

6-9-2014

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Yunis, Manal; Ngafeeson, Madison; and Koong, Kai, "Information Security as a Determinant of Nation's Networked Readiness: A Country Level Analysis" (2014). *Conference Papers in Published Proceedings*. Paper 1.

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INFORMATION SECURITY AS A DETERMINANT OF NATION'S NETWORKED READINESS: A COUNTRY LEVEL ANALYSIS

Complete Research

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Abstract

In a digital era where Information and Communication Technologies (ICT) play a pivotal role in driving forward the competitiveness of nations, it is imperative to understand the factors influencing the successful diffusion and deployment of this resource. ICT has become a global resource influencing the competitiveness of not only companies, but also nations. Previous research discussed the factors influencing ICT effectiveness and networked readiness; nevertheless, the impact of a country's secure communications, competitiveness, and ICT laws on global IT effectiveness has yet to be addressed. Using country-level data generated by World Bank, World Economic Forum, and UNDP, this study uses SEM and examines the impact that IT characteristics, laws, and secure communications have on the networked readiness level of countries. The impact of the various factors on a country's establishment of secure communication lines is examined. Further analysis is also done using multi-group level analysis to assess differences between country groups, regarding the impact of these different factors on networked readiness. A holistic model comprising technological, institutional, and economic factors is developed and tested, emphasizing secure communication and laws related to IT security and privacy protection. Findings are reported, implications are discussed, and recommendations for future research are presented.

Keywords: Networked Readiness, Information Security, Secure Communication, ICT Laws, Institutional Factors, Economic Factors, Structured Equation Modeling (SEM), Multi-group Analysis.

1 Introduction

Information security is both a national and an international issue concerned with various entities including: people, enterprises, and governments. It is also associated with different country-pertinent aspects including: technical, economic, social and political. As a result, interest in the development of sound national information security infrastructure and policies is becoming of increasing importance. “Security policy” is defined by the International Organization for Standardization (ISO) as “an approved top level statement, with a set of rules or plan of action, for the purpose of maintaining appropriate security for the organization” (ISO, 2013; ISO, 2005), where the organization here may refer to any entity ranging from a small enterprise to a country, a group of countries, or even the whole world. Furthermore, ISO defines “information technology (IT) security” as “the protection resulting from an integrated set of safeguards designed to ensure the confidentiality of information electronically stored, processed or transmitted; the integrity of information and related processes; the accountability of information stored, processed or transmitted; and the availability of systems and services” (ISO, 2013). The above ISO definitions illustrate that in the digital age, IT security is an integral component of information security, and that ICT (Information and Communication Technologies) laws related to information security and privacy protection are prerequisite for protecting both. In the current digital era, information associated with all fields of life is being primarily stored, processed, and transmitted using IT, and forming, with the prominent IT tool, the Internet.

Moreover, information is changing the rules of the game regarding the attainment of higher competitiveness levels at the firm and the nation level. With this in mind, it is crucial for organizations and nations to identify the resources that have the potential to drive ICT performance into the networked readiness level needed. Defined by Dutta et al (2010), networked readiness is viewed as “the degree of preparation of a nation or community to participate in and benefit from ICT developments”. With this definition in mind and with the crucial role that information security plays in protecting the information that entities at all levels depend upon to establish connectedness, it is interesting to examine the relationship that information security at the national level may have with a nation’s networked readiness. According to the United Nations Industrial Development Organization (UNIDO, 2011), connectedness represents the international, inter-organizational and intra-organizational networks established by each country through knowledge sharing and communication in order to achieve development goals. A country’s ‘connectedness’ level plays a crucial and positive role in enhancing its economic performance, which explains the growing interest of policy-makers in information and knowledge networks (UNIDO, 2011). Moreover, a country’s characteristics in terms of economy, ICT legal framework, and economic freedom may have a potential impact on a country’s level of connectedness and ability to participate in the networked economy (Dewan et al, 2010). As the Information Revolution has become a significant driver of the global economy, the digital divide - the gap in access to information technologies (IT) between developed and developing countries - is receiving increasing attention from researchers and policy makers. There is ample evidence that the divide is quite substantial. For example, Clark (2000) notes that, “although developing and transition economies accounted for 85 percent of the world’s population in 2000, they accounted for only 20 percent of Internet users and 10 percent of global spending on information technology.” Dewan et al

(2005) and Valery Samoilenko (2013) contended that there is dispersion in IT investment across countries, as related to per capita GDP. Dewan et al (2005) found that there is a high correlation between national wealth and IT investment levels, and that there is a large gap between developed and developing countries.

Previous research discussed the importance of networked readiness (James, 2013; Dutta and Mia, 2011; Kirkman et al, 2002), especially in reducing the digital divide amongst countries (ITU, 2012; Dutta and Jain, 2003). Previous research also discussed the factors leading to ICT maturity at the country level (Xu et al, 2004; Chandra et al, 2006; and Raven et al, 2007). More specifically, Usoro et al (2012) discussed the impact of economic and cultural factors on networked readiness, and reported positive and significant relationships. Furthermore, other studies examined important factors that could influence a country's adoption of certain technologies, such as socio-economic factors (Azari and Pick, 2005) or environment and policy factors (Gibbs et al, 2003). In addition to this, the impact of ICT maturity and networked readiness on economic development and global competitiveness has been a topic of discussion in many research papers (Raven et al, 2007; Dutta and Mia, 2011). Still, however, previous research did not provide a holistic examination of the impact of economic, technological, and institutional factors on networked readiness. Another important point that the present study emphasizes is that information security and assurance are of vital importance to the global outreach and image of organizations and countries to enhance global communication and collaboration. This is because as businesses, governmental agencies, and society in general become more reliant on the Internet and other computer networks, the adverse effect of attacks or the disruption of operations in those organizations will be higher (Vishik et al, 2013), and so will be the need for more effective security strategies and policies at the organizational as well as the country level. As important as they are, information security measures and the laws put for information security and privacy protection were not discussed previously within the context of their contribution to networked readiness levels.

2 Theoretical Framework

The paper derives its conceptual model from three major theoretical frameworks: the resource-based view (RBV) model, the technology-organization-environment framework (TOE), and the ISO international standards (ISO 2005, 2013). To start with, developed by Barney (1991), the RBV model suggests that attaining and maintaining a sustained competitive advantage requires the availability of strategic resources that are, heterogeneous in nature, not perfectly mobile, not imitable, and not substitutable without great effort. ICT resources are strategic resources that can help organizations and nations achieve competitive advantage. They also have the attributes of dynamic capabilities that allow executives and governments to set strategies to integrate/reconfigure available resources in order to achieve competitive advantage in a rapidly changing and dynamic environment (Wade and Hulland, 2004). Besides ICT, country strategists need to realize that the resources a nation has – law, economic standing, economic freedom, infrastructure, and sound government policies related to ICT investment, adoption, and use - cannot be undermined and should be holistically considered when discussing country-level networked readiness and IT security levels.

According to TOE framework, three contexts influence the adoption of technology: (1) the organizational context; (2) the technological context; and (3) the environmental context (Tornatzky and Fleischer, 1990). In the IS research stream, this framework proved to have a solid theoretical basis (Zhu et al, 2006). The present study examines networked readiness from the perspectives outlined in this theory: technology factors, including ICT quality, and infrastructure; organizational factors represented by governmental and institutional factors, including, policies set to support ICT investment, and efforts put to enhance economic freedom; and environmental factors, including the economic competitiveness and the laws put to protect information resources.

As for the ISO international standards, the major two are ISO 17799 and ISO 27001, where the former presents a code of practice for information security management, and the second provides a specification of the requirements for information security management (ISO/IEC, 2005). The set of guidelines and requirements outlined by ISO can pave the way for organizations to develop their own tailored information security management systems (Susanto et al, 2010). Previous research adopted Bakry's (2003) STOPE framework and structured the ISO 27001 codes and clauses across its five domains (namely, Strategy, Technology, Organization, People, and Environment) in order to enhance their understanding and facilitate their application (Susanto et al, 2010; Saleh et al, 2007).

3 Conceptual Model and Hypotheses

Based on the aforementioned theoretical framework, this paper presents a conceptual model that takes into consideration the dynamic capabilities inherent in ICT resources, as shaped by a country's characteristics and level of technology use. The networked readiness level is influenced by these three elements, as well as by the nations' policies and regulatory frameworks. The net benefit desired in this situation is a secure and globally competitive ICT performance and networked readiness. Such conceptual relationships are visually presented in Figure 1.

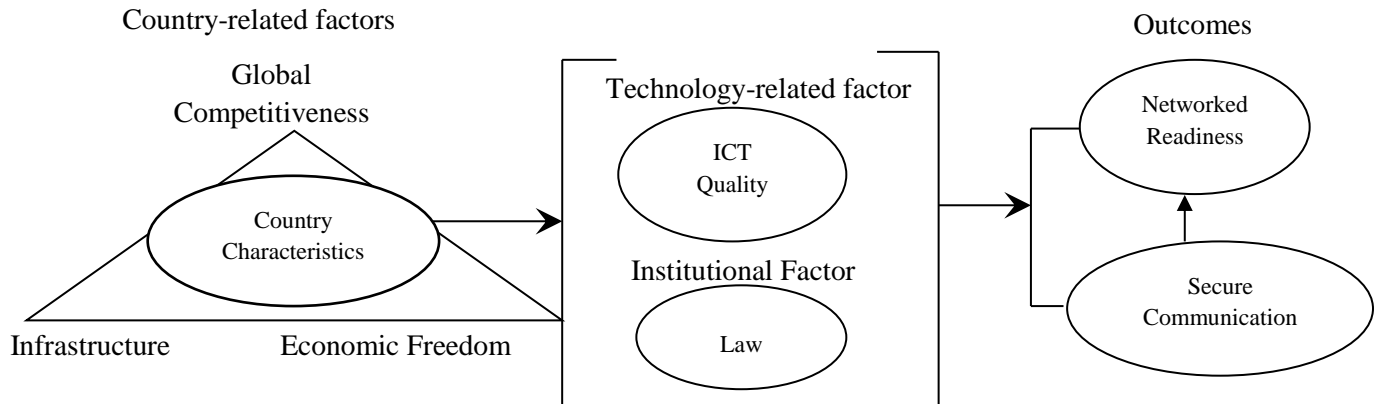


Figure 1. Conceptual Model for Secure Communications and Networked Readiness

3.1 Secure communication and networked readiness

Compliance with quality ICT international standards and online information security are pointed out as important elements for assessing e-readiness among countries (Mutula and Brakel, 2006). In a similar vein, regarding the factors that would determine post-adoption usage, Zhu et al (2006) mention that innovation compatibility is the strongest driver and security concern is a major inhibitor. In this study ICT quality is defined as comprising IT competence (Lee et al, 2007). Effective and quality ICT is expected to provide a service which is:

- **Available any time, any place, anywhere** - The core ICT infrastructure must be designed and able to support continuous unstoppable service, ensuring availability of needed information and connectivity at all times.
- **Robust and reliable** - Solutions will be developed which minimize points of failure and are supported by appropriate security measures.
- **Trustworthy and Secure** - Solutions must comply with security best practice and appropriate regulatory requirements. Furthermore, disaster recovery scenarios should be considered from the outset.

These characteristics conform to the basic principles and criteria of security outlined by Farahmand et al (2005), namely, confidentiality, integrity, and availability. They also indicate a relationship with the development of networked readiness that nations compete to have and improve. Networked readiness is the core component of the model to be presented and tested in this study. It is a strategic resource and a dynamic capability that is expected to integrate and reconfigure the allocation of the other resources within the command of a country. Considered by some researchers as ICT maturity, this dimension, at the first level, is a manifestation of technical readiness in organizations (Mahmood et al, 2001). At a broader level, ICT maturity was found to be a key determinant of organizations' willingness to use ICT as a strategic response to globalization challenges (Karimi et al, 1996) and as a means for international organizations and countries to attain competitive advantage. In addition, Karimi's et al (1996) study pointed at factors that have the potential to influence ICT maturity, namely infrastructure and environmental aspects. In this study, ICT maturity will be represented by 'networked readiness' – a measure constructed by the World Economic Forum and INSEAD (Institut Européen d'Administration des Affaires) to represent an assessment of a country's ability, preparedness, and capacity to make use of ICT and benefit from them to achieve global competitiveness (Goswami, 2006). This measure includes, but is not limited to: a country's current ICT infrastructure, regulatory environment, and the extent of ICT usage by its citizens and business organizations. The overall networked readiness index (NRI) is a summary measure of a nation's ability to benefit from ICT and participate in a globally networked economy. In this study, the networked readiness level was chosen for its scope and comprehensiveness (Usoro et al, 2012). Based on the above the following hypothesis could be posited:

H1: *Secure communication is significantly and positively related to networked readiness levels.*

3.2 ICT Quality

ICT quality is emphasized by several researchers as a means for enhancing ICT diffusion, penetration, and use. This implies that ICT quality level may determine the degree of networkedness that a nation may achieve. The measure appears as a major antecedent for ICT adoption and use in Delone and McLean Model of IS Success (Delone and McLean, 2003), and it comprises four scales: convenience of access, flexibility of the system, integration of the system, and response time). The relationship portrayed by Delone and McLean is confirmed in several other studies (e.g., Livari, 2005). Similarly, Xu et al (2004) contend that ICT competence is a significant determinant of e-business adoption. In other words, ICT quality may have an impact on a nation's networked readiness, as represented by the adoption of certain ICT-based models, such as e-government, e-banking, and e-health. Moreover, it influences the type of security infrastructure that a nation has. ICT quality also means that people trust the technology they use in terms of confidentiality and privacy, and thus adopt it and use it (RTR, 2006). Based on this, the following hypotheses could be derived:

H2a: *The quality of a country's ICT resources is significantly and positively related to its networked readiness level.*

H2b: *The quality of a country's ICT resources is significantly and positively related to its secure communication level.*

3.3 Law

The priorities of a nation are reflected in its policies and laws, and these in turn influence its rate of growth and direction of development. This component measures the impact of a nation's polity, laws, and regulations, and their implementation for the development and use of ICT (Dutta and Mia, 2011). Policy programs must remain coherent and manageable (Poel and Bodea, 2008). The role of the government policy in the process of ICT diffusion enhancement cannot be underestimated (Barretto et al, 2007). For example, the role of institutional systems in enhancing education and regulatory policies play is substantial in global Internet diffusion (Zhao et al, 2011). In conformity with these research findings, in a cross-country study on E-commerce, results corroborated the importance of government policy in firms' level of e-commerce use (Gibbs and Kraemer, 2004). Developed and developing countries associate different importance levels to the importance of laws related to ICT usage and security. For example, in certain developing countries, it was found that legislation and regulatory frameworks are still needed in data protection and privacy, cybercrime, computer misuse, and inappropriate web content (Belize National ICT Strategy, 2011). In Denmark, however, the government is committed to digitalizing all written communication between citizens, businesses and the public sector and to give all citizens a digital signature to promote the deployment of secure communication for purposes such as e-government and e-business. Based on this discussion, the following hypotheses could be established:

H3a: *ICT laws are significantly and positively related to its networked readiness level.*

H3b: *ICT laws are significantly and positively related to its secure communication level.*

3.4 Country Competitiveness Level

This study considers country competitiveness as a function of economic, institutional, and technology support factors. The economic factor is represented by global competitiveness, operationalized by the global competitiveness index (GCI) generated by the World Economic Forum (2011); the economic freedom of the country representing the level of openness in trading that a government of a certain country allows, supports, and develops; and infrastructure, the platform on which technologies and communication lines are built.

First, as for global competitiveness level, the rapid growth of economies, technological advancements, and strategic and economic alliances among countries are few of many reasons that have made the global competitiveness a more widely discussed topic. While most studies emphasized the role of ICT in global competitiveness, this study refers to global competitiveness as an indicator of a country's level of economy and development (Tallon, 2011; Niederman, 2005).

Second, infrastructure is defined as the level of availability and quality of the key access infrastructure for ICT within a country. A quality ICT-access infrastructure facilitates the adoption, usage, and impact of these technologies, which in turn promotes investment in infrastructure. Infrastructure thus plays a critical role in influencing the networked readiness of a nation (Dutta and Mia, 2011). In fact, one finds this factor a common element in mostly all the research work that dealt with all kinds of ICT adoption and diffusion. In the context of this study, it refers, among other things, to internet connectivity, high bandwidth for accessing the network, and sufficiency and competence of national power grid (Mutula and Brakel, 2009).

Finally, individuals have economic freedom when (a) the property they acquire in a legal way is protected from physical invasions by others, and (b) they are free to use, exchange, or give their property to another as without violating the rights of others (De Haan and Sturm, 2000). Economic theory indicates that economic freedom affects incentives. In their empirical study, De Haan and Sturm (2000) found that economic freedom may be important in explaining cross-country differences in economic performance. The importance of economic freedom manifests itself in many real life examples. A case in point is India, where the liberalization program of the government that began in 1991 has resulted in more multinationals setting up facilities in Bangalore (Thatchenkery et al, 2004). Taking the three sub-factors into consideration, an overall measure of a country's competitiveness level could be established. Based on this, the following hypothesis could be set:

H4: *The relations listed in hypotheses 1 through 3 will vary across high competitiveness and low competitiveness country groups.*

4 Study Design and Methodology

In this study, the targeted population is the set of countries that have some kind of networked ICT resources being used for conducting low or high intensive levels of global operations and activities. The study mainly depends on data sets generated in the form of reports by the World Bank (2012, 2011), World Economic Forum (2012), and United Nations Development Program (UNDP) (2011). Using

secondary data generated by a government or an international organization, like the World Bank or the UNDP could be considered a good approach since the data generated by these organizations are drawn from large samples, which makes them fairly valid and less biased.

4.1 Variables

The variables used in this study are derived from an analysis of previous literature related to this research stream. Care was taken to have a holistic model where most of the relevant economic, institutional, and technology related factors are included. The different data sets used were organized according to country and year. Missing values were dealt with either with deletion, or using certain imputation methods, like average computation. The final study sample consisted of 127 cases. As shown in Table 1, the endogenous (dependent) variables include ‘networked readiness index’ and ‘secure communication’. As for the exogenous (independent) variables, they include ICT Quality, and ICT Laws enforced in the country. The variable values are the averages of the values for the most recent data set; i.e. 2011 for some data sets and 2012 for the others, depending on the most recent data presented in the reports. These variables represent composite indicators/indices that were formulated by the above renowned organizations. The validation of the methodologies used is fully presented in the published reports.

Endogenous/Dependent Variable	Exogenous/Independent Variable
<ul style="list-style-type: none"> • Networked Readiness Index • Global Competitiveness Index (GCI) • Secure Communication Lines 	<ul style="list-style-type: none"> • ICT Quality • ICT Laws • Infrastructure • Economic Freedom Index (EFI)

Table 1. Research Variables

It is worth mentioning at this point that different countries have different characteristics, resources, and ICT capabilities. Based on this, the level of networked readiness will vary across countries (World Economic Forum, 2011), and the decisions made by organizations and policy makers will be very much affected by these variations in resources and capabilities. Also, these differences will guide the process of setting proper standards for the adoption and application of ICT resources as well as setting national level standards that would help in improving the factors influencing networked readiness and secure communication. Because of these variations across countries, it is expected to have countries clustered along different groups of readiness levels. This will be tested by a cluster analysis that will be discussed in the data analysis section.

4.2 Research Model

The study attempts to investigate the factors that are most likely to contribute to the variations in the networked readiness (ICT maturity) and secure communication levels across countries. To achieve this objective, and based on the nature of available data, the study will test a research model linking the exogenous variables – ICT quality and laws – to the two endogenous variables - networked readiness and secure communication. Also, the model suggests that secure communications provide the basis for the collaboration, knowledge transfer, and coordination needed for global relations over the networks. Therefore, the model proposes that networked readiness depends on secure communication.

Based on the aforementioned discussion, and the hypotheses listed above, the research model of this study is presented in figure 2. Note that the country competitiveness level is the clustering variable through which the impact of various country groups on the relationships tested will be examined and discussed.

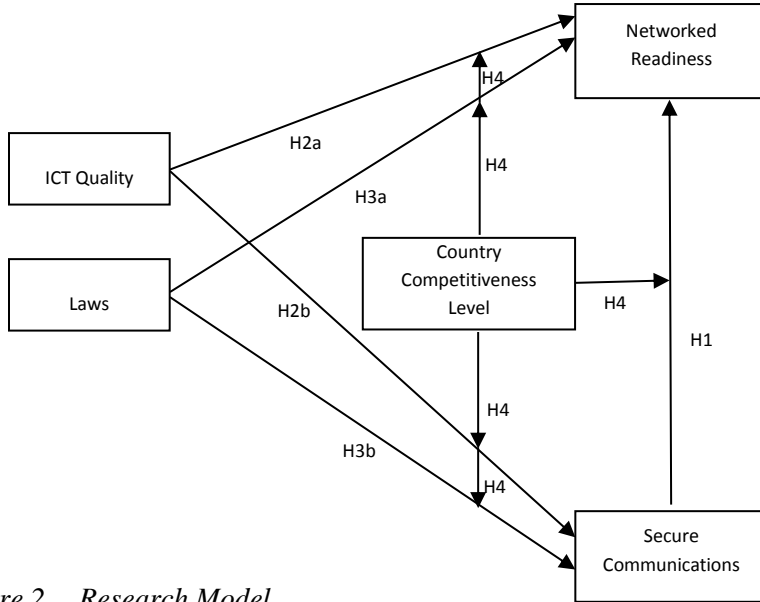


Figure 2. Research Model

This study employs cluster analysis and multi-group structured equation modeling (SEM) analysis in order to examine respectively (1) the different groups that various countries can be classified into, and (2) to examine the direct and indirect relationships between the dependent and independent variables. To start with, a hierarchical cluster analysis was conducted based on the three variables: global competitiveness, economic freedom, and infrastructure. The result indicated two or three possible clusters. The two cluster solution was chosen since it is closer to the common countries classification into developing and developed groups. Following this step, a K-means cluster analysis was conducted, with two clusters being specified. As a result, the cluster analysis technique generated a new grouping variable (with values of 1 and 2), which assigned a cluster membership to each case. Also, descriptive analysis was done for the three variables used for the clustering as well as the other variables included in the model (Figure 3). Looking at the means values differences in the clustering as well as the other variables in the model, one can differentiate between two groups of values: suggesting countries with high competitiveness levels (high values), and the second group indicating countries with low competitiveness levels (low scores).

Following the descriptive analysis, a path analysis was conducted to test the relationship between the independent and the dependent variables of the study. As a first step, all the variables were included. Based on the review of literature, two more steps were implemented. First, because the ICT quality manifest itself more in secure communication than directly in networked readiness, the relationship between ICT quality and networked readiness was fixed to zero. Second, previous research indicated a relationship between Law and secure communication as well as between Law and networked readiness.

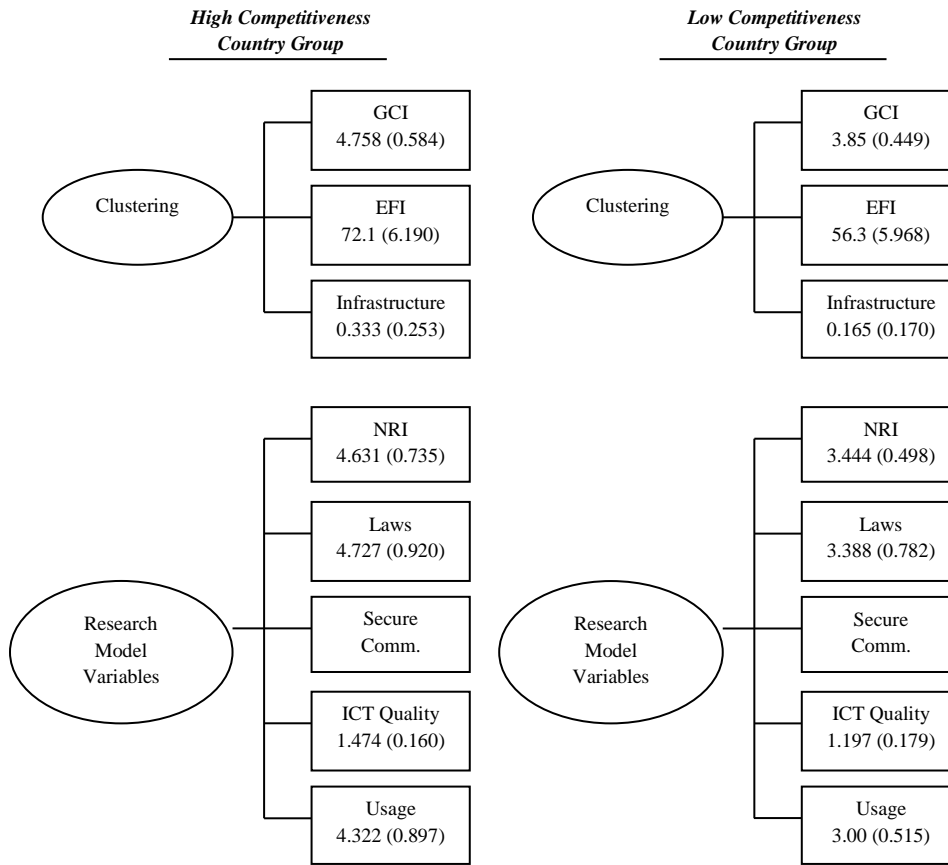


Figure 3. Descriptive Statistics for the Two-Cluster Solution

Drawing on this, the relationship between Law and secure communication was also fixed to zero. The results of these three steps are shown in Table 2. In the first step, all the variables were included, and thus a saturated model was developed. In the second step, all the relationships, except for the relationship between ICT quality and networked readiness were included. In the third step, the relationships between ICT quality and networked readiness and between Laws and secure communication were fixed to zero. Fixing the quality – networked readiness estimate to zero did not remarkably change the results obtained from the saturated model. The same result was obtained upon fixing the laws-secure communication estimate to zero. Also, a χ^2 difference test for the constrained and original models was conducted (Anderson and Gerbing, 1988), but resulted in no significant difference. Still, however, the results so far have strongly supported hypotheses 1, 2b, and 3a.

Structural Path	All Variables (step1)	Step 2	Step 3
Networked Read. ← Sec. Com.	0.148 **	0.143 **	0.143 **
Networked Read. ← Quality	-0.008	0.0 ^{fixed}	0.0 ^{fixed}
Secure Comm. ← Quality	0.522 **	0.522 **	0.515 **

Networked Read. ← Laws	0.160 **	0.161 **	0.161 **
Secure Comm. ← Laws	0.102	0.102	0.0 ^{fixed}
Model Fit Indices	CFI ¹ = 1.000; NFI = 1.000 IFI ³ = 1.000; RMSEA ⁴ = 0.000		CFI = 1.000; NFI ² = 0.999 IFI = 1.001; RMSEA = 0.000

* Significant at 0.05 level ** Significant at 0.01 level ¹CFI= Comparative Fit Index ²NFI= Normed Fit Index ³IFI= Incremental Fit Index ⁴RMSEA= Root Mean Square Error of Approximation

Table 2. Standardized Path Estimates for the General Model

Based on this, and given the asymmetric nature of the data, the quality-Networked readiness estimate was kept fixed since its p-value is very high (insignificant), and a multi-group level analysis based on the clustering variables was conducted on the statistical model derived above. As mentioned earlier, the clustering variable differentiates between low competitiveness countries and high competitiveness countries. Across the two country groups some differences in the relationships were encountered (Table 3). Moreover, results show that ICT laws, which are designed to provide countries with information security and privacy protection, have a greater impact on developing secure communication lines in developed countries than in developing countries, indicating that hypothesis 3b is supported only when developed countries are examined. This could be attributed to the fact that in developed countries, laws are more strongly enforced than in developing, lower competitive countries. Still, however, laws impact positively the networked readiness level in both groups although the impact is higher in developed countries.

Relationship	Group 1 (High Competitiveness)	Group 2 (Low Competitiveness)
Secure Communication ← Quality	0.527 **	0.709 **
Secure Communication ← Laws	0.105 *	-0.014
Networked Readiness ← Security	0.641 **	0.234 *
Networked Readiness ← Laws	0.117 **	0.096 *
Fit Indices: CFI = 0.999 NFI = 0.997 IFI = 0.999 RMSEA = 0.058		

* Significant at 0.05 level ** Significant at 0.01 level

Table 3. Path Estimates for the Two Country Groups

As for the overall model reported here, it has a very good fit, with CFI = 0.999, NFI = 0.997, and IFI=0.999. The RMSEA also shows a good model fit, with a value = 0.058. Moreover, since the results reported here show differences between the two country groups, then hypothesis 4 is supported.

5 Conclusion, Implications, Limitations, and Recommendations

Using data pertinent to developing as well as developed countries, the study could reveal the differences in the readiness and global competitiveness levels between countries with high networked readiness levels (majorly developed countries) and those with low networked readiness levels (mainly developing countries). A cluster analysis was performed, where a grouping variable classifying the countries into ‘low competitiveness’ and ‘high competitiveness’ groups was generated. Descriptive analysis run on the clustered cases clearly differentiated between countries with high competitiveness and those with low competitiveness levels. Those with high competitiveness levels also had higher mean values in ICT

quality, enforced ICT laws, and secure communication. They also had higher networked readiness levels.

Moreover, a path analysis was done, and a model with good fit was derived. The model revealed positive and significant relationships between networked readiness, i.e. ICT maturity, and secure communication. This implies that countries with higher levels of secure communication are more capable of achieving better scores in the global networked readiness index. Of course, ICT quality, and laws, along with secure communications, can drive a country’s networked readiness forward. This conforms to the results reported by previous research regarding the impact that secure ICT systems have on the competitiveness of global firms in international markets (Batra, 2006). Furthermore, the multi-group analysis clearly showed that the relationships mentioned before are all affected by the country group (high competitiveness vs. low competitiveness) that different countries belong to. Accordingly, most of the study hypotheses were supported, as shown below.

Hypothesis	Supported (Yes/No)
H1: <i>Secure communication is significantly and positively related to networked readiness levels.</i>	Y
H2a: <i>The quality of a country’s ICT resources is significantly and positively related to its networked readiness level.</i>	N
H2b: <i>The quality of a country’s ICT resources is significantly and positively related to its secure communication level.</i>	Y
H3a: <i>ICT laws are significantly and positively related to its networked readiness level.</i>	Y
H3b: <i>ICT laws are significantly and positively related to its secure communication level.</i>	Partially
H4: <i>The above will vary across high and low competitiveness country groups.</i>	Y

The main limitation of this study is the use of secondary data only. However, given the fact that sources are well renowned and international organizations, and given the unit of analysis in this study (countries), the secondary data in the form of composite indicators developed by the World Bank and UN organizations are very advantageous for this study.

In fact, it could be noticed, and in conformity with previous research, that the essence of networked readiness extends beyond any single metric. Because of this, there are over- and underperforming countries—countries that have put ICT on the national policy agenda and supported it with high security measures, and others that have not done so. The NRI allows a nation to benchmark its ICT performance and determine the effectiveness of policy. It also permits a country to learn from the policy and performance of other countries with similar profiles, and to identify best practice. ICT is the key to the evolution of our practices in many domains, such as education, work, personal relations, work effectiveness, and national productivity. An interesting characteristic of ICT, such as that of the Internet and mobile communications, is that overall value increases nonlinearly with the number of connected individuals and organizations (Dutta and Mia, 2011). Future research can build on the results derived from this study, use country-level case studies for comparative analysis, and include countries’ categorization, government type, and other social as well as economic and technology-related factors that would enhance the explanation of ICT maturity as well as the relationship between the networked readiness and ICT security.

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