993). The purpose of TAM is to help business leaders predict how readily IT will be accepted so that, if necessary, engineering processes can be altered before systems are mass-marketed to consumers who have no experience in using them.

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According to the model, the degree of user acceptance is determined by perceived usefulness and perceived ease of use. It also provides a basis for revealing the impact of external economic, utilitarian, and attitudinal variables on adoption decisions. Although TAM has been empirically

validated, applied, and replicated, the model does not yield meaningful information on users' opinions about adopting specific IT systems (Gounaris & Koritos, 2008). Hence, there is a need to expand on the factors that might have an impact on e-commerce acceptance or to integrate TAM with other models in order to improve its explanatory and predictive utilities (Awa et al., 2015).

#### 3.1 | Four factors of importance in Tanzania

Adoption of e-commerce technologies depends on people's awareness of and experience with using those technologies (Choshin & Ghaffari, 2017). Therefore, it is affected by:

- *Budget constraints:* According to Tanzania's 2017–2018 ministerial budget allocations, the information communications technology and science and technology sectors have among the lowest budgets (Ministry of Finance and Planning, 2017).
- *Internet penetration:* Although the level of Internet penetration in Tanzania increased in recent years, getting broad access to the Internet is still a significant challenge.
- *Computer literacy:* The degree of computer literacy in Tanzania has been hampered by poor physical and network infrastructures, inadequate human resources, and widespread poverty (Oreku, Mtenzi, & Ali, 2013).
- *Skills and training:* While the adult literacy rate in Tanzania is about 78%, only about 17.5% of those adults are familiar with using a computer (United Republic of Tanzania, 2012). Given this meager rate of computer literacy, it is difficult for the people to adapt to e-commerce technologies. The ICT industry can only fulfill its potential when most of the population it serves is able to use a computer (Pilot, 2011).

To shed light on e-commerce implementation in Tanzania, researchers developed a questionnaire that addressed these four factors. Survey participants were asked to respond to six statements about the perceived values and risks of e-commerce technologies by using five-point scale (1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, and 5 = strongly agree). They were asked to rate how strongly they felt that the adoption of e-commerce technologies had:

- increased efficiency and effectiveness
- increased profits and reduced costs
- created competitive advantage
- expanded the market
- led to fraudulent transactions
- increased security risks

The questionnaires were disseminated to 100 managers at IT and e-commerce companies registered with the Tanzanian Business Registration and Licensing Agency (BRELA) in three districts of Dar-es-Salaam: Temeke, Kinondoni, and Ilala (**Exhibit 2**).

Participants' responses to each statement were averaged to form a composite score for analysis. As **Exhibit 3** shows, the results reveal that skills and training, budget constraints, Internet penetration, and computer literacy are significant variables affecting e-commerce adoption, with means of 2.28, 2.25, 1.66, and 1.60, respectively. **Exhibit 4** shows that the relationship between e-commerce adoption and budget constraints, Internet penetration, computer literacy, and skills and training is statistically significant ( $p$  value is  $<.05$ ). Thus, this analysis confirms that the adoption of e-commerce technologies in the Tanzanian firms in the study is affected by budget constraints and by the degree of Internet penetration, computer literacy, and skills and training.

### 3.2 | The impact, value, and risks of e-commerce

The high costs associated with investment in e-commerce, which include hefty taxes imposed on e-commerce goods, annual website design and domain name expenses, and hosting and maintenance fees continue to slow the adoption of e-commerce in Tanzania, negating the effect of increased budgetary allocations by the Ministry of Finance (2017). Naturally, companies have numerous other priorities to consider when preparing their budget and, as a result, the implementation of programs to facilitate e-commerce technologies often falls at the bottom of the list.

In Tanzania, the speed of Internet service, the cost to maintain Internet applications, insufficient bandwidth, and high costs related to it are among the issues that continue to hamper Internet penetration. As a developing

country, Tanzania has yet to invest significantly or give priority to the information communications technology sector.

*This analysis confirms that the adoption of e-commerce technologies in the Tanzanian firms in the study is affected by budget constraints and by the degree of Internet penetration, computer literacy, and skills and training.*

In Tanzania, a shortage of IT/ICT experts and a poor level of computer literacy stifle the adoption of e-commerce. Training is needed to improve familiarity not only with e-commerce technologies, but also on a more general level with the basics of education and technology. To be able to use e-commerce technologies, a person must have at least a high school education, but a large part of the population in Tanzania has not had that level of training. Clearly, there remains a significant need for additional training and skill development.

According to the Tanzania Communications Regulatory Authority (2014), of the approximately 11 million Tanzanians who use the Internet, 7,716,500 do so by individual

**EXHIBIT 3** Factors affecting e-commerce adoption

Factors	Mean	Std. deviation
Factor 1 Budget constraints	2.2550	.98372
Factor 2 Internet Penetration	1.6600	.86340
Factor 3 Computer Literacy	1.6033	1.17941
Factor 4 Skills and training	2.2850	1.27278

**EXHIBIT 2** Summary of the study population

Population of Interest	Registered companies in Tanzania		
Target Population	Registered companies involved with IT/e-commerce (about 1,000 companies)		
Accessible Population	Registered companies involved with IT/e-commerce in Dar-es-Salaam (200 companies)		
Population Location	Temeke, Kinondoni, Ilala		
Source	BRELA—Business Registration and Licensing Agency		
District (Cluster)	Population	% Population	Sample size
Temeke	46	23%	23
Kinondoni	100	50%	50
Ilala	54	27%	27
Total	200	100%	100
<b>Sample size technique: Systematic random sampling and cluster sampling</b>			
Random number used	200/100=2		

**EXHIBIT 4** Significance of factors affecting e-commerce adoption

		Paired Differences					<i>t</i> -Statistic	Degree of freedom	Sig. (two-tailed)
		Mean	Standard deviation	Standard error	95% Confidence interval of difference				
					Lower	Upper			
Pair 1	Adoption-Budget Constraints	-.30417	.64964	.06496	-.43307	-.17526	-4.682	99	.000
Pair 2	Adoption-Internet Penetration	.29083	.48361	.04836	.19487	.38679	6.014	99	.000
Pair 3	Adoption- Computer Literacy	.34750	.88673	.08867	.17155	.52345	3.919	99	.000
Pair 4	Adoption-Skills and Training	-.33417	.73774	.07377	-.48055	-.18778	-4.530	99	.000

subscription, 3,402,550 use it at their place of a work, and 239,040 rely on service at Internet cafes, for a total penetration rate of 22%. For a nation with more than 55 million people and seeking to achieve competitive advantage in the 21st century, a 22% Internet penetration rate is considered low. The level of e-commerce readiness among the people of Tanzania is not advancing because of poor physical and network infrastructures, inadequate resources, a low level of computer literacy, widespread poverty, and concerns over costs, security, and privacy.

**Exhibit 5** shows the Spearman correlation between e-commerce adoption and its impact on business processes at 0.886, indicating a strong positive correlation between impact and e-commerce adoption. This implies that impacts on business processes increase as e-commerce adoption increases. **Exhibit 6** shows that the *p* value for e-commerce adoption

and impact on business processes is less than .05 and, therefore, statistically significant. These findings indicate that the impact of the adoption of e-commerce technologies on business operations is more likely to be positive rather than negative.

The statistical results given in **Exhibit 7** (page 48) reveal that the impact of e-commerce adoption on business processes increases as perceived values and risks increases.

More than 50% of the responses to the questionnaire statements were on the side of “strongly agree” and “agree.” This implies that the adoption of e-commerce technologies is perceived as having an effect on efficiency and effectiveness, increasing profits and reduce costs, creating competitive advantage, and expanding the markets, while opening up users to security risks and possibly leading to fraudulent transactions.

**EXHIBIT 5** Correlation analysis

		E-Commerce Adoption		Impacts	
Spearman’s rho	E-commerce adoption	Correlation coefficient	1	.886*	
		Sig. (two-tailed)	.	0	
		<i>N</i>	100	100	
	Impacts	Correlation coefficient	.886*	1	
		Sig. (two-tailed)	0	.	
		<i>N</i>	100	100	

\*Correlation is significant at the .01 level (two-tailed).

**EXHIBIT 6** Paired sample test

		Paired differences					<i>t</i> -Statistic	Degree of freedom	Sig. (two-tailed)
		Mean	Standard deviation	Standard error	95% Confidence interval of the difference				
					Lower	Upper			
Pair 1	e-commerce adoption— impact on business processes	-0.34417	0.59288	0.05929	-0.46181	-0.22653	-5.805	99	0

EXHIBIT 7 Correlation

			Impacts	Perceived values	Perceived risks
Spearman's rho	Impacts	Correlation coefficient	1	.967*	.914*
		Sig. (two-tailed)	.	0	0
		N	100	100	100
	Perceived values	Correlation coefficient	.967*	1	0.794
		Sig. (two-tailed)	0	.	0
		N	100	100	100
	Perceived risks	Correlation coefficient	.914*	.794*	1
		Sig. (two-tailed)	0	0	.
		N	100	100	100

\*Correlation is significant at the .01 level (two-tailed).

#### 4 | TOWARD ACCEPTANCE OF E-COMMERCE

Many studies have supported the value and advantages of e-commerce adoption, such as improved customer service (Abid, Rahim, & Sheepers, 2011) and improved communication, operational efficiency, accuracy, reliability, time management, and flexibility (Sajuyigbe, 2012). The findings of this study reveal that there is a strong positive relationship between e-commerce technologies adoption and impact on business processes. This means that as enterprises adopt e-commerce technologies, they are likely to see changes in their business processes. Among the possible benefits are increased efficiency, profits, and market reach, as well as reduced costs. With those benefits, however, comes the need to address the security and fraud risks that also may result from e-commerce activities.

*The level of e-commerce readiness among the people of Tanzania is not advancing because of poor physical and network infrastructures, inadequate resources, a low level of computer literacy, widespread poverty, and concerns over costs, security, and privacy.*

To help their companies reap the benefits of modern technological business platforms, organizational leaders in developing economies would do well to:

- recognize e-business as a new source of opportunities and growth, allowing access to international markets;

- explore the multiple ways that e-commerce can be applied—from product sourcing and distribution to financial management and marketing—so as to minimize costs and maximize reach;
- provide staff with the training they need to comfortably handle assignments in an e-commerce environment;
- offer staff members support and coaching in how to best develop trade through online channels;
- pay careful attention to the specific needs of conducting business online beyond the mastery of appropriate technologies, such as developing packaging designs and inventory practices that are suitable for e-commerce;
- carefully construct payment platforms that ensure privacy and security and minimize risks to both the company and its customers;
- work with government agencies to deter and minimize transaction risks;
- create awareness of the need for government to increase investment in information communications technology.

Several factors affecting e-commerce adoption, which previously have been studied, remain important issues for business leaders in Tanzania to address today. They include budget constraints, Internet penetration, computer literacy, and skills and training. An innovative partnership among businesses, government agencies, and trade and investment support institutions would help expand the use of e-business processes and elevate Tanzania's competitive position. The manner in which organizational leaders in both the public and private sector in Tanzania perceive e-commerce technologies—as benefiting the enterprise and its community or exposing them to serious risks—and communicate those views is likely to have a marked impact on how readily those technologies ultimately will be embraced.

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