Business-to-Consumer eCommerce Adoption in Nicaragua

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Abstracts

Electronic commerce has changed the landscape of business reality, enabling conduits that create opportunities for the ones capable of overcoming their challenges. The causes affecting the adoption have been well documented in many regions of the world. However, there are few studies in Latin America and especially in Central America. Therefore, this research aims to describe the factors that facilitate and inhibit Business-to-Consumer eCommerce adoption in Nicaragua. For this purpose, a literature review on eCommerce adoption in developing countries was carried out to find the possible factors that might affect the adoption based on the entrepreneurial characteristics (innovativeness, knowledge, and perceived behavioral control), the communication of the innovation (innovation decision, communication channels, homophily in communication networks, message about the innovation, and the personal proximity network in the information exchange), the characteristics of the innovation (relative advantage, compatibility, complexity, observability, and purchasing costs), and the socioeconomic context (market eReadiness, transport logistics, logistic services, financial institutions eReadiness, telecommunication eReadiness, legal framework, and government commitment) besides a series of control variables considered and supported by the "Diffusion of Innovation Theory" by Rogers (2003).

A questionnaire was developed based on prior empirical studies and tested through a pilot test prior to its application. The research comprises a descriptive approach, presenting secondary data about the country and industry related to eCommerce adoption in Nicaragua, and primary data obtained through the quantitative survey which tests the theoretical concepts from eCommerce adoption in this context. The survey had the participation of 315 managers from micro, small, medium, and large companies from all sectors in Nicaragua. The eCommerce status: connected eCommerce, static eCommerce, interactive eCommerce, transactive eCommerce, and integrated eCommerce were empirically investigated, using the survey to determine the characteristics of non-adopters that correspond to the categories of connected and static adopters from interactive, transactive, and integrated according to the eCommerce literature.

A descriptive statistics and logistic regression was used to analyze the data and research hypotheses. The analysis demonstrates the technology, communication, managerial characteristics, and contextual factors that may affect eCommerce. Three hypotheses were confirmed: re-

ative advantage, compatibility, and observability had a significant positive influence on the adoption of eCommerce in Nicaragua.

Concerning the control variables analyzed, only the variables related to revenue generation for the National sales of products, revenue generation for International sales of services, and revenue generation for National sales of services were significantly influencing eCommerce adoption. It demostrated the importance of technological factors and revenue on eCommerce adoption among other factors.

The result from the logistic regression found among all predictors (34) that three variables have an explanatory power and have a significant effect on the adoption of eCommerce: revenue of International sales of services, eCommerce knowledge, and compatibility. The analysis confirmed the relevance of revenue and a technological factor such as compatibility on the adoption of eCommerce besides the knowledge from the managerial dimensions.

The descriptive statistics provide insights about the characteristics of the companies; the great majority belong to the services sectors and are small organizations. Adopters represent 53% of the total of the participants companies which are in the interactive, transactive, integrated level of eCommerce, are mostly small companies with 20 years in the market, are located in the Pacific region, and are not export oriented.

The present findings might represent a significant contribution to the theoretical framework of eCommerce adoption in developing countries and as a starting point for supporting the development of organizations in Nicaragua and future research.

Keywords: eCommerce adoption, diffusion of innovation, developing countries, Nicaragua, and Central America.

Zusammenfassung

Der eCommerce hat die geschäftliche Realität verändert, um Chancen für diejenigen zu schaffen, die deren Herausforderungen überwinden können. Die Ursachen für diese Anwendung sind in vielen Regionen der Welt gut dokumentiert. In Lateinamerika gibt es allerdings nur wenige Studien, vor allem in Zentralamerika. Das Ziel dieser Forschung ist es daher, die Faktoren zu beschreiben, die die Anwendung von Geschäft-zu-Kunden-eCommerce in Nicaragua fördern oder behindern. Zu diesem Zweck wurde eine Literaturrecherche über eCommerce-Anwendung in Entwicklungsländern durchgeführt, um mögliche beeinflussende Faktoren zu ermitteln. Dies geschah auf der Grundlage der Merkmale der Innovation (relativer Vorteil, Kompatibilität, Komplexität, Beobachtbarkeit und Einkaufskosten), der Kommunikation der Innovation (Innovationsentscheidung, Kommunikationskanäle, Homophilie und Heterophilie in Kommunikationsnetzwerken, der Botschaft über das Innovations- und persönliche Näherungsnetzwerk im Informationsaustausch), die unternehmerischen Merkmale (Innovationsfähigkeit, Wissen und wahrgenommene Verhaltenskontrolle) und der sozioökonomische Kontext (elektronische Bereitschaft des Marktes, Transportlogistik, Logistikdienstleistungen, elektronische Bereitschaft von Finanzinstituten, elektronische Bereitschaft der Telekommunikation, dem rechtlichen Rahmen und der Verpflichtung der Regierung) neben einer Reihe von in Betracht gezogenen Kontrollvariablen, unterstützt durch die Theorie von der Diffusion der Innovation von Rogers (2003).

Auf der Grundlage früherer empirischer Studien wurde ein Fragebogen entwickelt und durch einen Pilottest vor der Anwendung getestet. Die Forschung beschreibt sowohl sekundäre Daten über das Land und die Industrie im Zusammenhang mit der eCommerce-Anwendung in Nicaragua als auch Primärdaten, die durch die quantitative Umfrage erhalten wurden, die theoretischen Konzepte aus der eCommerce-Anwendung in diesem Kontext untersuchen.An der Umfrage nahmen 315 Manager aus kleinen, mittleren und großen Unternehmen aus allen Bereichen in Nicaragua teil. Der eCommerce-Status: Verbundener eCommerce, statischer eCommerce, interaktiver eCommerce, transaktiver eCommerce und integrierter eCommerce wurden anhand der Umfrage empirisch untersucht, um die Eigenschaften von Nicht-Anwendern in den Kategorien "verbunden" und "statisch" und eCommerce-Anwender aus interaktiven, transaktiven und integrierten anhand der eCommerce-Literatur zu ermitteln.

Für die Analyse der Daten- und Forschungshypothesen wurden eine deskriptive Statistik und eine multivariate Analyse der logistischen Regression verwendet. Die Analyse zeigt die vier Dimensionen Technologie, Kommunikation, Managementmerkmale und Kontextfaktoren, die den eCommerce beeinflussen könnten. Drei Hypothesen wurden bestätigt: Relativer Vorteil, Kompatibilität und Beobachtbarkeit hatten einen signifikant positiven Einfluss auf die Anwendung von eCommerce in Nicaragua.

In Bezug auf die analysierten Kontrollvariablen waren nur die Variablen im Zusammenhang mit Umsatzerlösen für den nationalen Verkauf von Produkten, Umsatzerlöse für den internationalen Verkauf von Dienstleistungen und Umsatzerzeugung für den nationalen Verkauf von Dienstleistungen signifikante Einflussfaktoren der eCommerce-Anwendung. Dies zeigte u. a. die Bedeutung der technologischen Faktoren und Einnahmen auf eCommerce-Anwendung auf.

Das Ergebnis der multivariaten Analyse war in allen Anzeichen (34) vorhanden. Drei Variablen haben einen signifikanten Einfluss auf die Anwendung von eCommerce: Umsatz des internationalen Dienstleistungsvertriebs, eCommerce-Wissen und Kompatibilität. Diese bestätigen der Relevanz von Einnahmen und einen technologischen Faktor, wie Kompatibilität bei der Verabschiedung von eCommerce neben dem Wissen aus dem Management.

Die beschreibenden Statistiken geben Einblicke in die Merkmale der Unternehmen, die große Mehrheit sind kleine Organisationen im Dienstleistungssektor. 53 % sind Anwender, Unternehmen in der interaktiven, transaktiven und integrierten Ebene von eCommerce, vor allem kleine Unternehmen mit 20 Jahren Markterfahrung in der pazifischen Region, die nicht exportorientiert sind.

Die gegenwärtigen Ergebnisse könnten einen bedeutenden Beitrag zum theoretischen Rahmen der eCommerce-Anwendung in den Entwicklungsländern darstellen und als Ausgangspunkt für die Unterstützung der Entwicklung von Organisationen in Nicaragua und zukünftiger Forschung dienen.

Schlüsselwörter:eCommerce-Anwendung,Verbreitungvon Innovationen, Entwicklungsländer, Nicaragua, Zentralamerika

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List of Abbreviations

ALADI	Latin American Integration Association
B2B	Business-to-Business
B2C	Business-to-Consumer
C2C	Consumer-to-Consumer
CAFTA-DR	Central America Free Trade Agreement- Dominican Republic and United States
CARICOM	Caribbean Community Market
CEO	Chief Executive Officer
DOI	Diffusion of Innovation
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
ICT	Information and Communication Technology
OECD	Organization for Economic Cooperation and Development
SIEPAC	Central America Electrical Interconnection System
SMEs	Small and Medium-Sized Enterprises
TAM	Technology Acceptance Model
TOE	Technology Organization Environment Model
TPB	Theory of Planned Behavior
U. S.	United States
UTAUT	Unified Theory of Acceptance and Use of Technology

1. Introduction

1.1. Motivation and Objectives of the Thesis

The importance of information and communication technologies (ICT) has increased in recent times due to its role as a driver in "improving living conditions and opportunities around the globe" (Dutta & Mia, 2010, para Preface. 1).

These benefits include increasing a country's economic competitiveness through the positive effect on the productivity of its firms. However, it is uniquely possible to materialize when use of this technology is widespread (Oliveira & Martins, 2011, p. 110).

In particular, "innovation in eCommerce is changing the economic landscape in high-income countries" (Davis, 1999, p.25), creating what Schumpeter defines as "new combinations" of products, services, markets and channels (Jong & Marsili, 2010, p. 7).

eCommerce can be broadly defined as "sharing business information, maintaining business relationships, and conducting business transactions" (Pavlou & Chai, 2006, p. 241) by means of telecommunication networks.

Kauffman and Walden systematize the economic approaches of eCommerce, which include "the inter-organizational processes of market-based sell-buy relationships and collaborations or B2B eCommerce and consumer-oriented activities such as B2C and consumer-to-consumer (C2C)" (Zwass, 2003, p. 8). Among these types of approaches, "B2B is more broadly diffused than B2C", which remains at an early stage of development (Bertschek & Fryges, 2002, p. 1).

The scope of eCommerce in this study is based upon Turban (2011) and refers to using the internet and intranet to purchase, sell, transport or trade data, goods or services (Turban et al., 2011, p. 7). In particular, the relationship to be investigated is from businesses to consumers, which is referred to as B2C eCommerce.

In 1993, eCommerce emerged as the result of a "combination of technological, organizational, and societal developments" (Zwass, 2003, p. 8). Accordingly, these factors should be taken into account to understand the diffusion of this technology.

Most studies related to eCommerce have been conducted in developed countries. However, a series of studies have been carried out in developing countries (Fathian, Akhavan, & Hoorali,

2008, p. 578; Kshetri, 2007, p. 443; Maswera, Dawson, & Edwards, 2008, p. 187; Molla & Licker, 2005, p. 877; Nasco, Toledo, & Mykytyn, 2008, p. 697; Shemi, 2012, p.1; Tan, Tyler, & Manica, 2007, p. 332; Wresch & Fraser, 2012, p. 76), which are mainly related to SMEs due to the vast majority of enterprises belonging to this side in developing countries, representing an important sector driver of development and innovation in the world.

Additionally, the ongoing discussion shows that research on the adoption of eCommerce in developing countries has been discussed in terms of economic factors that inhibit or facilitate its adoption. For example, the existence of an ICT infrastructure is essential for eCommerce, although its high cost may inhibit its use in developing countries and eCommerce diffusion.

Therefore, it is valid for studies to highlight the interest in the influence of socioeconomic factors on the adoption of eCommerce in developing countries. This is especially relevant because not all of the 'required' socioeconomic conditions for adoption are met within these countries; for example, there is high inequality in the distribution of income, lack of business law for eCommerce, weak technological and educational infrastructure, among others, describing a panorama of challenges for the adoption of a complex technology such as eCommerce. By contrast, the availability of ICT resources and capital has contributed to the rapid adoption in developed countries, whereby the influence of these factors as well as how they are supposed to be set up has not necessarily been analyzed (Scupola, 2009, p. 163).

However, it is possible that not only these socioeconomic factors represent inhibitors or facilitators, but possibly also cultural (Travica, 2002, p. 20), cognitive (Lal, 1999, p. 667) behavioral (Nasco et al., 2008, p. 697) or communication factors (Geroski, 2000, p. 608; Mahajan, Muller & Bass, 1990, p. 1; Rogers, 2003, p. 36), among others.

Kshetri (2007) found an influence of "economic, cognitive and sociopolitical factors" at the business and consumer level in Nepal in successful and unsuccessful eCommerce business models (Kshetri, 2007, p. 444). Through the Perceived eReadiness Model[1], Molla and Licker (2005) determined contextual and organizational factors regarding micro-, meso- and macro-issues to understand the adoption of eCommerce in South Africa (Molla & Licker, 2005, p. 877). A different study (Fathian et al., 2008) also established a macro- and micro-level factor analysis of the "organizational features, ICT infrastructure, ICT availability, security and legal environment" in Iran for non-profit SMEs (Fathian et al., 2008, p. 578).

[1]The Perceived eReadiness Model comprises an organization's assessment of the eCommerce managerial, organizational and external situations about adopting eCommerce.

In the Caribbean nations, organizational and socioeconomic factors have also been investigated, including the barriers of logistic services, increasing competition and shipping costs found for eCommerce (Wresch & Fraser, 2012, p. 80).

Meanwhile, Travica (2002) analyzed the Diffusion Model and structural conditions in Costa Rica, including how culture contributes to explaining eCommerce in national contexts (Travica, 2002, p. 4).

The above description of the adoption of an eCommerce research approach closely indicates the areas of study and what remains left to be investigated, which allows us to establish the motives of this study.

First for eCommerce most research attempts to explain the adoption through the influence of organizational, contextual, technological and managerial factors (Crespi, Mahdi & Patel, 2004, p. 2; Kshetri, 2007, p. 443; Molla & Licker, 2005, p. 877; Tan et al., 2007, p. 332), whereas no studies have integrated the analysis of entrepreneurial characteristics (innovativeness, knowledge, perceived behavioral control[2]), how the communication of the innovation interacts (communication channels, homophily and heterophily[3] in communication networks, message about the innovation, and personal proximity network in the information exchange), most of the characteristics of the innovation (relative advantage, compatibility, complexity, observability, perceived need and cost) and the socioeconomic context (market eReadiness, transport logistic infrastructure, logistic services, legal framework, financial institutions, telecommunication and government commitment).

There is a lack of research integrating managerial, communication, technological and contextual factors. In particular, the approaches to eCommerce adoption do not include communication factors. This approach is conceived assuming that the contextual factor is potentially equally important as the managerial, technological and communication factors for determining eCommerce adoption.

Molla and Licker (2005) previously criticized the approach of solely focusing on one dimension of study on eCommerce adoption (Molla & Licker, 2005, p. 878). It can be argued that the "unequal distribution of ICT infrastructure, different products and services offered, the existence of rural and urban companies, and the use of different ICT applications" determined

[2]Behavioral control refers to people´s perceptions of the ease or difficulty of performing the behavior of interest.
[3]Homophily is the degree to which a pair of individuals who communicate are similar. Heterophily is the degree to which pairs of individuals who interact differ in certain attributes.

the different methods of adopting eCommerce (Shemi, 2012, p. 4). For this purpose, it is necessary to include as many dimensions as possible to understand how the adoption occurs, whereby a failure to do so might explain why so many ICT projects in developing countries have failed due to the misunderstanding of the complete contextual situation (Shemi, 2012, p. 5), repeating the same prescription to adopt from one developing country to another.

Second, this study will focus on large, medium-sized and small companies. Most studies in developing countries have been based upon small companies, essentially due to the main composition of the economy in developing countries belonging to this category (Molla & Licker, 2005, p. 848). However, the present study also aims to ascertain the differences that might exist between different company sizes and sectors of the economy. Large companies are normally early adopters of innovation due to their capacity to attract highly-qualified workers and the availability of different resources, especially ICT (Ang, Tahar, & Murat, 2003, p. 2; Hilbert, 2001, p. 65) for the case of eCommerce.

Third, the selection of Nicaragua - a developing country in the Central America region, where few studies have been conducted concerning eCommerce adoption in Central America (Medina, 2008, p. 5; Travica, 2002, p. 4) - prompted the interest in studying eCommerce adoption in a politically shaped by decades of dictatorship, the country is also exposed to the vulnerability of natural hazards country that is constantly dealing with political, natural and economic turmoil.

Economically, Nicaragua is positioned as the second-poorest country in Latin America, as well as reporting the lowest per capita income among Central American countries at US $2,151 in 2016 (World Bank, 2017). It lags behind the level of other economies in the region. Even though "overall poverty in Nicaragua decreased by more than 12% in the last five years from 42.5% in 2009 to 29.6% in 2014, extreme poverty[4] has also dropped from 14.6% to 8.3% in the same period" (Guerrero, 2015). The capital Managua has the lowest overall rate in the country, with "11.6%, followed by the Pacific area with 18.5% of its population. Meanwhile, the Caribbean region has a 39% rate and 44.4% for the Central region" (Guerrero, 2015).

[4]The extreme poverty line – according to the Living Standards Measurement Survey conducted by the National Institute of Development Information (INIDE) – is defined by the minimum consumption of 2,282 calories per person, whose annual cost is C$10,523, while the general poverty line is calculated at a level of annual minimum consumption per person of C$ 17,011.47.

The macro-economy remains stable and foreign direct investment shows a positive forecast (Banco Mundial, 2017). The gross domestic product (GDP) in 2016 was US $13.2 billion, with real growth of 4.7% and stable growth between 5.1% in 2012 and 4.7% in 2016.

GDP performance during the last five years is depicted below:

Table 1: Gross Domestic Product (GDP) and GDP Growth 2012-2016

	2012	2013	2014	2015	2016
Gross Domestic Product (GDP)	10. 645	11. 256	11. 806	12. 693	13. 230.1
GDP Growth	5.1%	4.5%	4.7%	4.9%	4.7%

Source: Retrieved from Investment Promotion Agency, ProNicaragua. Copyright 2017 by Investment Promotion Agency, ProNicaragua.

In terms of exports, in 2016 Nicaragua´s total exports amounted to US $4,839 million, similar to those obtained in 2015 (see Figure 1), thus projecting stable economic productivity, showing an annual growth rate of 8% during the 2007-2016 period (Investment Promotion Agency, ProNicaragua, 2017).

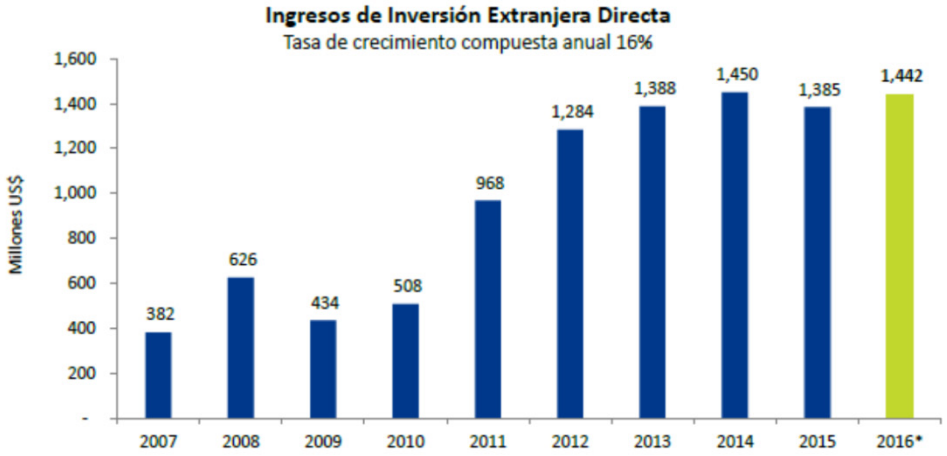
Figure 1: Yearly Exports in Million US$

Source: Reprinted from "Exportaciones Totales" by Investment Promotion Agency, ProNicaragua. Copyright 2017 by Investment Promotion Agency, ProNicaragua. Retrieved from http://pronicaragua.gob.ni/es/descubre-nicaragua/151-economia/

The country's FDI income is estimated at US $1.442 million (see Figure 2). FDI inflows to Nicaragua recorded an annual growth rate of 16% during the 2007-2016 period. This performance might reflect the stability, security and solid legal framework for investment. The sectors that the highest FDI investments were industry, financial, trade, services, telecommunications and energy (Investments Promotion Agency, ProNicaragua, 2017).

Since the early-1990s, the Central Bank of Nicaragua has established a policy of sliding the currency of 5% annually versus the US dollar. For 2017, the average exchange rate is C$ 30.05 per dollar. This successful system ensures high levels of currency stability and maintains the country's export competitiveness (Investment Promotion Agency, ProNicaragua, 2017).

Figure 2: Revenue of Foreign Direct Investment per Year in US$ Millions



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In Nicaragua, the main industries with the highest economic performance are agriculture, manufacturing, services, telecommunication and construction. The main exports products are agricultural, including livestock, fishing and mining. Exports of these products have dramatically increased and it is believed that the use of electronic commerce will boost Nicaragua exports (China Railway Siyuan Survey and Design Group CO. LTD, p. 5).

Therefore, Nicaragua should accomplish certain prerequisites such as the preparation of government and private sector network infrastructure, secure mechanisms and laws and increase penetration of the internet. Additionally, developments related to electronic banking, electronic tourism and agriculture continue as the Nicaraguan economy focuses on agriculture and tourism. Studies related to development indicate that eCommerce helps to increase economic values, with banking services on the internet facilitating the efficiency of national and international transactions and boosting commercial activities (China Railway Siyuan Survey and Design Group CO. LTD, p. 45).

The country remains behind in comparison to the rest of the Central American countries regarding ICT use. Concerning B2C eCommerce, the 2016 Global Information Technology Report ranked Nicaragua 124th out of 139 countries, while other countries in the Central American region – Costa Rica (53rd), Panama (43rd), Honduras (62nd) and El Salvador (63rd) – were better positioned globally (World Economic Forum, 2016).

A previous study on the adoption of B2B eCommerce (Medina, 2008) analyzed internal and external factors, finding that the demand of customers is an important factor to move online, while the lack of government eReadiness is affecting eCommerce diffusion. Internally, a higher educational level facilitates eCommerce adoption, besides understanding the eCommerce vision and the governance commitment (Medina, 2008, p. 3).

Therefore, in this scenario it is necessary to realize the importance of studying eCommerce adoption in Nicaragua as a country mainly constituted with a young population who are more engaged with new technology and concentrated in urban areas, which might represent a push factor for further eCommerce adoption locally. Moreover, the increasing export trend of the country might represent an important opportunity for businesses in Nicaragua to understand and adopt eCommerce, especially given that the local market remains at an early stage of eCommerce adoption.

Fourth, the study intends to measure adopters and non-adopters given that most ICT studies focus on potential adopters rather than adopters. According to the literature on eCommerce, there are six phases of eCommerce status indicators in developing countries: no eCommerce, connected eCommerce, static eCommerce, interactive eCommerce, transactive eCommerce and integrated eCommerce. The community of researchers on eCommerce consider a business as an adopter of eCommerce if it has reached an interactive eCommerce status (Molla & Licker, 2005, p. 881). In order to operationalize this, the indicators are described as follows:

- No eCommerce: not connected to the internet, no-email.
- Connected eCommerce: connected to the internet with e-mail but no website.
- Static eCommerce: that is publishing basic company information on the web without any interactivity.
- Interactive eCommerce: accepting queries, e-mails and form entries from users.
- Transactive eCommerce: online selling and purchasing of products and services, including customer service.

- Integrated eCommerce: website is integrated with suppliers, customers and other back office systems, allowing most business transactions to be conducted electronically (Molla & Licker, 2005, p. 890).

Critics such as Cushman and Klecun (2005) raise this argument, asking how it is possible for potential adopters to perceive the usefulness or ease of use of a technology if they have not had any experience with it (Cushman & Klecun, 2005, p. 3). However, Shemi's (2012) approach considered the adopters, aiming to understand the causes of success or struggles of eCommerce (Shemi, 2012, p.6).

In the present study, the aim is to consider companies that have not reached the transactional level but are already at an early stage of eCommerce, as well as full adopters at the stage of the transactional level. Furthermore, it aims to establish whether there are any significant differences or similarities between these groups.

Therefore, the main objective is to describe the factors that facilitate and inhibit B2C eCommerce adoption in Nicaragua related to the entrepreneurial characteristics (innovativeness, knowledge and perceived behavioral control), the communication of the innovation (innovation decision, communication channels, homophily and heterophily in communication networks, message about the innovation and personal proximity network in the information exchange), the characteristics of the innovation (relative advantage, compatibility, complexity, observability, purchasing cost) and the socioeconomic context (market eReadiness, transport logistic infrastructure, logistic services, legal framework, financial institutions, telecommunication and government commitment).

This objective will be achieved by breaking down the research into four questions:

1) How many businesses are adopters and non-adopters of eCommerce in Nicaragua?
2) What are the differences between adopters and non-adopters of eCommerce in Nicagua?
3) What are the main factors that facilitate eCommerce adoption in Nicaragua?
4) What are the main factors that inhibit eCommerce adoption in Nicaragua?

In order to answer these questions, the following objectives are formulated:

1) Critically review eCommerce adoption facilitators and inhibitors in developing countries.

2) Develop a theoretical framework to determine the factors that facilitate and inhibit B2C eCommerce adoption in developing countries.
3) Determine how many businesses are adopting B2C eCommerce in Nicaragua.
4) Identify the main differences between adopters and non-adopters of B2C eCommerce in Nicaragua.
5) Establish what factors facilitate or inhibit B2C eCommerce adoption in Nicaragua.

1.2. Research Question, Approach and Method

My thesis aims to cover the following main research questions:

How are the entrepreneurial characteristics, the innovation communication, the characteristics of the innovation and socioeconomic context factors influencing B2C eCommerce adoption in Nicaragua?

The present research for the causal analysis comprises a theoretical approach based upon the diffusion of innovation.

These theoretical frameworks aim to conceptualize and establish the relationship between eCommerce adoption and the characteristics of the innovation, communication of the innovation, entrepreneurial characteristics and the socioeconomic context.

The entrepreneurial characteristics, innovation communication, innovation characteristics and socioeconomic context are derived from the "Diffusion of Innovation Theory" (Rogers, 1976, p. 235, 2003, p. 257; Rogers & Kincaid, 1981, p. 127).

The entrepreneurial characteristics and socioeconomic context are complemented with the economic development theory (Mansfield, 1961, p. 746; Rogers, 2003, p. 22; Schumpeter, 1951, p. 64; Silverberg, G., 1991, p. 68) and the Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh (Venkatesh et al., 2003, p. 16).

The Diffusion of Innovation (DOI) approach has been used – besides other approaches – to explain the phenomena of eCommerce, such as the Technology Organization Environment Model (TOE), Institutional Theory and Resource-Based Theory (Tan et al., 2007, p. 333). Moreover, generally for technology adoption the most commonly-used theories are the Technology Acceptance Model (TAM), Theory of Planned Behavior (TPB), Unified Theory of Acceptance and Use of Technology (UTAUT), as well as the Diffusion of Innovation (DOI)

and the Technology Organization Environment Model (TOE) (Oliveira & Martins, 2011, p. 110).

These approaches tend to form two lines of research on IT adoption: on the one hand, the positivist school has been focused on variance models of diffusion and adoption; and on the other hand, the interpretivism line explores the sociology and phenomenology of user understanding and the construction of reality. Interpretivism attempts to identify the idiosyncrasies of adoption behavior to gain an understanding of the social context for technology adoption and diffusion. Meanwhile, positivism is moved by objectifying the adoption phenomenon for generalizability, considering interrelationships.

Rogers (2003) belongs among the positivists. Through his DOI Theory, he aims to explain the main characteristics of innovation (relative advantage, compatibility, complexity, observability, trialability) and their impact on adoption. Moreover, he also includes the impact on adoption in terms of the way in which the innovation is communicated and the influence of the social system.

Different studies are based upon Rogers' DOI Theory, which allows identifying "perceived" critical characteristics of innovation (relative advantage, compatibility, complexity, observability and triability). Some researchers have been affirmed to influence the attitude of potential adopters in a number of studies on information system adoption or rejection (Adams, Nelson, Todd, & Adams, 2013, p. 231; Fathian et al., 2008, p. 582; Limthongchai & Speece, 1999, p. 1573; Rogers, 2003, p. 257).

These studies have also suggested that Rogers´ model should include contextual factors (Al-Qirim, 2007, p. 464). This provides a valuable finding to consider the socioeconomic context as holding importance for technological issues – among others – such as a manager's characteristics and how the process of communication occurs. In this matter, Schumpeter´s development perspective has made a significant contribution to diffusion research (Miller & Garnsey, 2000, p. 460). The issues of the entrepreneurial influence, the development perspective as well as of how the process of innovation communication works have not been broadly studied all together and are thus included in the present research approach.

It is important to add the contextual factors to the discussion on eCommerce adoption, conceptualized as the facilitating conditions referring to objective conditions that can enhance adoption (Datta, 2011, p. 7). According to Venkatesh et al. (2003), facilitating conditions are defined as the degree to which a prospective adopter in a country believes that enabling fac-

tors exist to support the adoption of eCommerce technologies (Datta, 2011, p. 12). User perceptions towards eCommerce technologies somewhat depend on macro-level contingencies (Ibid). Many related studies demonstrate that a macro-level climate is a critical factor in eCommerce adoption independent of user-level perceptions of the technology and personal perception, among other factors (Datta, 2011, p. 13).

The facilitating conditions include "user perception of the macro-level socioeconomic context, which is independent of the individual adopter. Facilitating conditions covered objective factors such as efficacy, resource and technology availability, support structure and compatibility and experience" (Moore & Benbasat, 1991, p. 211; Datta, 2011, p. 13).

In a study related to global technology readiness, Kirkman et al. (2002) identified four distinct dimensions of facilitating conditions – policy (legislative environment), society (educational and training), access (infrastructure capabilities) and economy (national incorporation) – reflecting a perspective that will be included in the present study (Kirkman et al., 2002, p. 13).

Methodologically, the present research comprises a descriptive approach starting by defining theoretical concepts and objectives among the literature on eCommerce adoption and presenting secondary data relating to the country and industry concerning eCommerce adoption in Nicaragua, obtained through journals, newspapers, country reports and articles. This secondary data complements the primary data obtained through a quantitative survey instrument, which tests and reviews the theoretical concepts from eCommerce adoption and its theoretical framework.

The analysis will be based upon using a logistic regression, which is most suitable when the model has a set of independent variables that influence hypothetical and dichotomous categorical dependent variables (e.g. 'adopter', 'non-adopter').

Research such as the study conducted by Al-Qirim (2007) on the impact of ten factors on the adoption of different eCommerce communications and applications technologies in small businesses in New Zealand is a good example of this analysis technique (Al-Qirim, 2007, p. 462).

1.3. Thesis Outline

This thesis comprises six chapters. This first chapter features an introduction drafting the importance of the study, the problems to be investigated, the objectives, research questions, approach and method.

The second chapter comprises a review literature on the DOI related to the entrepreneurial characteristics, innovation communication, characteristics of the innovation and socioeconomic facilitating conditions. Furthermore, an analysis of Nicaragua relates to eCommerce adoption is conducted.

The third chapter discusses the hypotheses concerning entrepreneurial characteristics, the communication of the innovation, the characteristics of the innovation and the socioeconomic context that might influence eCommerce adoption, analyzing the main factors considered for developing countries.

The fourth chapter included the research methodology for the present study as well as the operationalization of variables required for elaborating the research instrument for the data collection and its validation procedures. Additionally, this chapter contains the sampling selection and the quantitative and descriptive analysis applied.

The fifth chapter presents the primary data gathered by the research instrument applied, identifying and discussing the notable findings. The sixth chapter sets up the discussion of the findings and summary of the conclusions resulting from the data gathering and analysis.

Furthermore, it establishes the implications according to the findings, as well as the limitations of the research and future research required in the field.

2. The Diffusion of Innovation Theory and Business-to-Consumer eCommerce Adoption in Nicaragua

The literature review in this chapter is composed by the Diffusion of Innovation Theory by Rogers (2003). This theory is one of the most widely used in a diverse range of disciplines from Agriculture to Marketing (Surry & Farquhar, 1997, p. 3) in terms of investigating how the innovation characteristics, communication, time and nature of the social system interact to facilitate or impede its adoption (Surry & Farquhar, 1997, p. 1).

The extensive use of this theory and its solid theoretical framework have been used in several studies about IT adoption with a quite established conceptualization of dependent and independent variables, whereby the adoption state as the dependent variable and independent variables relates to the manager, communication and technology have not been broadly studied related to eCommerce. Therefore, it was considered the most appropriate approach for this study. In this line, Al-Somali (2012) affirmed:

"*The literature shows that the DOI Theory has a solid theoretical foundation and consistent empirical support (Zhu et al., 2006a; Seyal and Rahman, 2003; Moore and Benbasat, 1991). It is believed that the Theory on Diffusion of Innovation provides well developed concepts and a large body of empirical results applicable to the study of information systems'(IS), innovations, adoption, and implementation as well as tools both quantitative and qualitative for assessing the likely rate of diffusion of a technology, and identifies numerous factors that facilitate or hinder technology adoption and implementation (Fichman, 1992; Moore and Benbasat, 1991).*
Nevertheless,researchers on complex organizational technology have criticized the deficiencies of the Innovation Diffusion Theory in explaining the adoption behavior and have concluded that innovation attributes are not sufficient to understand the adoption behavior of complex organizational technologies"(Al-Somali, 2012, p. 86).

The strength of this theory is recognized in the same manner as its weaknesses, mainly focusing on innovation characteristics to explain the adoption process. However, this weakness might be solved by including contextual factors from other theories. The literature on the diffusion of innovation suggests that technological issues alone are insufficient to understand the adoption of an innovation; rather, social and economic factors – among others – should be considered within the analysis of eCommerce adoption. In previous studies, four constructs have been identified as influencing businesses to adopt eCommerce: (1) organization charac-

teristics; (2) decision makers' characteristics; (3) innovation technology characteristics; (4) and the organization contextual characteristics (Hallal, 2009, p. 44). However, the communication constructs of Rogers (2003) have not been included within previous studies on eCommerce adoption.

2.1. Entrepreneurial Characteristics

2.1.1. Innovativeness

The diffusion of innovation is dependent upon certain characteristics that allow determining what type an individual adopts and at what time. According to these characteristics, it is possible to identify who are the early adopters, innovators, early majority, late majority and laggards. The members of each category usually share some common characteristics such as innovativeness, knowledge and perceived behavioral control.

Innovativeness is defined as "the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than other members of a system" (Rogers, 2003, p. 22). Studies on eCommerce demonstrate that managers' high degree of innovativeness helps to perceive the usefulness and ease of use of the innovation to acquire more knowledge about the innovation (Rivera Green, 2005, p. 20). In certain situations, the employees are ready to adopt despite facing resistance from their manager (Al-Qirim, 2007, p. 467).

2.1.2. Knowledge

Another adopter characteristic that has emerged as important for innovation adoption – particularly for complex technological innovations such as IT – is manager knowledge. Most IT technology requires a high degree of skill to understand the usefulness of the technology as well as for making adequate decisions to realize the employees' required skills and strategic decisions (Lal, 1999, p. 669).
Rogers (2003) describes that knowledge is "gained when an individual learns of the innovation´s existence and gains some understanding of how it functions" (Rogers, 2003, p. 20).

2.1.3. Perceived Behavioral Control

In addition to the innovativeness and knowledge of managers, a construct that has been not broadly analyzed in terms of eCommerce adoption and is the predictor of perceived behavior-

al control. It reflects individual´s perceptions that are present, namely personal and situational impediments. The inclusion of this construct into the analysis aims to identify cultural aspects regarding the adoption that have been found to gain relevance to identify manager risk orientation by culture (Nasco et al., 2008, p. 703).

2.2. Communication

2.2.1. Communication Channels

The communication of the innovation is believed to influence the innovation adoption rate as the adoption is taken as a social process where several factors are involved in terms of how this might affect the adoption. The types of channels and their suitability will depend on the characteristic of the innovation, whereby a mass media channel is more appropriate than an interpersonal channel for less complex innovations, whereby the use of a non-appropriate channel slows down the speed of adoption. Moreover, the degree of homophily or heterophily also holds relevance, whereby although homophily in individuals' attributes may facilitate the diffusion process, a certain degree of heterophily – especially in knowledge – is required to make the diffusion possible. As another factor, the personal proximity to an early adopter or an individual with more knowledge about the innovation might have a positive impact on the adoption. Finally, the last aspect to be discussed about the communication is the message transmitted about the innovation and how it affects the diffusion, whereby transmitting the message of possible returns from the innovation might speed up the decision of potential adopters to adopt.

Rogers (2003) established several factors involved in the communication of an innovation, including the means or channel through which the message about the innovation is transmitted. Given the importance of the communication to understand the adoption of a complex innovation like eCommerce, it is necessary to discuss which channels might be more appropriate to accelerate the diffusion and its effectiveness.

Communication channels can be mass media or interpersonal communication. Mass media channels include TV, radio and newspapers, while interpersonal communication works through worth-of-mouth. It is claimed that mass media is more efficient means of information for potential adopters than interpersonal communication, whereas the latter is more powerful to create change among individuals (Sahin, 2006, p. 15). In some cases, the first adopters are opinion leaders who use word-of-mouth and an informal manner to influence, even though the reliabil-

ity of the source of information is considered to play an important role in spreading the message about the innovation (Tolba & Mourad, 2011, p. 2).

Rogers and Kincaid (1981) contribute to understanding how this influence of an opinion leader on the diffusion of an innovation works, through explaining social networks as the patterns of friendship, advice, communication or support existing among the members of a social systems (Valente, 1996, p. 70). Accordingly, if a network partner has a higher number of nominations, they have a stronger influence for the adoption, whereby this network partner thus emerges as an opinion leader (Halila, 2007, p. 16).

The occurrence of the message with a faster speed and more intensity through interpersonal channels appears to happen through a subjective evaluation of an innovation transmitted to them from other individuals like themselves who have already adopted, which seems to imply that the adoption process seems to be ruled by the modeling and imitation of potential adopters of their network partners who have previously adopted (Michalaklis, Varoutas & Sphicopoulos, 2008, p. 235; Rogers, 2003, p. 19).

2.2.2. Homophily and Heterophily in Communication Networks

Homophily is defined as "the degree to which two or more individuals who interact are similar in certain attributes, such as belief, education, socioeconomic status, and the like" (Rogers, 2003, p. 19), while heterophily is "the degree to which two or more individuals who interact are different in certain attributes" (Rogers, 2003, p. 19).

In terms of uncertainty reduction concerning the adoption of an innovation, homophily has been shown to reduce this uncertainty and influence social cohesion, which leads to similarities in decision-making.

The reason is found in the transfer of ideas between similar individuals – homophily – through the degree of similarities in certain attributes such as beliefs, education, socioeconomic status, etc, that occurs in belonging to a same group or space, sharing the same interests and interacting in a free context. It is said that communication is more fluent with homophily, involving the knowledge gain becoming effective and attitudes being conducive for new ideas and changes (Rogers, 2003, p. 19).

Accordingly, in terms of adopting an innovation, the existence of homophily regarding education and socioeconomic status yet heterophily concerning knowledge about the innovation

would reflect the ideal situation. However, highly heterophilic populations can impede the process of communication, namely the process of persuasion (Geroski, 2000, p. 608).

2.2.3. Message about the Innovation

Another aspect to take into account concerning the message about the innovation concerns network externalities. This occurs "when the benefits from the use of a technology increase with the number of users. This means that the return is not equal when there are not many users; therefore, the higher the number of Internet users who buy on the Internet, the higher the expected return from adopting eCommerce" (Issue Paper 2 ICT diffusion to the economy, 2011, p. 2).

2.2.4. Personal Proximity Network in the Information Exchange

Personal proximity within a network normally indicates a degree of likeliness. According to Alba and Kadushin (1976), one finding of "proximity studies is that the closeness (proximity) between the members of a pair is both a cause and a consequence of their similarity (homophily) in certain respects" (Alba & Kadushin, 1976, p. 79). Accordingly, this proximity has more potential for influencing behavior and the adoption of an innovation.

A personal proximity effect might have its roots in balance theory, whereby Fritz Heider (1946) argued that a positive or negative individual perception towards another individual or object depends on this degree of proximity in communication dyads (Heider, 1946, p. 107).

The following proposition summarizes this viewpoint: "The degree of proximity in communication dyads is positively related to their potential for behavior change on the part of the dyadic partners" (Rogers & Kincaid, 1981, p. 132).

The proximity can be found in one or more characteristics, such as geographical proximity facilitating networking between firms and thus imitation and improvement. In case the proximity is with an early user, who could be a competitor, customer, supplier or service provider- a learning effect might occur from this early adopter and the potential adopter (Baptista, 2000, p. 516).

2.3. Characteristics of Innovations

2.3.1. Relative Advantage

In terms of Rogers (2003) theoretical framework on the diffusion of innovation, innovation characteristics have proven to be among the most influential factors in terms of innovation adoption including an IT innovation such as eCommerce. The five innovation characteristics proposed by Rogers (2003) are (1) relative advantage, (2) compatibility, (3) complexity, (4) triability and (5) observability (Rogers, 2003, p. 223).

However, after reviewing a series of studies related to eCommerce adoption, the following characteristics were considered relevant for inclusion in this study according to the context and technology: relative advantage, compatibility, complexity, observability and added cost.

Rogers (2003) studied adoption behavior, identifying a series of attributes of an innovation that are said to explain 49-87% of the variance in the rate of adoption of new technology (Rogers, 2003, p. 221). These attributes proposed by Rogers (2003) are relative advantage, compatibility, trialability, complexity and observability (Rogers, 2003, p. 223).

Moore and Benbasat (1991) agree with Rogers and Shoemaker (1971) concerning relative advantange, compatibility and ease of use - which can be compared with the notion of complexity from Rogers and Shoemaker (1971) - while adding image, result demonstrability, visibility and triability (Moore & Benbasat, 1991, p. 202). According to Tornatzky and Klein's (1982) review of 105 articles related to innovation diffusion in organizations, they extensively found the presence of Rogers's (2003) attributes, most frequently including relative advantages, compatibility and cost (Tornatzky & Klein, 1982, p.30).

In studies of eCommerce adoption, the attributes suggested by Rogers have been added as explanatory variables to measure the rate of adoption (Al Noor & Bin Arif, 2011, p. 48). These attributes have been combined with other theories; for example, Thong (1999) combined CEO characteristics from diffusion of innovation to the TOE, Chong et al. (2009) added the innovation attributes (relative advantage, compatibility, and complexity) from DOI and additional information sharing culture characteristics to the TOE framework, while Zhu et al. (2006a) and Wang et al. (2010) also combined DOI with TOE (Oliveira & Martins, 2011, p. 116).

Relative advantage refers to “the degree to which an innovation is perceived as being better than the idea it supersedes” (Rogers, 2003, p. 229). Relative advantage in technological diffusion observed in profit: the greater the perceived profit, the faster the adoption. The relative advantage construct is similar to perceived usefulness (PU) in TAM, where the usefulness is related to the perception that the use of specific application system might increase the performance in an organization context (Al-Somali, 2012, p. 110).

If the innovation advantages seem significant, the adoption time is reduced. The relative advantages can be seen from a practical perspective, including social prestige, economic benefits and satisfaction.

In the case of cost and social status, early adopters are more motivated to adopt an innovation, whereas the late majority and laggards are normally less motivated.

In terms of eCommerce, cost savings and efficiency seem to be relevant for large organizations, whereas some studies have found that this is not relevant for small firms, possibly because they do not know about the technology and thus ignore the possible benefits (Luen Teo, Chan, & Parker, 2004, p. 3).

It has been demonstrated that when companies are aware of the benefits, they tend to adopt more sophisticated eCommerce solutions (Luen Teo, Chan, & Parker, 2004, p. 3).

Iacovou and Benbasat (1995) and Chau and Hui (2001) discuss relative advantage according to direct and indirect benefits, stating that for small businesses indirect benefits do not motivate the adoption; rather, they rely more on immediate direct benefits (Luen Teo, Chan, & Parker, 2004, p. 3).

Many studies have found relative advantage to be the only significant variable to discriminate adopters from non-adopters in four types of communication – namely email, online data access, internet access and EDI-due to the adopters being aware of the many benefits, unlike the non-adopters (Al-Somali, 2012, p. 110). According to Rogers (2003), relative advantage is the strongest predictor for the rate of adoption.

Compared with other characteristics, perceived relative advantages in using eCommerce show the highest mean, which implies - for example, in a study of SMEs in Thailand - that the perceived advantages from this technology were clear, e.g. reducing operation costs, expansion of market share, increasing customers, sales and revenue, among others (Limthongchai & Speece, 1999, p. 1580).

2.3.2. Compatibility

Compatibility is defined "as the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and need of potential adopters. An innovation that is incompatible with the values and norms of a social system will not be adopted rapidly. For the adoption of this innovation, a process of developing a new value system is required which is typically a slow process" (Rogers, 2003, p. 15).

In studies about SME's eCommerce adoption, it has been found that the adoption rate is higher when eCommerce is compatible with the companys' traditional procedures, values, mentality, suppliers and the customers' way of doing business (Limthongchai & Speece, 1999, p. 1580; Luen Teo, Chan, & Parker, 2004, p. 5). However, Love et al. (2001) found that the adoption of eCommerce solutions among small businesses is impeded when it is not aligned with the organization's strategy and processes (Love et al., 2001, p. 41).

Furthermore, it is possible that attitudes towards eCommerce improve over time, which could also be related to other factors such the size of the company and its capabilities. Given that most small companies do not have highly-skilled employees and expertise, companies assume that such technology requires a certain size (Luen Teo, Chan, & Parker, 2004, p. 3).

Resistance to change is always an issue that organizations face regarding the adoption of a technology (Premkumar & Roberts, 1999, p. 308).

2.3.3. Complexity

The complexity factor has been identified as a major inhibitor for the adoption of eCommerce, whereby it mostly refers to small companies where the employees face problems understanding the technology, whereas large companies are apparently less affected by this factor. Studies conducted by MacGregor (2003) and Thong (1999) agree with this perception (Luen Teo, Chan & Parker, 2004, p. 4).

For this reason, some organizations show certain skepticism towards adopting eCommerce technology and how to face the current or previous technology with the new innovation. The situation is different when there is some technological expertise and understanding of the technology at the manager level, thus knowing how to overcome this transition state.

However, this is not a definitive inhibitor, with Al-Qirim (2003) suggesting that it can be overcome through a change agent leading the adoption. For example, a CEO can be involved in eCommerce development (Luen Teo, Chan & Parker, 2004, p. 4).

Results from previous studies in developing countries show the lack of knowledge about an innovation being a complex inhibiting factor, relating to the unfamiliarity of employees concerning how to operate a computer or software and internet technology (Al Noor & Bin Arif, 2011, p. 55).

However, complexity might not be an inhibitor per se, as Rogers (2003) defined it "as the degree to which an innovation is perceived as relatively difficult to understand and use" (Rogers, 2003, p. 257), although things might change when the technology appears to be user-friendly and easy to integrate, or when the mechanism to integrate it makes it seem easier to use and understand (Sahin, 2006, p. 18).

2.3.4. Observability

Observability refers to "the degree to which the results of an innovation are visible to others" (Rogers, 2003, p. 258). It is believed that the easier it is for individuals to see the results of an innovation the more likely that they are to adopt. Such visibility stimulates peer discussion of a new idea and the clustering of innovation. Moreover, the observability contributes to familiarity with the innovation and realizes the possible advantages if a potential adopter can see the positive effect of a technology in an organization, which likely prompts them to adopt this technology (Hallal, 2009, p. 87).

In the case of eCommerce, it is an easy-to-observe technology, and at least it can be easily recognized for the industry and consumers through websites allowing businesses to remain open 24 hours, 7 days a week to millions of users on the internet (Limthongchai & Speece, 1999, p. 1576).

2.3.5. Cost

The final attribute to consider is costs, referring to the total costs related to purchasing IT hardware and software by the organization (Mukherji, Rajagopalan, & Tanniru, 2006, 1687).

Costs are normally not discussed in terms of innovation adoption, but due to the nature of eCommerce as a high-cost innovation regarding purchasing costs, the decision was made to include this attribute in this theoretical framework, given that developing countries face a lack of infrastructure, thus increasing the purchasing costs of such technology.

2.4. Socioeconomic Facilitating Conditions for the Adoption of an Innovation

2.4.1. Policy

Prospective adopters of a new technology are not only influenced by their own characteristics as decision-makers, the technology and information mechanisms, but also by some macro-level circumstances. In prospective adopters of a new technology are not only influenced by their own some macro-level circumstances. In terms of eCommerce adoption technology, the macro-level context often represents critical factors that can be either facilitating conditions- as referred by Venkatesh et al. (2003) - or inhibitiors. Facilitating conditions are defined as "the degree to which a prospective adopter in a country believes that enabling factors exist to support the adoption of eCommerce technologies" (Datta, 2011, p. 12).

Kirkman et al. (2002) determined four dimensions of facilitating conditions: policy (legislative environment), society (education and training), access (infrastructure capabilities) and economy (national incorporation) (Kirkman et al., 2002, p. 13).

These conditions might provide opportunities or constraints for the adoption by organizations depending on the particular situation. In the case of developing countries, it is believed that there are more constraints in this matter than facilitators, whereby governments usually control key resources of cost and prices, and there is a lack of infrastructure and education on IT. Additionally, low income and a lack of credit availability for organizations affect the use and acquisition of new technology.

The existence of a legal framework in a country appears to be a driver of innovation adoption. In this matter, the government can play two roles as a promoter of innovation, namely applying eCommerce principles in government administration and procurement or through regulation and investment infrastructure. A government can positively drive eCommerce through enabling the free market, ICT policies and affordable internet access, as well as related issues

that affect eCommerce in terms of infrastructure development in the country and educational policies that promote the capabilities of ICT, among others (Tan et al., 2007, p. 335).

Molla and Licker (2005) affirm the relevant role of the government in the diffusion of innovation (Molla & Licker, 2005, p. 880). For example, through fiscal incentives and changes in regulations facilitating eCommerce activities and educational programs, the government can be a change agent and promoter of innovation (Mangiaracina, Perego, Campari, & Drivers, 2012, p. 326).

In terms of eCommerce, it has been found that "trade and telecommunication liberalization appear to have stronger impact on the adoption of eCommerce" (Tan et al., 2007, p. 335).

The government of Singapore reflects a good example of implementing an integrated plan of eCommerce policy initiatives to develop eCommerce legal and technical infrastructure and eCommerce services. The aim was to develop Singapore into an international eCommerce hub focusing on strengthening international trade, international financial services, telecommunication, transportation and the eCommerce service industry through foreign investment to lead the public and private sector to electronic services. This implied implementing the use of subsidies and fiscal incentives for eCommerce promotion and the development of electronic services, adjustment to the regulation framework, educational programs, the adoption of eCommerce in the public sector and the liberalization of telecommunication infrastructure (Wong, 2003, p. 26).

However, a government might also create barriers through restrictive or non-existent regulation as well as high tariffs, which limit the spread of the internet (Sukasame, Sebora, & Mohedano Suanes, 2008, p. 993). An example is the case of China, where the Chinese government controls all related internet for national security reasons. In Kenya, internet access costs are prohibitive and import duties on IT equipment reach almost 100% (Datta, 2011, p. 13).

In the particular case of lacking regulation referring to e-payments, this suggests that the lack of a legal framework in developing countries impedes the use of payment methods that enable and facilitate eCommerce, such as e-cash, e-checks, smart cards and encrypted credit cards (Hamed, 2009, p. 70).

In many developing countries, the payment system of paying by cash upon delivery and by bank transfer payments remains prevalent (Shemi, 2012, p. 238).

Summarizing the role of the government in eCommerce development, a study carried out in Taiwan provides a good conclusion in terms of policy implications, suggesting:

"*First of all, the most important policy issue that needs to be addressed in eCommerce development is the establishment of an effective legal framework under which the security of transactions and privacy of traders can be safeguarded. Secondly, market liberalization, which will inevitably lead to competitive pricing with regard to both Internet access and website maintenance, will also prove useful in Taiwan's efforts to promote eCommerce. Market liberalization also has the side effect of inducing product innovations, which are critical to the development of the B2C industry. Thirdly, there are different forces driving B2B and B2C eCommerce, and therefore separate policies must be formulated to effectively facilitate these different types of trade. A country that lags behind in one area may well move ahead in the other area given the right environment and policies. In particular, fourthly, there are different forces driving B2B and B2C eCommerce and the degree of industrialization, so therefore presents a golden opportunity for industrially backward countries to leapfrog to a higher level of economic development*" (Tain-JY, 2003, p. 30).

2.4.2. Society

The process of technology adoption as part of the process of development and modernization is affected by cultural aspects such as education. The adoption process requires certain knowledge and skills by decision-makers as well as the market, whereby both work as a double force to impulse this process.

For decision-makers such as managers, eCommerce represents a challenge as a high technology, whereby they often feel they do not have the competences to understand the full implications of eCommerce. As managers, they have little or no knowledge, whereas the lack of knowledge among employees and the difficulty to attract IT experts has opposite effects (Limthongchai & Speece, 1999, p. 1575).

Moreover, Costello et al. (2007) indicate that the lack of knowledge concerning the use of the technology and low computer literacy rates affect the adoption of ICT. Referring to organization ICT readiness, it was found that the lack of technical skills is an inhibitor (The Government of Hong Kong Special Administrative Region, 2009, p. 78).

As mentioned before, the eReadiness of the population is essential for the adoption, which can be enhanced through education. Education is seen as a precondition for the use of internet services. If the facilitators exist in a country to provide technical skills such as educational programs in schools and governmental policies conjugating with infrastructure, there is an increased probability for achieving higher education levels, which many studies highlight as influencing technology use, proving critical for ICT technology adoption in a country.

In the context of a poorly-educated population, it is found that the effective use of eCommerce does not exist, thus confirming the relationship between education level and ICT use (Mangiaracina, Perego, Campari & Drivers., 2012, p. 325, Gargallo-Castel, Esteban-Salvador, & Pérez-Sanz, 2010, p. 124).

Therefore, it appears that education at all levels of formal learning and internet literacy is a fundamental driver of ICT adoption. Some governments have engaged national efforts to place technology into schools; for example, the Ceibal Plan in Uruguay provided 380,000 computers to students in primary schools in 2009. In West Africa, Ghana and Nigeria have achieved success with their open university projects in distance learning, being an effective enabler of higher education (Economic Intelligent Unit, 2010, p. 10).

Kotelnikov (2007) effectively describes the current predicament: "*Countries are moving from an industrial economy to a knowledge economy in which economic growth is dependent on the country's ability to create, accumulate, and disseminate knowledge. Computers and the Internet have catalyzed the growth of the knowledge economy by enabling people to codify knowledge into a digital form easily transmitted to anywhere around the world. People who have access to this new wave of ICT – broadly defined as technology that can be used for transmitting and/or processing information – are part of an information society connected to a virtual network that constantly creates and disseminates new information. ICT has sped up the pace of globalization and increased the complexity of business practices because firms not only need to be familiar with their local context but also with global developments. Thus, to compete in the knowledge economy, countries need a strong ICT-literate skills base that can innovate and adapt quickly to change. More value is placed on the knowledge worker than ever before. Accordingly, knowledge, change, and globalization are the driving forces of the new economy*" (Kotelnikov, 2007, p. 4).

2.4.3. Access

Previous studies recognize access to technology as a social factor influencing the adoption, besides other series of factors such as economic factors related to income and cost-related factors, legal (laws, regulations, court cases), environmental (family, religion, way of life) and cognitive factors (innovativeness of the people, openness to foreign ideas). In digital divide studies, these factors commonly emerge in terms of influencing ICT adoption at different levels (Weber & Kauffman, 2011, p. 685).

Access facilitation refers to the availability of a telecommunication and information infrastructure as well as software, hardware and ICT services. Additionally, it also includes the quality of the infrastructure (Shemi, 2012, p. 14). Access to ICT is a prerequisite for the adoption, and its quality facilitates the adoption and usage. For this reason, infrastructure plays a critical role in the eReadiness of a country for eCommerce.

In developing countries, the low quality, non-availability and high costs of the ICT infrastructure inhibit eCommerce adoption through limiting the awareness of this technology and the non-existence of a critical mass necessary for the acceptance of a new technology, which is mostly offered in SMEs (Molla & Licker, 2005, p. 878, Kotelnikov, 2007, p. 10).

Analyzing the context of SMEs in terms of the adoption of ICT, Kotelnikov (2007) outlined the barriers that SMEs face, stating that the most prominent ones refer to the affordability and accesability of ICT infrastructure, followed by human capacity, financing and the existence of an appropriate legal framework (Kotelnikov, 2007, p. 18).

As main barrier to ICT access, affordability is discussed as inhibiting eCommerce adoption by limiting consumers' time on the use of the internet. Countries that have lower costs show a wider diffusion and use. Although access is fundamental for the adoption, the use of the technology depends on the organization and consumer preferences. Organizations that are more entrepreneurial tend to adopt and obtain new business models at a faster rate (e.g. eBay, Amazon in the US), promoting innovation at the inter-firm, inter-industry and inter-country level. At the country level, some countries like the US and Japan are known as innovators in some industries and Germany and Taiwan are regarding as fast imitators, thus suggesting that the innovation rate varies across countries (Kraemer, Gibbs, & Dedrick, 2002, p. 12).

Consumer preferences also represent a driver of eCommerce, determining the demand for products and services, which also depends on how much content is online, as well as the level of legal protection ensuring security and privacy (Kraemer et al., 2002, p. 14).

2.4.4. Economy

In terms of economic factors, a series of factors are expected to lead to the adoption, whereby there is a belief that wealth seems to be a positive indicator for the adoption due to some conditions under this situation being set up, including the availability of infrastructure, capital, and education. A clear example can be found in developed countries like the US, Germany and Japan, where eCommerce is more favorable in supply and demand terms. Moreover, it can be seen that the market eReadiness relates to the income distribution within a country, as shown in the case of countries such as Mexico and Brazil (Kraemer et al., 2002, p. 8).

Moreover, concerning economic factors, the institution eReadiness comes into the picture. In developing countries, the technological infrastructure of commercial and financial institutions is not sufficient mature to support eCommerce. An important concern in many developing countries is issues of security and privacy, whereby institutions face challenges regarding this matter, which also limits consumers in terms of electronic transactions. This is an issue that policy-makers should also consider to support financial and commercial institutions. Another issue that has not been broadly included within eCommerce studies is the inhibitors that developing countries face regarding logistic infrastructure. Ahmed et al. (2011) affirm that the development of transportation infrastructure is important for successful eCommerce (Ahmed, Dalbir, & Ibrahim, 2011, p. 322). In the same manner, Travica (2002) found that a lack of postal numbers, street names and transport system conditions affect the proper development of eCommerce, whereby this issue is quite present in Nicaragua and many Central American countries (Travica, 2002, p. 13).

2.5. Nicaragua

2.5.1. Country Context

The Republic of Nicaragua is the largest country in Central America with an area of 130,373km^2 (Investment Promotion Agency, ProNicaragua, 2018).

The country is bordered to the East by the Caribbean Sea, to the West by the Pacific Ocean, to the South by Costa Rica and to the North by Honduras. The administrative areas are constituted by 15 provinces, 2 autonomous regions and 153 municipalities (Ibid).

Figure 3: Map of Nicaragua

Source: Reprinted from Map of Nicaragua by CIA Factbook, 2017. Copyright by CIA Factbook. Retrieved from https://www.cia.gov/library/publications/the-world-factbook/geos/nu.html

With its proximity to the US as one of the strongest economies worldwide and its important eCommerce market, the location of Nicaragua in Central America might somehow have an influence on ICT adoption, establishing consumer trends to purchase online through major retailers such as Amazon or eBay. However, the presence of large retailers and local online retailers is minor due to issues including high logistic costs for local and international trade. The potential is recognized, but stores with an online presence recognize the limitations of home delivery (Baca, 2017).

Moreover, commercial agreements such as CAFTA DR between Nicaragua and the US have represented an important impulse for Nicaraguan commerce, pushing Nicaraguan businesses to go online to become more competitive in the American market. Additionally, in a news article “CAFTA: impacto positivo para Nicaragua” [CAFTA: positive impact for Nicaragua],

one of the aims of the commercial agreement is to facilitate online commerce to potentialize the benefits and simplify the procedures (Olivares, 2011).

The country's topography is characterized by being surrounded by an important volcano chain and water resources (Atlantic and Pacific Oceans and the Managua and Nicaragua Lakes), which have been attractive for foreign investment in clean energy and connecting the Pacific and Atlantic Ocean through a canal for commercial proposes.

The canal project construction had been discussed since the colonial era due to the advantage of the natural water entry by the San Juan river through the lakes and ending up in the Caribbean. For several reasons, the materialization of the project was not possible in previous eras, with Panama being the ideal location for the construction of a canal in Central America.

However, in recent years the project of constructing the Nicaraguan canal has been reactivated with a Nicaraguan-Chinese partnership. The canal is expected to account for 5% of world trade transport, representing significant benefits for Nicaragua and probably doubling the country's GDP. The project will include the construction of the inter-oceanic canal with locks, ports, resorts, airports, roads and a free trade zone (China Railway Siyuan Survey and Design Group CO. LTD, p. 4).

According to the news article "Presentan ruta del proyecto del canal interoceánico de Nicaragua" [Introduction of the inter-oceanic canal project of Nicaragua], there are plans to construct two ports: one in Rivas on the Pacific Coast and the other in the Autonomous Atlantic South region. The free trade zone includes a commercial area, export processing, a financial office and the creation of a city with 140,000 inhabitants. The free trade zone will provide more than 130,000 jobs and is expected to generate 27,000 million dollars annually by 2030. Moreover, the resorts are planned to be constructed along the canal and the airport in Rivas with a capacity of 1 million people for international flights. The planned roads and bridges will connect Nicaragua with its southern regions (Noticias Agencias, 2014).

In case this project is materialized, it is believed that it will represent a substantial boost for the Nicaraguan economy, providing infrastructure that is currently scarce in Nicaragua, as well as the possibility to generate increasing employment rates, improving Nicaragua's GDP and securing Nicaragua as an important commercial spot in the world. Therefore, in terms of eCommerce, the possible increase in its commercial conditions might also be important for Nicaraguan businesses. However, negative aspects mainly due to environmental concerns have also arisen with the construction of the Nicaraguan canal. In a news article "Las dudas

ambientales sobre el proyecto chino del canal de Nicaragua" [The environmental doubts about the Chinese project of the Nicaraguan Canal], it is discussed that it might cause damage to the ecosystem and pollution of drinking and irrigation water. The scientific and local communities are demanding more integral studies before the construction takes place, including a fairer agreement for the Nicaraguan side (Pianzola, 2014).

Continuing to evaluate the geographical and resource potential of Nicaragua and its possible influence on eCommerce, the Nicaraguan energy sector is another attractive area for foreign investment and development opportunities for the country (Investment Promotion Agency, ProNicaragua, 2013).

The Nicaraguan renewable energy matrix might also represent a driver for eCommerce through potentially reducing energy costs, which are currently among the highest in Central America.

The population of the Republic was estimated at 6.30 million in 2017 (Investment Promotion Agency, ProNicaragua, 2018), mainly concentrated in the capital of Managua. The distribution of the population by residential area is constituted by 56% in urban and 44% in rural areas. The Nicaraguan population is mostly young: 41% are between 0-19 years old, 19% between 20-29 years old, 15% between 30-39 years old, 10% between 40-49 years old, 7% between 50-59 years old and 8% are 60 years old or older (Ibid.). The following graphic shows the distribution of the population by provinces in 2017:

Table 2: Distribution of the Population by Provinces in Nicaragua in 2017

Province	Population	%Total
Managua (Capital)	1,507,330	24
Matagalpa	559,447	9
RAAN	505,424	8
Jinotega	457,042	7
Chinandega	421,759	7
León	400,864	6
RAAS	391,478	6
Masaya	370,807	6
Nueva Segovia	255,060	4
Estelí	225,127	4
Granada	204,988	3
Chontales	196,049	3
Carazo	188,837	3
Rivas	173,371	3
Boaco	163,381	3
Madriz	161,985	3
Rio San Juan	123,007	2
Total	**6,305,956**	**100.00**

Source: Distribution of the Population by Provinces in Nicaragua in 2017 by Investment Promotion Agency, ProNicaragua, 2018. Elaborated by the author. Retrieved from http://pronicaragua.gob.ni/es/descubre-nicaragua/139-poblacion/

This could represent strong potential for eCommerce assuming that having a young population that is more engaged with new technology is a positive factor that might help to diffuse eCommerce faster. Another factor is the constitution of the population in the urban area, given that slightly more than half (56%) of the population is concentrated in urban areas, especially in the capital Managua and large cities in the Pacific region, which also represent the most commercial and dynamic areas in the country. Indeed, most of the businesses, financial centers are located in Managua (Investment Promotion Agency, ProNicaragua, 2017).

The population with more purchasing power is also located in this area of the country, indicating that the Pacific region appears to be the most favorable location at the national level in terms of conducting eCommerce in Nicaragua, considering the concentration of population and businesses. Concerning education, a high rate of the population is literate at about 82.8%

(CIA Factbook, 2017), meaning that this proportion above the age of 15 can read and write. This fact contributes to assuming the possibility of having a population that is able to interact with ICT at a basic level.

Moreover, the news article "TICs y la educación superior en Nicaragua" [ICT and higher education in Nicaragua] claims that most undergraduate students aged between 17 and 21 years have grown up closely linked to advances in ICT. However, the existing traditional education system requires being adapted to the new market demand, including more ICT educational programs that promote more competitive and employable professionals (Opinión, 2009). Studies related to the "Knowledge Economy in Nicaragua" indicate the necessity of linking the quality of education to digital literacy, teaching foreign languages (English, French and German), implementing critical thinking and independent thought among the student mass. Additionally, from the educator side, constant training and ICT preparation is required. Another news article "Nicaragua en la cola de economía del conocimiento" [Nicaragua in the queue of knowledge economy], it is claimed that the educational deficiency of Nicaragua together with the lack of access and use of ICT place human capital in the country at a disadvantage in terms of interaction with technologies with major complexity such as eCommerce (Olivares, 2013).

The same news article describes another concern in Nicaragua related to education, namely the high desertation rate, whereby of the 92.4% of children enrolled at school age only 47.7% continue to the sixth grade (Olivares, 2013). In the case of higher education, the picture is not better: in the news article "TICs y la educación superior en Nicaragua" [ICT and higher education in Nicaragua], in 2009 a study conducted by the National Council of Universities suggested that the dissertation rate was around 7% (Opinión, 2009).

Culturally speaking, Nicaragua shows diversity. Among the Pacific region, the population is preeminently mestizo, an interbreeding of indigenous with Spanish persons: here, the population speak Spanish, which is the official language. Although there was also a British presence in the Atlantic, which introduced English in the country, the Creoles – black people of the Caribbean region – are descendants of colonia era slaves, speaking English and Spanish as a second language. Meanwhile, other indigenous populations like Miskitos, Rama and Sumu on the Atlantic Coast speak their tribal languages (CIA Factbook, 2017). The pre-existence of English and U.S. Americans (also a spatially-close country) in the territory somewhat influenced the use of English language in Nicaragua earlier than in other Latin American coun-

tries. The English language appears to be the main language for eCommerce, considering a country with English literacy and an advantage for eCommerce purposes.

A different cultural aspect that is also important to consider in terms of understanding how business develops in a country involves analyzing Hofstede's 'Cultural Dimensions'. The first dimension presented by Hofstede is power distance, "reflecting the degree to which people accept and expect inequality in the distribution of authority. In societies with high power distance, decision-making is centralized rather than consultative, hierarchies are stable and clearly defined, and there is respect for leaders. By contrast, in low power distance societies, decisions are based upon consensus, less rigid hierarchies, and less distance between leaders and subordinates. In the case of Latin American countries, decisions are made by the authority without the input of those under their position, although this does not mean they are not considered at all, but rather less commonly" (Wake Forest University, n.d.).

Regarding the dimension of individualism, "Latin America countries have a low individualism, which means that conformity and loyalty to the group are more highly valued than one's individuality is manifested" (Ibid).

The third category of masculinity reflects "the degree to which social and economic survival requires aggression, and the level of monetary reward is attached to success. Moreover, it is related to the definition of gender roles and the distinction between men's and women's behavior. In Latin America, the survival requirement is lower than in the U.S. while monetary rewards are more highly valued. Related to gender roles in Latin America, it is pronounced that men have great authority, especially associated with income motives" (Ibid). In the case of Nicaragua, as an effect of the revolution women tend to be more equal, gaining more authority and better positions. Indeed, it is one of the few countries in Latin America with a female president and many women in the public and private sector with positions at high management levels.

As the fourth category, uncertainty avoidance "describes how open societies are to risk. Latin America's preference is for clarity and safety: according to Hofstede, Latin American society does not readily accept change and risk-taking. Additionally, workers are more into receiving specific instructions and close supervision" (Wake Forest University, n.d.). These four categories of Hofstede might be important to consider to analyze how adoption decisions for eCommerce technologies are taken through an authoritarian decision rather than being risk-taking-oriented, considering the importance of the manager's position level, resources and

individualism. Technology such as eCommerce requires risk-taking orientation, innovative inclination and even the decision to adopt have to be made by the authority, albeit with consultation with the organization, given that they will interact with the technology and thus they should be involved for a more efficient and adjustable adoption within the organization.

Central American economies are small and characterized by lower middle income. Economically, Nicaragua remains one of the poorest countries in Latin America, as the country with the lowest per capita income among Central America countries: its per capita income was US$2,151.4 in 2016 (World Bank, 2017), see table below. It does not reach the level of other economies in the region, despite a 13% decline in overall poverty between 2009 and 2014, from 42.5% to 29.6%. Meanwhile, extreme poverty fell by 6% from 14.6% to 8.3% in the same period (Banco Mundial, 2017). Despite progress, poverty remains high. In addition, Nicaragua is still one of the least developed countries in Latin America, where access to basic services is a daily challenge.

Poverty in Nicaragua is concentrated 50.1% in rural areas and 14.8% in urban areas (World Bank, 2017). Mangiaracina et al. (2012) affirmed that GDP per capita and equal distribution of income are among the representative drivers for B2C diffusion. The reason might be found in the notion that new technologies usually diffuse faster where financial resources, infrastructure and human resources are available (Mangiaracina et al., 2012, p. 325).

Table 3: GDP per Capita in Central America

GDP per Capita		
Country	Population (million)	2016 ($)
Costa Rica	4.857.27	11.824.6
El Salvador	6.344.72	4.223.6
Guatemala	16.582.47	4.146.7
Honduras	9.112.87	2.361.2
Nicaragua	6.149.93	2.151.4

Source: GDP per Capita in Central America by World Bank, 2017. Elaborated by the author.
Retrieved from https://data.worldbank.org/country/nicaragua

However, it seems that the macro-economy shows a positive forecast, whereby foreign direct investment (FDI) recorded an annual average growth rate of 16 percent during the 2007-2016 period, reflecting a climate of stability and security supported by a stronger legal framework for investment. In 2016, FDI was estimated to total US $1.442 million, with industry, financial, trade and services, telecommunication and energy attracting the most investment. The origin of FDI revenue was increasingly diversified from a total of 22 countries in 2007 to 46 in 2015, representing a growth of 109 percent. In 2015, the five main countries of FDI income were Mexico (18%), the United States (18%), Panama (14%), China (7%) and Switzerland (6%), comprising 64% of the total (Investment Promotion Agency, ProNicaragua, 2017). Concerning exports, in 2016 Nicaragua´s total exports amounted to US $4,839 million, similar to those obtained in 2015, showing an annual growth rate of 8 percent during the 2007-2016 period. The main destinations are the United States, Central America, Mexico, the European Union and Venezuela (Investment Promotion Agency, ProNicaragua, 2017).Intra-regional trade has increased, partly based upon the strategy of "Open regionalism" where governments are renewing commitment to regional integration.

The smallness of these economies makes them extremely dependent on foreign trade, albeit to a lesser extent in Guatemala and El Salvador (World Bank, 2014), as shown in the following table:

Table 4: Exports of Goods and Services as a Share of GDP in Central America

Export of goods and services (% GDP)					
Country	2011	2012	2013	2014	2015
Costa Rica	32.86	32.17	31.33	32.28	30.04
El Salvador	27.98	25.62	26.37	25.96	25.79
Guatemala	26.63	24.87	23.72	23.16	21.16
Honduras	51.26	50.90	47.94	47.56	46.00
Nicaragua	45.02	47.47	45.21	45.01	39.98

Source: Export of goods and services (% GDP) by World Bank 2015. Elaborated by the author. Retrieved from http://wits.worldbank.org/CountryProfile/en/country/NIC/startyear/2011/endyear/2015/indicator/NE-EXP-GNFS-ZS

The dependency on foreign trade is significant – especially in Nicaragua and Honduras – whereby if this tendency continues eCommerce will become a key aspect for the competitiveness of Nicaraguan businesses. In Nicaragua, exports have been increasing due to the preferential agreements for trade liberalization in the country, whereby the existing trade agreements in Nicaragua are outlined below:

Table 5: Trade Agreements Subscribed by Nicaragua

Agreements	Countries
Free trade Agreement	US, Mexico, Panama, Taiwan, Dominican Republic, Chile and EU
Central American Common Market	Nicaragua, Guatemala, El Salvador, Honduras and Costa Rica. In addition, the free movement of capital, services and human resources between the CA-4 countries
Preferential Access Agreements	Japan (SGP), Norway (SGP), Canada (SGP), Russia (SGP) and ALADI
Alba	Venezuela, Ecuador, Bolivia, Cuba, Antigua & Barbuda, Dominica and St. Vincent & Grenadines
Recent agreements	ALADI (Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Mexico, Paraguay, Peru, Uruguay, Venezuela and Cuba)
Negotiating agreements	Canada, CARICOM

Source: Acuerdos Comerciales vigentes by Ministerio de Fomento, Industria y Comercio, MIFIC, 2014. Elaborated by the author. Retrieved from http://www.mific.gob.ni/es-ni/acuerdoscomercialesvigentes.aspx

As previously mentioned, the commercial relation that Nicaragua has with the US might influence eCommerce adoption in the country, given that the US is the largest trading partner of Nicaragua, accounting for more or less one-quarter of Nicaragua's imports and two-thirds of its exports (free zone exports). The US exported $1.1 billion to Nicaragua in 2011, including cereals, donated goods, mechanical machinery, textiles, apparel, oils, fats, medical and dental equipment, electrical machinery, vehicles and plastics (Embassy of the United States, 2014, p.1).

In the case of exports from Nicaragua to the US, in 2011 they totaled $ 2.6 billion, including textiles, apparel, automobile, wiring harnesses, coffee, meat, fish, tobacco, gold, fruits, vegetables and sugar. Aside from the US, other important trading partners for Nicaragua are Venezuela, El Salvador, Costa Rica, Mexico and the European Union (Ibid).

In terms of foreign investment, mostly US-owned subsidiaries of US companies operate in Nicaragua. The most significant investments are in textiles, apparel, energy, financial services, light manufacturing, tourism, fisheries and shrimp farming. Other major investors are Venezuelan, Mexican, Canadian and other Central American firms (Embassy of the United States, 2014, p. 1).

One of the most challenging issues affecting Nicaragua's development is the lack of infrastructure. It is the Central American country with the lowest density of paved roads, with 15% compared with 29% as the average for the region. The World Bank estimates that only 22% of the population has access to paved roads (OECD), which represents one of the lowest levels in the region. Indeed, the government has realized the need to establish a main aim of investing in infrastructure: according to the National Human Development Plan, infrastructure is considered one of the outstanding factors for economic development, whereby it is not only limited to transport but also ICT, energy and water.

In terms of air infrastructure, Nicaragua has an international airport located in the capital city of Managua and three national airports located in Bluefields, Puerto Cabezas and Corn Island. Moreover, there are rural airports in New Guinea, San Carlos, Siuna, Waspan, Rosita and Bonanza. The Managua airport was classified as one of the safest in Latin America and it serves fifteen international destinations daily, as well as being a cargo terminal for four airlines transporting to and from North, Central, South America and Europe (Investment Promotion Agency, ProNicaragua, 2017).

Future projects of the airport system include an expansion of the airstrip of Managua airport, allowing aircraft greater autonomy of flight and elevating the category of the airport, the rehabilitation of small airports, upgrades to Caribbean airports and the construction of airports in touristic areas such as Ometepe (Concejo de Comunicación y Ciudadanía, 2012).

The ports' infrastructure is out date with a scarcity of operation systems and non-specialized staff. Lacking deep-water ports in the Caribbean has forced moving products through ports in Honduras and Costa Rica, thus increasing production costs and making local producers less competitive in the international market due to high transportation costs. In the Pacific, Sandino

and Corinto ports have the capacity to handle international container traffic through the Pacific and the Atlantic, whereby current modernization projects might allow international traffic as the rehabilitation of Rama and Bluefields ports in the Caribbean develop (Concejo de Comunicación y Ciudadanía, 2012) (Ibid).

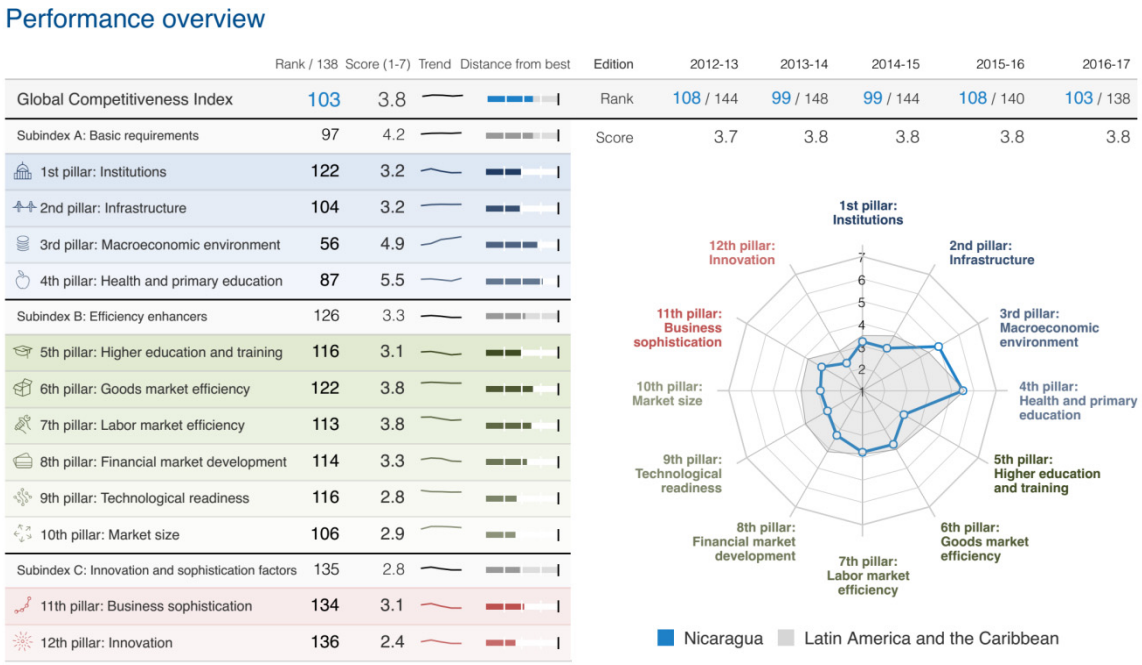
Another infrastructure sector that holds relevance for eCommerce is energy. The sector has been developing with dynamism in the last five years, with considerable public and private investment at the national level. This effort has led to an important improvement in the coverage of electric services for the population, which had previously been neglected. At present, there is 90% national coverage and an increasing installed capacity to supply the demand of the national market, which aims to export energy in the future via the Central America Electrical Interconnection System (SIEPAC). In 2016, renewal energy sources represented 51% of the matrix and by 2020 the goal is set at 55% (Investment Promotion Agency, ProNicaragua, 2017).

The postal sector also plays an important role for eCommerce. In recent years, investment has been made in the postal sector with the opening of ten post offices in the Caribbean and rural areas, benefiting more than 250,000 citizens and allowing 94% of the population in Nicaragua to have access to these services. The diversification of postal services is also happening from correspondence services, courier shipments, international parcels, remittances from the US and payments for basic services, among others. The increment of quality is an aim to achieve a greater impact on the wellbeing of the country (Concejo de Comunicación y Ciudadanía, 2012).

In 2013, as already mentioned, the government granted a concession to a newly formed Chinese-run company to finance and build an interoceanic canal in Nicaragua and related projects that are estimated as significant infrastructure developments in the country. However, it presents serious concerns from a legal and environmental perspective, and the construction has not yet started (CIA Factbook, 2017).

In the Competitiveness Global Index of 2016-2017, Nicaragua ranked 103rd out of 138 countries (see Figure 4), a position that clearly illustrates the need for improvement, specifically in innovation, for which it ranks 136th of 138 countries. Other indexes further demonstrate the need for development: Nicaraguan technology readiness ranks 116th out of 138 countries, business sophistication 134th, market size 106th, infrastructure 104th and institutions 122nd (The Global Competitiveness Report 2016-2017, p. 280).

Figure 4: Competitiveness Global Index: Nicaragua 2016-2017

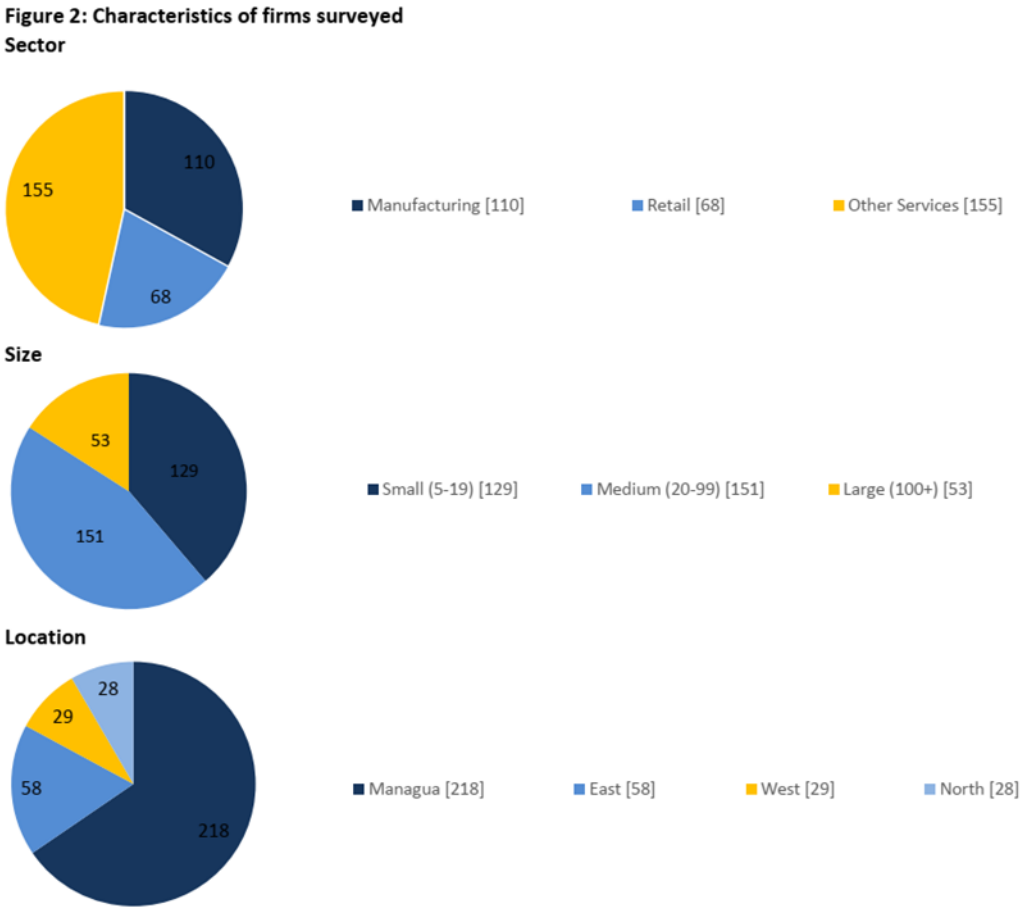


Source: Reprinted from Competitiveness global index: Nicaragua 2016-2017 by The Global Competitiveness Report 2016-2017, p.280. Retrieved from http://www3.weforum.org/docs/GCR20162017/05FullReport/TheGlobalCompetitivenessReport2016-2017_FINAL.pdf

2.5.2. Industry Context

According to the Enterprise Survey conducted by the World Bank (2016), the Nicaraguan sector is mainly constituted by the services sector, following by manufacturing and retail (World Bank 2016, p. 4). The private sector is dominated by micro and small businesses and a large informal sector (World Bank, 2016, p. 2). However, medium-sized enterprises are growing (World Bank, 2016, p. 4). In terms of location, most companies are located in the Pacific region and the capital Managua, as well as the largest cities in the East (see Figure below).

Figure 5: Characteristics of Firms Surveyed



Source: Reprinted from Enterprise Survey Nicaragua 2016 by World Bank, 2016, p.4. Retrieved from https://www.enterprisesurveys.org/~/media/GIAWB/EnterpriseSurveys/Documents/Profiles/English/Nicaragua-2016.pdf

Nicaragua´s economy is primarily based upon agriculture, generating 70% of employment and 40% of GDP. In 2015, 43.2% of Nicaragua's total exports corresponded to agriculture (Investment Promotion Agency, ProNicaragua, 2017). Meat, coffee and gold are the three main export commodities (CIA, Factbook 2017). The products with the greatest export potential in Nicaragua are cassava, peanuts, cocoa, honey, beans and cashews. Other products with high potential include sesame, pineapples, mangos, guava, watermelons, onions, vegetables and citrus (Investment Promotion Agency, ProNicaragua, 2017).

The country has become an attractive destination for investment in the outsourcing sector, offering increasingly specialized services for the externalization of knowledge processes (KPO), externalization of business processes (BPO) and shared service centers (Investment Promotion Agency, ProNicaragua, 2017).

Additionally, manufacturing is an important economic engine and one of the most dynamic sectors in Nicaragua. In recent times, firms have operated under a free zone tax regime, which has significantly contributed to the country´s total exports, representing 39% of the exports in 2015.

The manufacturing of goods has been diversified to more sophisticated processes (Investment Promotion Agency, ProNicaragua, 2017).

Summarizing, the five main industries with the highest economic performance in Nicaragua include agriculture, manufacturing, services, telecommunication and construction. The main products that generate foreign currency are agricultural exports, manufactured products and tourism. Nicaragua´s main exports are agricultural products, including agriculture, livestock, fishing and mining. Agricultural exports from Nicaragua have increased dramatically. Therefore, it is believed that the effective use of eCommerce will boost Nicaraguan exports and agricultural growth.

Government investment policies strongly focus on the tourism sector as one of the main economic activities in Nicaragua, as well as agroindustry, fisheries and mining (Concejo de Comunicación y Ciudadanía, 2012).

The establishment of a public-private dialog system has been essential for the promotion of economic growth in Nicaragua, which has been recognized as favorable for the business environment. One of the main results is the tripartite minimum wage agreement for the free zone sector (Investment Promotion Agency, ProNicaragua, 2017). Moreover, Nicaragua´s economy is among the freest in the world according to a recent Economic Freedom of the World (EFW) report, ranking 45th out of 159 countries in 2016 (Investment Promotion Agency, ProNicaragua, 2017).

This report analyzes the economic freedom (levels of personal decision, ability to enter markets, security of private property, rule of law, etc.) established by country's policies and institutions, whereby it is evident that advances have been made to support industry development in Nicaragua (Investment Promotion Agency, ProNicaragua, 2017).

Related to fiscal incentives, the government offers incentives for export-oriented sectors including free zones, tourism, mining and forestry, including the Tax Concertation Law (822) for certain productive sectors, tax benefits for exportation, exports of goods of national production or services being applied 0% valued added tax (VAT) rate, exports of goods being taxed with 0% selective consumption tax (ISC) and a tax credit offered for advances or annual IR with prior approval from the tax administration. Additionally, tax benefits exist for producers, with some exemptions for raw materials, machinery and equipment to agricultural producers and for the forestry sector, which enjoys a 50% exemption of the municipal tax on sales and 50% on the profit derived from the use. Moreover, companies that invest in forest plantations may deduct 50% of the amount invested for IR purposes (Investment Promotion Agency, ProNicaragua, 2017).

The tax system also has a temporary admission regime for inward processing, which allows the entry of goods into the national territory and the local purchase of goods without the payment of all kinds of duties and taxes. Companies that export at least 25% of their total sales with an exported value of less than US $50,000 per year can benefit from this regime (Investment Promotion Agency, ProNicaragua, 2017).

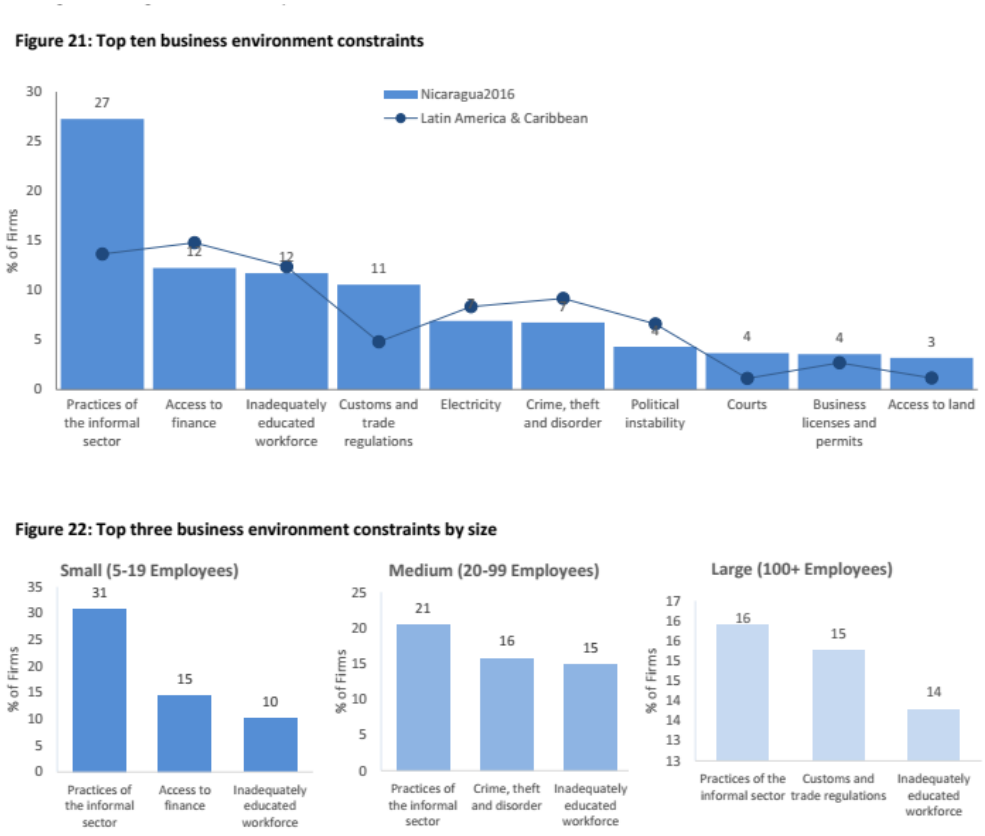
The free zone regime for companies interested in establishing export-oriented operations in the textiles and clothing, manufacturing, agroindustry, contact center and BPO industries offers a 100% exemption of the payment of income tax generated by activities in the zone for the first ten years, among other benefits (Investment Promotion Agency, ProNicaragua, 2017).

The legal framework in Nicaragua also protects private property and recognizes equal legal guarantees for foreigners, promoting investments through the Law for the Promotion of Investments (Law 344), which recognizes a series of guarantees. The existence of several treaties for the alternative resolution of conflicts and the Law of Mediation and Arbitration (Law 540) conform a body of mechanisms to solve controversies with contractual relations. These series of law conform a basic regime to support the activities of the industrial sector (Investment Promotion Agency, ProNicaragua, 2017).

Despite advances made by the government through the legal framework and aforementioned incentives, two main constraints are the practices of the informal sector and the inadequate workforce, which is recognized by small, medium-sized and large companies to affect their performance. Future efforts should be made in terms of access to finance for small companies (see Figure 6). Informal sector practices are strongly rooted in the business environment,

whereby adequate formalization should be ensured according to their needs and idiosyncrasies. The workforce in Nicaragua generally has basic education, albeit with a lack of specialization in the required areas. The expenses on education by the government are high, at approximately 22% of the national budget, although an approach that places a greater focus on the needs of the country is required (Investment Promotion Agency, ProNicaragua, 2017).

Figure 6: Business environment constraints



Source: Reprinted from Enterprise Surveys Nicaragua 2016 by World Bank, 2016, p. 10. Retrieved from https://www.enterprisesurveys.org/~/media/GIAWB/EnterpriseSurveys/Documents/Profiles/English/Nicaragua-2016.pdf

2.5.3. eCommerce in Nicaragua

In terms of ICT, Nicaragua was the first country in Central America to gain internet connectivity and the second in Latin America, in 1988. However, this early internet connectivity has not ensured the subsequent diffusion and exploitation of ICT (Medina, 2008, p. 8). Indeed, in

terms of ICT use the country remains behind compared with other Central American countries.

The telecommunications sector in Nicaragua is fully privatized and one of the most modern in Central America. Nicaragua offers high-quality fiber optic connections through three international submarine cable systems: ARCOS-1, MAYA-1 and Emergia (Investment Promotion Agency, ProNicaragua, 2017).

The largest providers of telecommunications in Nicaragua are Tigo Business, Claro, IBW, Ideay, Telefonica and Yota, among others. Among the services available are internet from a fractional service up to full DS3, voice connection through analog or digital lines, 4G wimax for internet and mobile telephony.

It is estimated that two-thirds of municipalities have fixed broadband internet. 85% of the population has 3G coverage, and there are 1.2 million mobile connections. 87% of the total municipalities are covered by optical fibers and 90% of municipalities. The international capacity was recently increased by 6OGB. The reduction of the mobile internet rate went from 29.99 in 2006 to 9.99 in 2016, but the capacity has also increased from 256kb in 2006 to 1MB in 2016. However, an inhibitor for the growth of the sector remains the low purchasing power as reflected by per capita income (CANITEL, Cámara Nicaragüense de Internet y Telecomunicaciones, 2017).

Fixed telephony is 100% digital technology, whereby 40% of urban areas have the technology, and 1 million people have access to the service. There is a 6% annual growth, although it is affected by the substitution of the fixed mobile category (CANITEL, Cámara Nicaragüense de Internet y Telecomunicaciones, 2017).

Related to mobile access, there are more than 8 million mobile connections and more than 2 million smartphones. 100% of major cities are covered and 85% of the population with 3G technology (CANITEL, Cámara Nicaragüense de Internet y Telecomunicaciones, 2017).

The telecommunication sector is among the three sectors that attract the greatest flow of FDI. In 2015, the telecommunication sector ranked in first place, accounting for 31% of total FDI and reflecting 6.6% of GDP (CANITEL, Cámara Nicaragüense de Internet y Telecomunicaciones, 2017).

Besides the type of technology, the speed is also an important factor that might affect eCommerce, whereby a slow internet connection does not facilitate advanced applications or higher eCommerce levels. Considering today's reality as a complete online society where banking and shopping depend on online providers, not having sufficient bandwidth is a disadvantage for any business.

In Nicaragua, only 27.84% of the population have a speed higher than 1Mbps, while the rest have access between 64 Kbps and 512Kbps. In the following table, the range of internet speeds is shown:

Table 6: Speed Range

Speed range	Percentage
≥ 1 Mbps	27.84%
≥ 512 Kbps	59.92%
≥ 256 Kbps	78.21%
≥ 128 Kbps	96.20%
≥ 64 Kbps	100.00%

Source: Speed Range by Instituto Nicaragüense de Telecomunicaciones y Correos, TELCOR 2014. Elaborated by the author. Retrieved from http://www.telcor.gob.ni/Desplegar.asp?PAG_ID=50

Other elements that determine the speed are internet working devices, network topology, users' computers, servers, energy conditions and congestion. In the case of Nicaragua, energy and adequate ICT infrastructure are elements that require investment.

A previous study on B2B eCommerce adoption in 2008 analyzed internal and external factors of companies, finding the demand of customers is an important factor to move online, and that the lack of government eReadiness is affecting eCommerce diffusion (Medina, 2008, p. 3).

Internally, a higher educational level facilitates eCommerce adoption, besides understanding the eCommerce vision and governance commitment (Ibid).

The eReadiness Index by Visa illustrates that Nicaragua remains far behind in comparison to the rest of Latin America and the US, whereby several factors might affect its low ranking

indicators in terms of demand, infrastructure, banking and technology adoption indexes (Visa, 2010, p. 2).

The government has taken some steps to support eCommerce diffusion through some initiatives such as the approval of the Electronic Signature Law in 2010, and preliminary studies to reinforce the security and confidence of electronic commerce in Nicaragua starting in 2013. The Law of Electronic Signature recognizes the efficacy and legal value of electronic signatures, digital certificates and all information published intelligibly in electronic format (Benavides, 2010). However, more government regulations such as the Electronic Commerce Law and Electronic Check Law still need to be stipulated or modified to accomplish requirements of developments (China Railway Siyuan Survey and Design Group CO. LTD, p. 8).

Concerning investment policy, the government aims to continue investing in ICT to increase its quality and infrastructure to ensure the necessary impact to foster competitiveness. Besides infrastructure, policies are also addressed to improve the education of ICT in the country. Therewith government objectives include the promotion of technology and innovation for strengthening the national quality system and the development of the technical capacities of human capital, connectivity through the internet to all public schools to facilitate interaction and the use of educational technologies to improve the quality of learning and training to teachers in the country in educational technologies and innovation (Investment Promotion Agency, ProNicaragua,2016).

However, regardless of the government efforts to develop and upgrade ICT infrastructure, some companies in Nicaragua do not have a website despite increasing interest in having online channels among many such companies. The news article “eCommerce without clicking” suggests that eCommerce is incipient due to low trust and diffusion (Vidaurre, 2013) due to minimal online payment systems and low access to the internet, which does not allow the awareness and maturity of this technology.

Nevertheless, there are many issues to be addressed at the national and business levels to diffuse eCommerce in Nicaragua, starting with increasing internet access, improving infrastructure and regulation. The news article “eCommerce without clicking” further indicates that it should be considered a technology with potential due to the country being young, constituted by 2.57 million inhabitants between 5 and 24 years old, namely reflecting the section of the population who are more engaged with new technologies (Vidaurre, 2013). Moreover, the

economy of Nicaragua has recently experienced sustained economic growth based upon a disciplined management of fiscal, monetary and exchange policies.

According to the eReadiness index – reflecting some well-established indicators to observe the conditions of a country in terms of conducting eCommerce – it is possible to observe that in comparison to the rest of Latin America and the US, Nicaragua is one of the smallest markets as well as having the lowest GDP per capita. Moreover, in terms of internet users, El Salvador has the lowest rate in the Central America region. Concerning IT infrastructure, fixed telephony remains low in relation to regional access, although mobile telephony is almost similar to countries such as Peru and Mexico. In terms of PC access, Nicaragua actually has among the highest rates within the Central America region. The cost of broadband and subscriptions seems to be one of the main inhibitors in terms of infrastructure according to this index:

Table 7: eReadiness indicators in Latin America

COUNTRY	POPULATION (IN MILLIONS)	GDP PER CAPITA (IN US$)	% 25-35 YEARS OLD	INTERNET USERS	POTENTIAL DEMAND INDEX	FIXED TELEPHONY	MOBILE TELEPHONY	PC	BROADBAND SUBSCRIPTIONS	COST OF BROADBAND (IN US$)	INFRASTRUCTURE INDEX
Argemtina	40,3	7,726	15,8%	29,7%	0,65	24,9%	122,8%	12,8%	9,1%	20,14	0,61
Bolivia	9,8	1,724	14,8%	12,8%	0,32	7,3%	64,5%	2,7%	1,0%	53,00	0,19
Brazil	193,7	8,220	17,1%	40,1%	1,78	21,7%	95,7%	25,0%	7,7%	15,53	0,70
Chile	16,9	9,525	14,6%	33,8%	0,50	21,1%	107,5%	18,9%	10,2%	24,38	0,59
Colombia	45,6	5,087	16,0%	42,0%	0,73	17,9%	90,3%	11,7%	4,4%	31,72	0,41
Dom.Republic	9,7	5,176	15,5%	25,1%	0,40	10,5%	93,1%	2,4%	2,9%	18,99	0,43
Ecuador	13,6	4,059	15,3%	29,9%	0,44	14,6%	99,0%	15,5%	0,3%	24,90	0,40
Guatemala	14,0	2,662	14,1%	16,8%	0,36	11,5%	155,6%	2,8%	0,7%	50,01	0,37
Honduras	7,4	1,823	15,4%	15,4%	0,32	13,4%	140,7%	2,6%	0,0%	25,00	0,40
Mexico	109,6	8,135	16,3%	29,0%	1,14	19,8%	77,6%	18,4%	9,4%	20,05	0,52
Nicaragua	5,7	972	16,0%	19,2%	0,33	5,7%	71,1%	6,4%	0,8%	39,99	0,26
Panama	3,4	7,132	15,6%	30,4%	0,39	16,4%	154,6%	3,1%	6,7%	16,95	0,62
Peru	29,1	4,356	16,3%	27,4%	0,55	10,6%	73,3%	14, 8%	3,1%	22,28	0,43
Puerto Rico	3,9	21,869	14,2%	40,0%	0,52	24,9%	149,5%	25,4%	6,2%	24,95	0,66
Paraguay	6,3	2,337	15,6%	14,8%	0,31	8,4%	128,6%	11,9%	1,9%	24,13	0,44
El Salvador	6,1	3,623	14,2%	11,1%	0,29	19,6%	155,3%	10,2%	2,6%	21,99	0,54
Uruguay	3,3	9,425	14,1%	41,9%	0,44	29,5%	126,0%	16,5%	7,9%	13,81	0,69
Venezuela	28,6	11,789	16,1%	31,2%	0,61	22,9%	110,2%	16,3%	7,2%	13,99	0,88
Latin America	547,0	7,327	16,3%	33,2%	1,11	19,4%	96,9%	17,9%	6,8%		0,59
Spain	45,9	35,116	16,1%	57,7%	1,00	46,1%	112,9%	50,5%	21,5%	17,45	1,00
U:S	307,0	46,436	13,5%	78,9%	2,95	48,4%	90,0%	93,2%	25,0%	19,95	1,27

Country	Credit card	Debit card	ATMs	Banking index	Mobile Broad Band	E-buyers	Online Purchase	Techno-logy Adoption index	Online Tax payers	Mayor Retailers Online	Potential Supply index	Ereadiness index
Argentina	40,8%	40,7%	15,000	0,34	3,32%	3,48%	875	0,32	0	2	0,09	0,46
Bolivia	2,2%	12,7%	908	0,04	0,32%	1,50%	44	0,20	0	0	0,00	0,17
Brazil	71,2%	123,0%	174,255	0,97	4,27%	9,73%	13,230	0,61	0	10	0,33	0,95
Chile	53,2%	48,0%	7,562	0,70	3,41%	7,02%	1,028	0,55	131,974	6	1,06	0,63
Colombia	16,6%	33,0%	9,274	0,20	1,85%	4,02%	435	0,20		1	0,07	0,36
Dom. Republic	16,7%	30,8%	2.000	0,17	1,38%	4,16%	209	0,34		0	0,00	0,31
Ecuador	14,2%	19,7%	1,340	0,13	0,60%	2,50%	71	0,15		1	0,06	0,26
Guatemala	8,6%	12,5%	1.254	0,09	0,76%	2,02%	77	0,21	9,500	1	0,06	0,25
Honduras	8,1%	11,6%	735	0,10	0,70%	1,99%	28	0,20		1	0,06	0,25
Mexico	10,8%	53,0%	39,856	0,20	0,99%	4,30%	2,625	0,31	418,972	11	0,22	0,53
Nicaragua	10,8%	12,3%	568	0,10	0,35%	1,79%	12	0,15		1	0,06	0,20
Panama	15,7%	56,5%	944	0,62	1,52%	2,94%	102	0,26		0	0,00	0,43
Peru	16,1%	46,9%	3,763	0,22	0,53%	3,14%	276	0,20	34,049	1	0,13	0,34
Puerto Rico	33,8%	42,5%	1,478	0,42	4,91%	3,30%	588	0,59		0	0,00	0,50
Paraguay	12,2%	11,7%	526	0,14	0,61%	2,04%	38	0,24		0	0,00	0,27
El Salvador	7,2%	14,9%	694	0,10	0,80%	2,04%	46	0,33		1	0,06	0,30
Uruguay	51,5%	43,9%	1,985	0,58	4,85%	5,12%	82	0,36		0	0,00	0,48
Venezuela	24,5%	51,0%	15,124	0,34	0,86%	5,16%	906	0,34	0	0	0,00	0,45
Latin America	37,6%	69,6%	277,266	0,51	2,50%	5,90%	21,775	0,41			0,22	0,62
Spain	95,4%	67,0%	61,374	1,00	11,30%	16,01%	8,400	1,00	5.630,896		1,00	1,00
US	187,8 %	165,1%	500,000	2,14	14,59%	74,00%	146,42	2,25	98.000,000		2,25	2,12

Source: Visa, 2010, p.2

Additionally, even credit card penetration is more or less close to the average across the Latin American region. However, for debit cards it is low, likewise concerning the presence of ATMs. Thus, it can be said that there remains a gap to be covered in the Nicaraguan banking sector. In the same manner, in terms of technology adoption, e-buyers and online purchases are among the lowest in the region, with no significant presence of major retailers. All of these factors prompt the conclusion that in terms of eReadiness, there are major improvements to be made in Nicaragua, especially concerning infrastructure and technology adoption. Nonetheless, there is a belief that Central America as a region has an enormous potential given its proximity to the US and recent regional integration (Visa, 2010, p. 8).

In recent years, online banking has grown in Nicaragua, along with the penetration of internet and mobile use. Transactions in non-traditional channels of Nicaraguan banks are around 30-40% and are predicted to further increase. Applications such as mobile banking and mobile wallets are becoming more popular among the population, along with innovative products as Visa Prepaid Cards, which allow making purchases and payments and recharging money without requiring an account (Vidaurre, 2014).

However, Nicaragua´s challenges in terms of IT and eCommerce are based upon the lack of a strategy concerning how these elements may help to resolve the pitfalls of quality, productivity and efficiency.

Accordingly, all kinds of initiatives and projects should be consistent and match a well-formulated strategy. As previously mentioned, expanded access to the internet is another significant challenge, with the digital divide reflecting a considerable challenge for the country´s competitiveness given that SMEs and microenterprises – which are the core of the country´s productivity – have lower access to ICT services (Deutsche Gesellschaft für Internationale Zusammenarbeit, 2013, p. 148).

Therefore, Nicaragua should accomplish certain prerequisites such as the preparation of government and private sector network infrastructure, secure mechanisms and laws and increased penetration of the internet. Additionally, development related to electronic banking, electronic tourism and agricultural marketS should continue as the Nicaraguan economy focuses on agriculture and tourism. Studies related to development indicate that eCommerce can help to increase economic values, with banking services on the internet facilitating the efficiency of national and international transactions and boosting commercial activities (China Railway Siyuan Survey and Design Group CO. LTD, p. 45).

3. Discussion of the Hypotheses

3.1. Entrepreneurial Characteristics

The adoption of eCommerce is believed to be influenced by certain entrepreneurial attributes. Among these relevant characteristics are: innovativeness, behavioral control, and knowledge.

According to Rogers (2003), innovativeness helps to understand the desire and main behavior in the innovation decision process and is defined as "the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than other members of a system" (Rogers, 2003, p. 22). Entrepreneurial innovativeness tends to determine eCommerce adoption because it relies on the principle that the higher the innovativeness the more likely the eCommerce adoption (Al-Qirim, 2007, p. 465). There is also a link between the innovativeness degree - depending upon macro-economic factors and micro-level factors such as access to credit - and the diffusion process (Miller & Garnsey, 2000, p. 453).

In previous models that seek to explain ICT innovation adoption, innovativeness was found to be part of the explanation related to managers attributes (Molla & Licker, 2005, p. 879). In the same direction due to the CEOs playing a main role in the organization, the introduction of ICT technologies were determined by their decisions, contrary to the organization that did not have this technology. It was found that less innovative managers were in charge (Al-Qirim, 2007, p. 467). Therefore, the hypothesis proposed is:

H1a. The manager innovativeness positively affects the adoption of business-to-consumer eCommerce in Nicaragua.

The manager behavioral control is about the belief of the presence or absence of requisite resources and opportunities. Therefore, it is said that the adoption of an innovation depends on individual perception that if the behavioral control is high, the tendency is to adopt eCommerce. The behavior control affects the intention to undertake a behavior and may influence behavior in situations where the users intend to undertake the behavior but are prevented from doing so. Perceived behavioral control relates to the extent to which the

person believes to have control over personal or external factors that may facilitate or constrain behavioral performance.

Venkatesh et al. (2003) find that perceived behavioral control is a significant predictor (Venkatesh et al., 2003, p. 453). Moreover, in other ICT adoption studies, it was found that for a succesful implementation it was necessary to find individuals under this project more or less under control. Failure is costly in personal and professional terms and high technology usually means high margin of failure and risk and the persons incharge necessarily should have perceived behavioral control to master this kind of task (Bartl, Füller, Mühlbacher, & Ernst, 2012, p. 5).

This leads to the following hypothesis:

H1b. The manager behavioral control positively affects the adoption of business-to-consumer eCommerce in Nicaragua.

Knowledge is the start of the innovation decision process, whereby once the managers answer all the questions about the innovation - what?, how?, why? - this allows well-informed managers to proceed towards the adoption of innovation through the required organizational changes (Lal, 1999, p. 676). Moreover, a lack of knowledge would affect the perceptions of the usefulness of eCommerce and thus inhibit the adoption of eCommerce. It is said that only an owner, who knows about the efforts to set up the technology and the performance that can achieve it and has precise knowledge about the technology will have an impact on its expected performance.

In previous studies the lack of knowledge about the ICT inhibit the managers to recognize the benefits and use of the technology (Ismail, Jeffery & Belle, 2011, p. 8). Additionally, it was a determined variable to differentiate adopters from non-adopters of eCommerce (Grandon & Pearson, 2004, p. 200).

This leads to the following hypothesis:

H1c . The manager's eCommerce knowledge positively affects the adoption of business-to-consumer eCommerce in Nicaragua.

3.2. Communication of Innovation

The Communication of Innovation is an aspect that has not been broadly studied on eCommerce adoption. However, there are a series of variables that are worthy to analyse and assumed that might affect the process of adoption.

The type of innovation decision can be made by an individual or collectively, whereby the individual decision is classified as optional or authoritarian. Optional decisions are independent of the other members of the system; however, there is some influence from norms and interpersonal communication although the unit of decision remains the individual. In the case of authoritarian decisions, a decision is made by members with power, status, and expertise, allowing a fast implementation in comparison to a collective decision in which many members of a system are involved, requiring time and consensus in the same manner as the optional decision which normally requires consultation. Therefore, authoritarian decisions are likely to involve a faster adoption rate of an innovation (Rogers, 2003, p. 29).

A previous study indicates the CEO´s main role on deciding to adopt ICT technologies was crucial according to his willigness and characteristics (Al-Qirim, 2007, p. 467). This leads to the following hypothesis:

H2a. The innovation decision approach positively affects the adoption rate of business-to consumer eCommerce in Nicaragua.

In terms of communication channels, there are two types that play a role in the innovation decision process, namely mass media and interpersonal. Mass media channels are important at the knowledge stage, while interpersonal channels hold relevance at the persuasion stage. For this reason, it is believed to positively influence on the adoption if interpersonal communication occurs at the persuasion stage due to using a communication channel that is inappropiate to a given stage being associated with later adoption (Rogers, 2003, p. 205).

The core of the importance of interpersonal communication on the adoption process is the notion that the diffusion of an innovation is a very social process that requires interpersonal communication relationships. Through this, it is possible to create change strong attitudes. For instance, due to certain homophily among the individuals that interact regarding beliefs, education, etc.

This supports the following hypothesis:

H2b.The interpersonal communication channel of eCommerce transmission positively affects the adoption of business-to-consumer eCommerce in Nicaragua.

According to Rogers (2003), a person is more likely to accept a technology when he shares similar attributes. Homophilous individuals facilitate more effective communication, thus enabling knowledge and changes of behavior through the similarities in beliefs, education, and social status as well as the free choice to interact (Rogers, 2003, p. 306). However, when it comes to the diffusion of an innovation, a certain degree of heterophily is needed due to the necessary exchange of information. Therefore, it is said that ideally homophily between individuals - except in knowledge - facilitates the adoption of an innovation.

The roots of these phenomena lie in strong or weak ties, whereby new ideas and innovation diffusion is likely to occur when individuals in the social system are exposed to more distant individuals. As Rogers states: *"When source and receiver are identical, no diffusion can occur*"(Clements,1980, p. 28*).* This leads us to the following hypothesis*:*

H2c. The high homophily degree in knowledge on communication networks negatively affects the adoption of business-to consumer eCommerce in Nicaragua.

A technology rate of adoption also might be influenced by its possibility to produce returns. On the communication perspective if this is the message spread about a technology like eCommerce its rate of diffusion is greater. Mansfield (1961) and Griliches (1957) support the influence of economic explanation message affecting the rate of adoption (Griliches, 1957, p. 519; Mansfield, 1961, p. 746). A message of expecting return is visible in a technology which use increase exponentially and is visible like eCommerce. Therefore, higher is the expected return over its adoption ("Issue Paper 2 ICT diffusion to the economy", 2011, p.2). This leads us to the following hypothesis:

H2d. The message on eCommerce in producing returns positively affects the adoption of business-to-consumer eCommerce in Nicaragua.

A presence of personal proximity in the information exchange it is believe to influence the adoption of an innovation, due to the likeliness and similarities between the members in the information exchange. The proximity could be on location, characteristics and so on, causing an imitation or improvement process among the members (Baptista, 2000, p.516). In eCommerce adoption this imitation or improvement process might occur with the existing of personal proximity between competitors, suppliers or customers to adopt eCommerce. This supports the following hypothesis:

H2e. The high degree of personal proximity networks in the information exchange about business-to-consumer eCommerce positively affects the adoption of business-to-consumer eCommerce.

3.3. Innovation Characteristics

Innovation Characteristics are among the variables which have been more broadly analysed in previous research on innovation diffusion, and they are consistently considered as determining factors influencing the adoption of technologies. Therefore, for their relative relevance, they are ranked by Rogers (2003) in his theoretical framework: relative advantage, observability, complexity, compatibility, and cost (Rogers, 2003, p. 222).

Relative advantage reflects technical, economic, and sociological factors. Rogers (2003) identifies economic profitability, low initial costs, reduced discomfort, saving time, and effort, etc.; as relevant factors (Rogers, 2003, p. 229). Some studies have found that relative advantage is significant in terms of discriminating adopters from non-adopters for technologies such as email, online data access, Internet access, and EDI (Grandon & Pearson, 2004, p. 199). Iacovou et al. (1995) also found that the benefits perceived differ between non-adopters and adopters (Iacovou et al., 1995, p. 468).

Zhu & Kraemer (2005) state that eCommerce facilitates the strong efficiency of internal processes, customer service, and improved relationships with trading partners (Zhu & Kraemer, 2005, p. 67). Clayton and Goodridge (2004) found that companies with eBusiness have higher productivity (Clayton & Goodridge, 2004, p. 53), whereby employees realize the relative advantage of the new technologies, which facilitates the implementation, and thus it is believed that the relative advantage is perceived as positively affecting the adoption (Al-Somali, 2011, p. 164). This leads us to the following hypothesis:

H3a.The perceived relative advantage of business-to-consumer eCommerce positively affects its adoption in Nicaragua.

The compatibility attribute that an innovation should have relies on a compatible innovation reducing the uncertainty and increasing the rate of adoption (Sahin, 2006, p. 18). This

uncertainty is reduced due to a consistency with the values, past experiences, and needs among the adopters concerning the technology; for example, if the technical aspects and procedures are compatible with the organizations, firms are more likely to adopt. In the opposite direction, a lack of compatibility may create organizational resistance and strengthen inhibitors for the adoption.

In previous findings on eCommerce adoption, compatibility emerged as significant factor, confirming that the compatibility of eCommerce and a firm´s culture, value and practices are highly important for the rate of adoption (Grandon & Pearson, 2004, p. 209).

The following hypothesis is formulated:

H3b. The perceived compatibility of business-to-consumer eCommerce positively affects its adoption in Nicaragua.

About complexity, Moital (2006) expressed: "It appears that the more experienced the individuals, the lower the perceived complexity. The adoption of Innovations Theory (Rogers, 2003) provides a possible explanation for this relationship. According to the theory, experience is one of the main sources of learning and greater experience with using an innovation is expected to lead to greater knowledge about that innovation. If an individual has greater knowledge about using an innovation, he/she is likely to regard its use as less complex as the person knows what to do to make the innovation perform in the desired way" (Moital, 2006, p. 396).

The complexity of an innovation depends on how difficult it is to understand and use: If the perception of an innovation is that it is complex to use and understand, more difficulties will emerge regarding its adoption. An innovation perception is facilitated by media information, expert opinion, and peers, whereby such knowledge reduces uncertainty.

In a manner that an innovation such as eCommerce is integrated into the organization or users, the degree of complexity is reduced. By contrast, when the innovation is not well known and used, this has a negative influence (Hallal, 2009, p. 87). Therefore, in terms of eCommerce, the complexity is understood as the ease of use or learning of eCommerce. Several previous studies on information technology adoption have found complexity as a key factor for adoption and specially for adapting and using ICT in developing countries (Fathian et al., 2008, p. 579).

This will leads us to the following hypothesis:

H3c. The perceived complexity of business-to-consumer eCommerce negatively affects its adoption in Nicaragua.

The visibility or observability of the innovation facilitates awareness, which encourages its adoption. For eCommerce, a major use of computer and the Internet as well as sharing information between peers will represent more visibility of eCommerce, thus positively affecting its adoption. The observability allows more knowledge and confidence in technology, being aware of the advantages or even the disadvantages.

In previous studies, observability positively demostrated to influence the decision of eCommerce adoption (Hallal, 2009, p. 295). Therefore, it is estimated to be an important predictor, and the following hypothesis is formulated:

H3d. The perceived observability of business-to-consumer eCommerce positively affects its adoption in Nicaragua.

Any ICT implementation is normally costly, whereby only large companies can afford and have the appropiate knowledge for the most adequate technology adquisition and implementation. Therefore, it is said that the availability of a special budget positively affects the adoption of eCommerce. Normally small companies do not have the budget and invest in unnecesary solutions on the spot in the market. The costs might include connectivity, software, license fees, training, etc. In developing countries, connectivity costs remain a challenge as the know-how of more effective IT solution for organization. This is seen as one strategic and technological barrier (Modimogale, 2008, p. 25).

The following hypothesis was formulated:

H3e.The lack of financial budgets to invest in business-to-consumer eCommerce negatively affects its adoption in Nicaragua.

3.4. Socioeconomic Context

In developing countries such as Nicaragua, which has a small market, the small economic scale impedes the adoption of eCommerce through a lack of purchasing power, low connectivity, lack of credit cards, and a series of limitations affecting the consumer market. However, previous studies in Nicaragua have demostrated that the market eReadiness is a

facilitator for eCommerce adoption (Medina, 2008, p. 3); even though, it has the lowest GDP per capita in Central America (Banco Mundial, 2017), the purchasing power is limited, and a market is not in good conditions given the lack of capacity of purchasing power.

This leads us to formulate the following hypothesis:

H4a. The market eReadiness positively affects business-to-consumer eCommerce adoption in Nicaragua.

In Nicaragua, as in most Central American countries, the lack of good transport infrastructure is evident, representing an important impediment for the private sector as an incentive to invest in technology, whereby having an effective distribution system allows companies to deliver the products to customers. By contrast, not having such a system limits companies' logistic facilities. Nicaragua lags behind in terms of transport infrastructure, including the quantity and quality of roads, bridges, airports, etc.

Nicaragua is the country with the lowest density of paved roads in Central America, while there are a lack of ports in the Caribbean region as well as only one airport in Nicaragua handling International flights among other infraestructural issues (Acevedo, 2007).

The hypothesis formulated in this matter state as follow:

H4b. Shortcomings in the transport infrastructure negatively affect the adoption of business-to-consumer eCommerce in Nicaragua.

eCommerce strongly depends on an efficient logistic infraestructure, given that without an effective logistics service a succesful transaction cannot occur, which impedes eCommerce development. Therefore, in terms of key components for developing eCommerce the distribution and delivery systems are fundamental. Like the majority of countries in the region, Nicaragua has a lack of logistic services with few companies operating across the country and high costs, which limit the support eCommerce.

Therefore, the hypothesis formulated is:

H4c. The logistic services negatively affect the adoption of business-to-consumer eCommerce in Nicaragua.

Most of the banking sectors in developing countries lack a reliable or efficient system for eCommerce. It is believed that having proper financial institutions that facilitate making payments over the Internet with credit, debit, or smart cards is crucial for eCommerce. Eventhough the financial sectors are leaders in technology implementation, they are still

limited Nicaragua is also one of the countries with the lowest credit card penetration and online purchasing rates in the region (Visa, 2010, p. 3).

The hypothesis formulated states:

H4d. The financial institutions'eReadiness negatively affect the adoption of business-to-consumer eCommerce in Nicaragua.

The telecommunication infrastructure is considered fundamental for eCommerce adoption due to the required pre-existing infrastructure for eCommerce, including the presence of telephone lines, computers, bandwidth, electricity, etc. Without such facilities, users, consumers, and organizations cannot participate in eCommerce.

Another aspect that affects telecommunication is how open and competitive telecommunication markets are. In Nicaragua, previous studies on ICT ascertained that Nicaragua lags behind in matters of ICT diffusion in respect to the rest of Central America (World Economic Forum, 2016). For this reason the following hypothesis was formulated:

H4e. The telecommunication eReadiness negatively affects the adoption of business-to-consumer eCommerce in Nicaragua.

The legal framework allows promoting safe transactions. If the legal framework is weak, consumers and organizations feel unprotected in case of online fraud, which limits reputation building for business and prompts a lack of security and privacy. Indeed, this is the situation in most developing countries like Nicaragua, where a proper legal framework to protect online transactions does not exist.While some steps have been taken, more regulation is required to promote safety online. For example, the Law of Electronic Signature and Data Protection Law exists, which recognize the efficacy and legal value of electronic signatures. However, in Nicaragua a lack of a national strategy still exists concerning ICT adoption, which represents a major legal limitation (Deutsche Gesellschaft für Internationale Zusammenarbeit, 2013, p. 154).

The corresponding hypothesis is the following:

H4f. The legal framework negatively *affects the adoption of business-to-consumer eCommerce in Nicaragua.*

The lack of a proper involvement of the government is believed to delay the adoption of the technology; for example, the lack of promotion through subsidies and incentives, the lack of regulation, and policy framework impede protection for consumers, educational programs,

and the overall development of eCommerce (Mangiaracina et al., 2012, p. 326). For commerce in general, the government is realizing the urge to improve the logistic infrastructure and invest in this among other infrastructures. Moreover, in recent years, it has introduced a series of laws requiring approval for electronic transactions.

The hypothesis is as follows:

H4g. Poor government commitment negatively affects the adoption of business-to-consumer eCommerce in Nicaragua.

4. Research Design

4.1. Research Methodology

This section contains a description of the methodology used in this study. Considering the nature of the research question, the most closely appropriate methodology was selected. In this case, a quantitative approach was more indicated due to the main research question focusing on the relationship between B2C eCommerce adoption and entrepreneurial, technological, communication, and contextual factors, whereby this approach allows finding the existent causality and describing the situation of this technology adoption in this context. To the best of my knowledge, this set of factors has not previously been tested, whereby the study aims to fill the gap through this approach. Moreover, within the quantitative approach, more specifically a confirmatory research design is used to confirm the theoretical hypotheses based upon Rogers' (2003) contribution in the context of Nicaragua providing a more extensive statistical analysis. Additionally, descriptive statistics are applied to provide an initial analysis of this phenomenon.

To accomplish the aim of describing by measurable properties, a positivism paradigm is followed. Orlikowski and Baroudi (2002) affirm that research is positivist when there are "formal propositions, quantifiable measures of variables, hypothesis testing, and inferences about a phenomenon from the sample of a population" (Orlikowski & Baroudi, 2002, p. 5). Additionally, the positivism paradigm was considered appropriate due to the maturity of technology adoption theories, and the clear definition of dependent and independent variables that enable using and adapting the study to different technologies (Al-Somali, 2011, p. 93).

Research literature indicates that there are different possible approaches to research depending on the proposed aims and objectives of the study. Among the categories are exploratory, descriptive, analytical, or predictive approaches (Hamed, 2009, p. 112).

In the present study, the approach to be conducted is a descriptive research design. The justification for the use of this approach coincides with the list suggested by Shiu, Hair, Bush & Ortinau (2009) related to the descriptive research approach: "(1) the nature of the initial decision problem selected, (2) the set of research questions, and (3) the research objectives" (Shiu, Hair, Bush & Ortinau, 2009, p. 225). The nature of the problem requires describing B2C eCommerce adoption ascertaining whether determined factors related to the entrepreneur, communication, characteristics of the technology and context influence the adoption of this technology. To find this casuality, which appears to exist according to Rogers´ theoretical assumptions, a set of objectives and questions are engaged, leading to quantifying the adopters and non-adopters to discover the influence of the factors assumed.

The descriptive approach allows obtaining the data through two options, namely asking questions or through observation. The option selected for this study is asking questions. This approach is used as the intention is to make inferences about the target population, which is possible through asking questions to a large sample size (Shiu et al., 2009, p. 226). Another determining reason is the possibility to derive opinions or attitudes from the sample; in this case the perceptions of managers/owners (Hamed, 2009, p. 123). Shiu et al. (2009) affirm that this approach also offers the possibility to analyze the data in different ways, given the option to derive patterns and trends in the data and make comparisons with the common data gathered (Shiu et al., 2009, p. 226).

However, an awareness about the possible disadvantages or problems with this approach should be stated here. The first disadvantage is presented during the initial stage of the survey design with the construct development, scale measurement, and questionnaire designs (Shiu et al., 2009, p. 227). Bradburn, Sudman & Wansik (2004) suggest that one way to avoid this issue is to have as a reference previous instruments used in this case as this justifies the use of questions that try to obtain similar data as in past studies. Accordingly, this facilitates a comparison with other studies, reducing the testing process and providing validated scales (Bradburn, Sudman & Wansik, 2004, p. 23).

The second disadvantage is that the type of questions mostly used in questionnaires impedes more detailed information about the research problem, and a complementary approach should

be adapted, such as interviews, although this can be solved by delimitating the aim of the study regarding the data to be gathered (Shiu et al., 2009, p. 228). The third disadvantage is the lack of control over the timeline, whereby authors such as Adams et al. (2014) affirm that the response rate is usually poor (Adams et al., 2014, p. 119).

Indeed, this is one of the main concerns in this study due to the limitation of time for gathering the data and the characteristics of the population to be studied, whereby managers are difficult to approach and usually not oriented to participating in surveys, especially regarding such a novel subject. However, there is the awareness of major efforts to be engaged as more follow-ups, and the use of networking to try to gain an improved response rate. A fourth disadvantage concerning the seriousness of the answers is that it is difficult to determine the researcher's trust (Shiu et al., 2009, p. 228). For this purpose, it is planned to give the respondents privacy although the presence of the interviewer does not assure that errors do not occur, nor misinterpretation in the administration or through registering the answers by the interviewer. The final disadvantage according to Shiu et al., (2009) is related to the statistical techniques, which might produce a certain level of subjectivity during the interpretation of data, and thus somewhat affect the reliability and applicability of the research (Shiu et al., 2009, p. 228).

Having justified using this approach and the possible disadvantages, it is now required to conceptualize what a survey is. Through the literature, there are a series of definitions of surveys; for instance, Scheuren (2004) affirms that "the word survey is used most often to describe a method of gathering information from a sample of individuals" (Scheuren, 2004, p. 9). Other terms include systematic or organized and quantitative. Therefore, a survey can be defined as a research strategy in which quantitative information is systematically collected from a large sample taken from a population (De Leeuw, Hox, & Dillman, 2008, p. 2).

To collect data through a survey, the instrument is a self-reporting data collection instrument that the participants in a study must fill out. According to Johnson and Christensen (2004), the aim is to gather information about the perceptions and behavioral intentions of participants (Johnson & Christensen, 2004, p. 170). Collis and Hussey (2003) recommend that the questionnaire must be a list of structured questions selected after a pilot testing from chosen sample of the target population (Hamed, 2009, p. 134).

Adams et. al. (2014) recommend that the questionnaire is tested on the target population, to find out if any difficulty exist with the questions (Adams et. al., 2014, p. 128).

There exist different categories of questionnaires and in this particular case, the option selected was a self-administered paper questionnaire, which allows controlling and being assured that the respondent is the target one, and that they should answer entirely without the presence of the interviewer. Concerning the composition of the questionnaire, the type of question can be open or closed. Those selected in the present study are closed, and thus in this case the category of answers must be presented explicitly placing options beforehand. The selection of closed questions is easier and quicker to answer and facilitate the quantification, asking more questions in a determined length of time and using scales in comparison to open questions in interviews.

Saris & Gallhofer (2007) suggest that when it comes to the design of survey, a series of decisions should be taken into consideration in terms of their operationalization: first concerning the choice of topic, the type of research problem, and the approach (Saris & Gallhofer, 2007, p. 4).

The topic selected and its problematization, which compromise determining the casuality between choses possible factors that had not been analyzed in an integrated manner related to B2C eCommerce in Nicaragua with Roger´s (2003) suggested framework for innovation rate of adoption in conjunction with contextual factors justify the use of descriptive approach in the present study.

The second decision concerning the design of a survey is related to the selection of variables (Saris & Gallhofer, 2007, p. 4). In the case of B2C eCommerce adoption in Nicaragua, the assumption is that it is not a uni-dimensional phenomena, and several variables might affect the adoption including the entrepreneurial characteristics, communication issues, innovation characteristics, and context.

Accordingly, it was necessary to develop an inventory of possible principal causes and establish the relationship between the dependent variable (B2C eCommerce rate of adoption) and independent variables related to the entrepreneurial characteristics, communication, innovation characteristics, and context.

The initial establishment featured the dependent variable (B2C eCommerce rate of adoption), the independent variables innovation characteristics, communication of the innovation, and the entrepreneurial characteristics based upon Rogers' (2003) Diffusion of Innovation Theory. Rogers affirmed that only the perceived attributes of innovation have been broadly investigated (Rogers, 2003, p. 222), although from my knowledge not the rest of the variables.

Additionally, Lee and Cheung (2004) affirm that Rogers' model excludes the influence of environmental factors (Lee & Cheung, 2004, p. 386). In the present study, some relevant factors in the context of Nicaragua have been included.

This is essentially the first relationship setup on this study between the B2C eCommerce rate of adoption and its aforementioned possible causes. To corroborate, a literature research on information system adoption was carried out to find the existence of studies among eCommerce adoption and the main causes correlated to the adoption, which also allow providing content validation using construct operationalized in previous studies and adapted to the present study.

Once the relationship between the dependent and independent variables has been determined, each of the independent variables will be discussed according to the findings, separating the discussion by the group to which they belong.

Limthongchai and Speece (1999) found that concerning the characteristics of the innovation, relative advantage, compatibility, trialability, and observability were all positively correlated with adoption rate of eCommerce, which means that this tends to indicate a higher adoption rate. However, complexity was negatively correlated with adoption rate, which can be understood as the higher the complexity of an innovation resulting in its lower adoption (Limthongchai and Speece, 1999, p. 1582). Al-Qirim (2007) found that relative advantages of certain eCommerce technologies positively influence the adoption (Al-Qirim, 2007, p. 462).

In the same line, Malekpour & Norouzi (2013) encounter that relative advantages and compatibility positively influence businesses to adopt this innovation, which is consistent with prior IT innovation adoption (Malekpour & Norouzi, 2013, p. 161).

Luen Teo, Chan & Parker (2004) also identify eCommerce adoption's motivating and inhibiting factors beside relative advantage, compatibility, complexity, and other factors that might affect eCommerce adoption, including knowledge and expertise about eCommerce as well as management attitudes towards eCommerce (Luen Teo, Chan & Parker, 2004, p. 1).

One factor that has not been extensively researched from this group is the purchasing cost. This is understood as the total cost for an organization to purchase IT technologies (Mukherji et al., 2006, p. 1687). Among the innovation characteristics suggested by Rogers (2003), the cost of the technologies was neglected as an elementary part of the innovation characteristics that might be relevant in the context of developing countries where the lack of capital is an

important determinant for the adoption or non-adoption. Prior to the complexity or relative advantages and subsequent characteristics, purchasing costs can be assumed as the major reason inhibiting the adoption in some cases, especially for small and medium enterprises.Weber and Kauffman (2011) affirmed that for this technology to diffuse uniformly across countries, a progressive reduction in adoption costs is required, mainly based upon the purchasing cost in developing countries (Weber & Kauffman, 2011, p. 692).

The selection of the present characteristics has two main reasons: First, the lack of studies including most of the characteristics proposed by Rogers (2003) in the adoption of one technology such as B2C eCommerce; and second, as has been concluded in a previous study (Malekpour & Norouzi, 2013), the diffusion theory suggests that a company's adoption might be influenced by five innovation characteristics, namely relative advantage, compatibility, complexity, observability, and trialability (Malekpour & Norouzi, 2013, p. 163).

The literature review on adoption indicates relative advantages and compatibility being found as significant factors that influence a company's adoption. However, considering the context of the study in a developing country where the access to ICT technologies remains incipient, this also influences the knowledge acquisition and experience, which might also be relevant to include the observability and complexity factors. Additionally, in a low-income country such as Nicaragua, the purchasing cost is also considered to severely affect the adoption of eCommerce.

Moreover, contradictory results concerning whether a factor affects the adoption of eCommerce in different contexts led to the necessity to analyze a series of factors in a specific context to ascertain whether they affect adoption in the same way in this context.

Concerning the communication variables exposed by Rogers (2003), the factors affecting the rate of adoption of any innovation had not been broadly explored. It is said that adoption is the final stage of a communication process; therefore, it is important to realize how this communication occurs, what factors affect it, the way in which decisions are taken, the experience of the decision-makers, and characteristics among others when considering eCommerce as a complex technology. As previously affirmed, the lack of experience and knowledge concerning IT technologies among managers in developing countries as well as the mechanisms that affect the speed of adoption according to the type of decision involved, are not well known.

Therefore, it is necessary to include in the analysis the role that the type of decisions plays. It is assumed that collective and authority decisions are more common than optional decisions in organizations (Rogers, 2003, p. 29). Moreover, the adoption also depends on the innovativeness of the authority.

Another communication factor that is included in the analysis is the communication channel. According to Michakalakelis, Varoutas, Sphicopoulos (2008), Mahajan, Muller and Bass (1990), the communication channel represents "crucial elements" such as "the initial critical mass" of adopters (Michakalakelis, Varoutas & Sphicopoulos, 2008, p. 240). The communication channels, namely the means by which information about an innovation is transmitted, can be mass media or interpersonal communications. It is considered that for the adoption of eCommerce interpersonal channels are more effective in persuading the adoption rather than the awareness that might create the diffusion through mass media channels (Zhou, Dai, & Zhang, 2007, p. 57).

In the spread of information, the homophily and heterophily aspects of communication have not been broadly explored within an ICT context. For the diffusion of complex technologies such as eCommerce, it is important to realize whether this factor affects the adoption through a higher degree of homophily or heterophily.

An additional factor included within the communication aspect is determined as "the message of expecting return," beeing referred to by Griliches (1957) in the agricultural field where there is proof of a correlation between the efficiency of a new technology in producing returns and the rate of acceptance (Griliches, 1957, p. 516). It is not known whether the same situation occurs with eCommerce.

Moreover, it is believed that highly personal proximity is required for the adoption due to the notion that the stronger the tie, the more potential for influencing the potential adopters. This phenomenon should be analyzed in the context of eCommerce. Rogers (1976) previously investigated this phenomena in family planning although in the field of ICT there is no particular reference - to my knowledge - about B2C eCommerce due to this, and its importance for the effect on communication and behavioral changes (Rogers & Kincaid, 1981, p. 132).

In terms of entrepreneurial aspects, it was decided to include three facets: innovativeness, behavioral control, and knowledge. According to previous eCommerce communications and

applications technologies research in developed countries, a CEO's innovation appears to be a determinant factor in terms of the adoption.

This importance might be explained by Agarwal and Karahanna, exposed on cognitive absorption, which is determined by the personal innovation, withouth which it is not possible to associate the benefits of this technology and its approach. Additionally, Rogers (2003) stated that innovation is crucial for understanding main behavior in the innovation decision process, and it also helps to relate whether there is any relationship with the context conditions, adopter variables, and communication behaviors of earlier and later adopters.

A different factor that has not been investigated embedding B2C eCommerce technologies is "behavioural control," which, besides cognition factors, significantly predicts managers' intentions to implement ICT (Bartl et al., 2012, p. 1). According to Ajzen (1991), identifying the obstacles of human behaviors introduced the Theory of Planned Behavior (TPB) based upon the Theory of Reasoned Action. There are different findings against and in favor of the correlation between perceived behavioral control and adoption intentions. Pavlou and Fygenson's (2006) research on Internet users purchasing online found that perceived behavioral control explains a significant portion of the variance in adoption intentions (Pavlou & Fygenson, 2006, p. 117). Chang (1998) also found an outstanding predictor of intention and with the same argument as Venkatesh et al. (2003), albeit in some relationships. However, Nasco et al.(2008) do not find this relationship in the case of adoption of eCommerce by managers in Chile (Nasco, Toledo, Mykytyn, 2008, p. 703).

Considering Nicaragua as a developing country with a poorly educated population regarding technological knowledge, it is assumed that this might affect the effective usage of eCommerce. It is proven that a high level of education is critical for IT adoption. The importance lies in whether employees and managers have knowledge or IT skills as this increases the possibilities of ICT use in an organization. According to MacGregor et al. (1996), Cragg and King (1993) agree that the lack of IT knowledge creates pitfalls for companies' adoption, especially among SMEs (Shah Alam & Mohammad Noor, 2009, p. 115).

On the socioeconomic side, the market eReadiness factor is included, considering that Nicaragua's market presents several limitations in terms of connectivity and low per capita incomes among others. This surely might affect the readiness of the market to push organizations to integrate eCommerce to satisfy its needs. The interesting phenomena to

explore concerning market ereadiness is assuming that even though the conditions in Nicaragua are not optimal, some businesses might have a different approach and decide to adopt through innovative business models that can adjust to such an environment, while others might wait and carefully assess the situation.

eCommerce requires certain prerequisites of physical infrastructure. For this purpose, it is acknowledged that in Nicaragua this is a major challenge to ascertain the existence of the minimal infrastructure capacities, and whether there is sufficient reliability and efficiency to support eCommerce (Lawrence & Tar, 2010, p. 24).

Lawrence and Tar (2010) affirmed that inefficient delivery systems and transport are obstacles for eCommerce, whereby these represent incentives for the private sector to invest in new technology given that although they can invest in technology, difficulties of delivering the product might represent a barrier to adoption (Lawrence & Tar, 2010, p. 32). Through the analysis of several factors, the same author indicated that logistics was the strongest factor for the implementation of eCommerce. Kshetri (2007) found that in small developing countries such as in the Caribbean, logistics challenges are an important barrier to eCommerce adoption, whereby this finding also might be expected in Nicaragua, which shows some similarities with the Caribbean nations. It is demonstrated in developed countries such as the U.S. that the rapid growth of eCommerce is based upon counting on infrastructure and delivery systems (Kshetri, 2007, p. 444).

The speed of new paradigms such as eCommerce will depend on the readiness of social capabilities as financial institutions (Castellaci, 2012, p. 1152).

Traditionally, financial institutions and multinationals are the early adopters and largest investors in eCommerce worldwide, thus appearing as indicators of the eCommerce stage at the national level, (Rohm, Kashyap, Brashear & Milne, 2004, p. 373). Moreover, it is important to measure the eReadiness of financial institutions in Nicaragua given that the diffusion of ICT keeps increasing, and it is important to evaluate the capability of these institutions to support eCommerce in general.

Another supporting industry that is elementary to investigate is telecommunication infrastructure, given that without the basic presence of telecommunication infrastructure and Internet access, B2C eCommerce presence and development is not possible. There is evidence that the availability of telecommunication infrastructure is a driver for eCommerce adoption (Mangiaracina et al., 2012, p. 325).

It has been demonstrated that institutional change in Latin America has been a driver of eCommerce growth. In countries such as Mexico and Brazil, they have developed legal frameworks for eCommerce transactions as well as policies and incentives increasing the Internet use and trust (Rohm, Kashyap, Brashear & Milne, 2004, p. 376). In Nicaragua, it is assumed that they are still challenging the rule of law as in other developing countries. It is shown that when buyers and sellers have a higher degree of trust whereby they can have legal recourses to protect their rights, this helps to promote the diffusion of online transactions (Mangiaracina et al., 2012, p. 326, Rohm et al., 2004, p. 376).

Among the contextual factors that affect eCommerce adoption, government role had been proven as one of the main important attributes that firms need to recognize in terms of inhibiting the adoption (Molla & Licker, 2005, p. 891). Lawrence and Tar (2010) agree that besides infrastructure and economic aspects, the lack of government strategies is a significant obstacle for the adoption of eCommerce (Lawrence & Tar, 2010, p. 23). In the case of Nicaragua, even though some steps have been taken in this area, it is presumed that a major obstacle for firms when it comes to adopting eCommerce is for customers to trust in online transactions.

The previous argumentation of the factor selection was made by reviewing literature concerning eCommerce adoption in developing countries and diffusion theory, constituting an exploratory phase as a guidance for the phenomena explanation and the construction of concepts and assumptions. The search was focused on journal articles and books on the Internet, computerized databases, and country and regional reports such as from the World Bank, the Ministry of Commerce of Nicaragua, and the United Nations. This exploratory phase aimed to support the articulation of the hypotheses as well as development of the survey questionnaires, identifying the main factors and their relation to B2C eCommerce adoption in Nicaragua.

4.2. Operationalization

Having determined the selection of variables, the next procedure involved determining the structure of the questionnaire and explaining in measurement terms the activity, namely establishing a definition of the variables and their scale and type in the process known as operationalization (Al-Somali, 2011, p. 224). The constructions were created based upon the literature review on information technology adoption, eCommerce adoption, enterprise

studies, and regulation in Nicaragua which define the construct and its correlation with the phenomena.

The first part of the questionnaire contains eleven descriptive items to characterize the managers/owners and companies/organizations on issues that might somehow affect eCommerce adoption in Nicaragua. Through the literature about IT adoption, it is mentioned how some factors related to the education level of the managers and employees affect the speed and willingness to adopt. It is affirmed that some descriptors such as education background, industry, and firm size are important predictors of eCommerce adoption as the more educated the employees are in an organization and the larger they are in size, the more they are oriented to adopt eCommerce. Moreover, some industries tend to be more IT-skilled, such as financial, retail, and accommodation industries (Crespi et al., 2004, p. 8; Lal, 1999, p. 676).

Additionally, export orientation, time in the market, type of clients, and revenue issues are also included. Most of the constructs use multi-item scales borrowed from previous research.

The table below shows the construct measures - scale and sources:

Table 8: Construct Measures

Construct	Managers' highest level of education achieved
Measures	Highest level of education achieved:
Scale/Response	1.Elementary School 2.Secondary School 3.Undergraduate 4.Postgraduate
Sources	Molla & Licker (2005) Tan et al. (2007)

Construct	Business sector
Measures	In which area does your company operate?
Scale/Response	1. Agriculture, cattle industry, forestry and hunting 2. Fishing, 3. Mining and quarrying, 4. Manufacturing, 5. Free trade zone, 6. Electricity, gas, steam, and air conditioning supply, 7.Water supply; sewerage, waste management and remediation activities, 8. Construction, 9. Wholesale and retail trade; repair of motor vehicles and motorcycles, 10. Transportation and storage, 11. Accommodation and food service activities, 12. Information and communication, 13. Financial and insurance activities, 14. Real estate activities, 15. Professional, scientific and technical activities, 16. Administrative and support service activities, 17. Public administration and defense; compulsory social security, 18. Education, 19. Human health and social work activities, 20. Arts, entertainment and recreation, 21. Other service activities, 22. Activities of households as employers; undifferentiated goods-and service-producing activities of households for own use, 23. Activities of extra-territorial organizations and bodies.
Sources	Department of Economic and Social Affairs United Nations (2008)

Construct	Type of product and/or services
Measures	What type of products and/or services does your company offer?
Scale/Response	Open question
Sources	Romer (1990)

Construct	Number of employees
Measures	How many employees does your company have?
Scale/Response	1. 1-5 2. 6-30 3. 31-100 4. More than 100
Sources:	Reglamento de Ley de Promoción y Fomento de las Micro, Pequeñas y Medianas Empresas (Ley MIPYME) Geroski (2000) Lal (1999) Crespi et al. (2004) Scherer (1992) Tan et al. (2007)

Construct	Average level of education of employees
Measures	What is the average education level of the employees?
Scale/Response	1. Primary 2. Secondary 3. Undergraduate 4. Postgraduate
Sources	Tan et al. (2007) Luen et al. (2004)

Construct	Time in the market
Measures	Since when is your company active in this area?
Scale/Response	1. Less than 2 years 2. 2-10 years 3. 11-20 years 4. Over 20 years
Sources	Crespi et al. (2004)

Construct	Export orientation
Measures	Does your company export goods and/or services?
Scale/Response	Yes No
Sources	Romer (1990), Geroski (2000), Silverberg (1991), Miller & Garnsey, (2000), Mansfield (1961)

Construct	Specialized employees
Measures	In my view, hiring employees specialized in there area is:
Scale/Response	Unimportant, very little importance, slightly important, More or less important, Important,Very Important, Totally important
Sources	Lal (1999) Scherer (1992)

Construct	Sales revenue
Measures	Does your company generate sales revenue by national and/or international sales of products and/or services online?
Scale/Response	Yes No Not applicable
Sources	World Bank enterprise survey Nicaragua 2009/ sales section

Construct	Percentage of total revenue
Measures	If your answer was "yes" to the previous question, could you please indicate the approximate percentage of total revenue by products and/or services for sale online in the last fiscal year?
Scale/Response	10%, 11-25%, 26-50%, 51-75%, 76-90%, 76-90%, > 90%
Sources	World Bank enterprise survey Nicaragua 2009/ sales section

Construct	Annual investment on online presence
Measures	Approximately what percentage of annual investment the company invests in its online presence? (e.g. Internet, email services, online catalogue, payment, online service, human resources, etc.)
Scale/Response	10%, 11-25%, 26-50%, 51-75%, 76-90%, > 90%
Sources	Gsell (2009)

Construct	Customers
Measures	Who are your customers?
Scale/Response	1. Other companies or organizations 2. Individuals 3. Both
Sources	World Bank enterprise survey Nicaragua 2009/ sales section

The second part of the questionnaire evaluates the perception of the population of interest (managers and/or owners of small, medium, large companies, and organizations of Nicaragua) about B2C eCommerce adoption possible facilitators and inhibitors. In his Diffusion of Innovation Theory, Rogers (2003) determines a number of factors that might influence the diffusion of any innovation, including the entrepreneurial characteristics, the communication of the innovation, and the characteristics of the innovation, which is the theoretical framework used from the present constructs. Moreover, it is assumed that besides these factors in developing countries, contextual factors should also be included as undertaken in this research.

The present study hypothesized that seven independent variables might have a direct effect on B2C eCommerce adoption in Nicaragua related to the context: “market eReadiness”, “transport infraestructure”, “transport logistic infrastructure”, “financial institution eReadiness”, “telecommunication eReadiness”, “legal environment”, and “government commitment”.

Of the entrepreneurial variables, those assumed to influence B2C eCommerce adoption are “innovativeness”, “behavioral control”, and “ knowledge”. The adoption of eCommerce might also be influenced by communication, whereby Rogers (2003) proposed determined factors that might affect, such as “innovation decision”, “interpersonal communication channel”, “homophily degree in communication”, “the message on eCommerce in producing return” and “personal proximity network in the information exchange”. Moreover, regarding innovation, assumed characteristics include “relative advantage”, “compatibility”, “complexity”, “observability”, and “purchasing cost”.

The items related to “market eReadiness”, “government commitment”, “telecommunication readiness”, and “legal environment” were adapted from Molla and Licker (2005), while the “innovation decision” items were adapted from Grandon and Mykytyn (2004) (Grandon & Mykytyn, 2004, p. 53; Molla & Licker, 2005, p. 882). The rest of the items were elaborated using theoretical concepts by Rogers (2003) and previous studies on the adoption of IT technologies. According to Bradburn, Sudman, & Wanski (2004), the use of previous instruments is recommended to shortcut the testing process due to the items that have previously been validated (Bradburn et al., 2004, p. 23). All items are measured on a seven-point Likert Scale from between “completely agree” and “not applicable”. Below are the construct with the description:

Table 9 : *Construct of eCommerce adoption in Nicaragua*

Construct			***Measures***	***References***	***Influence positive or negative***
Item ID	***Variables***	***Description***	***Proposition***		
H1E	*Hypothesis 1* *The Entrepreneurial*				
H1E1	*Innovativeness*	Indicates how quickly someone is perceived to adopt eCommerce innovations compared to others in	I consider implementing new technologies before my competitors.	Al-Qirim, (2007)	Positive

		their social system; the interest in having a new product, service and the willingness to risk to obtain them.			
H1E2	*Behavioral control*	Reflects an individual´s belief about the presence or absence of requisite resource and opportunities and the individual´s assessment of his or her personal capability to perform the desired behavior.	I believe that I have sufficient management capacity in terms of business-to-consumer eCommerce.	Nasco et al. (2008) Bartl et al. (2012) Pavlou & Fygenson (2006)	Positive

H1E3	*eCommerce* *Knowledge*	Represents the individual understanding of how eCommerce operates.	I believe that my knowledge of business-to-consumer eCommerce is sufficient.	Lal (1999) Anckar (2003)	Positive
H2Co	*Hypothesis 2* *Communication of the innovation*				
¿ H2Co1	*Innovation decision*	Refers to the persons involved in an innovation decision adoption.	I have the responsibility to decide on the adoption of innovations like business-to-consumer eCommerce in the	Rogers (2003)	

			company For me, it is necessary to consult on the adoption of innovations like business-to-consumer eCommerce with: Shareholders Board General Manager Sales Department Department of Computer Administrative Staff Other functional areas such as Finance Distribution, Export, etc.		Positive

H2Co2	*Interpersonal communication channel of eCommerce transmission*	Refers to the reliable means by which information about a complex innovation is transmitted to or within the social system.	I trust the information on business-to-consumer eCommerce to spread from person to person.	Michalakelis et al. (2008) Rogers (2003)	Positive
H2Co3	*Homophily in knowledge in communication network*	The degree to which a pair of individuals who communicate are similar in knowledge.	For me, a person is likely to receive information about business-to-consumer eCommerce through a person with the same level of knowledge about eCommerce.	Geroski (2000) Rogers (2003)	Negative

H2Co4	*Message of B2C eCommerce in producing returns*	The perception of receiving the message of the high capacity of B2C eCommerce to produce returns.	I think I get the message of the high capacity of business-to-consumer eCommerce to generate economic benefits.	Miller & Garnsey (2000) Mansfield (1961) Griliches (1957)	Positive
H2Co5	*Personal proximity network in the information nexchange about B2C eCommerce*	The existence of a high proximity in personal network in the information exchange about B2C	For me, it is probable to exchange information on business-to-consumer eCommerce mainly with	Rogers (2003)	Positive

		eCommerce.	people who are close to me.		

Construct			***Measures***	***References***	***Influence positive or negative***
Item ID	***Variables***	***Description***			
H3Ch	*Hypothesis 4* *Business-to-Consumer eCommerce Characteristics*				

H3Ch1	*Relative Advantage of B2C eCommerce*	Represents the degree to which an innovation is perceived as being better than the idea it supersedes.	I believe that I perceive the benefits of business-to-consumer eCommerce technology in comparison to previous communication and information technologies.	Adams et al. (2013) Fathian et al. (2008) Limthongchai & Speece (1999) Rogers (2003)	Positive
H3Ch2	*B2C eCommerce Compatibility*	Refers to the degree to which an innovation is perceived as consistent with the existing values, past experiences and needs of potential adopters.	I feel that business-to-consumer eCommerce supports my business.	Limthongchai & Speece (1999) Rogers (2003) Luen et al. (2004)	Positive

H3Ch3	*B2C eCommerce* *Complexity*	Refers to the degree to which an innovation is perceived as relatively difficult to understand and use.	I perceive business-to-consumer eCommerce technology as complex to use.	Limthongchai & Speece (1999) Mangiaracina et al. (2012) Rogers (2003)	Negative
H3Ch4	*B2C eCommerce* *Observability*	Indicates the degree to which the results of an innovation are visible to others.	I perceive that the benefits of business-to-consumer eCommerce are clearly visible.	Limthongchai and Speece (2003)	Positive

				Rogers (2003)	
H3Ch5	*B2C eCommerce innovation purchasing cost*	Refers to the cost related to purchasing IT hardware and software and the capability to obtain it.	I think I have sufficient budget to invest in business-to-consumer eCommerce innovation.	Anckar (2003) Mukherji et al. (2006)	Positive

Construct			***Measures***	***References***	***Influence positive or negative***
Item ID	***Variables***	***Description***	***Proposition***		
H4S	*Hypothesis 4* *Context*				

H4S1	*B2C eCommerce Market eReadiness*	The assessment about customers eReadiness to conduct B2C eCommerce.	I believe our customers are ready to buy online.	Lawrence & Tar (2010) Mangiaracina et al. (2012) Molla & Licker (2005) Miller & Garnsey (2000)	Positive
H4S2	*Transport infrastructure*	The assessment of transport infrastructure, namely which conditions might affect eCommerce.	The transportation infrastructure in the country is suitable for business-to-consumer eCommerce.	Mangiaracina et al. (2012) Lawrence & Tar (2010) Molla & Licker (2005)	Negative
H4S3	*Logistic services*	The assessment of logistics services in the country, namely which conditions might affect	Logistics services in the country are adequate for	Mangiaracina et al. (2012)	Negative

		eCommerce.	business-to-consumer eCommerce.	Lawrence & Tar (2010)	
H4S4	*Legal environment*	The assessment of the legal system's adequacy to regulate eCommerce.	I perceive the legal environment in the country is favorable to conduct business-to-consumer eCommerce.	Mangiaracina et al.(2012) Indjikian & Siegel (2005) Molla & Licker (2005) Tan et al. (2007)	Negative
H4S5	*Financial institutions eReadiness for eCommerce*	The assessment of financial institutions capability to support eCommerce activities in the country.	Financial institutions in the country are prepared to carry out business-to-consumer eCommerce.	Mangiaracina et al.(2012) Molla & Licker (2005) Anckar (2003)	Negative

H4S6	*Telecommunication infrastructure*	The assessment of the telecommunication infrastructure in the country.	The country's telecommunications infrastructure is reliable and efficient.	Mangiaracina et al.(2012) Molla & Licker (2005)	Negative
H4S7	*Government commitment about eCommerce*	The assessment of the national government's commitment to support eCommerce	I think the government is seriously committed to promote business-to-consumer eCommerce.	Mangiaracina et al. (2012) Indjikian & Siegel (2005) Molla & Licker (2005)	Negative

The item to determine the type of eCommerce existing in the organization was operationalized, giving three answers as options (Business-to-Business, Business-to-Consumer, and both) to the question: “What kind of eCommerce does your company have?”. Based upon the literature, the most frequent types are B2B (Business-to-Business) and B2C (Business-to-Consumer). A definition based on Turban et al. (2015) was used for each (Turban, King, Kyu Lee & Liang, & Turban, 2015, p. 10).

For the operationalization of eCommerce adoption, to make it tractable eCommerce maturity indicators were used. The literature suggests six phases in developing countries: no eCommerce, connected eCommerce, static eCommerce, interactive eCommerce, transactive eCommerce, and integrated eCommerce. In this study, it was measured from the connected to integrated eCommerce phase. According to many researchers, interactive eCommerce is accepted as the beginning of eCommerce; therefore, adopters were considered as being from this group and non-adopters prior to this group (Molla & Licker, 2005, p. 881).

The last two questions are related to the facilitators and inhibitors adapted from Grandon and Mykytyn (2004). In the previous questions, a filter was created for adopters and non-adopters, addressing the question depending on whether they are adopters or non-adopters according to their answer. The question about facilitators for adopters was formulated by asking: “How important are the following resources for your company to implement business-to-consumer eCommerce?”. Please mark for each statement the option with an “x” that best reflects your opinion: highly qualified employees (Lal, 1999, p. 677), financial assets (Scherer, 1992, p. 1417; Grandon & Mykytyn, 2004, p. 54), knowledge and understanding of executives about B2C eCommerce (Grandon & Mykytyn, 2004, p. 55; Lal, 1999, p. 676) abilty to determine the need of our clients for B2C eCommerce (Molla & Licker, 2005, p. 896), ability to innovate (Scherer, 1992, p. 1422), availability of hardware and software (Grandon & Mykytyn, 2004, p. 55). To measure the importance, a seven-point Likert scale was used.

The question related to the inhibitors was formulated as follows: “How far is it likely that the following reasons could imped the market entry to Business-to-Consumer eCommerce in an advantage stage?. Please mark for each statement the option with an “X” that best reflects your opinion: lack of financial assets to conduct business-to-consumer eCommerce (Scherer, 1992, p. 1417), lack of knowledge and understanding of our executives about business-to-consumer eCommerce (Lal, 1999, p. 677), lack of demand for business-to-consumer eCommerce among our

customers (Hasan & Harris, 2009, p. 93; Miller & Garnsey, 2000, p. 457), lack of qualified employees (Majumdar, 2008, p. 589), lack of an appropiate legal environment to conduct busines online (Indjikian & Siegel, 2005, p. 684; Molla & Licker, 2005, p. 877, p. 236; Tan et al., 2007, p. 336), lack of a reliable and efficient telecommunication infrastructure (Alshihi, 2006, p. 116; Mangiaracina et al., 2012, p. 325; Molla & Licker, 2005, p. 877), lack of adequate national logistic services for eCommerce (Mangiaracina et al., 2012, p. 236), and lack of preparation of financial institutions to conduct eCommerce (Molla & Licker, 2005, p. 887, Tan et al., 2007, p. 333).

The third decision might affect the costs, question formulation, and quality of data, whereby it implies the data collection method (Saris & Gallhofer, 2007, p. 5). As previously mentioned, the instrument used in this study is a self-administered questionnaire. The approach comprises a mixed-mode survey where in the contact and follow-up phases, telephone and email is applied. For the data collection without participating phase, a self-administered questionnaire is delivered to the managers by M & R delivery service and collaborators. Here the person is in charge of delivery to the managers in the response process. In the case where it is possible to agree with the managers to deliver the questionnaire via email, this approach will be used although the main approach will be the self-administered questionnaire by personal delivery.

The decision to select this mode is partly due to the likely quality of the data and response. After several considerations concerning whether to use a different approach, this was deemed the most appropriate for timeline reasons. Before this selection, web survey options were considered, whereby three different types of software were used to develop a survey (Survey Gizmo, Unipark, Q-set), which took three months to set up, and the best option for the questionnaire model was Unipark's template. However, after discussions with experts in Germany and Nicaragua, this approach was not recommended to receive the response on time and to have the certainty of the manager as the respondent. For this purpose, a paper version was implemented as the main option as well as a Word version of the questionnaire to be sent by email when requested as the most appropriate option for the manager.

4.3. Sampling

The main goal intended to be reached by a quantitative study is the capacity to be representative, whereby the selected sample reflects the attributes of the target population. Accordingly, the higher

the representativeness, the higher the generalisability of the findings and thus the higher the quality of the study (Al-Somali, 2011, p. 214).

There are two criteria to differentiate samples, either "(1) the way in which they are related to the universe of which they are a part, or (2) the technique or method used in obtaining them. Either or both of these criteria, considered together, are relevant to the way in which a particular sample is to be characterised" (Peatman, 1947, p. 290). Normally, it is not possible to obtain all the information about the universe to check the representativeness of the sample: for this reason, instead the character of a sample is described in terms of the methods, whereby in this case a random sample method is selected. A random sample is defined as: "each observation or measurement of a random sample has the same opportunity, no more and no less, as all the other instances of the universe of appearing in the sample" (Peatman, 1947, p. 295). In other words, "every possible subset of size *n* from a population of size *N* has the same probability of being selected as the sample. That means that every unit in the population has the same probability (= n/N) of being in the sample, and so forth" (De Leeuw, Hox & Dillman, 2008, p. 106). The technique to ensure that each instance or member of the universe has an equal opportunity to participate in the study comprises "numbering each member or instance of the universe, and then drawing the desired size of sample by means of a lottery technique which in itself has been tested for randomness" (Peatman, 1947, p. 295).

In the present study, a pre-test was conducted with 30 surveys. For the estimation of the sample size, a bietapic random sampling was performed. The result of the first stage (182 surveys) allowed deriving the sample size (n = 282) using a confidence level of 95% and an estimation error of 15%. During the first stage 182 surveys were gathered and during the second 282 eventually resulting in 315.

The formula used for the simple random sample for the study is as follows: $n=z^2s^2N/(N-1)e^2+z^2s^2$, where *s* represents the variance mean, *e* the estimated error, *z* the confidence level, *N* is the universe, and *n* the sample. In the present study, we estimated a universe *N* of 1000, an e of 0.15, a confidence level of 95% (1.96) and a variance mean of 2.303 obtaining as a sample an estimated (n) of 282.

It is known that "simple random sampling is the simplest form of probability sampling and forms the building block for many of the other sampling designs. The use of simple random sampling can be justified when there is not so much information about the population, and the researcher has little or no experience with statistics" (De Leeuw, Hox & Dillman, 2008, p. 106).

In the current study, the simple random sample was selected using a list based upon members of organizations with access to the worldwide web with the availability of contact information from the Directory of Industry, Commerce and Services from 2011 created by the Ministry of Commerce, and Industry of Nicaragua, due to this being the most recently updated, reliable organization list based upon the International Standard Industrial Classification of All Economic Activities by the United Nations system (Department of Economic and Social Affairs United Nations, 2008). This standardization is particularly important in Nicaragua as there are issues with the formalization of organization data.

This directory contains 14,000 micro, small, medium, and large establishments of industrial transformation, mining, construction, wholesale trade commodities, trade commodities, materials, supplies, machinery and equipment, services for production units, institutions, and major organizations (Ministerio de Fomento, Industria y Comercio, 2011, p. 5).

This helps to ensure that the sample is generally representative of the population. The criteria for the selection comprised including companies listed in the Industry Directory that provide contact information of websites and emails. As a result of this criteria, 1,880 organizations were found with emails and/or websites. Once the organizations are selected, the individual participants should be decision-makers at the management level.

The selection of participants from all sectors, sizes, and geographical locations among other factors, relies on the aim of the present study to have a complete picture of the situation of adoption and non-adoption of B2C eCommerce in Nicaragua, identifying whether there are any significant differences or similarities.

4.4. Internal and External Validity

To develop a perfect questionnaire, it is said that even with years of working in the field it is practically an unachieved aim. A pre-test is a mechanism that allows gaining an idea if what the researcher is trying to communicate to the respondent is in the right direction. The researcher might face the situation of heterogeneity among the respondents or the characteristics of the respondents, and the research context may be unknown, whereby such reasons might tend to show that a pre-test is necessary.

It is believed that “testing is the only way of assuring that the survey written indeed communicates to respondents as intended. A useful way to study this process is through the four cognitive steps of

comprehension, recall, judgement, and response" (De Leeuw, Hox & Dillman, 2008, p. 176). Under this framework, error results if respondents misunderstand the survey questions or key concepts, do not know to or cannot recall the necessary information from memory, use an inappropiate shortcut for making a judgment, or prefer to hide or distort certain information and provide a socially desirable answer (De Leeuw, Hox & Dillman, 2008, p. 117). There are diverse forms to pre-test the questions, which might count upon the participation of the respondents or experts. (De Leeuw, Hox & Dillman, 2008, p. 197).

Accordingly, the combined method is the best choice, and an approach of four steps is suggested. "The first step could be an informal testing, second, an expert review or a systematic review of the questionnaire. The third one, could be cognitive interviews or focus groups. The fourth would involve the testing of the questionnaire in actual field conditions adding respondents debriefing and behaviour coding" (De Leeuw, Hox & Dillman, 2008, p. 197). Additionally, further tests can be conducted posteriori if required. Although this is the ideal four-step approach usually in Ph.D. research, we face two constraints namely time and resources. In this case, what is suggested is a three-step approach, which should include: "First, informal testing followed by some type of in-depth testing such as expert review, expert systematic review of the questionnaire, cognitive interviews, or focus groups. Finally, a field test with either respondents debriefing or behaviour coding" (De Leeuw, Hox & Dillman, 2008, p. 198).

Having this in mind, the first step comprised a traditional field test for a self-completion survey. In this test, questionnaires are sent out to the participants to examine substantive answer patterns of non-response items and any indicator of confusion and response rates. This test was applied between February and March 2014. A first wave (35 surveys by email) was selected with random sampling, whereby 13 companies replied by email to a complete questionnaire. To speed up the process, a second wave of surveys were subsequently sent out (20 surveys) and collected in person. This initial pre-test was mainly to find out the speed of the responses, and whether there might be any difficulty following the instructions and content of the questions.

The second pre-test comprised an expert review, which should be carried out by experts with good knowledge of the research topic, fieldwork issues, and questionnaire design among others. The experts were selected in the field of survey design and application, market research, entrepreneurship, economy, and innovation. The questionnaires were sent out via email to five

experts from COSEP[5], M & R[6], Universidad Agraria de Nicaragua, Universidad Nacional Autónoma, and Cámara de Comercio. The questionnaire was attached with a Questionnaire Appraisal System-99 (Willis & Lessler, 1999, p. 3), which has 26 categories in eight steps:

STEP 1: READING: Determine whether it is difficult for the interviewers to read the question uniformly to all respondents.
STEP 2: INSTRUCTIONS: Look for problems with any introductions, instructions, or explanations from the respondents' point of view.
STEP 3: CLARITY: Identify problems related to communicating the intent or meaning of the question to the respondent.
STEP 4: ASSUMPTIONS: Determine whether there are problems with assumptions made or the underlying logic.
STEP 5: KNOWLEDGE/MEMORY: Check whether respondents are likely to not know or have trouble remembering information.
STEP 6: SENSITIVITY/BIAS: Assess questions for sensitive nature or wording and bias.
STEP 7: RESPONSE CATEGORIES: Assess the adequacy of the range of responses to be recorded.
STEP 8: OTHER: Look for problems not identified in Steps 1-7.

The questions analyzed were selected according to the questions that presented difficulties for respondents in the first pre-test. The questions selected from the questionnaire draft were 8, 9, 10, 11, 13, 14, 15 and 16.

The result of the pre-test allowed me to relocate some questions; for example, the question related to the education level of the manager was relocated to the first section of the questionnaire, where contact information is requested. Furthermore, one expert suggested including the "free zone" category on the company sector, due to it representing 16% of the formal employment and representing the same amount of export goods. Moreover, in Nicaragua, fishing is set up in a separate category of economic activity; therefore, it was also separated in the final version.
Subsequently, in the economic activities category, the following question was related to the type of businesses of the company, which might appear repetitive or similar to the previous question, and thus it was changed to ask about the type of product or services and be more precise.

[5] COSEP (Consejo Superior de la Empresa Privada): Council of the Private Sector in Nicaragua
[6] M&R: Market Research Specialist

In question number 7, “high qualified employees” substituted “specialised employees in their field” as it is a more specific term to identify the capabilities of the employees. In this question, the importance scale also slightly changed in some terms.

Question number 8 was changed and split into two questions, namely 8 and 9. Before the question directly asked whether the revenue were “significant,” whereby many participants agreed that the term was ambiguous, and the question should also be changed to represent a more sensible question to ask. For this reason, the first question was to ask whether the company/organization generated revenue by products or services at the National level or International level in the fiscal year, whereby the answer should be “yes,” “no” or “not applicable”. In the case where it is affirmative, they should indicate at a scale between 10%, 11-25%, 26-50%, 51-75%, 76-90%, and 90%. The same scale is also used to indicate how much is invested per year.

In questions 12, 15, and 16, the scale terms also slightly changed to be more adequate to the terms used in Nicaragua for agreement, importance, and probability scales. Additionally in question 12 in point f), the term aggregated ‘shareholders’ was employed as recommended according to the decision-maker levels in Nicaragua.

The third pre-test involved respondents debriefing questions, which are “special follow-up questions used to determine respondents’ understanding of the original survey question” (De Leeuw, Hox & Dillman, 2008, p. 185). This type of pre-test is used “to determine respondents’ understanding of terms and phrases in survey questions, and the extent to which these are in line with what the questionnaire designer had in mind” (De Leeuw, Hox & Dillman, 2008, p. 87). In this test, ten companies participated from the first 30 companies involved in the pre-test. The questionnaire was sent out again with follow-up questions added to the questions that were considered sensitive in the pre-test and those that were important to be certain that the participants understand the terms, whereby the questions used were formulated according to the literature review on respondent debriefing. For example, concerning the question related to the level of eCommerce adoption participants were asked: “What went through your mind when you were asked to describe the current situation of your company in the previous question?”. This kind of question tends to look for respondents’ understanding of the options provided to confirm that their answer was addressed correctly.

4.5. Scale Reliability

Besides evaluating the content and understanding of the questions in the statistic test Cronbach´s alpha, α is required for the scale reliability test. Cronbach´s alpha α test helps to measure the consistency of multiple items scale (Groves et al., 2004, p. 265). It can be explained in a simple manner to ascertain "the variance within the item and the covariance between a particular item and any other item on the scale " (Field, 2009, p. 674).

The values of Cronbach´s alpha indicates low or high reliability, whereby a high value of Cronbach´s alpha points to high reliability, low response variance, or that the answers to one item affect the response to another thus inducing positive correlation. A low value might indicate low reliability, or that the items do not measure the same construct (Groves et al., 2004, p. 266).

The criteria for the acceptable value of Cronbach alpha may vary, whereby some researchers suggest 0.7 as the acceptable value (Al-Somali, 2011, p. 244), while others such as Hinton et al. (2004) suggest cut-off points for reliability as excellent reliability (0.90 and above), high reliability (0.70-0.90), moderate reliability (0.50-0.70), and low reliability (0.50 and below) (Hinton et al., 2004, p. 364).

Additionally, other researchers suggest that a value of 0.80 for basic research and 0.90 for applied research is acceptable. In the present study, all the reliability coefficients satisfied the minimum criteria: overall, the coefficient result was 0.85 with the individual variable being close to the overall result. This can be interpreted as the reliability of the instrument being acceptably able to measure variability among the respondents (Molla & Licker, 2005, p. 886).

Following the pre-test and validation of the instrument, the data collection process started. The process was divided into three steps. First, was the contact phase and verification, during which the organizations were reached to verify contact information, and the decision-makers about IT adoption in the company as well as to introduce the questionnaire. Second, after contacting the organizations, the drop-off phase continued, during which 940 questionnaires were sent out in nine waves, followed by several follow-up calls, emails, and visits to keep track until the questionnaire had been returned.

The questionnaire was personally delivered accompanied by a cover letter explaining the aim of the study, the mechanism to complete it, and the confidentiality statement about the information provided. In most situations, the questionnaire was facilitated directly to the target person, and if

this was not the case, it was passed to a person who ensured providing the questionnaire to the target person. The reason for facilitating to a third person in some situations was due to it not being possible to contact the person requested,whereby it was necessary to count upon the cooperation of a contact person.

The justification for using the personal delivery approach was that it ensured reaching the target respondents. Moreover, it allowed greater control with the data collection timeline (Al-Somali, 2011, p. 238). From 940 questionnaires, 315 were collected overall.

The researcher counted upon the support of collaborators during this phase, whereby 21 collaborators among ten cities from three institutions participated (Universidad Americana de Nicaragua, Universidad Agraria de Nicaragua and M & R). The timeframe for the data collection was from April 2014 to August 2014 and the response rate was 33.5%. According to Saunders et al. (2007), a response rate between 30% and 50% is acceptable. The approach used for the respondents was based upon the key informant, considering the managers as the suitable participants for the survey due to their position as strategic persons managing decisions like director managers or general managers, where normally they might be involved in decision related to the adoption of IT, thus providing validity and reliability to the data in this manner (Tan & Lischert, 1994, p. 7).

The researcher faced numerous pitfalls during the data collection process. First, during the contact phase, the researcher realized that some businesses had already changed contact data or manifested no interest to participate, whereby the reasons might include trust issues as normally companies in Nicaragua are not used to facilitate data, there is not a research culture in the country, nor an understanding of the possible benefits that this type of study might bring to them. Even though the participants were reached and the questionnaire was delivered, multiple follow-up emails, and phone calls were required to obtain the complete questionnaire, and in some cases it was required to distribute the questionnaire again creating more delivery waves than expected.

Another important situation presented was the lack of time by managers in many cases, due to the limitated transport available required to carefully coordinate the routes and time to distribute and collect the survey.

Besides the regular issues presented that appear during the data collection and in the particular case of Nicaragua, it must also be taken into account that natural disasters and political turmoil might occur. Indeed, during this research, an earthquake occurred just at the beginning of the data collection in April 2014, which severely affected the capital and surrounding cities, creating a red

alert state in the country that is the maximum alert given to this type of natural disaster. In fact, this was considered the second largest earthquake in Nicaragua after the one that destroyed the Capital in 1972. Accordingly, for this research, it meant a delay for the data collection as the red alert state stopped business operation in the country.

However, besides the pitfalls, using facilitators as networking support was extremely useful to reach the target respondents, whereby the small size of the country, and the concentration of the business sector in the Pacific region facilitated this process in the same manner.

4.6. Data Screening and Adjustment

Prior to any analysis, data screening is required to ascertain whether there is any missing or miscoded data. The use of descriptive statistic procedures were used to find out the existence of these issues.

The miscoded data - whereby the wrong or no code is assigned - was analyzed by checking each question to identify any miscoding.

In the case of missing data that occurred when the individual did not respond the survey or a survey item (Newman, 2009, p. 8), this might ultimately cause incorrect conclusions and affect the generalizability of the research. The missing data is due to a lack of knowledge about the issue, inapplicability, sensitive questions, or simply by accident whereby respondents forget to reply to the questions (Al-Somali, 2011, p. 246).

There are many mechanisms to treat the missing data. In this particular case, as the percentage of missing data was between around 0.3% and 13.1% for most of the questions, a single imputation was applied, which is advisable when the percentage of missing data is low and mostly corresponds to a sample with similar characteristics (Comisión Económica para América Latina y el Caribe, 2007, p. 29).

Moreover, imputation is used when the missing data usual is at the item level, replacing the missing data with values later used in statistical estimation. The application of imputation aims to reduce the bias of non-response (Groves et al., 2004, p. 341).

For questions 13 and 14 related to the type of eCommerce and level of eCommerce, the value assigned was according to the data available about the companies, such as their size, sector,

products, services, and eCommerce evaluation of the website, namely whether it contained informative sections such as “About the company,” “Products,” “Contact Us,” “Online query,” “Virtual Community”, “Online database”, and the ”Type of email available” (Tan et al., 2007, p. 335).

Summarizing, simple imputation was applied from questions 0 to 12 - aside from question 2 which is an open question - company data and website analysis from question number 13 to 14, data adjustment on question number 8, 9, 15, 16, and for questions number 12e, the non-response resulted from the participant not presenting the particular situation for the statement provided.

4.7. Descriptive Statistics

Descriptive statistics were used to facilitate giving answers to the research questions, leading to the multivariate analysis using frequencies and percentages and supported by graphics (Hallal, 2009, p. 164). The data was analyzed with the support of Statistical Package for Social Science (SPSS). The analysis comprised univariate and bivariate analysis.

The univariate analysis involved analyzing single variables, which allows localizing mistakes in the data input and providing a comprehensive result of the data collected. The nature of the variables measure is nominal which allows to identifying the central tendency and the most frequent value in the distribution.

The bivariate analysis was used to investigate whether relationships between variables were statistically significant. The method applied was selected according to the nature of the variables measurement: as in this case the variables are nominal, cross tabulation, and the Chi-Square Test were applied (Hallal, 2009, p. 164).

The variables relationship established were between the independent variables related to the characteristics of the companies, technology, communication, managerial, context assessment, inhibitors, and facilitators with the dependent variable of eCommerce level and the independent variable of type of eCommerce as well as the independent variables previously mentioned.

Logistic regression was selected, due to the nature of the data and the research question. The aim was to explain the adoption of B2C eCommerce where the independent and dependent variables are categorical in this case. In other words, the given variables can help to explain which of two categories the company is likely to belong to related to B2C eCommerce adoption. In such situation

when the aim is “to predict membership of two categorical outcomes the analysis is known as binary logistic regression” (Field, 2009, p. 265).

Within the logistic regression, a method of analysis should be selected, whereby the chosen method here was a stepwise method assuming that there is no previous existing research and no assumptions on the distribution of the variables.The stepwise regression is “a method of multiple regression in which variables are entered into the model based on a statistical criterion (the semi-partial correlation with the outcome variable). Once a new variable is entered into the model, all variables in the model are assessed to see whether they should be removed” (Field, 2009, p. 794).

5. Results

5.1. Introduction

The objective of this chapter is to present the descriptive statistics results from the questionnaire applied to obtain the data. The researcher analyzed 315 questionnaires, self-completed by managers. The managers who participated in this study belong to micro, small, medium, and large-sized companies from all regions in Nicaragua (Pacific, Central, Atlantic) and sectorThe inclusion criteria of the participants were occupying a manager position in companies from all sizes and regions with a website and/or email, and accepting participation in this study. The exclusion criteria were not having a website and/or email. The reason for these inclusion criteria is due to the eCommerce status[7] indicator of eCommerce in developing countries obtained from the literature and presented as follows (Molla & Licker, 2005, p. 881):

1. **Connected:** Internet connection with emails but no website.
2. **Static:** Basic company information available on the Internet but no customer interaction.
3. **Interactive:** It is possible to make requests online, send emails, and fill in online forms.
4. **Transactive:** It is possible to buy and sell products and services online, as well as online customer service.
5. **Integrated:** There is an integration between suppliers and customers, which allows the majority of commercial transactions to take place online.

[7]eCommerce status: The literature indicates six-phase eCommerce status for eCommerce realities of developing countries: no eCommerce, connected eCommerce, static eCommerce, interactive eCommerce, transactive eCommerce and integrated eCommerce. Many researchers have accepted interactive eCommerce as the beginning of eCommerce. A business was defined as having adopted eCommerce, if it has achieved an interactive eCommerce status.

All the participants responded to the questionnaire, which was previously pre-tested with a small sample that counts with the selection criteria. The questionnaire comprises 24 items. Nine constitute general data of the participants, eleven for company profile characterization, one concerning the perception of business-to-consumer eCommerce adoption, one about the type of eCommerce adopted, one for the eCommerce level adopted, one for the facilitators, and one for the inhibitors. Sixteen items are multiple choice and nine open questions. The data was analyzed with SPSS statistic software using descriptive statistics (frequency, percentage and mode), and Chi-Square Test for the independency test supported by Excel software for the graphics.

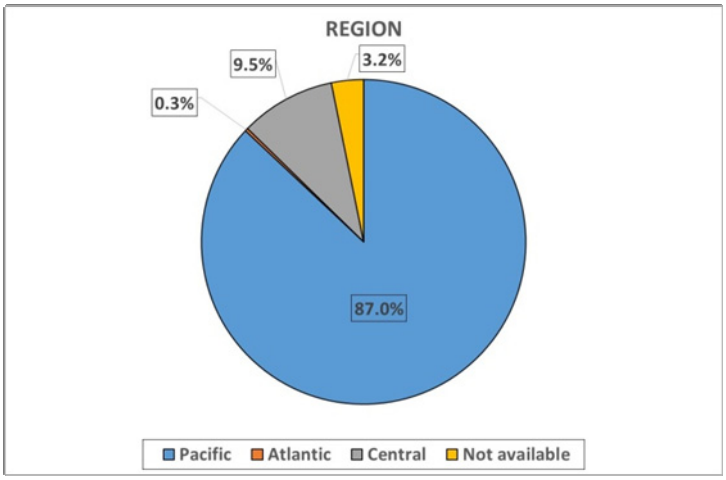
The description of the results discusses the profile of the companies, the analysis of the hypotheses tested related to the entrepreneurial characteristics, the innovation communication, the characteristics of the innovation and socioeconomic context factors, and the control variables that might affect eCommerce adoption. Additionally, it presents the main facilitators and inhibitors for business-to-consumer eCommerce adoption and discusses the model resulting from the logistic regression.

5.2. Profile of the Companies

The companies' profile were analized according to their location, education level, export orientation, sector, size, time in the market, and revenue generation.

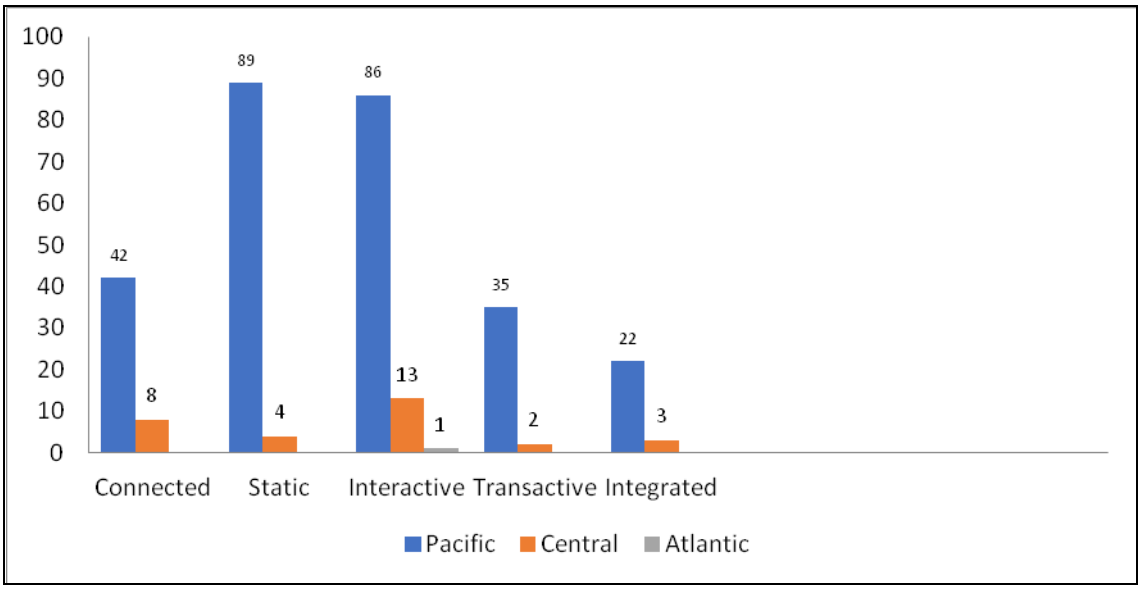
It was observed related to the location that the majority of the companies (87%) are located in the Pacific region where the Capital is located as well as most developed cities, whereas practically none were present in the Atlantic region of the country, what implies a corelation between urbanized areas and the availability of the required infrastructure for eCommerce adoption, also related to most populated areas and business located in Nicaragua (Figure 7).

Figure 7: Companies by region in the Country in Percentage



Source: Own Survey n = 315

Figure 8: Number of Companies´ eCommerce level by region in the country



Source: OwnSurvey n = 305

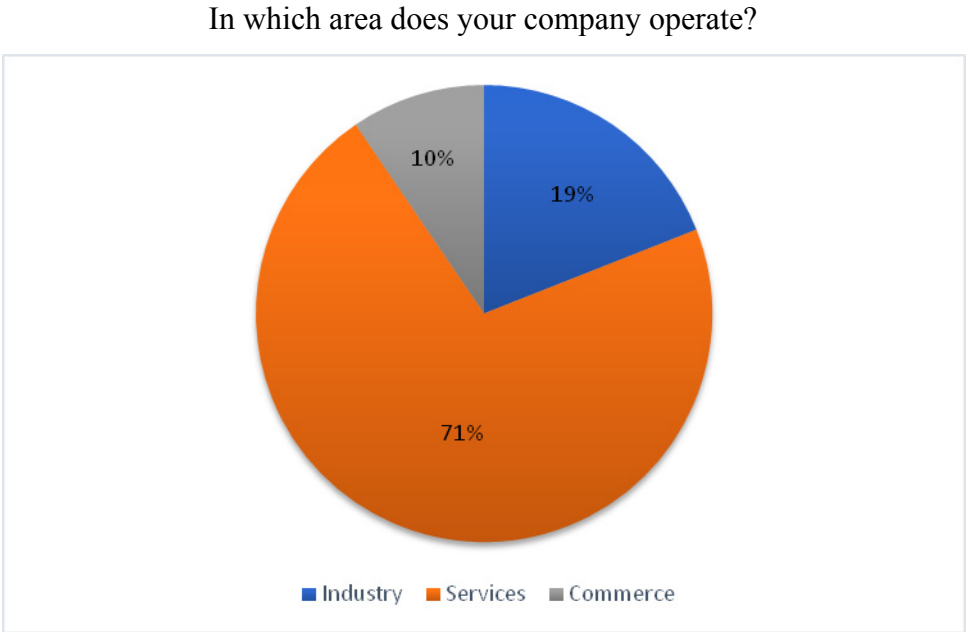
Figure 8 shows the companies´ frequency distributed by eCommerce level in each region, displaying that companies located in the Pacific region mostly have a static and interactive level. Meanwhile in the Central and Atlantic region, it is not possible to give any affirmation due to insufficient observations representing these two regions in the present study to issue any statement**.**

However, in comparison of these results by region, there might be the possibility to affirm that the Central region is following the eCommerce presence, and that in the future we can expect more companies at the advance level to be more transactive and integrated, if they follow a migration path forward.

There was an outstanding result concerning the companies' business sector. The 23 sub-categories included in the questionnaire were regrouped into three main categories: (1) industry; (2) services; and (3) commerce.

The great majority belongs to the service sector (71%). Industry was the second largest group and commerce the lowest representation (Table 10). This result show the new trend on diversification to the service sector which keep increasing. The Nicaraguan government and the private sector are strongly investing in tourism services.

Figure 9: Companies by Business Sector in Percentage



Source: Own Survey

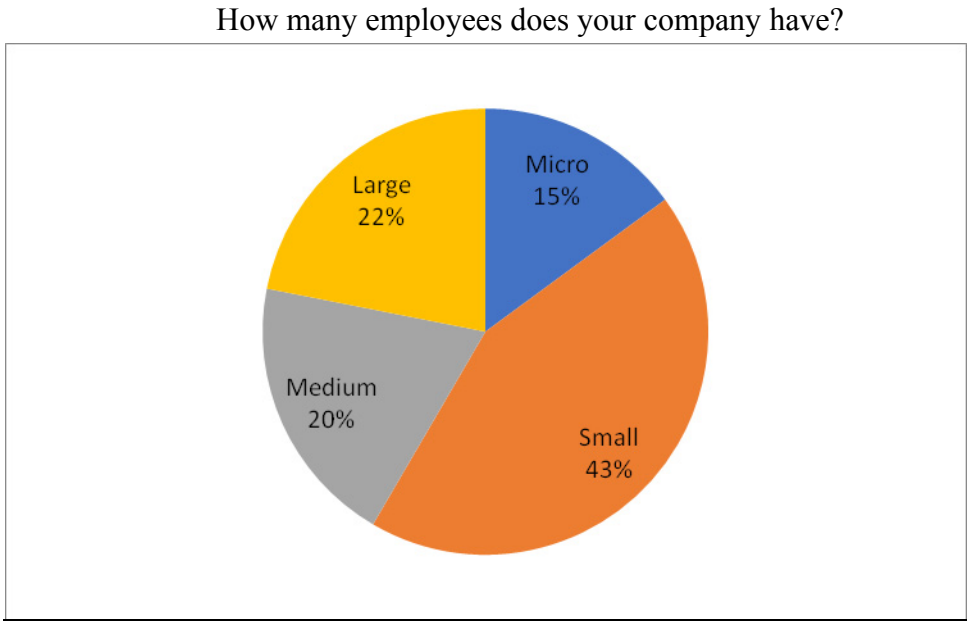
Table 10: eCommerce Adoption by Sector

	eCcommerce Adoption by Sector					
	Connected	**Static**	**Interactive**	**Transactive**	**Integrated**	**Total**
Industry	11	21	15	7	6	60
	3,5%	6,7%	4.8%	2.20%	1.90%	19%
Services	35	69	79	26	16	225
	11.1%	21.9%	25.1%	8.3%	5.1%	71.4%
Commerce	7	5	10	4	4	30
	2.2%	1.6%	3.2%	1.3%	1.3%	9.5%
Total	53	95	104	37	26	315
	16.8%	30.2%	33,0%	11.7%	8.3%	100%

Source: Own Survey n = 315

According to the eCommerce level, 33% (104 companies) in the three sectors have an interactive level that allows them to accept requests, send emails, and obtain information from the clients through forms. However, in the industry sector, companies are more distributed across the levels from connected to interactive, while the companies from the service sector tend to be more at the static (21,9%) and interactive level (25,1%). Transactional eCommerce is practically possible to the companies from the services sector and in the case of the industry and commerce, there is essentially no considerable representation of this group, and the few participants are more or less equally distributed across the different levels. From these results (see table 10), it is possible to observe that the nature of the companies influence the level of eCommerce at which they operate. It can be seen that companies in services need to have more interaction and transactional eCommerce. Companies from the industry are at the static and interactive level as they might be more oriented towards simple publishing information and receving orders on their websites meanwhile companies from the commerce have more presence at the interactive level.

Figure 10: Companies Distribution by Size on Percentage



Source: Own Survey

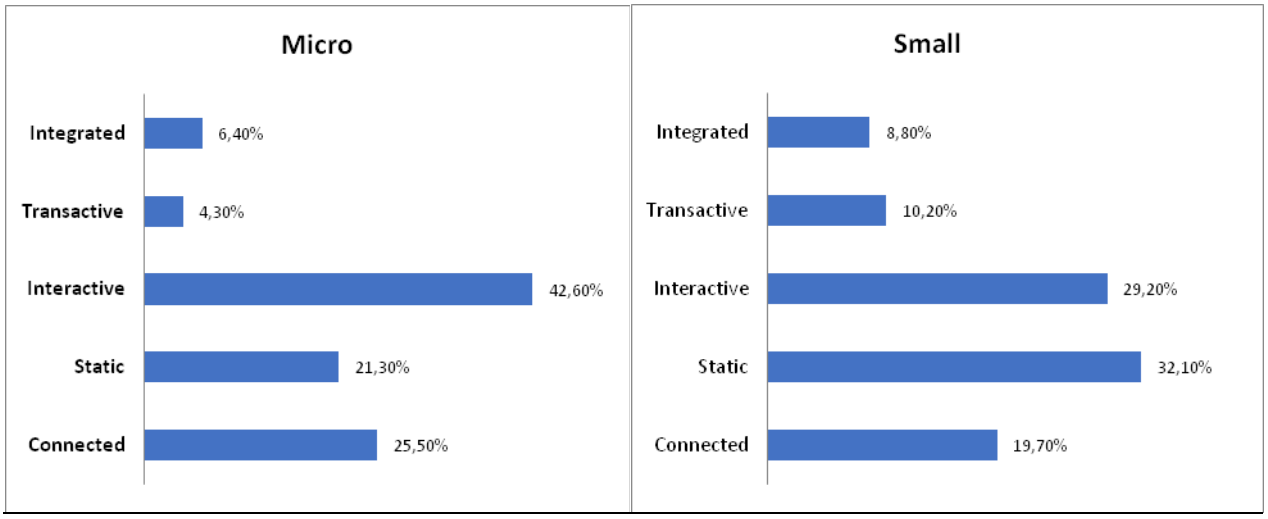
Note: Micro (1-5 employees), Small (6-30employees), Medium (31-100 employees), Large (More than 100 employees)

In terms of the size of the participants' companies (see Figure 10), it can be observed that the distribution characterizes the Nicaraguan context with mostly small size companies (43%) and more or less equally distributed between medium (20%), large (22%), and micro (15%) sizes. However, it was expected to have a higher participation of large companies as they are believed to have a stronger online presence and advanced application. The results show two important situations, namely the increasing online presence of small size companies (43%); even though, they are the majority in Nicaragua in terms of size and also its presence online is high, and the notion that the micro size companies results can be interpreted positively even though this group has the lowest representation (15%) in comparison with the rest of groups, the result is considered significant.

Concerning the size of the companies and its eCommerce level, the findings were not as expected in most cases. For instance, micro-sized companies were reported in strong numbers at the interactive level (42.60%) and not at the connected level, while small companies are more distributed between interactive and static, and the same situation applies to the medium size companies.

Moreover, surprisingly large companies are not that advanced concentrated within the two dominant groups of interactive and static, and not at the transactive level, contrary to expectations (Figure 11 & 12).

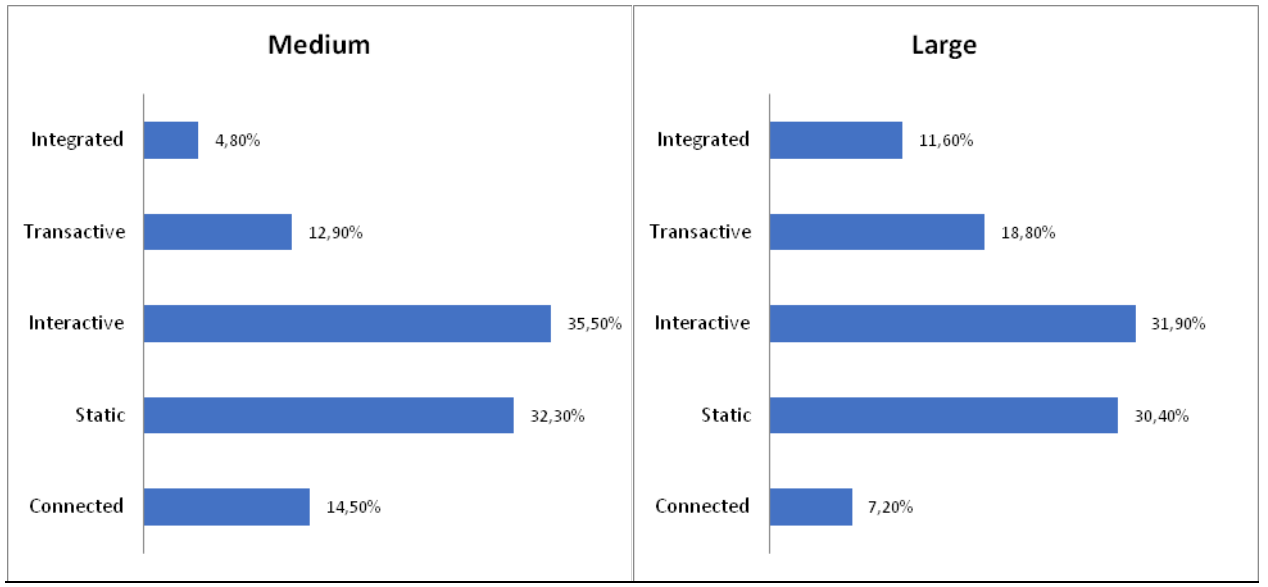
Figure 11: Distribution of Micro and Small Companies by eCommerce Level in Percentage



Source: Own Survey

Note: Micro (1-5 employees), Small (6-30employees), Medium (31-100 employees), Large (More than 100 employees)

Figure 12: Distribution of Medium and Large Companies by eCommerce Level in Percentage



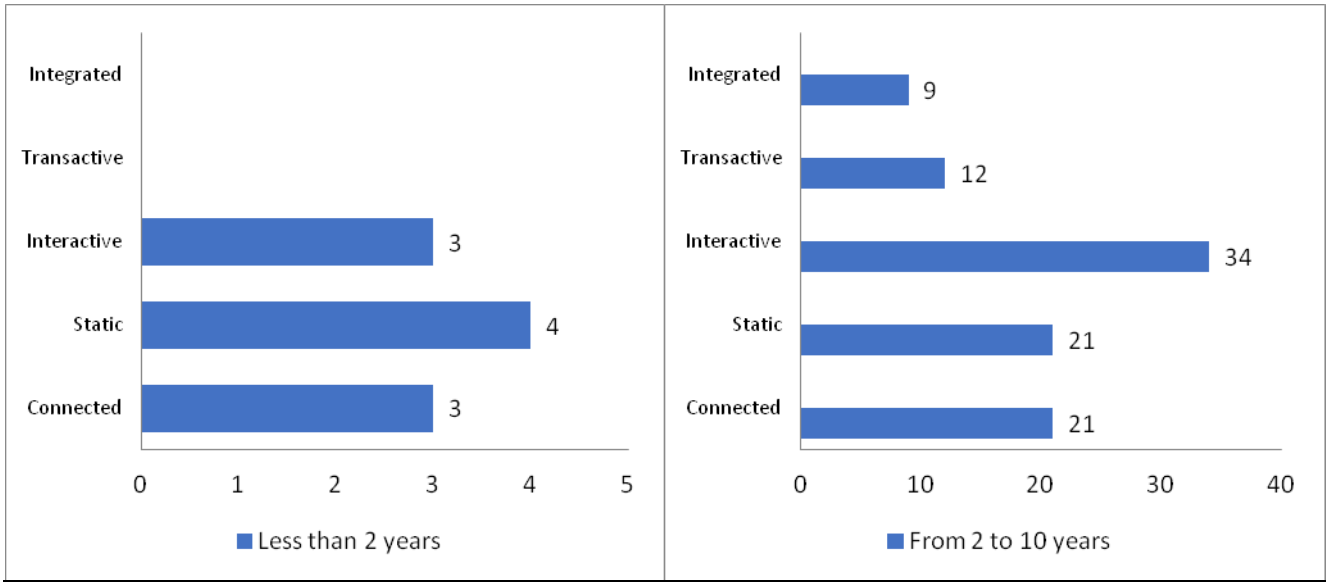
Source: Own Survey

Note: Micro (1-5 employees), Small (6-30employees), Medium (31-100 employees), Large (More than 100 employees)

The companies' time in the market (see Figure 13) result is interesting given that the expectation was to find more start-up companies with less than two years in the market (10) being more proactive on eCommerce adoption. However, most of the companies have operated for more than 20 years in the market (110) and in this context, more time in the market among other factors, influences the adoption of eCommerce. Moreover, concerning the level of eCommerce, it was expected to find fewer companies at the advanced level of eCommerce than at the transactional and integrated level although the distribution of companies according to their time in the market did not vary. Indeed, there was no significant different distribution from the companies from 2 to 10 years, 11 to 20 years, or more than 20 years in the market, whereby most of these companies belong to the static and interactive level (Figure 13 & 14).

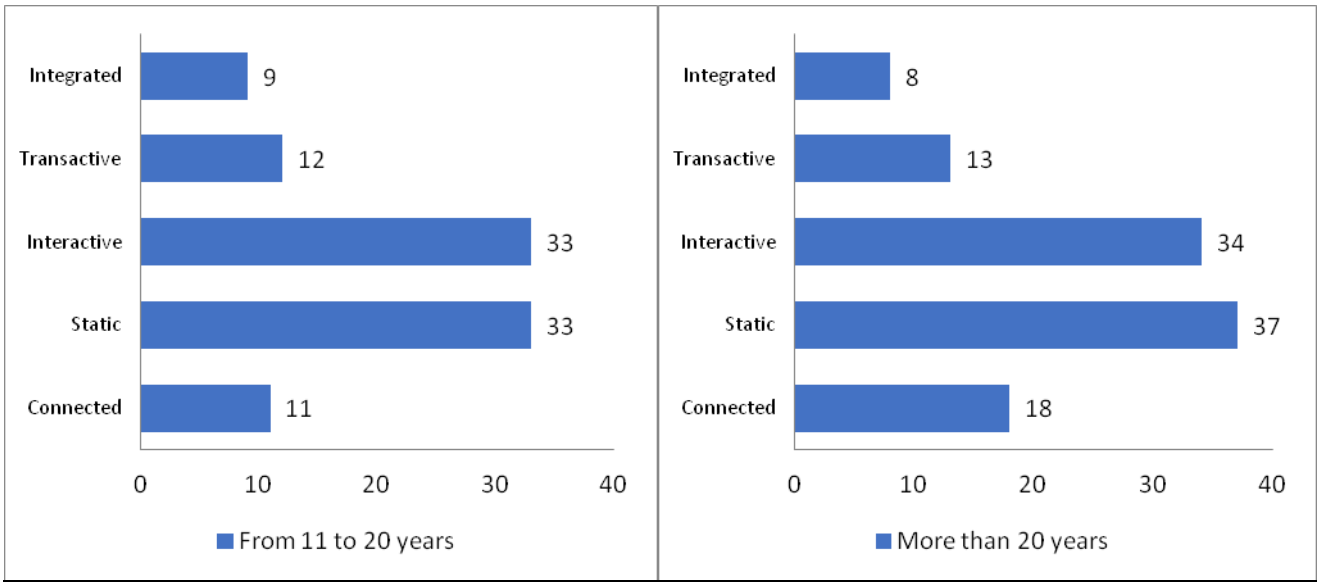
Figure 13: Distribution of Companies by Time in the Market in Numbers (less than 2 years and from 2 to 10 years)

For how long has your company been active in this area?



Source: Own Survey n = 315

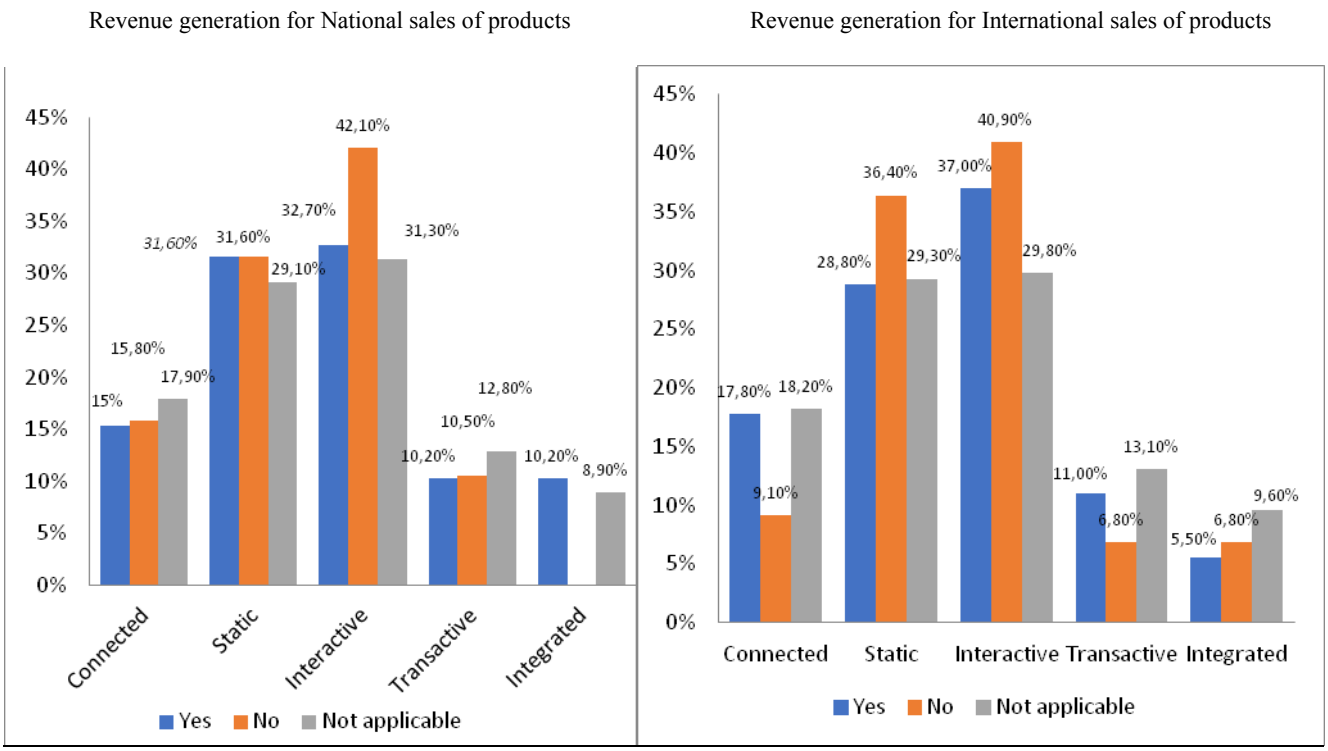
Figure 14: Distribution of Companies by Time in the Market in Numbers (From 11 to 20 years and more than 20 years)



Source: Own survey n = 315

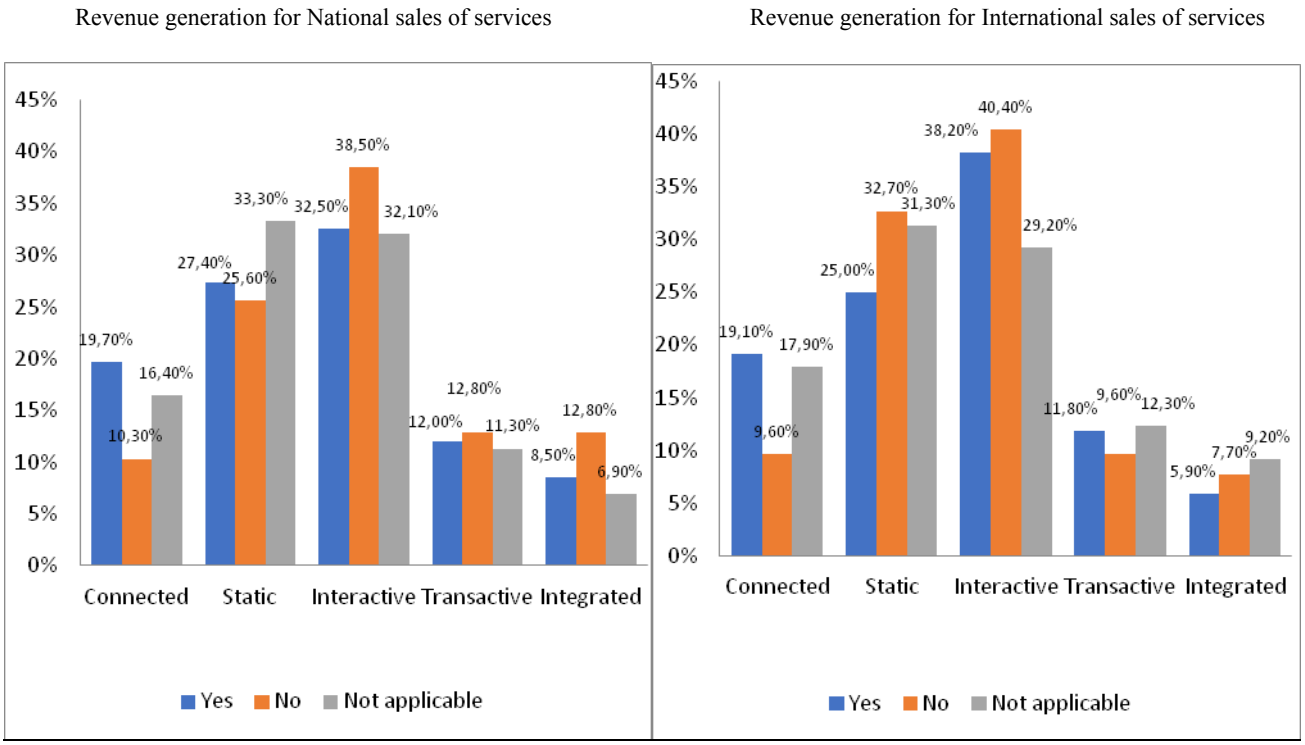
Figure 15: Revenue Generation for National and International Sales of Products

Does your company generate sales revenue by national and/or international sales of products and/or services online?



Source: Own Survey

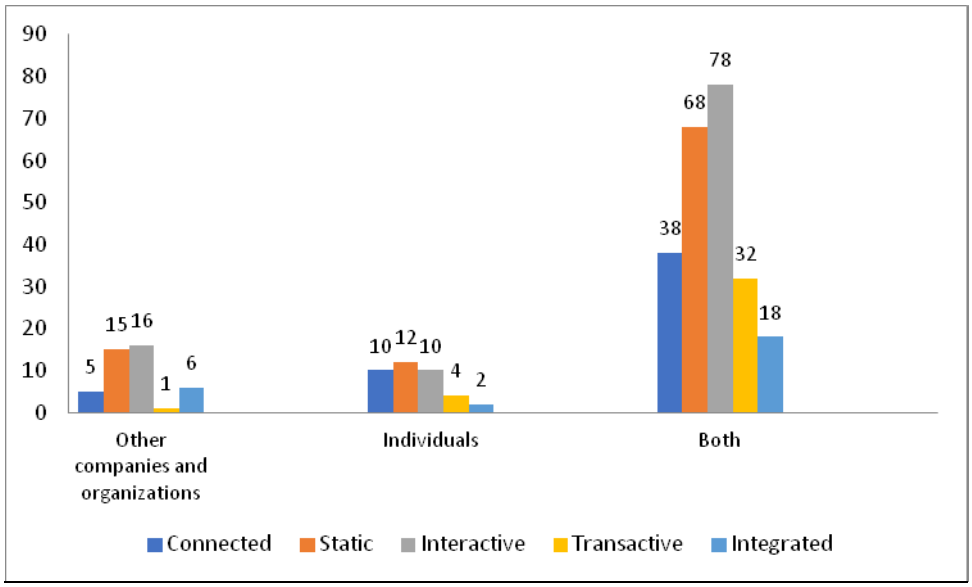
Figure 16: Revenue Generation for National and International Sales of Services



Source: Own Survey

Figure 17: Type of Customers

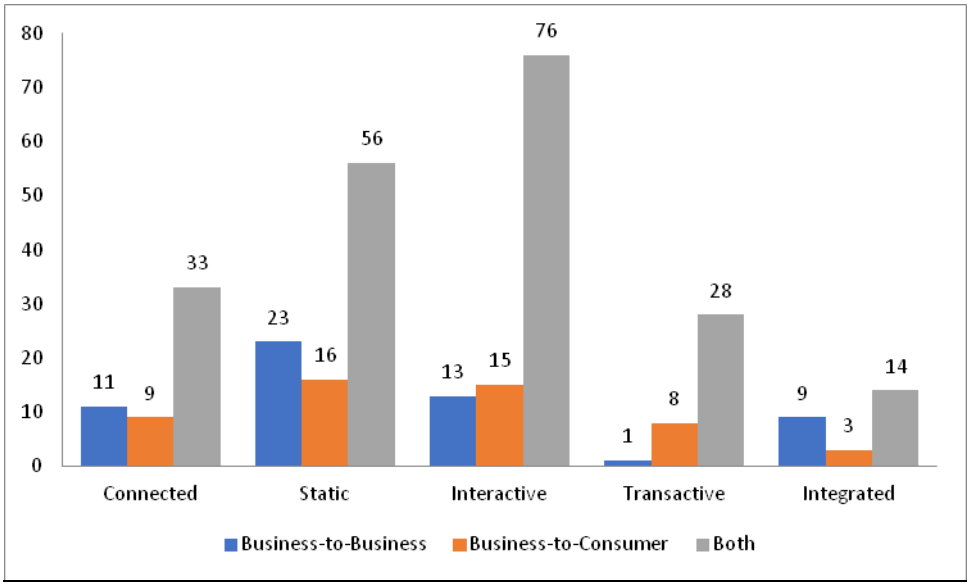
Who are your customers?



Source: Own Survey n = 315

Figure 18: Type of eCommerce by Level in Numbers

What kind of eCommerce does your company have?



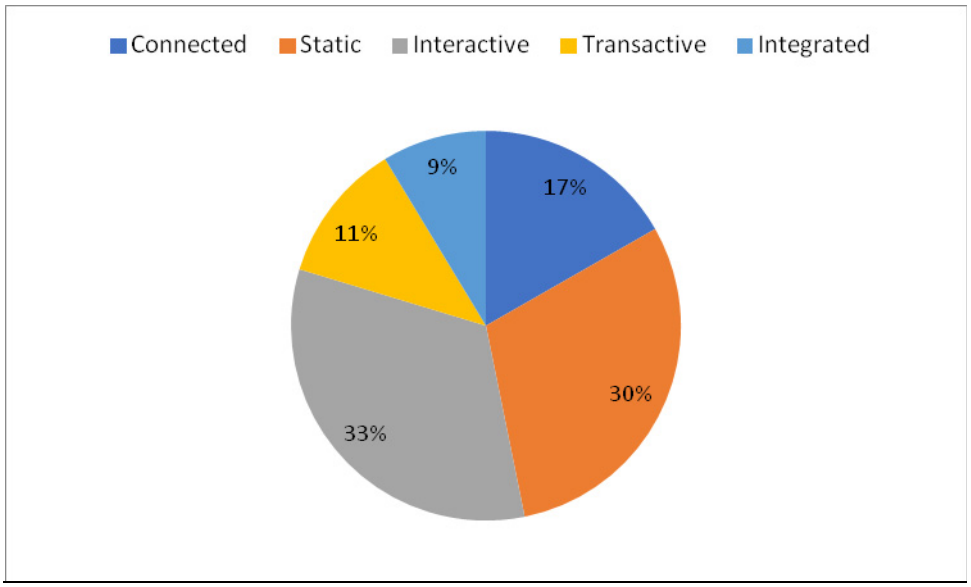
Source: Own Survey n = 315

In terms of eCommerce type availability, similar results emerged concerning the type of customer results with most of the companies having both types of eCommerce simultaneously - namely business-to-business and business-to-consumer (n =207) - rather than the availability of only one or the other, which might indicate that companies in Nicaragua do not only focus on particular customers, but rather deem it necessary to address both in the same manner.Comparing the results of companies with a business-to-business (n = 57) and business-to-consumer (n= 51) focus, there is no

relevant difference contrary to the expectations of having more companies with a business-to-business focus, which is usually the case. As it was mentioned before, according to the type of clients, they probably have more strategic orientation and resources that might address purely to one type or possibly to have more strategic orientation with both (Figure 18).

Figure 19: Level of eCommerce in Percentage

Which of the following options best describes the current situation of your company?



Source: Own Survey

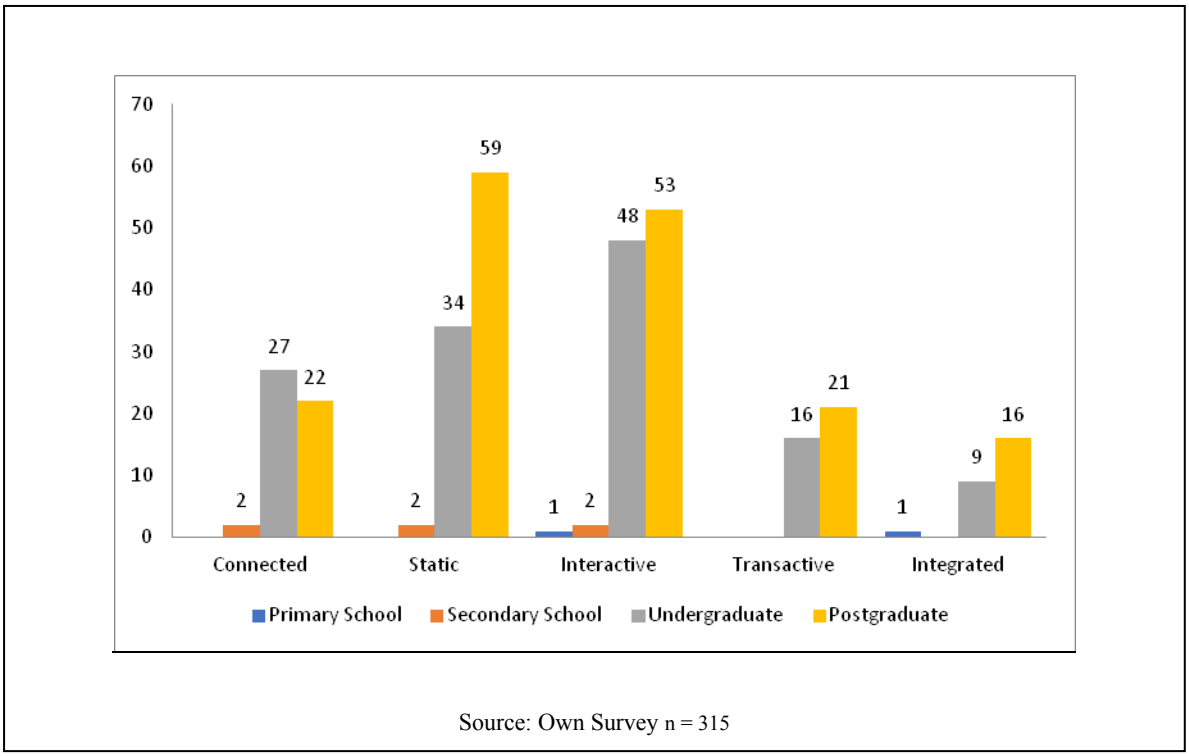
On figure 19 is presented one of the most important findings. It illustrates the distribution of eCommerce use in companies by level, giving answer to one of the research questions: *Which of the following options best describes the current situation of your company?*. Most of the participants, companies with an email and/or website in Nicaragua, use eCommerce for accepting requests online, receiving and sending emails, and receiving completed forms. 33% of the companies belong to the interactive level, while 30% of the companies are at the static level, publishing basic information on the Internet but with no customer interaction. Two important findings relate to the potentiality that

the companies at the interactive level have to pass to the transactive eCommerce level, representing a major step for companies in eCommerce matters as well as the possibility of companies being connected (17%). This might also increase over time considering a great number of companies remain unconnected; however, this can be interpreted that they might have to be on the Internet in the long run.

According to eCommerce adoption literature, adopters starts from the interactive level and further which are represented by 53% from the total, whereby companies from the connected to the static level represent 47%. Even though the number of adopters is slightly higher than non-adopters, it reflects the necessity to more efforts by organizations in Nicaragua to embrace new technologies and get advanced on a migration path to a higher eCommerce status.

Regarding the education variables, managers have mostly undergone postgraduate or undergraduate studies, which was expected, and thus it is possible to affirm that this might positively affect the adoption of eCommerce, given that well-educated managers tend to have more knowledge of IT technologies, and thus be able to make decisions about its implementation. In terms of the education of employees, the majority have secondary and undergraduate levels of education, which is not surprising given that a highest level of education will be optimal for the advanced implementation of eCommerce. It could be considered a limitation for companies (see Figure 20 & 21).

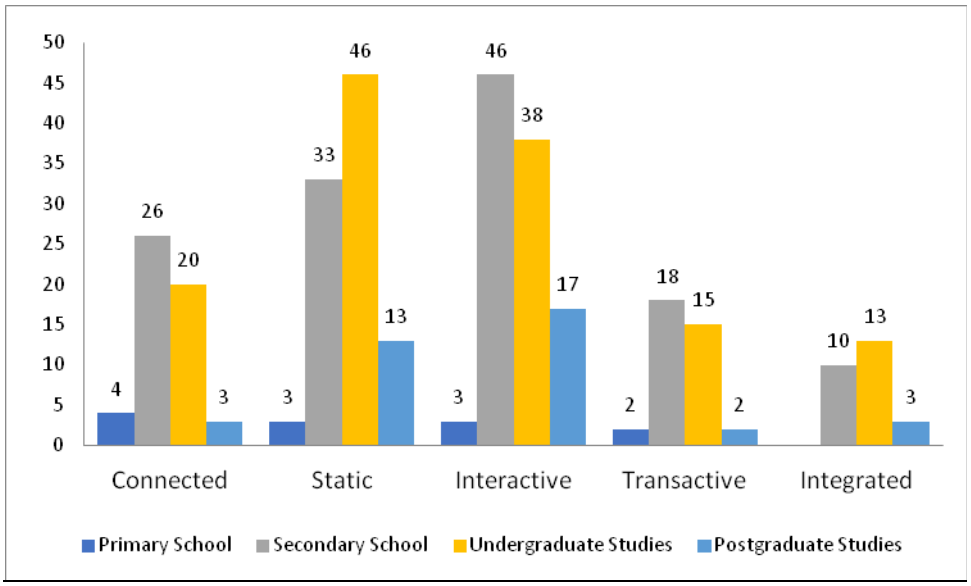
Figure 20: Highest Level of Education Achieved by Managers by Numbers



Source: Own Survey n = 315

Figure 21: Average Educational Level of the Employees

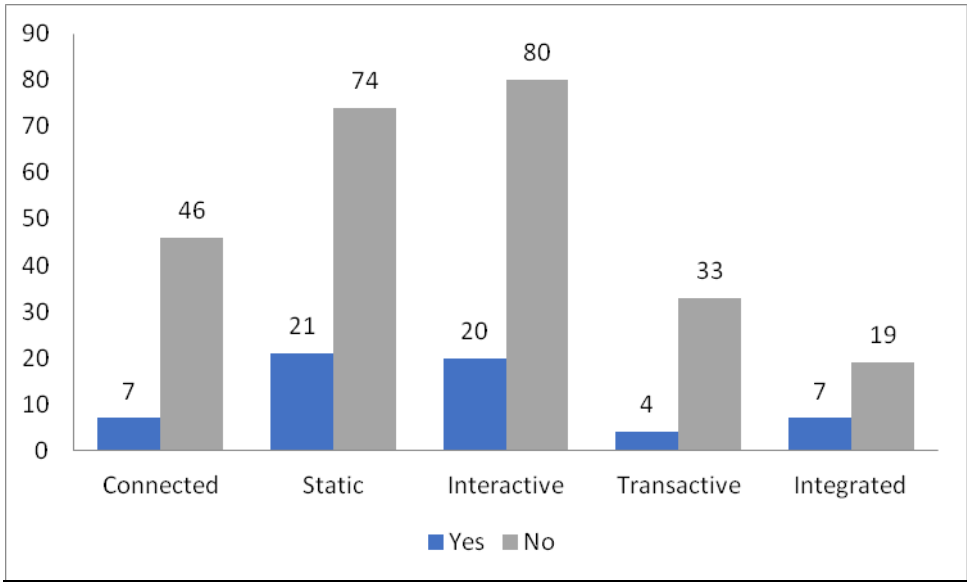
What is the average educational level of the employees?



Source: Own Survey n = 315

Figure 22: Companies' Export Orientation by Numbers

Does your company export products and/or services?



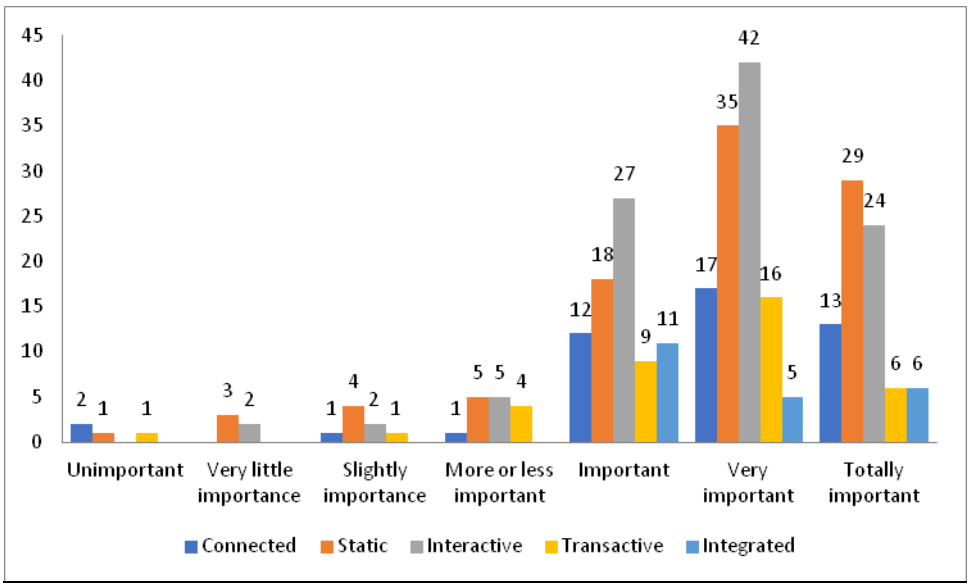
Source: Own Survey n = 315

The result on export orientation shows what is known about the no export orientation of most of Nicaraguan companies with a result of 256 no-export companies, and 59 which are export-oriented, indicating that this might affect the development of companies in Nicaragua.When they are exposed to the requirements of Internationalization, they tend to be to regarding the implementation of IT technologies to obtain competitive advantages and market expansion. The only surprising result to mention is that there is no direct influence of an advance level of eCommerce on being export-oriented, whereby the results show that most of the export-oriented companies were at the static (21) and interactive (20) levels (see Figure 22).

The following result related to the managers' perceived importance of hiring specialized employees clearly shows that most managers are inclined to hire specialized employees as can be seen in the figure 23. Indeed, the categories important, very important, and totally important acumulated the great majority of managers'responses. This result represents a positive influence on eCommerce considering that it is required to improve in matters of higher education and specialization of human resources in Nicaragua for the adoption of high demanding new technologies such as IT.

Figure 23: Importance of Hiring Employees Specialized in Their Areas by Numbers

In my view, hiring employees specialized in their area is:

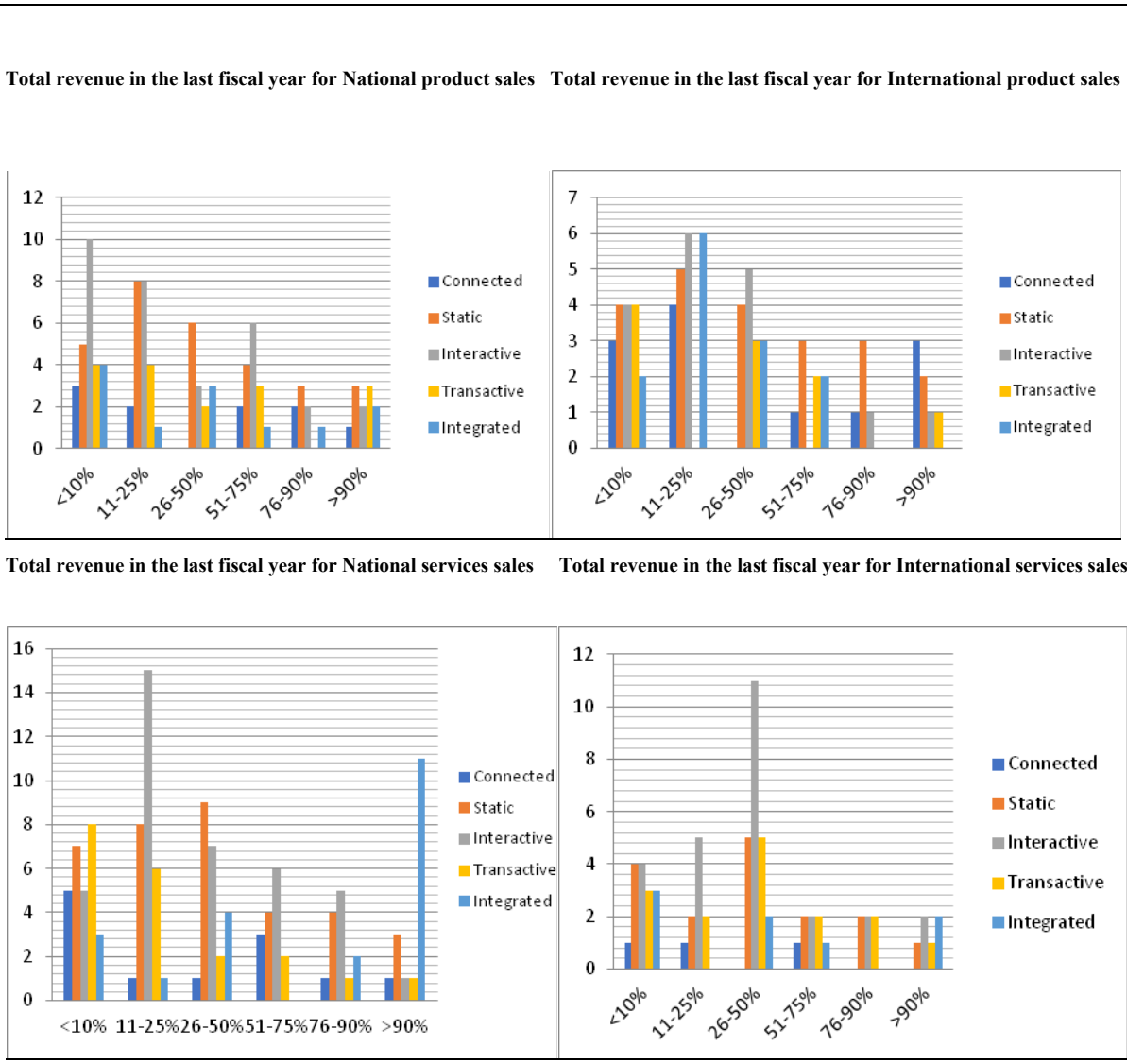


Source: Own survey n = 315

Regarding revenue generation, most companies generate less than 25% of their revenue through online National and International sales of products and services. Aside from International services sales, most companies generate between 26% and 50%, which might reflect the fact that companies obtain benefits through Internationalization and expansion in other markets besides locally through online sales, and the nature of the service demands more the use of this technology. Nonetheless, the majority of companies generate revenue from National products sales (98), National services sales (117), and have a static and interactive level (Figure 24).

Figure 24: Total Revenue in the Last Fiscal Year for National and International Product and Services Sales by Numbers

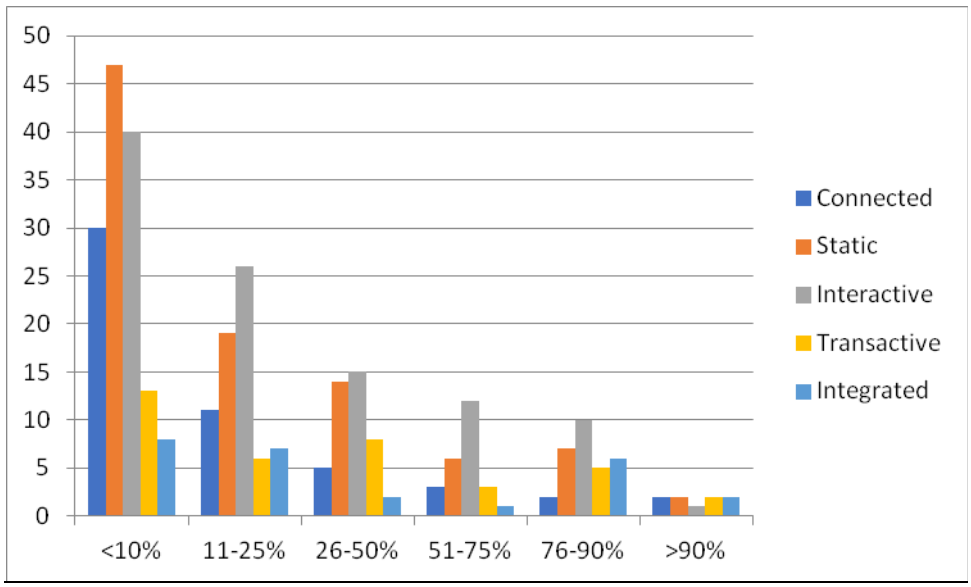
Could you please indicate the approximate percentage of total revenue by products and/or services for sale online in the last fiscal year?



Source: Own Survey n = 315

Figure 25: Companies' Yearly Investment in Online Presence by Numbers

Approximately what percentage of annual investment the company invests in its online presence? (e.g. Internet, email services, online catalog, payment, online service, human resources, etc.)



Source: Own Survey n = 315

The investment in online presence among companies tends to be low, whereby the majority of companies invest less than 25% (207). However, it is possible to observe a potential tendency to increase over time as figure 26 shows a linear distribution across categories. It can be interpreted that the level of eCommerce does not have an important influence on the investment, as the majority of participant companies were from the static and interactive levels, and the results do not show any particular result or difference concerning the level of eCommerce and the investment in online presence.

5.3. Bivariate Analysis

In the following section, the Bivariate Analysis aims to ascertain whether the relationship between the dependent variable of eCommerce adoption levels, and the independent variables are statistically significant. This analysis shall provide more outputs on how the technological, managerial, contextual, and communicational dimensions besides other variables which define the organization effect or not of the adoption. The dimensions to be analysed were developed in previous chapters, and it will be possible to wait and see, whether there is any relationship among the indicators with the eCommerce adoption variable.

Due to the nominal nature of the variables, a cross tabulation and Chi-Square Test is considered the most appropiate method to test the statistical relationship assumed in the developed hypothesis. The relationship is assumed, if the Pearson Chi-Square Test is below the p-value ($p<0.05$) and thus is used in this analysis. This section will present the assumptions, findings, and the significant cross tabulation results.

5.3.1. Hypotheses of Managers Characteristics

On previous research, a series of factors have been found on the influence for eCommerce adoption on the side of manager decision. Among these factors are: innovativeness, behavioral control, and eCommerce Knowledge. The hypotheses are presented below:

Table 11: Hypotheses of Managers Characteristics

H1. Hypotheses Related to the Managers Characteristics	Sig.
H1a. The managers´ innovativeness positively affects the adoption of business-to-consumer eCommerce in Nicaragua.	0.082
H1b. The managers´ behavioral control positively affects the adoption of business-to-consumer eCommerce in Nicaragua.	0.081
H1c. The managers´ eCommerce Knowledge positively affects the adoption of business-to-consumer eCommerce in Nicaragua.	0.348

The result of the Chi-Square Test shows that innovativeness, behavioral control, and eCommerce knowledge of managers does not influence the adoption, the p-value result is above 0.05 ($p>0.05$).

5.3.2. Hypotheses of Communication

Related to communication on the literature of Innovation Diffusion researchers have been discussing that the "Innovation Decision", "Interpersonal Communication Channel", the "Homophily Degree in Knowledge", the "Message on eCommerce Producing Return" and "High Degree of Personal Proximity Network" affect the adoption, therefore a series of assumptions were made to test this relationship. Following the hypotheses:

Table 12: Hypotheses of Communication

Hypotheses Related to the Communication	Sig.
H2a. The innovation decision approach positively affects the adoption rate of business-to-consumer eCommerce in Nicaragua.	0.691
H2b. The interpersonal communication channel on eCommerce transmission positively affects the adoption of business-to-consumer eCommerce in Nicaragua.	0.385
H2c. The high homophily degree in knowledge on communication networks negatively affects the adoption of business-to-consumer eCommerce in Nicaragua.	0.194
H2d. The message on eCommerce in producing return positively affects the adoption of business-to-consumer eCommerce in Nicaragua.	0.479
H2e. The high degree of personal proximity network in the information exchange about business-to-consumer eCommerce positively affects the adoption of businness-to-consumer eCommerce.	0.744

According to the statistical result, the Innovation Decision, the Interpersonal Communication Channel, the Homophily in Knowledge, the Message of eCommerce in producing return, and the

High Degree of Personal Proximity does not affect eCommerce adoption. The p-value result obtained for this variable was above 0.05 ($p > 0.05$).

5.3.3. Hypotheses of Technology Characteristics

On the "Technological Dimension", the literature demonstrates that several factors are related to the adoption of eCommerce, among them are: relative advantage, compatibility, complexity, observability, and financial budget. Therefore, the hypotheses assumed were:

Table 13: Hypotheses of Technology Characteristics

Hypotheses Related to the Technology Characteristics	Sig.
H3a. The relative advantage perceived about business-to-consumer eCommerce positively affects its adoption.	0.023
H3b. The perceived compatibility of business-to-consumer eCommerce positively affects its adoption.	0.011
H3c. The perceived complexity of business-to-consumer eCommerce negatively affects its adoption.	0.858
H3d. The perceived observability of business-to-consumer eCommerce positively affects its adoption.	0.001
H3e. The financial budget available to invest in business-to-consumer technology negatively affects its adoption.	0.150

The hypotheses were tested for the assumed relationship. From these factors, there are three that have significant positive influence on eCommerce adoption. They are: relative advantage, compatibility and observability which p-value result was below 0.05 ($p < 0.05$). However, complexity and financial budget were not significant.

5.3.4. Hypotheses of Context

On the Context Dimension, there was assumed several factors that might affect eCommerce adoption in Nicaragua as market eReadiness, transport infrastructure, transport logistics, financial institution eReadiness, telecommunication eReadiness, legal environment, and government commitment among the main factors that were found on previous research and were considered to affect eCommerce adoption in developing countries.

Table 14: Hypotheses of Context

Hypotheses Related to the Context	Sig.
H4a. The market eReadiness positively affects the adoption of business-to-consumer eCommerce in Nicaragua.	0.607
H4b. The transport infraestucture negatively affects the adoption of business-to-consumer eCommerce in Nicaragua.	0.738
H4c. The transport logistics infrastructure negatively affects the adoption of business-to-consumer eCommerce in Nicaragua.	0.430
H4d. The financial institution eReadiness negatively affects the adoption of business-to-consumer eCommerce in Nicaragua.	0.131
H4e. The telecommunication eReadiness negatively affects the adoption of business-to-consumer eCommerce in Nicaragua.	0.523
H4f . The legal environment negatively affects the adoption of business-to-consumer eCommerce in Nicaragua.	0.606
H4g. The government commitment negatively affects the adoption of business-to-consumer eCommerce in Nicaragua.	0.406

The Chi-Square Test on the relationship between eCommerce adoption and the context indicators found that there is no statistical significance between market eReadiness, transport infrastructure, transport logistics, financial institutions, telecommunication eReadiness, legal environment and government commitment. The p-value result on these variables was above 0.05 ($p > 0.05$).

Summing up the analysis of the four dimensions about the technology, communication, managerial characteristics, and contextual factors which might affect eCommerce: Three hypotheses could be

confirmed. They constitute interesting findings, as all of them are related to the "Technological Dimension" rather than others that were considered. The three hypotheses that were confirmed are: relative advantage, compatibility, and observability. For the communication, managerial, and contextual dimensions no statistically significant relationship were found following the confirmed hypotheses:

Table 15: Confirmed Hypotheses

Dimension	Confirmed Hypotheses
Technological	H3a.The relative advantage perceived about business-to-consumer eCommerce positively affects its adoption.
	H3b. The perceived compatibility of business-to-consumer eCommerce positively affects its adoption.
	H3d. The perceived observability of business-to-consumer eCommerce positively affects its adoption.

Table 16: Control Variables

Control Variables	Sig.
Department	0,297
Highest level of education achieved by the manager	0,331
Business sector	0.570
Size of the companies	0,119
Average education of employees	0,355
Time in the market	0,579
Export orientation	0,347
Importance of hire specialized employees	0,505
Yearly online investment and level of eCommerce	0,198
Customers	0,252

Control Variables	Sig.
Revenue generation for national sales of products	0,014
Revenue generation for international sales of products	0,103
Revenue generation for national sales of services	0,050
Revenue generation for international sales of services	0,001
Total revenue in the last fiscal year for national product sales	0,885
Total revenue in the last fiscal year for international product sales	0,396
Total revenue in the last fiscal year for national services sales	0,321
Total revenue in the last fiscal year for international services sale	0,922

The previous results (Table 16) for the control variables shows that in terms of Location (department), education level of managers,business sector, size of the companies, average education level of employees, time in the market, export orientation, importance of hired specialized employees, yearly investment, customers, the revenue generation, and the percentage of revenue generation, only the variables revenue generation forInternational sales of services, and revenue generation for National sales of services were significant, the p-value result in those cases was below or equal to 0.05 ($p \leq 0.05$), demonstrating how important the generation of revenue is for the adoption in the Nicaraguan context ahead from previous factors mentioned which are normally significant in a developing country context.

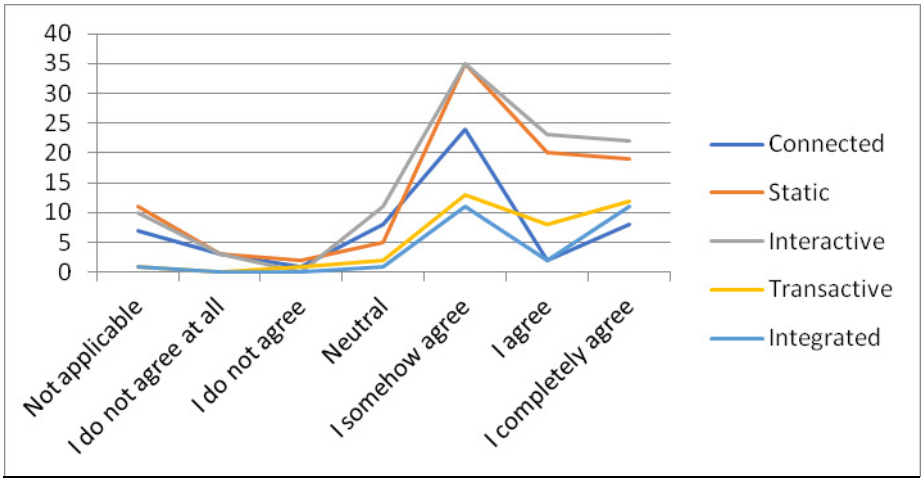
5.4. Managerial Dimension: Descriptive Statistics Business-to-Consumer eCommerce Adoption

The following figures (Figure 26 & 27) show the results to the questions:“How far do you agree with the following aspects regarding the market entry into Business-to-Consumer eCommerce?”. About the managerial dimension analysed: The figures show a tendency from the majority of the participants across all eCommerce levels expressing an attitude addressed to the agreement, and especially on innovativeness and behavioral control. However, managers show a tendency to be neutral and to the agreement related to eCommerce knowledge. What could be interpreted is that managers recognize the need to have innovativeness and behavioral control required for the adoption, but have doubts about the knowledge required.

Figure 26: Innovativeness and Behavioral Control by Numbers

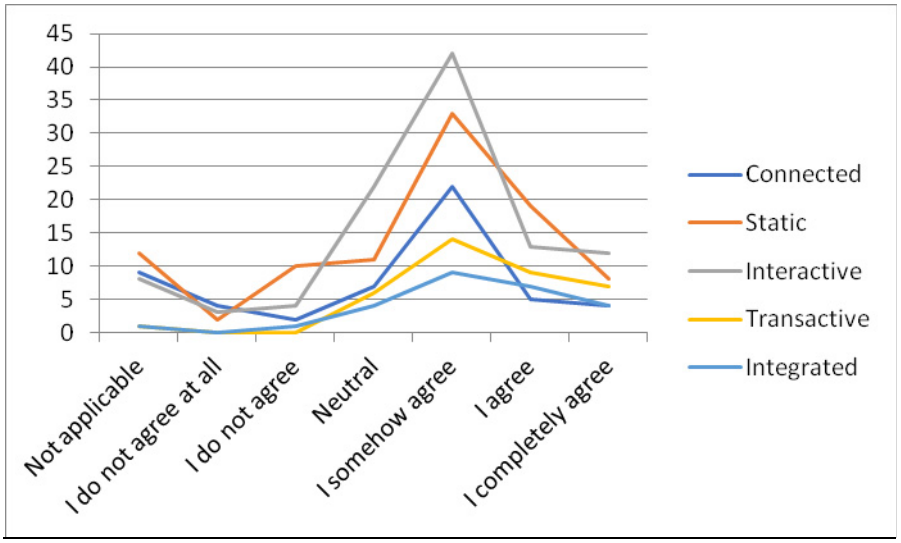
Innovativeness

I plan to implement new technologies before my competitors do:



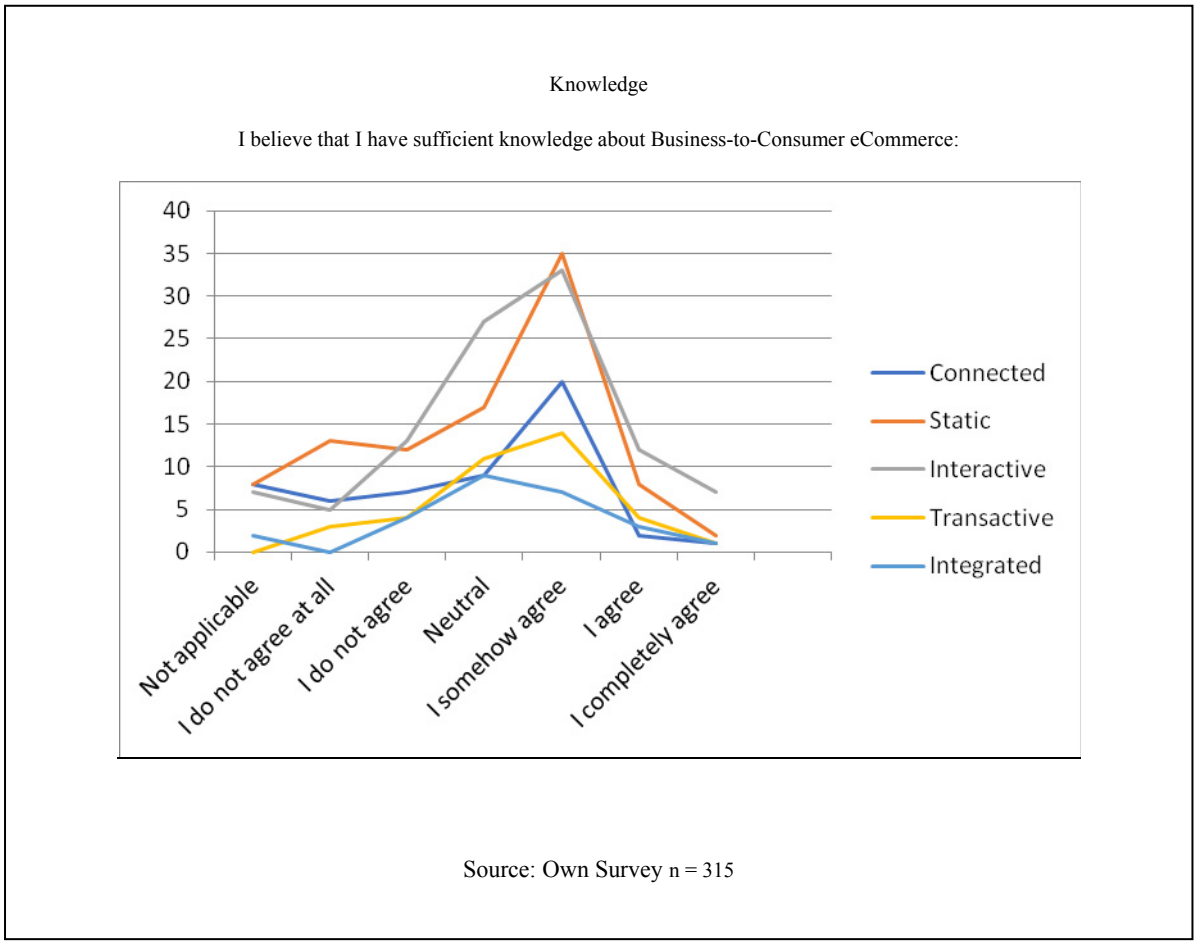
Behavioral Control

I believe that I have sufficient administrative resources to run Business-to-Consumer eCommerce:



Source: Own survey n = 315

Figure 27: Knowledge by Numbers



5.5. Communication Dimension: Descriptive Statistics Business-to-Consumer eCommerce Adoption

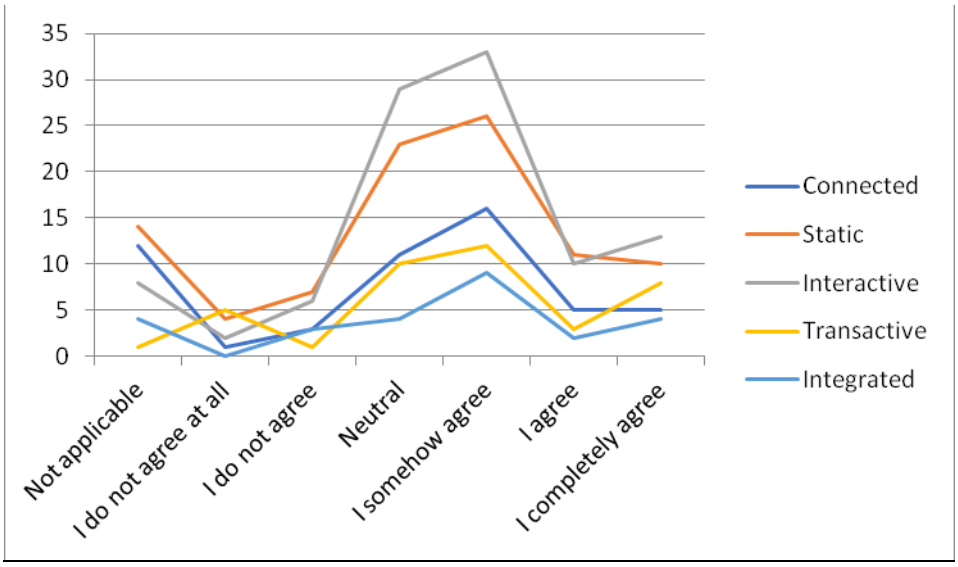
On the communication aspect related to the previous question, personal decision had two of the highest peaks across all levels of eCommerce between a neutral position and somehow agree, on information exchange word of mouth, homophily, economic message, and personal proximity have a tendency to an agreement. It means that on the decision about the implementation, there are uncertainties, if it corresponds only to the manager to decide the implementation of the technology. It might be interpreted that the correspondence to decide be by more than one person or to a different authority. Nevertheless, most of the participants affirm that the information exchange occur through word of mouth, existing homophily or similarities between the agents of communication. Mostly, the message transferred is about a potential economic benefit if the technology is implemented, and that a personal proximity exists, where the information is obtained.

This is an important overall finding, as there is so far no data on previous studies related to eCommerce communication on the adoption process. This results helps to understand how this process occurs in this context, the factors that do not present variable tendency and which are a bit more complex that require to be looked at as the personal decision factor (Figures 28-30).

Figure 28: Personal Decision and Interpersonal Information Exchanged by Numbers

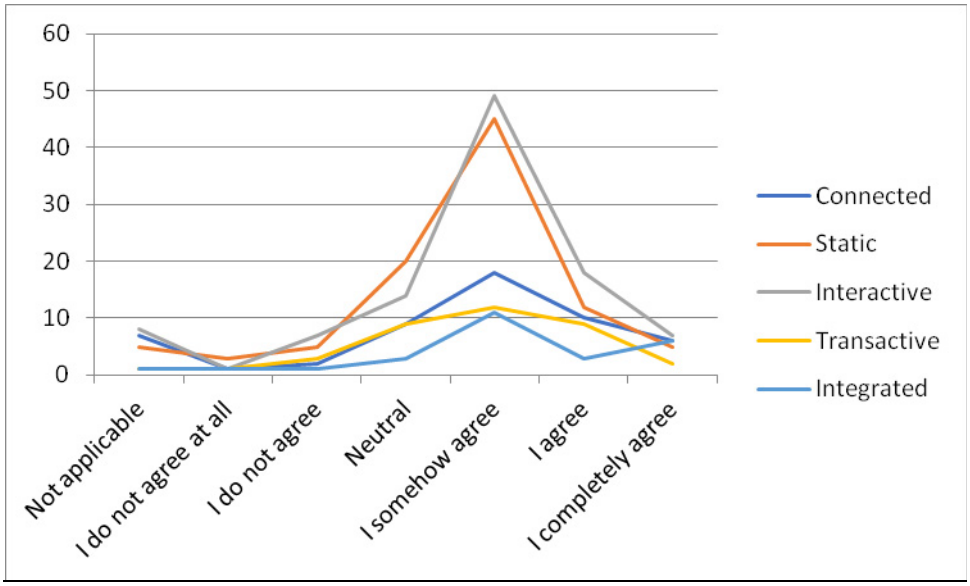
Personal Decision

I have the responsibility to decide about the implementation of innovations like Business-to-Consumer eCommerce in my company:



Information Exchanged Word of Mouth

In my opinion, it is possible to receive information about Business-to-Consumer eCommerce via word-of-mouth communication from person to person:

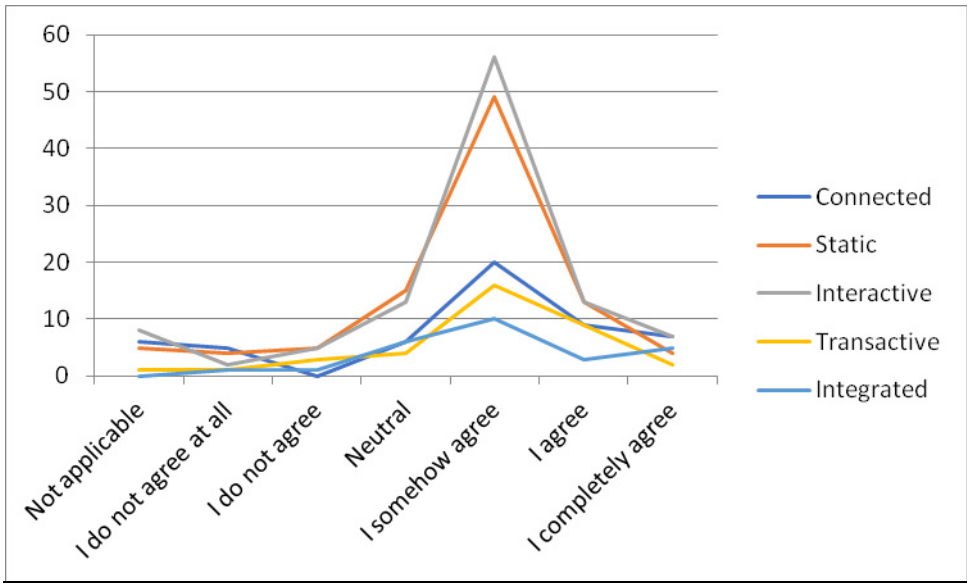


Source: Own Survey n = 315

Figure 29: Homophily and Economic Message by Numbers

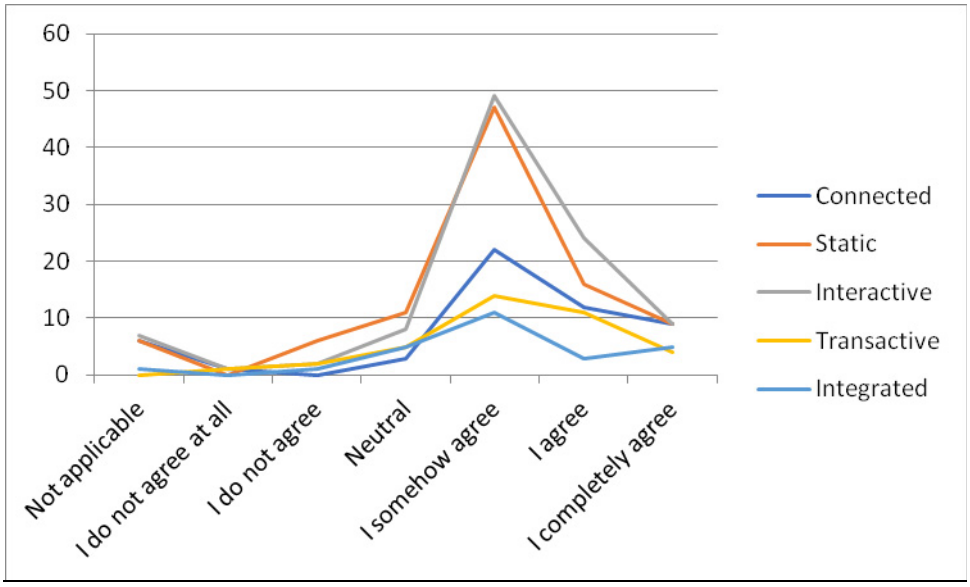
Homophily

In my opinion, it is possible to receive information about Business-to-Consumer eCommerce from people with the same level of knowledge in the area of eCommerce:



Economic Message

I have the impression that Business-to-Consumer eCommerce has the potential to generate economic benefits:



Source: Own Survey n = 315

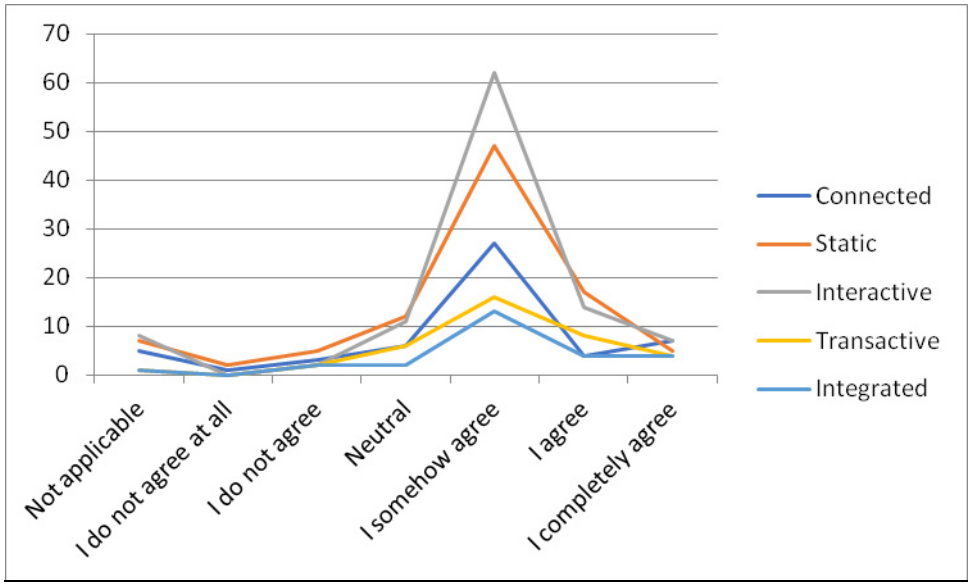
5.6. Technology Dimension: Descriptive Statistics Business-to-Consumer eCommerce Adoption

The technology dimension follows the tendency so far as in the previous dimensions on recognizing the presence of the characteristics of the technology as relative advantage and compatibility, but also a degree of complexity of this technology and its visibility. Contrary, it was expected to constitute an important finding as related to the financial costs of this technology and the availability of capital by the organization. The companies in this case vary in their perception, staying between a neutral position and somehow agree about having the budget required for this technology. This can be interpreted that there is a concern or the belief to require more financial capital for investing on the adoption of eCommerce, but most of the small companies in the country are not capable to assume the budget required. However, they do not perceive the advantage, observability, and compatibility of it within their business, but issues such as financial budget and degree of complexity might affect the adoption (see Figures 30-32).

Figure 30: Personal Proximity and Relative Advantage

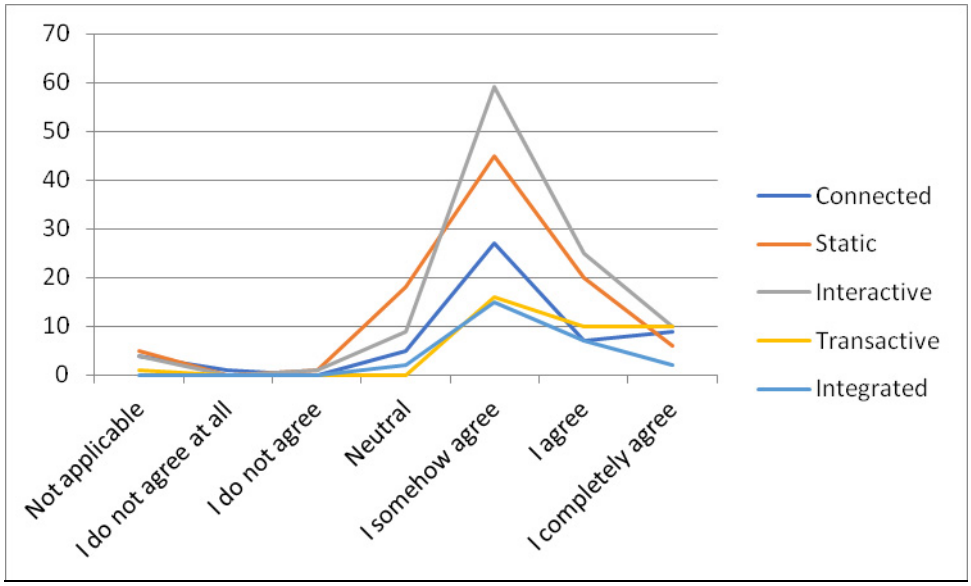
Personal Proximity

In my opinion, it is possible to exchange information about Business-to-Consumer eCommerce especially with people close to me:



Relative Advantage

In my opinion, one can assume the advantages of new technologies of Business-to-Consumer eCommerce from previous information technologies:

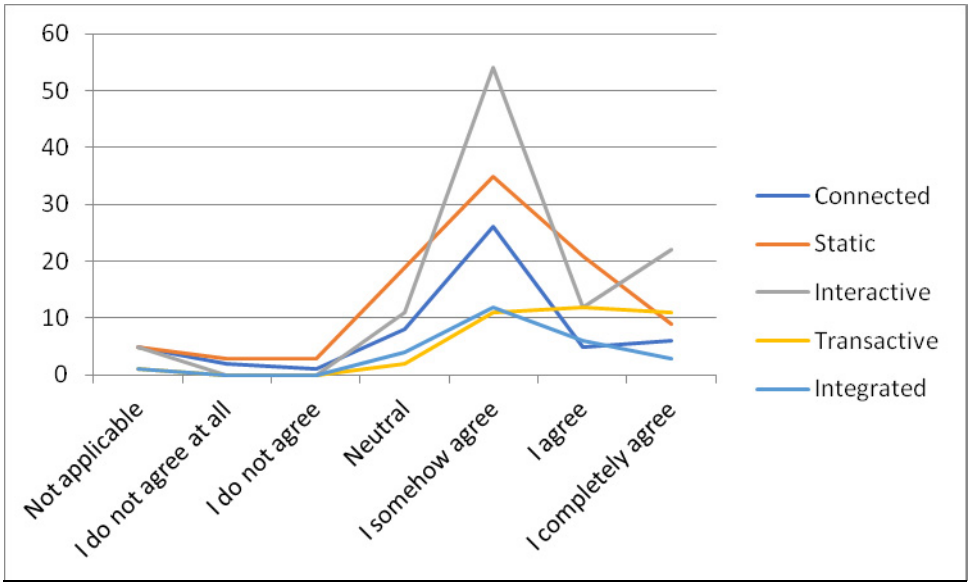


Source: Own Survey n = 315

Figure 31: Compatibility and Complexity

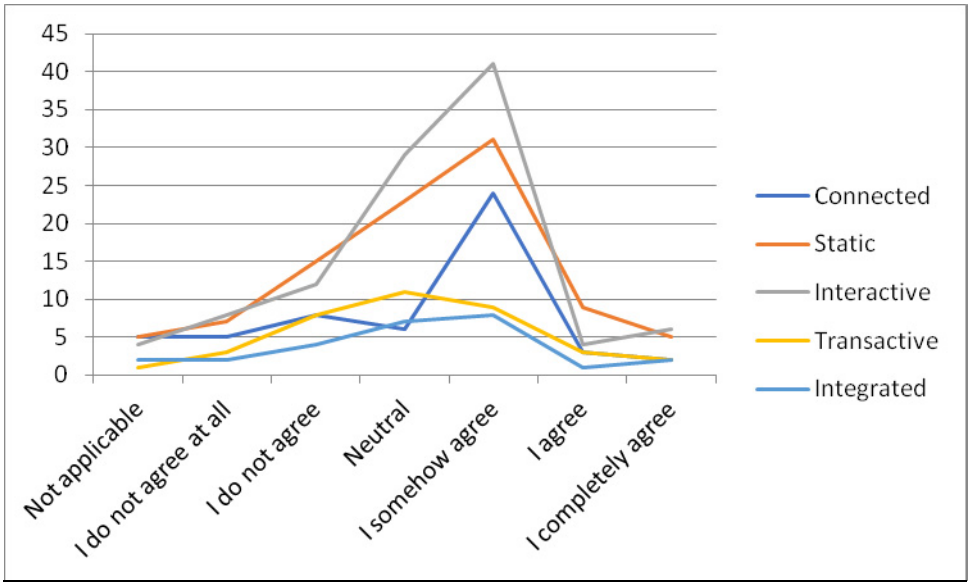
Compatibility

I feel that Business-to-Consumer eCommerce is compatible with my business:



Complexity

I perceive the technologies of Business-to-Consumer eCommerce as being rather complex to use:

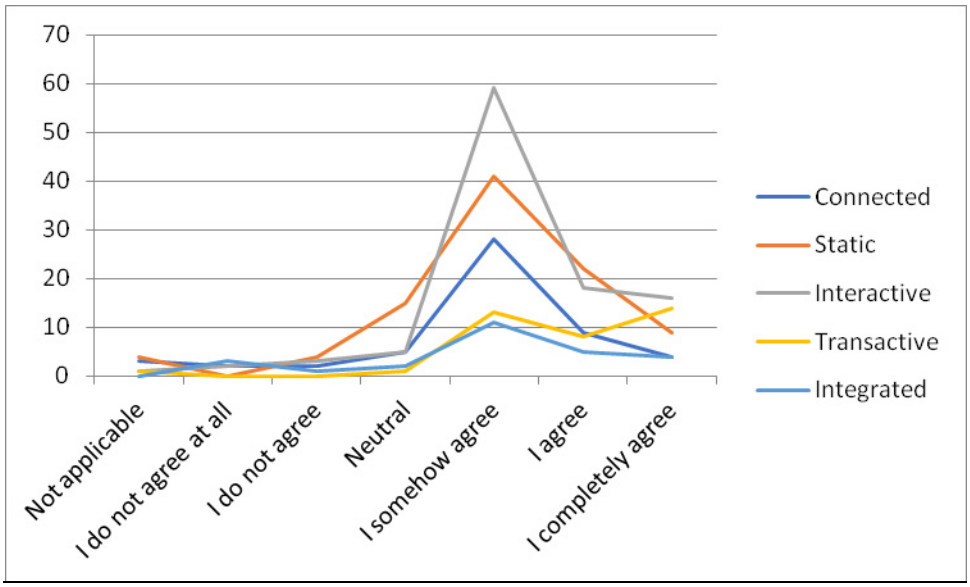


Source: Own Survey n = 315

Figure 32: Observability and Budget

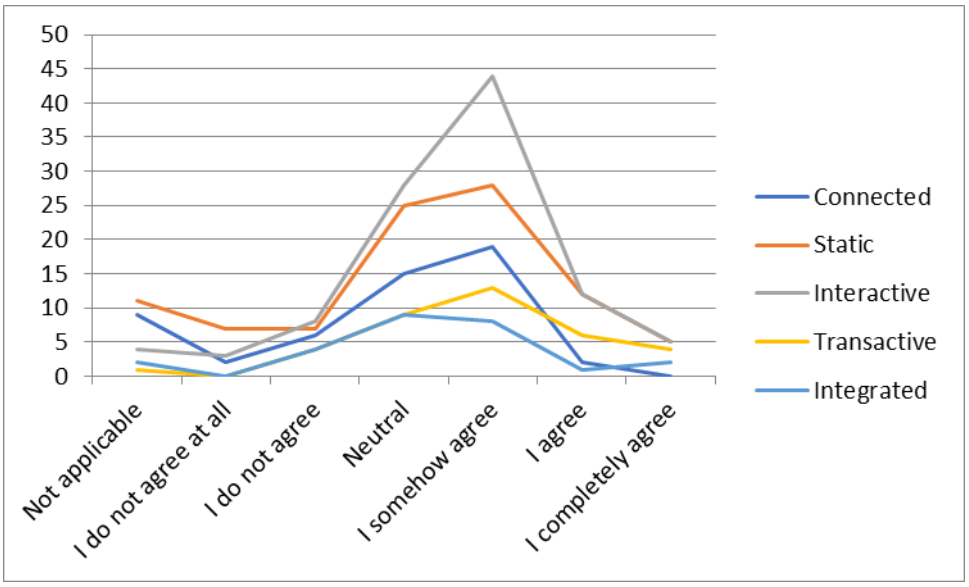
Observability

I have the impression that the advantages of Business-to-Consumer eCommerce are clearly visible to companies:



Budget

I believe that I have sufficient budget to invest in innovations like Business-to-Consumer eCommerce:



Source: Own Survey n = 315

5.7. Contextual Dimension: Descriptive Statistics Business-to-Consumer eCommerce Adoption

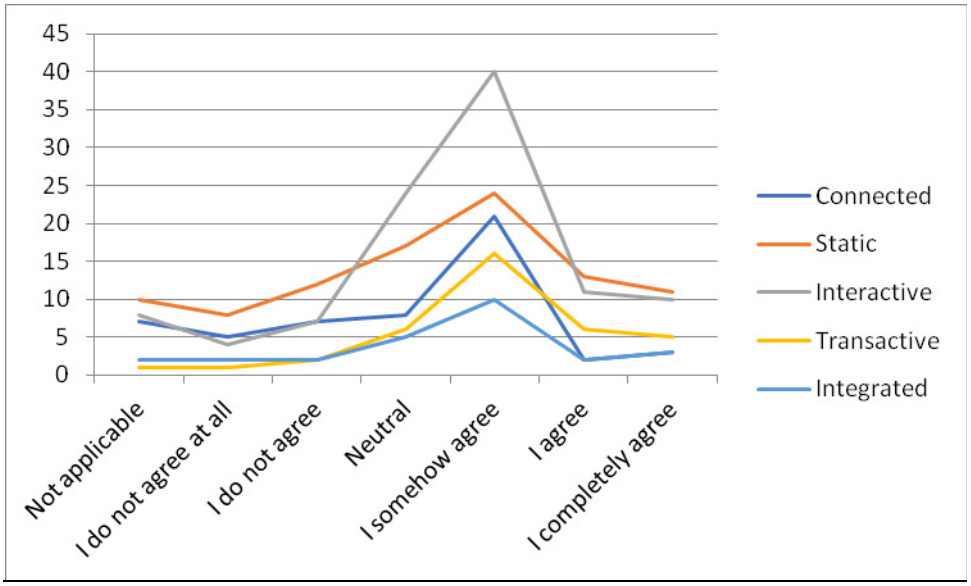
The contextual dimension which describes the market eReadiness, transport logistic infrastructure, logistics services, legal framework, financial institutions, telecommunication, and government commitment is the dimension which presents more variations on its tendency (see Figures 33-36).

The participants consider relative to market eReadiness and agree that it exists for eCommerce, but related to transport logistics infrastructure, logistic services, legal framework, financial institutions, and telecommunication, there is still more work to find the path required as the responses vary across disagreements and neutral tendency. There is not a majority agreement of all this factor eReadiness. In the particular case of government commitment, the majority adopted a neutral position about considering the government committed to support and promote the adoption of ICT technologies. It can be intepreted as a feeling that the managers do not see a plan for promotion, do not know how to consider the position of the government related to this matter, or do not want to comment about the government role. The government is a crucial agent to promote innovation, and if the managers do not emit any opinion or they are not sure about their position, a strong recommendation is to work hand and hand both to the development of ICT in the country and probably to take a more proactive position and to propose to the government what is required.

Figure 33: Market eReadiness and Transport Logistics Infrastructure

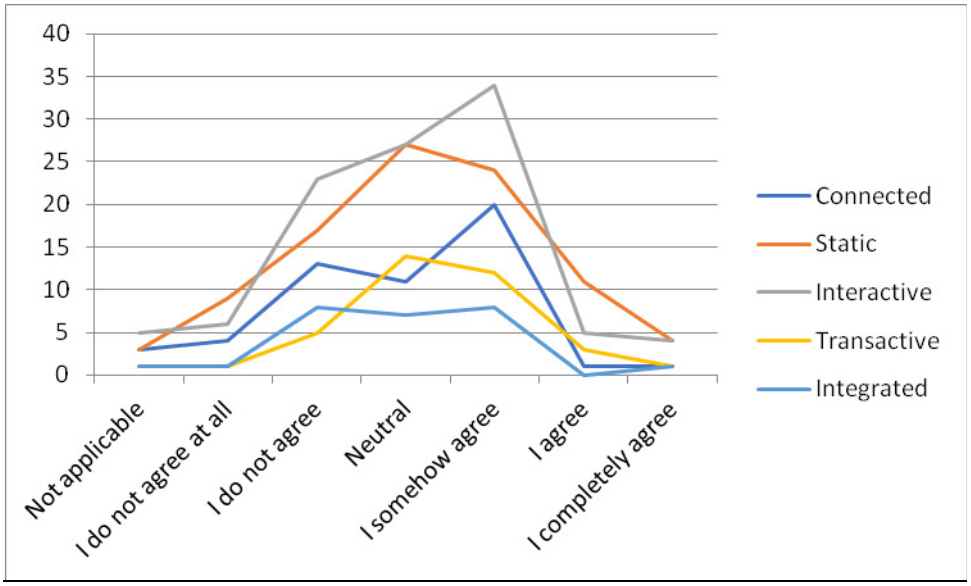
Market eReadiness

I believe that our customers would be willing to buy online:



Transport Logistic Infrastructure

The country's transport infrastructure is sufficient to practice Business-to-Consumer eCommerce:

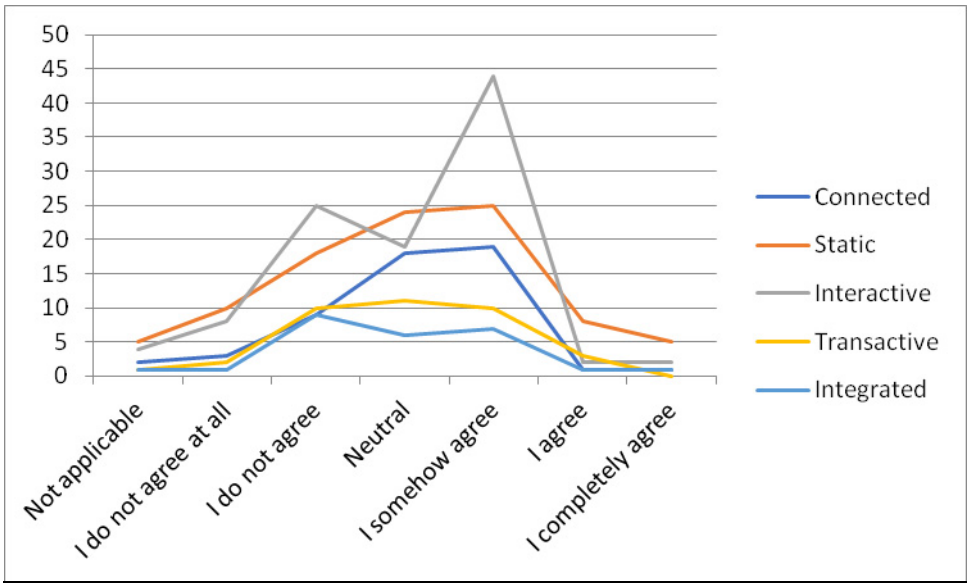


Source: Own Survey n = 315

Figure 34: Logistics Services and Legal Framework

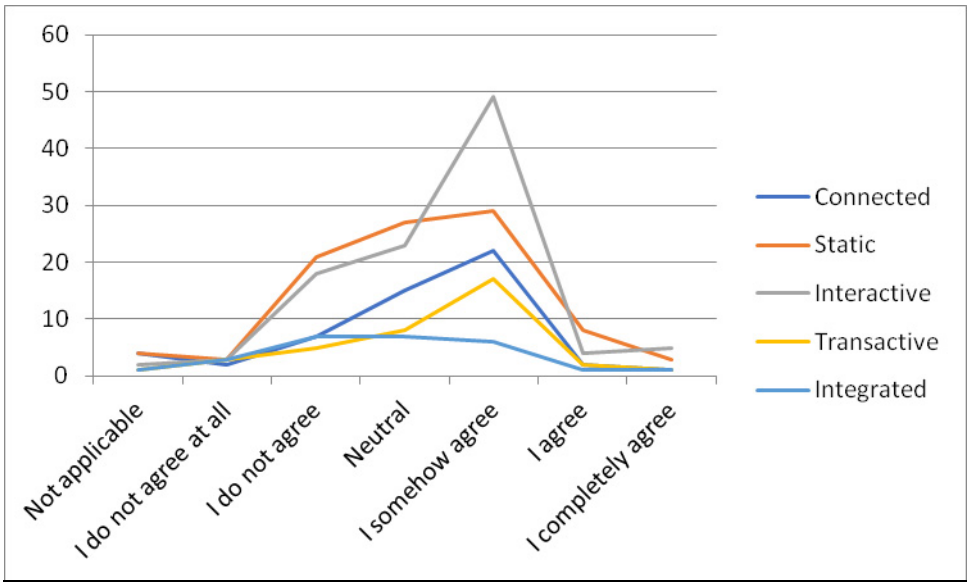
Logistic Services

The country's existing logistic services are sufficient to practice Business-to-Consumer eCommerce:



Legal Framework

I have the impression that the country's juridical framework is an advantage when it comes to practicing Business-to-Consumer eCommerce:

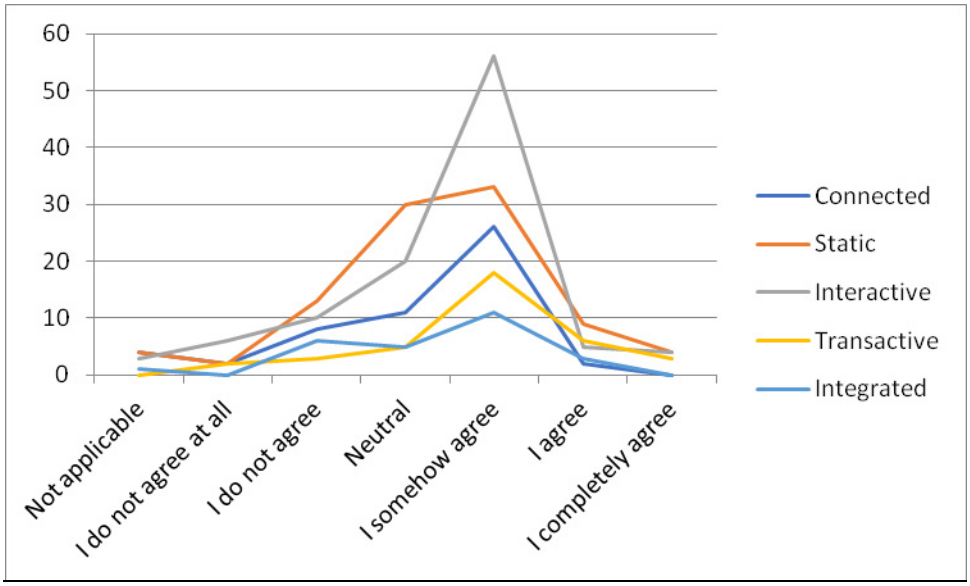


Source: Own Survey n = 315

Figure 35: Financial Institutions Infrastructure and Telecommunication Infrastructure

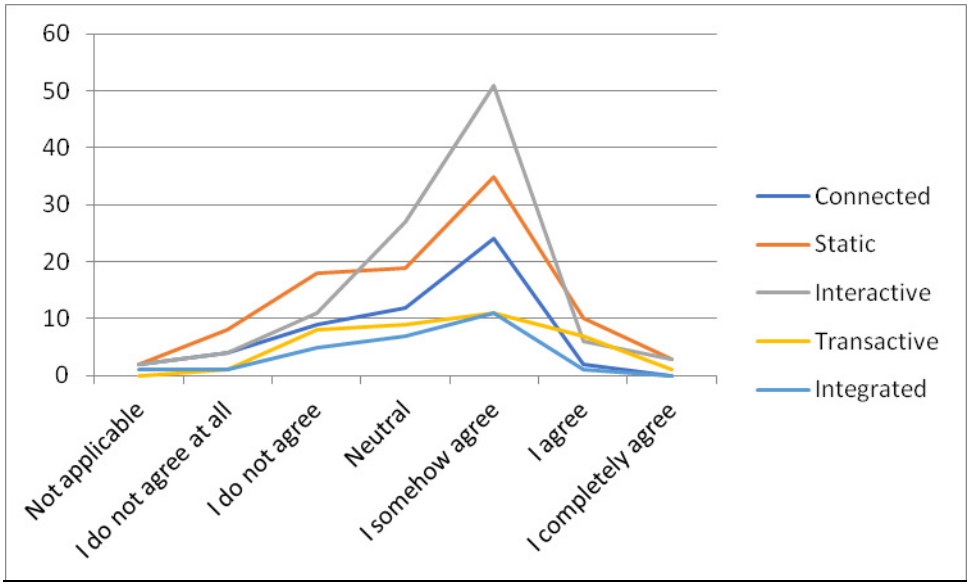
Financial Institutions Infrastructure

The country's financial institutions are prepared for Business-to-Consumer eCommerce businesses:



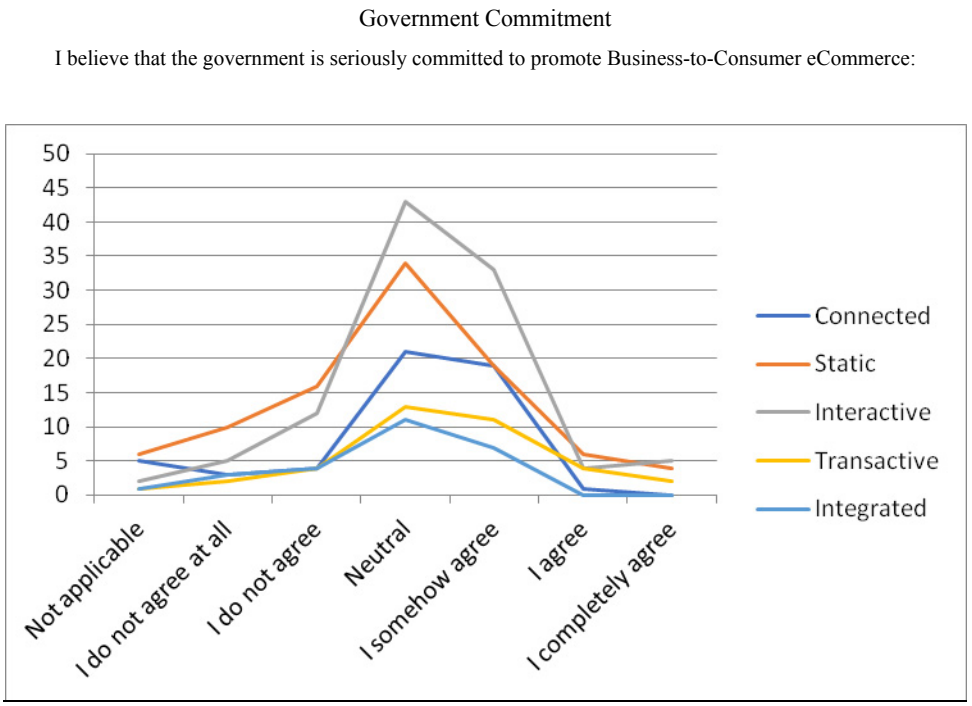
Telecommunication infrastructure

The country's telecommunication infrastructure is trustworthy and efficient:



Source: Own Survey n = 315

Figure 36: Government Commitment



Source: Own Survey n = 315

5.8. Inhibitors for Business-to-Consumer eCommerce Adoption

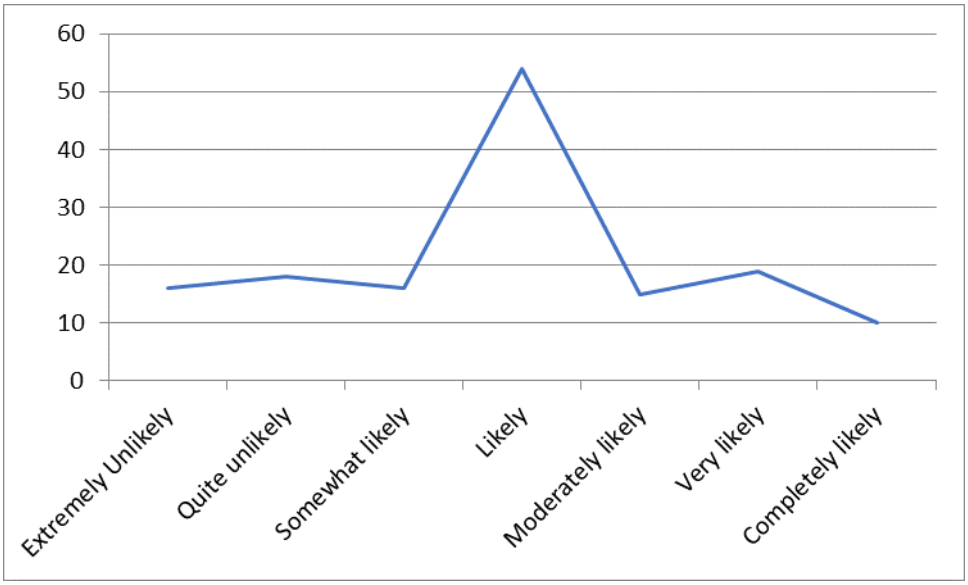
Supported by previous research findings to understand the impediment of business-to-consumer eCommerce adoption, a series o internal and external factors were considered to ask the participants about their perception of what could impede the process of adoption. Therefore, a series of affirmations were proposed to ascertain the degree of likehood as an impediment by asking: "How far is it likely that the following reasons could impede the market entry to Business-to-Consumer eCommerce in an advantage stage?". Most of the following affirmations (see Figures 37-40) were likely to affect the adoption which includes the lack of financial means, knowledge, logistics services, customer demand, qualified employees, legal framework, and lack of preparation by

financial institutions although the trustworthy and effectiveness of telecommunication were less likely to affect the adoption.

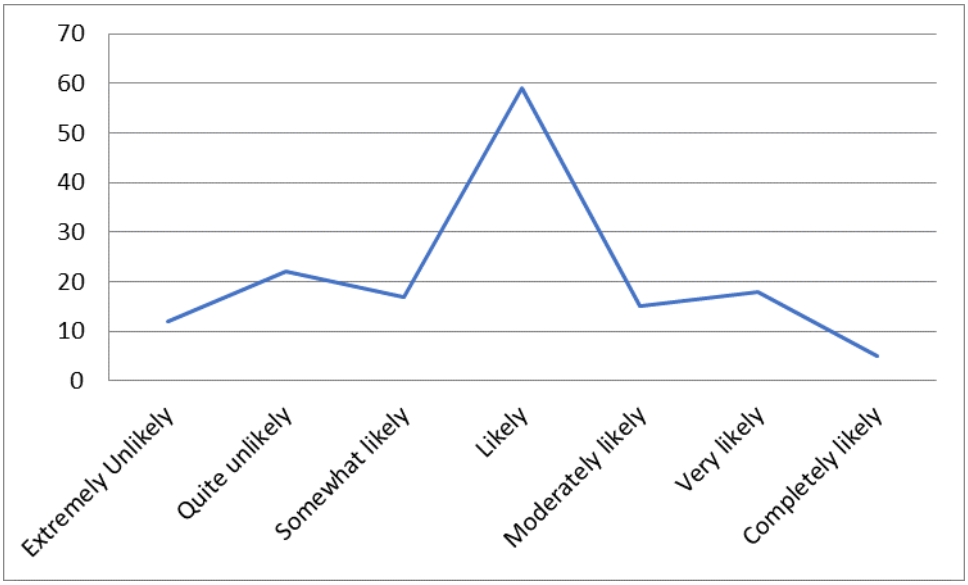
Meanwhile, the lack of preparation by financial institutions for practising business-to-consumer eCommerce and the lack of an appropriate juridical framework in the country more strongly affected the implementation. This might indicate that it should be considered that there is no particular factor which can be seen as inhibiting the adoption of eCommerce, but all the factors exposed here are likely to impede it. Therefore, they should be discussed in the media about how this panorama could be improved. After all, the managers who were interviewed do not perceive to have optimum conditions for the adoption.

Figure 37: Lack of Financial Means and Lack of Knowledge and Understanding by Managers

The lack of financial means to completely implement Business-to-Consumer eCommerce:



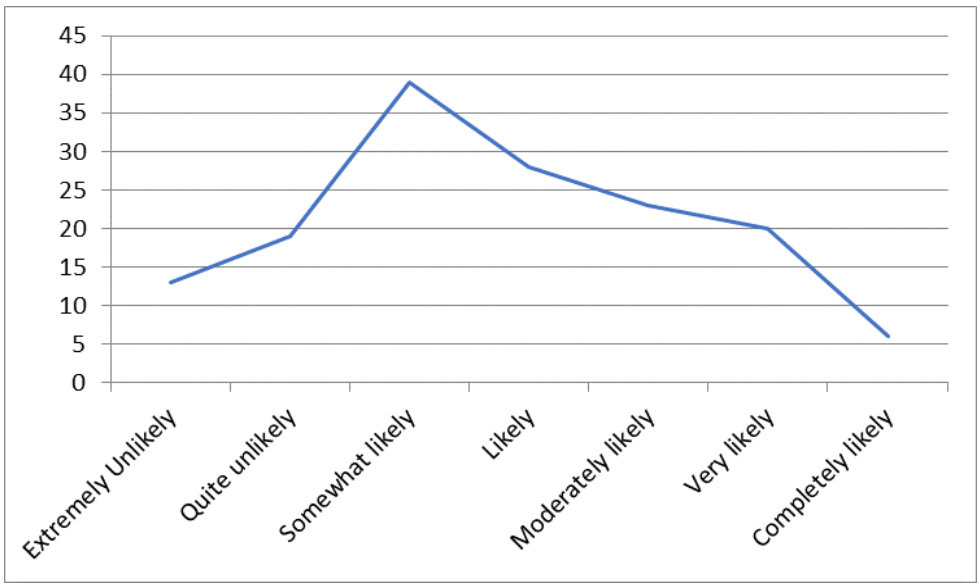
The lack of knowledge and understanding of Business-to-Consumer eCommerce by management:



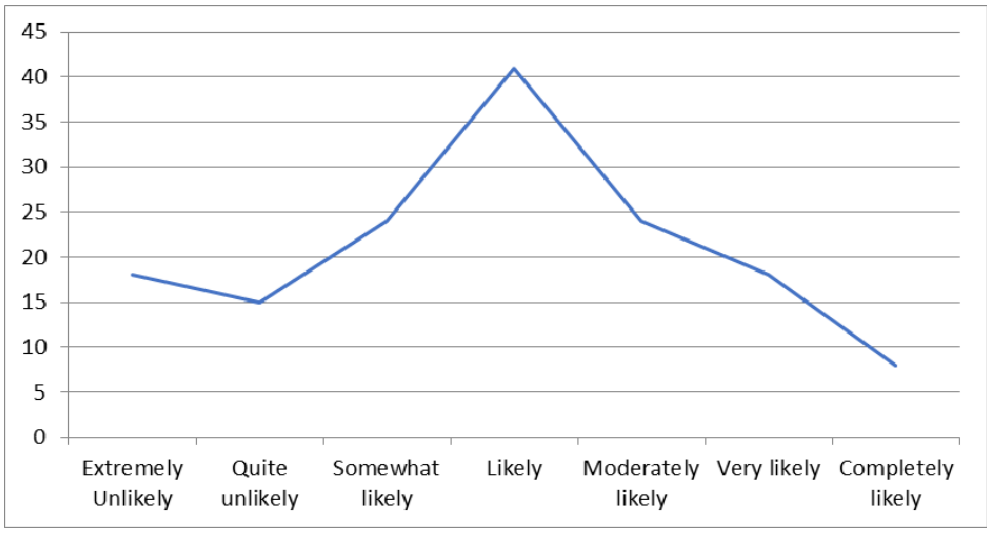
Source: Own survey n = 148

Figure 38: Lack of Trustworthy and Effective Telecommunication and the Lack of Appropiate Logistics Services

The lack of a trustworthy and effective telecommunication infrastructure in the country:

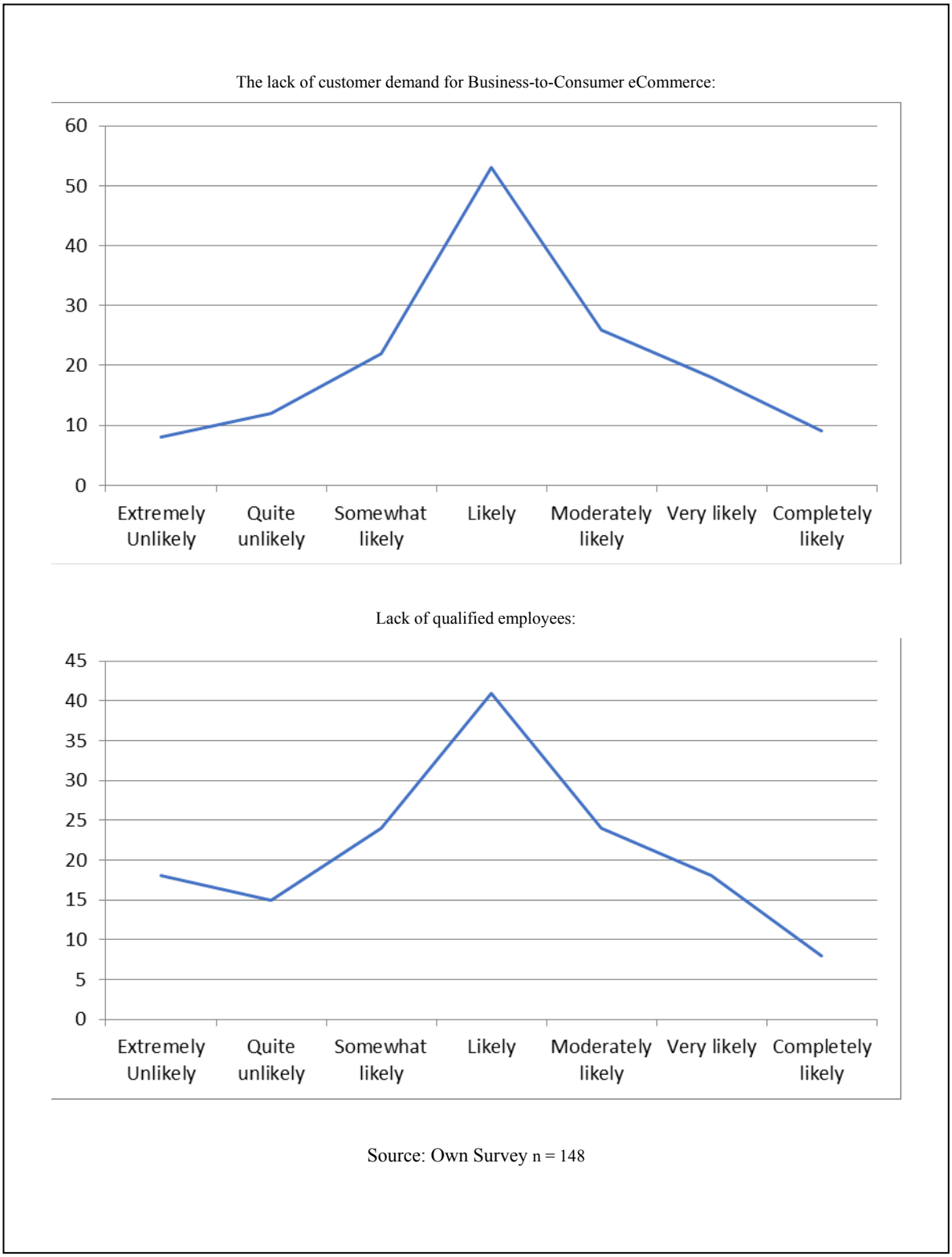


The lack of appropriate logistics services for Business-to-Consumer eCommerce in the country:



Source: Own Survey n = 148

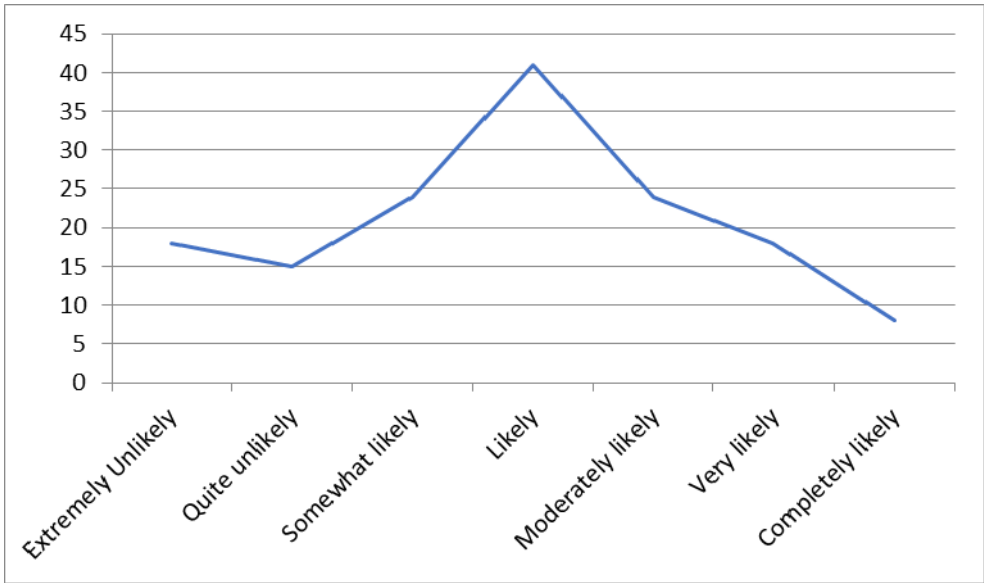
Figure 39: Lack of Customer Demand and Lack of Qualified Employees



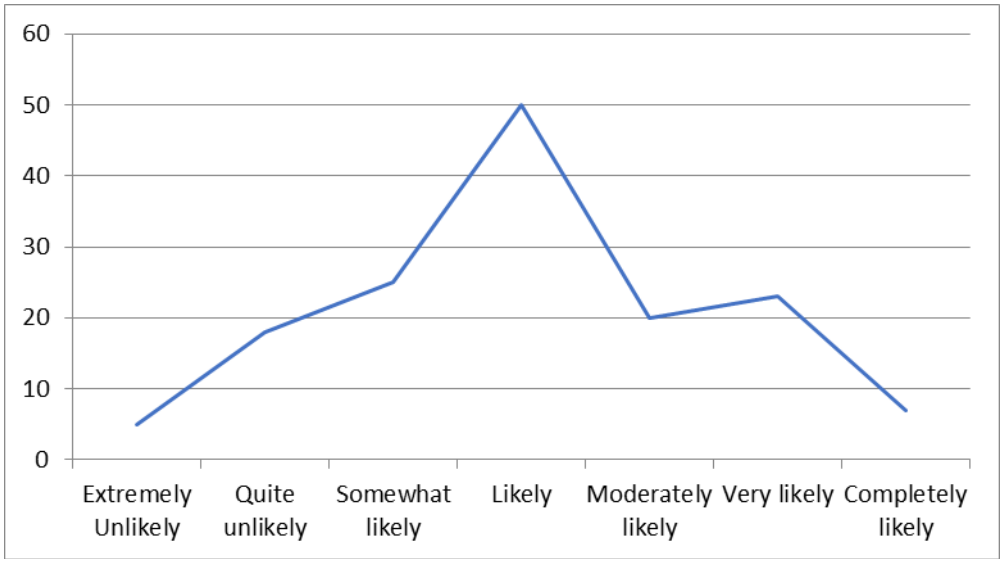
Source: Own Survey n = 148

Figure 40: Lack of an Appropiate Juridical Framework and Lack of Preparation by Financial Institutions

The lack of an appropriate juridical framework in the country that allows concluding business deals over the Internet:



The lack of preparation by financial institutions for practicing Business-to-Consumer eCommerce:



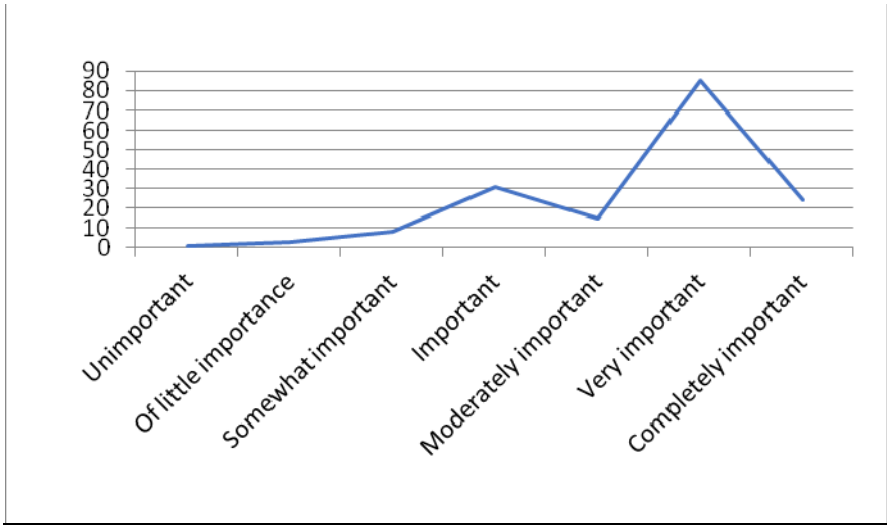
Source: Own Survey n = 148

5.9. Facilitators for Business-to-Consumer eCommerce

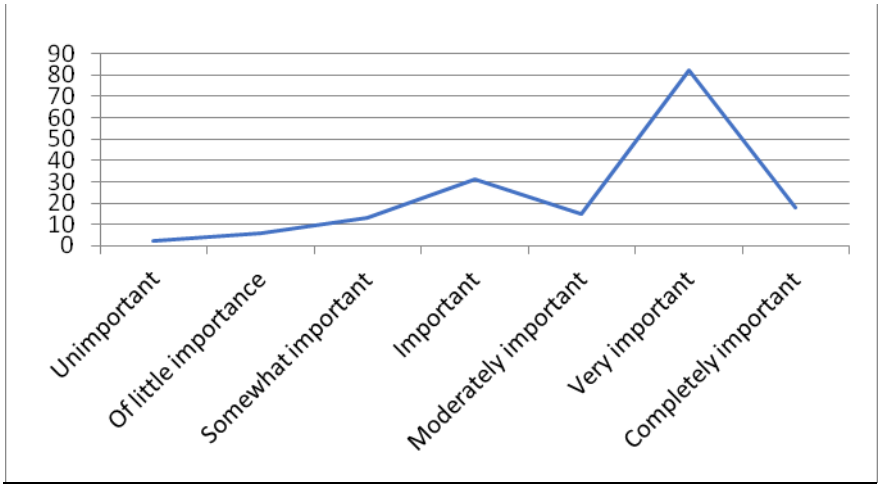
Conforming to the question related to the facilitators for Business-to-Consumer eCommerce, all the affirmations were rated as average on their importance, showing quite similar results and thus demonstrating that they are equally important elements related to the financial resources, knowledge, qualification of employees, innovativeness, equipment availability, and vision. The question asked related to this matter was: “How important are the following resources for your company to implement business-to-consumer eCommerce?”. It demonstrated that contrary to the gloomy picture shown by the inhibiting factors, the tendencies vary on how the adoption of eCommerce is affected by the interplay of facilitators and inhibitors. It shows that the perception to facilitate the adoption are equal when they involve financial and human resources and do not differentiate in the importance between them. Practically, they have to all be present in the same manner for a succesful adoption (see Figures 41-43).

Figure 41: Highly Qualified Staff and Financial Resources

Highly Qualified Staff:



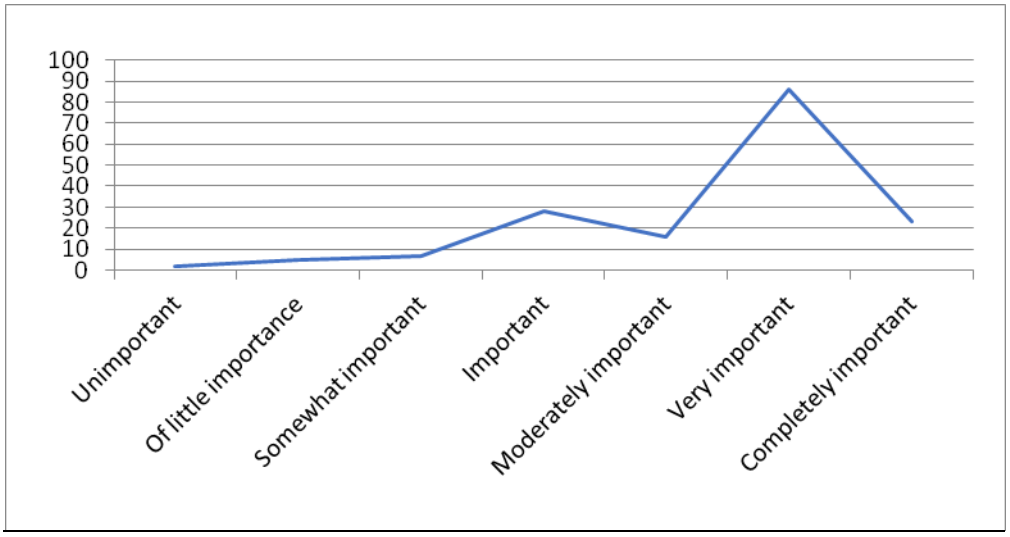
Financial Resources:



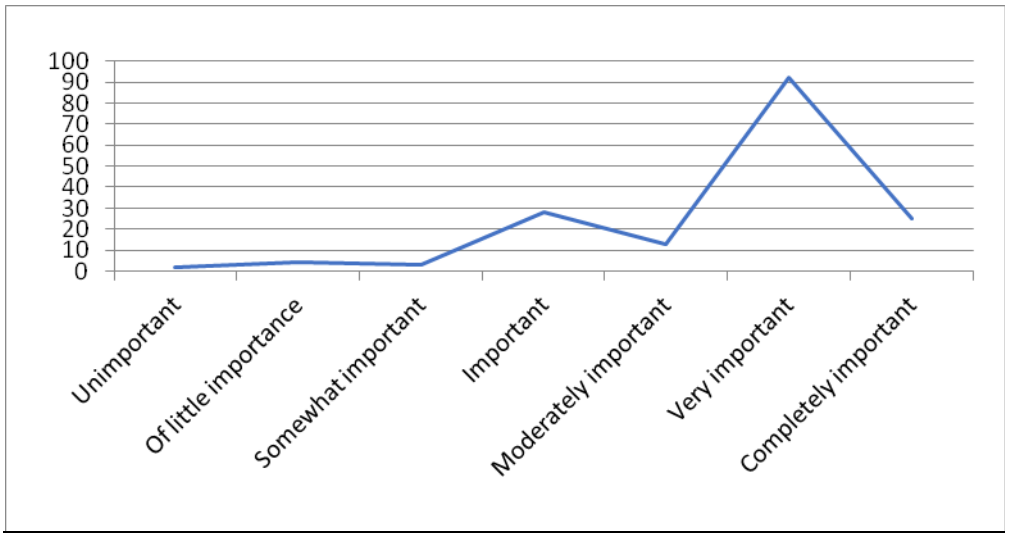
Source: Own Survey n = 167

Figure 42: Knowledge and Understanding by Managers and Ability to Determine Customer Needs

Knowledge and Understanding of Business-to-Consumer eCommerce by the Managers:



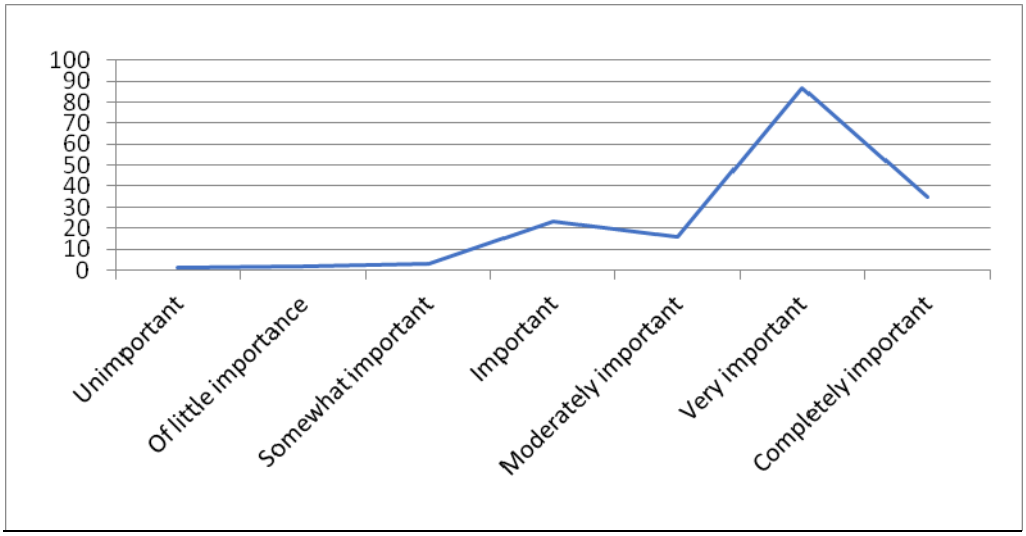
Ability to Determine Customer Needs Regarding Business-to-Consumer eCommerce:



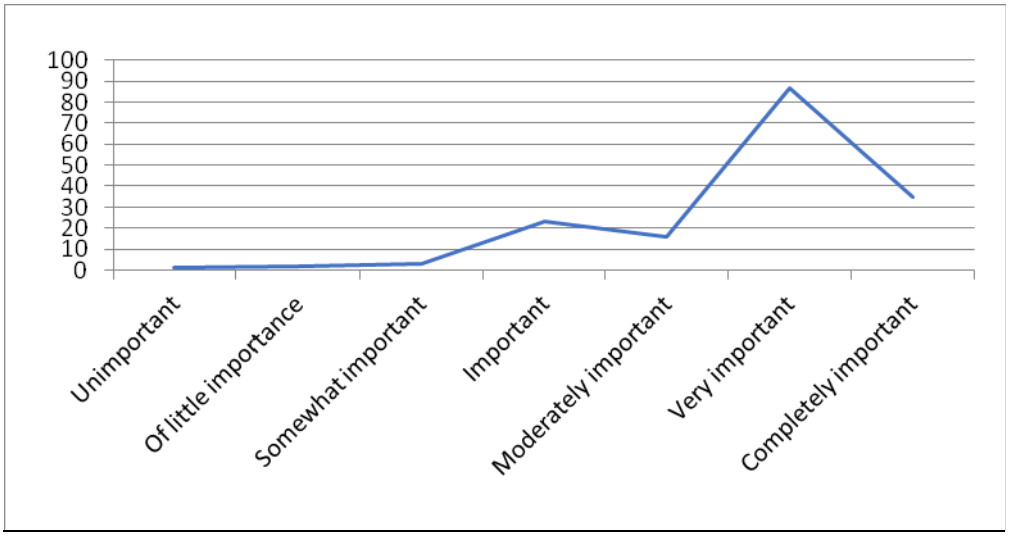
Source: Own Survey n = 167

Figure 43: Innovation Potential and Availability of Hardware and Software

Innovation Potential:



Availability of Hardware and Software:



Source: Own Survey n = 167

5.10. Logistic Regression

Aiming to determine the factors that explain the adoption of eCommerce in Nicaragua, a complete model with 34 predictors was formulated. On the model estimated, adoption (dependent variable) is dichotomy (non-adopter = 0, adopter = 1). Therefore, a logit binomial is applied. The independent variables were constituted by all registered form data collection with its original response levels aside from the sector, which was classified in fewer categories to be precise if they belong to: (1) industry, (2) services, or (3) commerce. This classification was conducted to establish functional relationships between the independent and dependent variables since the probability of occurrence of some categories are very low. The causal analysis was processed with 315 cases.

That analysis was carried out with 34 predictors representing three entrepreneur characteristics variables (managers' innovativeness, managers´ behavioral control, and managers´ eCommerce knowledge), five communication variables (innovation decision, interpersonal communication channel, homophily in knowledge, economic message of producing returns, and personal proximity), five technological variables (relative advantage, compatibility, complexity, observability, and budget), seven context variables (market eReadiness, transport infrastructure, transport logistics infrastructure, financial institutions eReadiness, telecommunication eReadiness, legal environment, and government commitment) and fourteen control variables (department, highest level of education achieved by manager, business sector, size of the companies, average education level of employees, time in the market, export orientation, importance of hiring specialized employees, yearly online investment, customers, revenue generation for National sales of products, revenue generation for International sales of products, revenue generation for National sales of services, and revenue generation for International sales of services).

The variable selection method (stepwise regression - forward and backward) was used to find the most parsimonious model.

Table 17: Omnibus Tests of Model Coefficients

Omnibus Tests of Model Coefficients				
		Chi-square	**Df**	**Sig.**
Step 3	**Step**	**13.674**	**6**	**0.033**
	Block	**47.925**	**13**	**0.000**
	Model	**47.925**	**13**	**0.000**

Source: Elaborated by the author, based on collected data

The minimal adequate model found was statistically significant, (df = 13, N = 315) = 47.925, p = 0.000 < 0.05 (Table 17), representing that the model was able to distinguish between the respondents that adopt eCommerce and respondents who did not adopt eCommerce.

Table 18: Model Summary

Model Summary			
Step	**-2 Log likelihood**	**Cox & Snell R Square**	**Nagelkerke R Square**
3	387.611	0.141	0.188

Source: Elaborated by the author based on collected data

The model explained between 14.1 % (Cox & Snell R Square) and 18.8% (Nagelkerke R Square) of the variance of eCommerce adoption (Table 18) and classified 65,7% of cases (Table 19).

Table 19: Classification Table

Classification Table[a]					
Observed			Adoption		Percentage correct
			Non-adopters	Adopters	
Step 3	Adoption	Non-adopters	94	54	63.5
		Adopters	54	113	67.7
Overall Percentage					65.7
a. The cut value is .500					

Source: Elaborated by the author, based on collected data

The classification table of the model results (Table 19) shows to what extent the percentage of cases classifies adopters and non-adopters. The results indicate that it was possible to predict organization adoption, based on the model with an accuracy predicting correctly 67.7% of the cases, meanwhile the non-adopters' predictive value of the model was 63.5%. The model Hosmer and Lemeshow goodness of fit test chi-square value is 5.946 with a p= 0.546 (Table 20). This value is larger than 0.05 indicating no evidence of poor fit so that the model is worthwhile.

Table 20: Hosmer and Lemeshow Test

Hosmer and Lemeshow Test			
Step	Chi-square	Df	Sig.
3	5.946	7	0.546

Source: Elaborated by the author based on collected data

Table 21: Variables in the Equation

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.. Lower
Step 1[a]	P8_d(1)	-1,037	,299	12,035	1	,001	,355	,197
	Constant	,947	,270	12,288	1	,000	2,579	
Step 2[b]	P8_d(1)	-,904	,311	8,460	1	,004	,405	,220
	P12_k			7,668	6	,263		
	P12_k(1)	-1,079	,589	3,355	1	,067	,340	,107
	P12_k(2)	-21,816	17974,843	,000	1	,999	,000	,000
	P12_k(3)	-22,098	19783,379	,000	1	,999	,000	,000
	P12_k(4)	-1,140	,445	6,581	1	,010	,320	,134
	P12_k(5)	-,564	,358	2,479	1	,115	,569	,282
	P12_k(6)	-,701	,415	2,860	1	,091	,496	,220
	Constant	1,518	,391	15,086	1	,000	4,562	
Step 3[c]	P8_d(1)	-,826	,321	6,645	1	,010	,438	,233
	P12_c			12,962	6	,044		
	P12_c(1)	-,960	,858	1,253	1	,263	,383	,071
	P12_c(2)	-1,485	,830	3,197	1	,074	,227	,045
	P12_c(3)	-,344	,786	,192	1	,662	,709	,152
	P12_c(4)	,073	,762	,009	1	,924	1,075	,242
	P12_c(5)	-,687	,734	,876	1	,349	,503	,119
	P12_c(6)	-,072	,817	,008	1	,930	,931	,188
	P12_k			5,958	6	,428		
	P12_k(1)	-,695	,669	1,082	1	,298	,499	,135
	P12_k(2)	-21,838	17811,902	,000	1	,999	,000	,000
	P12_k(3)	-22,379	19447,835	,000	1	,999	,000	,000
	P12_k(4)	-1,058	,476	4,936	1	,026	,347	,137
	P12_k(5)	-,492	,379	1,686	1	,194	,611	,291
	P12_k(6)	-,838	,442	3,600	1	,058	,433	,182
	Constant	1,897	,737	6,627	1	,010	6,669	

Source: Elaborated by SPSS based on collected data

As shown in Table 21, variables in the minimal adequate model equation are P8_d (revenue generation for international sales of services) with its two levels, P12_c (eCommerce Knowledge) with its seven levels, and P12_k (eCommerce Compatibility) its seven levels. On these variables, one level is taken as reference. Four predictors from these variables made a unique statistically significant contribution to the model of eCommerce adoption: P8_d (1) (“yes” - revenue generation for international sales of services - 0.010), P12_c (eCommerce Knowledge- 0.044), P12_k (4) (“Neutral” - eCommerce Compatibility - 0.026), P12_K (6) (“I agree” - eCommerce Compatibility-0,056). Moreover, it was marginally statistically significant P12_c (2) (“I do not agree at all”- eCommerce knowledge - 0,074).

Concerning the odds “No revenue generation for international sales of services” group is 2.28 times higher being adopter than the odds for “yes revenue generation for international sales of services” group (P8_d (1)). This can be interpreted as the opportunity of the companies which do not generate revenue by international sales of services to be in advance, in comparison with the ones that do it already. On the other hand, the odds for “Not applicable-Compatibility” group is 2.88 times higher being adopters than the odds for “Neutral-Compatibility” group (P12_k (4)). These odds shows that companies which are not aware of the Compatibility tend to have greater chances to adopt than the ones that are in a neutral position about Compatibility. In the same direction, the odds for “Not applicable-Compatibility” group is 2.31 times higher being adopter than the odds for “I completely agree- Compatibility” group (P12_k(6)). The aforementioned indicates that the chances also increase for the companies, which are not aware about Compatibility as the ones that they are. Additionally, the odds for “Not applicable-eCommerce Knowledge” group is 4.41 times higher being adopter than the odd for “I do not agree- eCommerce Knowledge” group (P12_c (2)). On eCommerce knowledge perspective in general, it might imply that not being sure about the knowledge on eCommerce might lead to a higher inclination toward adoption than expected, when a better previous knowledge was related to a more positive approach. Therefore, an appropriate knowledge is required, but not very much.

6. Discussion of the Findings, Conclusions for Research and Summary

6.1. Discussion

On the adoption process of a technological innovation, there exists a complex interrelation of a variety of factors related to the context of the technology adopters among others. Therefore, it is believed from our knowledge that it is only possible to understand how the adoption occurs by analyzing the complex interaction of these factors in its determinant context.

In a manner to provide understanding of the phenomena, this research aims to describe the factors that facilitate and inhibit the adoption of business-to-consumer eCommerce in Nicaragua in terms of the characteristics of the managers, communication, characteristics of the innovation and context. Even though the present research shows that the numbers of firms that adopt eCommerce in Nicaragua are ahead numerically speaking from the non-adopters, it also shows that adopting is not very popular and extended. This could be explained by the importance of the inhibitors like the

ones studied in the process of adoption, but also by the fact that there are not so many facilitators so that there are only relatively few firms and organizations at the transactive or integrated level of eCommerce.

The analysis was carried out based on the hypothesis that the entrepreneurial characteristics, communication approach, innovation characteristics, and socioeconomic context might affect the adoption of business-to-consumer eCommerce. Therefore, in order to guide the empirical approach of the study, the following research question was formulated:

How are the entrepreneurial characteristics, the innovation communication, the characteristics of the innovation and the socioeconomic context factors influencing Business-to-Consumer eCommerce adoption in Nicaragua?

On the entrepreneurial characteristics, the analysis was carried out relating to innovativeness, behavioral control, and eCommerce knowledge in this dimension. The Chi-Square results test does not show any influence from these three characteristics as statistically significant.

The results of the descriptive statistics show that the decision makers perceive themselves to count with enough innovativeness and the capability to face the adoption although on eCommerce knowledge, they perceive a certain need to improve their knowledge to be able to adopt and adapt this new technology into their organization. The explanatory model also indicated that eCommerce knowledge is a key factor for the adoption. This could lead us to conceive that on managerial dimensions cognitive factors go ahead on relevant to influence the adoption in comparison to behavioral factors in this context. Managers see themselves as risk takers and creative enough; however, adequate knowledge related to the innovation can make a difference to being adopters or not adopters. This is an important finding that helps to characterize the decision makers in Nicaragua that could serve as input for future studies in developing countries. Probably the lack of exposure to new technologies and lack of education on ICT keep this group and organization far behind adopting innovations or even developing innovations.

A dimension which has not been broadly studied related to the influence on the adoption, but whose results constituted and intended to provide more light to the understanding of how the process of communication occurs on the adoption, and which results are therefore a significant contribution to the theoretical framework.

The literature suggests to analyse five communication variables: Innovation Decision, Interpersonal Communication Channel, Homophily in Knowledge, Economic Message of Producing Returns, and Personal Proximity; even though, the results obtained by the Chi-Square Test show that there is no statistical significance of these variables on the adoption, nor were they reflected in the explanatory model.

From all the communication variables, the one that caught the attention for the way it was reflected in the descriptive results, was the personal decision. The decision makers were neutral about this position and not totally in agreement, which can be translated as the decision to adopt might be dependent from more than one instance and not just themselves. This can take us to the idea that it represents a complex decision which requires different knowledge than they have, about financial issues to face among others. Among the other variables what is implicated is that the information exchanged to influence the adoption is more probably that which occurs through words of mouth, with persons that share certain similiarities and where a the personal proximity exists, making the economic message obtained about eCommerce technologies more recognizable. Therefore, it is important to understand that this is telling us about the process that probably occurs in most developing countries where there is a strong influence by personal networks. This homophily and proximity is a dynamic factor that occurs in these societies and also gets to influence the organizational adoption path, if there is an agreement among the decision makers over these variables. The personal decision variation result is thus probably reflecting the important cognitive and resources influence on adoption or non-adoption.

According to the theoretical framework, the innovation characteristics were analyzed along the characteristics defined in the literature as: relative advantage, compatibility, complexity, observability, and budget. The discussion that goes through these innovation characteristics might influence the adoption of eCommerce technology. From the hypotheses tested, whose results are presented in the previous chapter and related to the technology, three characteristics were found to have statistical relevance[8] affecting the adoption: relative advantage, compatibility and observability. This is also reinforced by the descriptive statistics which show how across the different level of eCommerce adoption there is an agreement by the participating managers identifying the relative advantage, compatibility, and visibility of this technology. However, it did not occur to be significantly affecting eCommerce adoption by the budget and complexity; even though, it is possible to recognize that they do not perceive, or most of them do not perceive, to count with the

[8]p-value below 0.05.($p<0.05$).

capital required to adopt eCommerce. It is still not the main factor for them concerning the technology or its complexity. In this line, among all the technology variables, compatibility with the already existing IT in the firm is the only one that has a significant effect on the eCommerce adoption showing an increased importance about the awareness of the existing compatibility.

These results imply that for mostly small sized companies from the service sector principally, eCommerce represents a relative advantage by being compatible with the IT of the organization, which is already diffused across it. Even though financial issues in this organization are still important, they were able to manage for the adoption, but still a significant number of other factors to overcome needs to be discussed. Nevertheless, the increasing presence of this technology in Nicaragua and the awareness of its potential benefits has been key criteria for the current adoption and sign to follow and spread to continue giving benefits to non-adopters and early adopters, but not forgetting how compatible organizations are with it, or if it is better adapted to its need.

The contextual dimension which refers to market eReadiness, transport logistics infrastructure, logistics services, legal framework, financial institutions, telecommunication, and government commitment, has been broadly studied, and it was found out to be a dimension with an important influence on eCommerce adoption. An analysis of the descriptive results shows that they should not be left unattended at the time to discuss the factors that affect eCommerce adoption. On the perception of managers, they identify a marked eReadiness for eCommerce; however, they seem to struggle with transport logistics infrastructure, logistics services, legal framework, financial institution, and telecommunication. They have the market as a push factor for the adoption but from the other side, they do not have the support of the relevant institutions.

What is crucial is to have a committed and adequate legal framework, and supportive financial and telecommunication sectors. Both can be interpreted and given some steps, but more is needed; especially, oriented to support small enterprises which are the majority and are the ones struggling for access to the financial institutions and the telecommunication infrastructure. About the logistics infrastructure, it is well known that Nicaragua is still facing significant problems related to it which need to be overcome in order to facilitate commerce, more investment in roads, ports, and airports across the country, and the presence of logistics services able to cope with the Nicaragua context. The government view from the managers in the results is illustrated that there is not a clear definition of the role for the government in this matter, but it can help to define that it is closely related to the work that is needed on logistics infrastructure, telecommunication, and so on.

Besides the dimensions discussed previously, there are a series of characteristics of companies that also determine the adoption of eCommerce. According to the characteristics of companies, an adoption is more prompt to occur or not. The variables that were considered to be included as determinant for the adoption are: department, highest level of education achieved by manager, business sector, size of the company, average education level of employees, time in the market, export orientation, importance of hiring specialized employees, yearly online investment, revenue generation for National sales of services, and revenue generation for International sales of services.

On one hand, the results illustrate that from all these characteristics the ones that were determinant and statistically significant are the ones related to the revenue generation for International sales of services and revenue generation for National sales of services in concordance with the Chi-Square Test. Additionally, according to the model fitted the revenue of International sales of services were significant and quite important to mention the ones that do not generate revenue still demostrate a tendency to adopt eCommerce.

On the other hand, it is important to be aware of the characteristics of the companies that participated. The great majority belongs to the services sector that normally is a push factor due to services oriented companies usually dependent and implement more new technologies for the nature of their services. This requires more interaction and intangibility in all the processes of commercialization and different with companies that require it in a minor degree. Meanwhile, companies oriented to more traditional sectors such as agriculture in Nicaragua, are still left behind in the implementation. The size factor provides an important radiography of what is happening with small organizations in developing countries. It could be interpreted that small organizations are taking a step forward in implementing eCommerce, as 53% of the participants organizations are adopters of eCommerce in Nicaragua. Most of the companies are practically small-sized representing an oustanding result for understanding the adoption in this kind of companies and that, in spite of their size, they present certain characteristics such as services oriented with more than 20 years in the market, above undergraduated training level of managers, and an increasing interest in hiring specialized employees. Although, these characteristics could be considered driving factors, it is equally likely that the lack of both investment in ICT and no export orientation slow down the level of adoption of eCommerce. However, there is already a certain success in obtaining revenue from using this channel that is close to becoming a key factor that could motivate the adoption by similar organizations.

6.2. Implications for the Research Question

This research was addressed with the guideline of the main research question, searching to identify and understand how the entrepreneurial characteristics, the innovation communication, the characteristics of the innovation and socioeconomic context factors are influencing Business-to-Consumer eCommerce adoption in Nicaragua. Therefore, the main objective is to describe the factors that facilitate and inhibit B2C eCommerce adoption in Nicaragua related to the entrepreneurial characteristics (innovativeness, knowledge and perceived behavioral control), the communication of the innovation (innovation decision, communication channels, homophily and heterophily in communication networks, message about the innovation and personal proximity network in the information exchange), the characteristics of the innovation (relative advantage, compatibility, complexity, observability and purchasing cost), and the socioeconomic context (market eReadiness, transport logistics infrastructure, logistics services, legal framework, financial institutions, telecommunication, and government commitment).

The formulation of the main research question was intended to contribute first to the critical reviewing of the eCommerce adoption facilitators and inhibitors in developing countries. Second, to develop a theoretical framework to determine the factors that facilitate and inhibit Business-to-Consumer eCommerce adoption in developing countries. Third, to determine how many businesses are adopting Business-to-Consumer eCommerce in Nicaragua. Fourth, to identify the main differences between adopters and non-adopters of Business-to-Consumer eCommerce. Fifth, to establish what factors facilitate or inhibit Business-to-Consumer eCommerce adoption in Nicaragua.

A series of four sub-questions to the main research question are formulated for the problem and the research gap identified. The research was structured according to them.

This objective was achieved by breaking down the research into four questions:

1) How many businesses are adopters and non-adopters of eCommerce in Nicaragua?
2) What are the differences between adopters and non-adopters of eCommerce in Nicaragua?
3) What are the main factors that facilitate eCommerce adoption in Nicaragua?
4) What are the main factors that inhibit eCommerce adoption in Nicaragua?

These previous questions set up the discussion above, willing to contribute to the closing of the research gap in this identified area. Concerning to the first question, related to the adoption or non-adoption of eCommerce, the analysis suggests that most of the companies in Nicaragua are adoptiing eCommerce. Having as indicators eCommerce status from the literature for the reality in developing countries, the following six phases: no eCommerce, connected eCommerce, static eCommerce, interactive eCommerce, transactive eCommerce and integrated eCommerce. According to Molla & Licker (2005) "many researchers have accepted interactive eCommerce as the beginning of eCommerce", therefore, it is said a business is defined as having adopted eCommerce, when it has reached an interactive eCommerce status (Molla & Licker, 2005, p. 881).

Numerically, the results show that there was not a significant difference between the percentage of adopters and non-adopters, whereby adopters represented 53% from the participating companies and non-adopters 47%, although the importance of these findings is that the result was expected to be the opposite, with more non-adopters than adopters. Among these non-adopters, 17% are at the connected stage, and 30% static. Meanwhile among the adopters, 33% were interactive, 11% transactive, and 9% integrated. In terms of the eCommerce type, there was not a significant difference between the type of eCommerce, business-to-business (57), and business-to-consumer (51). Instead, it was interesting to find that most of the companies have both types of eCommerce.

The reason behind these results might be related to managerial and technological issues which mainly face small companies in developing countries, in particular the size of the market. Small companies require more preparation and awareness of the advantage of ICT technologies as they do not have the knowledge about what would be a good solution according to their needs. Commerce might will still be incompatible with their reality, and the adoption process has a way to go through. Moreover, it is a small market and small companies' investments might be an issue to afford this technology and being in a small market, they may say: "what for"?. However, adopters are ahead in Nicaragua which may imply some degree of awareness of its benefits and the necessity to implement it, especially for service-oriented companies, as the literature suggests on the approach of adoption:

"The unequal distribution of ICT infrastructure, products and services, between the developed and developing countries, or urban and rural SMEs also accounts for differences in how e-commerce is appreciated and applied in organisations" (Shemi, 2012, p. 4).

The majority of the participants (76%) is service-oriented which also influences the adoption of eCommerce and its aplication, and the applicability of eCommerce on services is broad. Service-

oriented tend to take more advantage of ICT technologies and be early adopters. However, the non-adopters are still a significant number, even in the Pacific region which is the most urbanized area.

Regarding the second question about the differences between adopters and non-adopters of eCommerce, the findings indicate that the model was able to differentiate quite neatly between the two groups Among all the predictors considered in this study, it is reasonable to conclude that International sales of services (control variable), eCommerce knowledge (managerial variable), and compatibility (technology variable) were the m ost important determinants of eCommerce adoption.

In previous studies, there is an agreement between the importance of compatibility for the adoption of eCommerce:

"*The alignment of e-commerce with the organisation's strategy and processes needs to be present for an organisation to adopt e-commerce. Love, Irani, Li, Cheung and Tse (2001) found that small businesses reported that the adoption of an e-commerce solution was inhibited when not aligned with the organisation's strategy and processes. Jones et al (2003b) also mention this inhibitor, stating that the e-commerce solution has to be applicable to the organisation to motivate adoption of e-commerce" (Teo et al., 2004, p.4).*

"Lewis and Cockrill (2002) support this argument of compatibility based on a study of small retail firms, where they found that only when the products of the retail firm were viewed as appropriate to be retailed electronically would the firm be motivated to adopt e-commerce. This view is also echoed by Hughes, Golden and Powell (2003)" (Teo et al., 2004, p.4).

In the particular case of companies in Nicaragua, the findings confirm how important the compatibility is for the decision to adopt eCommerce. For the case of eCommerce knowledge, there also appears to be a significant factor that limits companies to adopt, and it is important to highlight that the majority are small companies where an additional important issue is found in previous studies on B2C adoption in developing countries, according to Mangiaracina et al. (2012):

"The average level of education within a country may also be influential. The technological knowledge, necessary for the creation and effective usage of eCommerce related activities, may not be available in the countries with poorly educate populations. High levels of educational attainment are proven to be critical in the extent of computer technology adoption in a country"(Mangiaracina et al., 2012, p. 312).

Additionally, the literature considers that in terms of the analysis of eCommerce adoption, some control variables should be included. Accordingly, factors such as size and location usually appear to be significant, which in fact play a role although the revenue factors among the level of education, size, location, sector, time in the market, export orientation, type of customers, and hiring specialized professionals appears to be statistically significant. This can be interpreted as a sign for the assumption that the potential economic benefits push the adoption in comparison to other contextual and characteristics of the companies.

Concerning revenue generation by sales, it is known that "electronic commerce offers a great opportunity to SMEs to gain greater global access and reduced transaction costs, provides substantial benefits via improved efficiencies and raised revenue, facilitates access to potential customers and suppliers, productivity improvements, customization of products and services and information exchange and management" (Kenneth, Rebecca, & Ayodo, 2012, p. 76).

In Nicaragua, the revenue generation proved significant in terms of the adoption for International services sales, where the main profit generation was between 26% and 50%. This is an interesting finding from this study, since with getting a financial benefit impulse, companies tend to adopt, especially if they are in the service sector and internationally oriented. Similar results are expected in other developing countries as Bangladesh for SMEs. There is the belief that they have the potential to earn huge profits and revenue from using eCommerce for exporting (Al Noor & Arif, 2011, p. 56).

The result obtained goes along with estimates done by OECD. According to their estimation, 95% of all companies in OECD countries use internet in doing their business in 2016, with B2B and B2C valued around $19.9 trillion and $2.2 trillion. The trade is domestic but becoming more International; the message of profits and benefits might not take long to reach developing countries (UNESCAP, United Nations Economic and Social Commision for Asia and the Pacific, 2016, p. 104).

Most of the research approach ascertained that factors influencing eCommerce adoption relate to managerial, organizational, and contextual factors. In the present study, considering the lack of literature and empirical evidence, managerial (eCommerce knowledge, innovativeness, and behavioral control), communicational factors (innovation decision, interpersonal communication, personal proximity, and homophily), technological (complexity, compatibility, observability, relative advantage, and cost), contextual (market eReadiness, transport infrastructure, logistics services,

financial institutions, telecommunication infrastructure, and government commitment), were included, allowing the opportunity to identify which factors were significant.

It is important to mention that communication factors have not been broadly studied concerning eCommerce, and combining then with other factors, such as contextual, managerial, and technological ones. Moreover, control factors were included such as size, education, and location among others. In this manner, this study intended to cover as many dimensions as possible in order to understand the factors that affect the adoption process of eCommerce.

As it was discussed, to differentiate between adopters and non-adopters, the results distinguish that the technological factors strongly influence relative advantage, compatibility, and observability. However, the same does not occur with the contextual, communication, and managers characteristics, but rather only these technological factors were significant. This might indicate that more has to be done in terms of the knowledge and benefits of eCommerce, and there is no serious limitation when it comes to contextual and human factors, which are widely believed to be the decisive limiting hurdles in developing countries.

It is important to mention how clearly the descriptive results were related to the concentration of companies in the Pacific region (87.0%) and their practical inexistence in the Atlantic (0.3%) and Central regions (9.5%), which confirms the importance of urbanization for the adoption.

The sector differentiation also agrees with findings in the literature, indicating that the service sector tends to be more proactive towards the adoption of ICT. Concerning the manager education level, the results were positive for the adoption, whereby the managers mostly have tertiary education at the undergraduate and even postgraduate level. Another interesting finding is related to the time in the market, whereby the expectation was to find companies with less than 2 years in the market, although the results show that most of the companies have more than 20 years, and the adoption or non-adoption did not vary due to the time in the market. Additionally, the level of investment is less than 10% of their yearly business investment, which has also been broadly discussed on resources and technology adoption in developing countries. The reasons might truly vary, because the lack of resources or because the special experience that SMEs do not invest in any new technology unles they are certain of inmediate returns on investments and lesser gestation period, which are somewhat less important for large companies (Lal, 1999, p. 1205).

Corresponding to the third question about the factors that facilitate eCommerce adoption in Nicaragua, the following factors were selected from the literature as they were identified as the main

ones: Highly qualified staff, financial resources, knowledge and understanding of Business-to-Consumer eCommerce by the management, ability to determine customers needs, innovation potential, and availability of hardware and software. As discussed above, to differentiate the adopters and non-adopters, these factors provided a previous input to understand the problematic, yet these previous results are insufficient to understand the conditions of adoption processes. The results of the analysis rated an average on the importance and in this context qualification, financial resources, knowledge, innovation, and technology are equally important for the adopters. As this finding implies for the adoption to exist, an interconnection between these elements accomplishes the process of adoption regardless of the perspective of managers in Nicaragua. There is no one factor ahead of another on the importance level. Nevertheless, there is no reason to limit these factors. Probably more factors are important for the adoption and should not be rigid for consideration, but at least it serves as the beginning for further analysis.

On the fourth and last research question about inhibitors of eCommerce, the study pretended to have the perception of managers related to issues that have been found in previous studies affecting eCommerce adoption: lack of financial means, lack of knowledge and understanding by management, lack of customer demand, lack of qualified employees, lack of trustworthy and effective telecommunication infrastructure in the country, lack of logistic services, lack of an appropriate juridical framework, and lack of preparation by financial institutions.

This series of factors internal and external from the organization is frequently discussed in the literature toward the adoption of eCommerce in developing countries. As it has been shown in previous results; even though, the adopters go ahead in this particular case numerically, still non-adopters are a significant number to consider, and therefore the reason for that needed to be identified. According to the results, the lack of preparation by financial institutions and the lack of an appropriate juridical framework in the country ranked higher on how strongly it affected the implementation of eCommerce. This gives light to identify the problem, and that in this particular case the organizational factors were not as relevant as the contextual ones, depending strongly on the environment where the organizations were in. This for some might imply great limitations as we can see with the results, or it may present a great challenge, namely adjust the adaptation to the circumstances.

6.3. Implication for the Diffusion Theory

The analysis from the results facilitate outputs about the Diffusion Theory concerning eCommerce adoption in developing countries. A series of conclusions can be drawn that contribute to the understanding of this theory and its intersection with other theories.

6.3.1. Complementing the Lack of Managerial, Communication, Technological and Contextual Factors Analyzed in Developing Countries

First, the most outstanding contribution of this study is providing more outputs about the innova tion adoption process in ICT at this time in developing countries. With the support of previous findings, this study has created a theoretical framework that tries to combine factors from the Diffusion of Innovation Theories whose combination has not yet been tested. Usually, managerial factors (eCommerce knowledge, innovativeness, and behavioral control), technological factors (relative advantage, compatibility, complexity, and observability), and contextual factors (market eReadiness, legal framework, financial institutions, infrastructure and government) have been discussed, but no communication factors (innovation decision, interpersonal communication, personal proximity, economic message, and homophily), and especially not all of them have been brought together.

In the present study, considering the lack of literature and empirical evidence, managerial factors (eCommerce knowledge, innovativeness, and behavioral control), communication factors (innovation decision, interpersonal communication, personal proximity, message, and homophily), technological factors (complexity, compatibility, observability, relative advantage, and cost) and contextual factors (market eReadiness, transport infrastructure, logistic services, financial institutions, telecommunication infrastructure, and government commitment) were explored together.

The findings clearly show what differentiates adopters from non-adopters, - mainly the previous managerial experience and the communication, technological, and contextual factors. These factors affect significantly eCommerce knowledge (managerial factor) and compatibility (technological factor). This is in line with the literature on diffusion of innovation and eCommerce. “High levels of educational attainment are proven to be critical in the extent of computer technology adoption in a country” (Mangiaracina, Perego, Campari, & Drivers, 2012b, p. 325).

Previous studies recall the importance of adequate levels of ICT knowledge for the implementation of eCommerce in developing countries, and this occurred in the particular case of Nicaragua where there is still a large gap in this regard between firms and organizations in general.

Additionally, the compatibility of eCommerce technology appears to be significant for the adoption as discussed by Rogers (2003) about the requirements and charateristics of the technology to be compatible for its implementation. The perception of being incompatible with their business is still a psychological limitant for managers and employees to adopt new technologies. This is an important finding for it might be a frequent occurrence in Latin America, where the shortcomings in technological education make it difficult to identify what it means to struggle with the traditional procedures, processes, and values at the moment to decide whether to adopt or not adopt eCommerce. In innovation literature, eCo-mmerce adoption is higher when it is compatible with established company values and procedures (Limthongchai & Speece, 1999, p. 575).

On technological issues, this result contributes to close the research gap among the different technology characteristics. Compatibility with the already existing IT systems of the firm is the oustanding issue to be solved in comparison with complexity, observability, relative advantage, and cost.

Another contribution to the literature radicated in proving or refuting the belief of the benefits that eCommerce has with regard to income generation when approaching the International market. The results obtained with this study confirm the revenue originated through International sales, and the opportunity it provides for small and medium enterprises gaining global access. This is the case of the enterprises in Nicaragua, that are mostly small companies getting revenue through the expansion of their markets (Kenneth et al., 2012, p. 76).

It has been proven with the result that the perception of relevance of certain contextual factors for the impeding of eCommerce adoption as the lack of preparation by financial institutions and of an appropiate juridical framework are in concordance with the neccesity suggested in the literature of the inclusion of contextual factors beside Rogers´ model (Al-Qirim, 2007, p. 464). Even though in his model, these factors do not appear to be as relevant as the technological ones, when asking the managers about the main impediments in the present study, these two factors appeared to be the most relevant also to them. It is always appropiate not to stay narrowed to certain models which are limited to only one side of the contextual side or just technology or any other factor, - according to Molla & Licker (2005): “Several of the existing models of adoption emphasize the relevance of

technological, financial, and legal infraestructure constraints. While most countries still need to address such problems, improvements (such as in telecommunication developments) over the last few years make consideration of contextual constraints as sole determinants of eCommerce adoption untenable. Understanding eCommerce in developing countries therefore requires approaches and models that are flexible enough to capture change" (Molla & Licker, 2005, p. 887).

In the same approach, Schumpeter's development perpective has made a significant input into diffusion research so that entrepreneurial and contextual issues are being introduced into the discussion of innovation diffusion. More is said about "macro-level contingencies" by Venkatesh et al. (2003) on the Unified Theory of Acceptance and Use of Technology (UTAUT), that intersect with the discussion considering user perception of the macro-level socioeconomic context independently of individual factors for the adoption of innovations such as eCommerce, and with this it is a bit clearer where to go from here on the discussion whether to include or not contextual factors into the theretical framework.

6.3.2. Size

The contribution to the literature about the "size effect" on the adoption is one of the most important ones from this work. In developing countries, the great majority of companies are of small size; therefore, these finding might serve as an imprtant contribution to recognize their reality.

In the existing literature, there are several studies that found a positive relationship between the adoption of new technologies and the size of the firm. There is the belief that large firms are better positioned for the benefits of innovations, also better positioned financially to face the gains and losses, and better prepared to employ a skilled workforce which is assumed to work more effectively and efficiently (Lal, 2002, p. 1208). Nevertheless, the present results show that the majority are small companies (43%), followed by medium (20%), large (22%), and micro (15%) ones. The results help to see the increasing presence of small companies and the increase of their status, and their upward paths to higher levels of adoption, finding even most of the micro-sized companies at the interactive level. Meanwhile, small and medium size companies are struggling to jump between static and interactive, and the larger-sized companies, as it is described in the literature, stay at the advanced level between connected and transactive.

6.3.3. Geography

There are no geographical data available about eCommerce adoption in Nicaragua. It is important to mention from the descriptive results, how clearly the results were related to the concentration of companies and adopters in the Pacific region (87.0%), with practical inexistence in the Atlantic (0.3%) and the Central region (9.5%), which confirms the importance of geography for the adoption.

6.3.4. Start-Up, Older Companies and Adoption

There is often the assumption that the adoption of eCommerce occurs mostly in start-ups which are more technologically oriented and flexible. However, our study found that most of the adopting companies have been operating for more than 20 years, and in some cases, they where found at the advanced transactional and the integrated levels of eCommerce. Certain characteristics such as experience and financial resources among others seem to make established companies adopt innovations such as eCommerce easier than start-up firms.

6.3.5. Cost and Investment for Adoption

When carrying on the collection of data, it was assumed that one possible result would be the low investment in online presence in developing countries, - which ended up to be true to Nicaragua. The importance of capital for the adoption of an innovation had been broadly discussed, especially for the ones who are costly for small companies. In Nicaragua, the investment tends to be low as the majority of companies invest less than 25% of its budget on yearly business investments on its online channel; however, the results show it will increase over time.

With respect to the lack of capital to invest is a reality by the majority of small companies in the developing countries. Credit by banks or other financial institutions is in most of the cases the only way for beginning the innovative process.

It is necessary to add generally that considering the adoption as a complex phenomenon such as eCommerce, that it alwas depends on the characteristics of the adopter and of the always complex and unique circunstances under which it takes place. In this piece of research, relevant variables related to size, sector, education, investment, revenue, and export orientation were explored.

Another contribution of this research is that it provides some descriptive output about eCommerce by size level, from static to integrated, and it differentiates between adopters and non-adopters across each level.

6.3.6. Industry

This study has positive lessons and implications for managers, whereby the results could serve as guidelines especially for managers who would like to proceed from a static eCommerce level to a transactive one, because it is at that threshhold where the weaknesses and strengths of the adopters and the non-adopters are being presented. This empirical findings demonstrate the relevance of the decision-makers as managers in the adoption process of innovation in developing countries without whom this process is not possible. Top management must be convinced and influence its organization about the benefits and difficulties that the whole organization will face. Managers in Nicaragua could learn from these results to recognize and work on issues such as eCommerce knowledge, investment, complexity, observability, and revenue, which appear to be the main factors that require to be worked on.

The present study also provides an overview about the various sectors or industries in Nicaragua. The data and information provided by this study facilitate a better understanding about the factors that affect eCommerce adoption, and in this manner it will help to make the decisions for more appropriate ICT policies. Sufficient information is provided related to infrastructure conditions, eCommerce knowledge, sectors, and financial investments, just to mention some more in order to create a picture of the factors asnd conditions that require further efforts; for example, new policies and investments, legal frameworks and in the support for less developed sectors and regions.

6.4. Limitations and Further Research

This research contributes to enrich the theoretical framework of eCommerce adoption in developing countries with a diffusion of innovation theoretical approach. It was known that some issues will just be kept open for further research. Traditional limitations for research such as time to reach further accomplishments require a larger number of surveys that could enrich the results.

However, some of the results obtained in this context with the participation of many top managers as interviewees and experts are worthy to mention and deserve a special summing-up: One of the accomplishments from this research is the collection of data and the richness of the data. Secondly. this study contributes to our knowledge about the innovation adoption process of eCommerce in developing countries, combining a series of factors from the following dimensions: managerial factors (eCommerce knowledge, innovativeness, and behavioral control), communication factors (innovation decision, interpersonal communication, personal proximity, message, and homophily), technological (complexity, compatibility, observability, relative advantage, and cost), contextual (market eReadiness, transport infrastructure, logistic services, financial institutions, telecommunication infrastructure, and government commitment), considering also control variables related to size, sector, education, investment, revenue, and export orientation. Although these factors provide quite a complete scenario in order to better understand the effect of these factors, more profound studies can be addressed comparing sectors, sizes and levels of eCommerce among others.

Some issues and approaches were not considered in this study. Further reesearch should include organizations that do not yet have any access to email and Internet in order to understand the situation of these companies and family enterprises, when it comes to the first steps into the internet world.

The great majority of studies about eCommerce adoption have been conducted in developed countries. The extension of this research to the developing countries should provide a validation and a contribution to the enhancement of the theoretical framework, especially through more studies carried out in Latin America.

A comparative study with a developed country could try to find out existent or non-existing effects by the poor-rich context factor or any other dimension, be it the managerial, the communication and/or the technological aspect. Finally, more in depth studies chould focus on one sector, size, cost or level of adoption.

This study was done at a certain moment within a short period of time, and it is not a longitudinal study which probably would be more complete. As the phenomenon of eCommerce adoption is a process which occurs over time, where changes are expected to happen, it would certainly be valuable to monitor patterns over the time.

This study used primarily a quantitative approach; for a deeper understanding of the process of eCommerce adoption and further research, it is deemed advisable to include qualitative approaches in order to get an in-depth comprehension of this phenomenon.

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Appendices

Questionnaire

Freie Universität Berlin

Dear Sir/Madame:

I am Clelia Medina from Nicaragua, PhD candidate for Innovation Management at Free University Berlin in Germany. I am currently carrying out an investigation in the area "**Business-to-Consumer Electronic Commerce in Nicaragua"**. In a wider sense this study aims to investigate factors, which facilitate or complicate the introduction of Business-to-Consumer eCommerce in Nicaragua.

Since the results of this study facilitate the Nicaraguan businesses to enter new markets through use of information and communication technologies, it is important that you answer each question carefully and honestly. **This is not a test and there are no correct or incorrect answers.**

We would very much appreciate, if you could fill in the attached questionnaire for this study. **We assure you that all information will be treated confidentially and that your answers will be treated anonymously.**

Instructions:

1. The larger part of questions can be answered through choosing and marking suggested answers with a cross. Please answer all questions.
2. Please answer all questions in the given order.
3. I would like to remind you that the value of this study depends of your sincerity in personally answering this survey.

Thank you for your time and support.

With kind regards,

Clelia Medina M.

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Name of company:

Name of respondent:

Position: Email:

Phone number: Mobile number:

City: Department:

Highest level of education:

1. Primary school ( )
2. Secondary education/high school ( )
3. Undergraduate studies ( )
4. Postgraduate studies ( )

Please mark the answer with an "X" that best reflects your opinion.

1. In which area does your company operate?
    1. Agriculture, livestock farming, forestry und hunting ( )
    2. Fishery ( )
    3. Mining and quarrying ( )
    4. Manufacturing ( )
    5. Free zone ( )
    6. Electricity, gas, steam and air conditioning supply ( )
    7. Water supply, sewerage, waste management and remediation activities ( )
    8. Construction ( )
    9. Wholesale and retail trade; repair of motor vehicles, motorcycles ( )
    10. Transport and storage ( )
    11. Accommodation and food service activities ( )
    12. Information and communication ( )
    13. Finance and insurances activities ( )
    14. Real estate activities ( )
    15. Professional, scientific and technical activities ( )
    16. Administrative and support service activities ( )
    17. Public administration and defense; compulsory social security ( )
    18. Education ( )
    19. Human health and social work activities ( )
    20. Art, retreatment and recreation ( )
    21. Other service activities ( )
    22. Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use ( )
    23. Activities of extra-territorial organizations and bodies ( )
2. What type of products and/or services does your company offer?
3. How many employees does your company have?
    1. 1-5 ( )
    2. 6-30 ( )

3. 31-100 ( )

4. More than 100 ( )

4. What is the average educational level of the employees?
   1. Primary school ( )
   2. Secondary education/high school ( )
   3. Undergraduate studies ( )
   4. Postgraduate studies ( )

5. Since when is your company active in this area?
   1. Less than 2 years ( )
   2. 2-10 years ( )
   3. 11-20 years ( )
   4. More than 20 years ( )

6. Does your company export products and/or services?
   1. Yes ( )
   2. No ( )

Please mark the answer with an "X" that best reflects your opinion.							
7. In my view, hiring employees specialized in their area is:	Unimportant	Very little importance	slithly important	More or less important	Important	Very important	Totally important

8. Does your company generate revenue by national and/or international sales of products and/or services online?

	Yes	No	Not applicable
Products			
National sales			
International sales			
Services			
National sales			
International sales			

9. If your answer was "yes" to the previous question, could you please indicate the approximate percentage of total revenue by products and/or services for sale online in the last fiscal year?

	<10%	11-25%	26-50%	51-75%	76-90%	>90%
Products						
National sales						
International sales						
Services						
National sales						
International sales						

10. Approximately what percentage of annual investment the company invests in its online presence? (e.g. Internet, email services, online catalog, payment, online services, human resources etc.)

	<10%	11-25%	26-50%	51-75%	76-90%	>90%
Yearly investments in online presence						

11. Who are your customers?
    1. Other companies or organizations ( )
    2. Individuals ( )
    3. Both ( )

12. How far do you agree with the following aspects regarding the market entry into Business-to-Consumer eCommerce? Please mark for each statement the option with an "X" that best reflects your opinion:

	Not applicable	I do not agree at all	I do not agree	Neutral	I somewhat agree	I agree	I completely agree
a. I plan to implement new technologies before my competitors do.							
b. I believe to have sufficient administrative resources to run Business-to-Consumer eCommerce.							
c. I believe to have sufficient knowledge about Business-to-Consumer eCommerce.							
d. I have the responsibility to decide about the implementation of innovations like Business-to-Consumer eCommerce in my company.							
e. In my view it is necessary to consult the following entities during the implementation of Business-to-Consumer eCommerce:							
General shareholder assembly							
Board of directors							
General manager							
Sales department							
IT department							
Administrative staff							
Other functional areas: Finance, Distribution, Export, etc.							
f. In my opinion it is possible to receive information on Business-to-Consumer eCommerce via word-of-mouth communication person to person.							
g. In my opinion it is possible to receive information on Business-to-Consumer eCommerce from people with the same level of knowledge in the area of eCommerce.							
h. I have the impression that Business-to-Consumer eCommerce has the potential to generate economic benefits.							
i. In my opinion it is possible to exchange information on Business-to-Consumer eCommerce especially with people close to me.							

j. In my opinion one can assume the advantages of new technologies of Business-to-Consumer eCommerce from previous information technologies.							
k. I feel that Business-to-Consumer eCommerce is compatible with my business.							
l. I perceive the technologies of Business-to-Consumer eCommerce as rather complex to use.							
m. I have the impression that the advantages of Business-to-Consumer eCommerce are clearly visible to companies.							
n. I believe to have enough budget to invest in innovations like Business-to-Consumer eCommerce.							
o. I believe that our customers would be willing to buy online.							

p. The country's transport infrastructure is sufficient to practice Business-to-Consumer eCommerce.							
q. The country's existing logistic services are sufficient to practice Business-to-Consumer eCommerce.							
r. I have the impression that the country's juridical framework is of advantage when it comes to practicing Business-to-Consumer eCommerce.							
s. The country's financial institutions are prepared for Business-to-Consumer eCommerce businesses.							
t. The country's telecommunication infrastructure is trustworthy and efficient.							
u. I believe that the government is seriously committed to promote Business-to- Consumer eCommerce.							

13. What kind of eCommerce does your company have?
    1. Business-to-Business eCommerce: the exchange of information and/or trade of products and/or services between companies and organizations ( )
    2. Business-to-Consumer eCommerce: the exchange of information and/or trade of products and/or services through companies to individual consumers ( )
    3. Both ( )

14. Which of the following options describes best the current situation of your company? Please only choose one option.
    1. Internet connection with emails, but no website ( )
    2. Basic company information available on the internet, but no customer interaction ( )

    If your answer is 1 or 2, please continue with question 15

    3. It is possible to make requests online, send emails and fill in online forms ( )
    4. It is possible to buy and sell products and services online, as well as online customer service ( )
    5. There is an integration between suppliers and customers, that allows the majority of commercial transactions online ( )

    If your answer is in the range of 3 to 5, please continue with question 16

15. How far is it likely that the following reasons could impede the market entry to Business-to-Consumer eCommerce in an advanced stage? Please mark for each statement the option with an "X" that best reflects your opinion:

	Extremely unlike-ly	Quite Unlikely	Somewhat likely	Likely	Moderately likely	Very likely	Completely likely
a. The lack of financial means to completely implement Business-to-Consumer eCommerce.							
b. The lack of knowledge and understanding of Business-to-Consumer eCommerce by management.							
c. The lack of customer demand for Business-to-Consumer eCommerce.							
d. Lack of qualified employees.							
e. The lack of a trustworthy and effective telecommunication infrastructure in the country.							
f. The lack of appropriate logistic services for Business-to- Consumer eCommerce in the country.							
g. The lack of an appropriate juridical framework in the country that allows to conclude business deals over the internet.							
h. The lack of preparation by financial institutions for practicing Business-to-Consumer eCommerce.							

16.How important are the following resources for your company to implement Business-to-Consumer eCommerce? Please mark for each statement the option with an "X" that best reflects your opinion:

	Unim-portant	Little im-portance	Somewhat important	important	Moderately important	Very important	Completely important
a. Highly qualified staff.							
b. Financial resources.							
c. Knowledge and understanding of Business-to- Consumer eCommerce by the manage-ment.							
d. Ability to determine customer needs regard-ing Business-to-Consumer eCommerce.							
e. Innovation potential.							
f. Availability of hardware and software.							

List of participants

N°	Organization	Position	Email
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88	Hotel Las Mercedes	Finance Manager	lopez@lasmercedes.com.ni
89	Agro España	IT Manager	neftali.urbina@agroesnica.com
90	Consultores de Seguros S.A.	Manager	ivaniacastrocenreguros@turbonet.com.ni
91	Radio Bautista	Executive Assistant	turadiobautista@hotmail.com
92	CEWEB	Manager	ventaceweb@ni.net
93	Hotel La Riviera	Executive Assistant	hotelriviera@cablenet.com.ni
94	Empresa Juvenil Tem	Manager	dfletes2@gmail.com
95	Amtra Mudanzas y Almancenaje S.A.	Accounting Manager	rlatino@grupoamtra.com
96	Hotel Euro	Executive Assistant	eurohotelnicaragua@gmail.com
97	Crown Plaza Hotel	Marketing Manager	loidelopez@ehg.com
98	UNITEC	Marketing Manager	mercadoypublicidad@unitec.edu.ni
99	Fide/El observador Económico	Executive Assistant	info@fideg.org
100	Passer Velox S.A.	Finance Manager	olga. sanchez@parras.com.ni
101	Gómez Vargas Constructores S.A.	Executive Assistant	guevaraconstructores@yahoo.com
102	Fondo de Desarrollo Local	Finance Manager	ocampus@fdb.org.ni
103	Bayer	Marketing Manager	luis.reynosa@bayer.com
104	Compañia Cercevecera de Nicaragua	General Manager	jaime.rosales@ccn.com.ni
105	Consortium Tablada y Asociados	Associate	tablada@consultiemlega.com
106	Laboratorio Mauricio Díaz Miller	Manager	capulloni@yahoo.com
107	FUNIDES	Finance Director	edmundo.miranda@funides.com
108	KUERO	Design Director	ana@kuero.com
109	AMCHAM	Executive assistant	eudacion@amcham.org.ni
110	Universidad Thomas More	Director	asuntos.exteriores@unithomasmore.edu.ni
111	Catholic Relief Services (CRS)	Human Resources Manager	veronica.alvarez@crs.org
112	Radio Corporación	Sport News Director	gustavob04@yahoo.com
113	Seguros América-Grupo Pellas	Portfolio Manager	gzavala@sequeosamerica.com.ni
114	COMUNICA	Executive Assistant	info@comunicarelaciones publicas.com
115	Opticas Munkel	Marketing Director	kgonzalez@grupomunkel.com
116	Aurora Bienes Raíces	Manager	aurorabienesraices@yahoo.com
117	Grupo Lexis S.A.	Manager	cestrada@attorneysnicaragua.com
118	Sistemática Internacional Inc.	Manager	scraig@sistematicainternacional.com
119	Kenworth de Centroamerica	Executive Assistant	nasistgerencia@kwcs.vom.gt

120	Mega Impresiones S.A.	Technical Director	emayorga@megaimpresiones.com.ni
121	Don Pan	Executive Assistant	donpan@online.com.ni
122	Manufactura de productos Rolter, S.A.	Executive Assistant	mariel.delgado@rolter.com
123	Casa McGregor S.A.	Human Resources Manager	aroni@casamcgregor.com.ni
124	RAMACAFE	Advisor	ilsesolorzano@hotmail.com
125	ICCO	Programm Director	betsy2400@gmail.com
126	Hotelito Kelly	General Manager	hotelitokelly@turbonett.com.ni
127	Profitness. S.A.	Manager	profitnessnicaragua@gmail.com
128	Criscasa	General accounting	mponce@criscasa.com.ni
129	Escuela de computación Silviano Matamoros	Laboratory Director	manysalv@hotmail.com
130	Manuquinsa	President	presidencia@manuquinsa.com.ni
131	Casa Pellas	Director	sduarte@casapellas.com.ni
132	Vistazo Económico	Manager	jjmedina1949@yahoo.com
133	Laboratorio de control de calidad de medicamentos	Technical Director	taniadpsi@yahoo.es
134	Remanso Beach	Executive Assistant	robertapaizano@hotmail.com
135	Universidad Internaciona de Agricultura y Ganaderia	Vice-President	d.marinbriones@yahoo.com
136	Hotel La Estación	Executive Assistant	laestanciónhotel@gmail.com
137	Hotel Villa Isabella	Accounting Manager	jaxtraw101@aol.com
138	Universidad La Anunciata	Manager	universidadanunciata@gmail.com.ni
139	Hotel Victoriano	Staff Manager	hotelvictoriano@gmail.com
140	Hotel Casablanca	Manager	casablanca@ibw.com.ni
141	Hotel Gran Oceano	Executive Assistant	hgoceano@ibw.com.ni
142	Callejas Sequeira e Hijos	Legal representant	casesa@ibw.com.ni
143	Embajada de la República de Argentina	Executive Assistant	argentina-comercial@amnet.com.ni
144	Pro Nicaragua	Intelligence Director	gsanchez@pronicaragua.org.ni
145	UNICIT	Faculty of Economics Dean	fce@unicit.edu.ni
146	Hotel Azul	Accounting Manager	info@hotelazulsanjuan.com
147	Dicegsa	Vice-general Director	edavila@dicegsa.com.ni
148	Banco La Fise	Manager	mcastellon@lafise.com
149	Cargill de Nicaragua S.A.	Purchasing Manager	yohana_sanchez@cargill.com
150	Disnorte-Dissur	Marketing Manager	xramirezpe@disnorte-dissur.com.ni
151	ONG Internacional	Coordinator	elena.moreno@ca.care.org
152	Holcim	Executive Director	dionisio.saenzromero@holcim.com
153	Hotel Contempo	Marketing Manager	v.osorio@contempohb.com

154	Aurami S.A.	Sales Manager	stephaniemairena@gmail.com
155	Sociedad Dávila	Manager	carmelitascafe@gmail.com
156	Compañia Cervecera de Moropotente	President	
157	UNIVAL	President	unival@unival.edu.ni
158	PBS Nicaragua	Manager	luisa.ordonez@grouppbs.com
159	Alvarado Asociados	Associate	jalvaradoqalvaradoyasociados.com.ni
160	Chile Calmito	Owner	romeromolina.ni@gmail.com
161	Puschendorf. CO. Ltda	Accounting Manager	Patricia@gmail.com
162	Libelula Coffeeshop	Owner	nelson-pineda@yahoo.com
163	Cefinsa	Manager	ceciliabacah@gmail.com
164	Restaurante Casa Vieja	Manager	casaviejaleon@gmail.com
165	UCAN	Vice president	vicerector@ucan.edu.ni
166	Probacon S.A.	Manager	rigobertoramos@probacon.com
167	M&R Consultores	Design Director	heydicastellon@myrconsultores.com
168	Colchones Cabrera	Manager	colchonescabrero@hotmail.com
169	Marea Alta	Administrative Manager	cristhianj@mareaalta.net
170	Conceptos	Owner	conceptosvp@gmail.com
171	Conchas Negras	Manager	conchasnegras@cablenet.com.ni
172	Copynic	Executive Assistant	copynic@cablenet.com.ni
173	Remusa	Branch Director	mvillalta@remusacr.com
174	ETIPLAST	General Manager	wcastroe@etiplast.com
175	SOLSESA	Purchasing Manager	marlonjimenes@yahoo.es
176	Panadería Soledad C.de. Cardosa, S.A.	Associate	acardosani@yahoo.com
177	Abonatura	Director	abonatura@gmail.com
178	COSEP	Executive Director	gcarrion@cosep.org.ni
179	EBENEZER CELL ZAY	Technical Director	berenicemairena@hotmail.com
180	Mundoventura	Marketing Director	markitrig@mundoventura.travel
181	American University	President	unlalen21@yahoo.com
182	REPSA	Human Resources Manager	rrhh@repsaautocentro.com
183	Schuvar Tours	Sales Manager	a.perez@scsuvartours.com
184	Vigilancia C.R.S.A	Manager	carmelomreyes@hotmail.com
185	Casa Pellas	Marketing Manager	
186	Fundación Puntos de Encuentro	Executive Director	vanesa.cortez@puntodeencuentros.org
187	Laboratorios Laquisa	General Manager	laquisa@gmail.com/lzapata@gmail.com
188	BAC	Manager	bacnicaragua@gmail.com
189	Universidad Paulo Freire	President	rector@upf.edu.ni
190	UCA	Vice-president	renata@ns.uca.edu.ni
191	Siman Galeria	Human Resources Manager	claudia_castro@sima.com
192	Alfanumérica S.A.	General Manager	jaime.argeñal@alfa.com.ni
193	Plascencia Cigars	Marketing Manager	sergiotorres@plasenciatabacco.com

194	Hotel Jericó	Manager	hoteljerico@yahoo.es
195	Hotel Casa Blanca	Manager	rogermegon@gmail.com
196	Pro mujer	General Manager	gloria.ruiz@promujer.org
197	Oriflame de Nicaragua	Sales coordinator	gladys.morales@oriflame.com.ni
198	Farmex	Director	mruiz@farmex.com.ni
199	Miel Don Pelayo	General Director	cmargerez57@yahoo.com
200	Apicola de Oriente S.A.	General Manager	apicolasa@cablenet.com.ni
201	Resic Arte Bisuteria	Owner	lucidigrenda49@gmail.com
202	Cereales Pivacaya	Owner	cerealespivacaya@gmail.com
203	Caite Velas Artesanales	Owner	jcaroa@velacaite.com
204	Havivis Muebles	Marketing Manager	havivismercadeo@gmail.com
205	Laboratorios Bengochea	Manager	g.operaciones@laboratoriosbengochea.com.ni
206	Universidad de Ciencias Comerciales	President	ivan.ortiz@ucc.edu.ni
207	Casa Pellas	Sales Manager	sduarte@casapellas.com.ni
208	HOPSA	Administrative Manager	kteran@hotsanic.com
209	Maquinarias y equipos S.A.	IT Director	miguel.garcia@maquipos
210	Comercio Internacional de Maquinarias	Marketing Director	emora@cim.com.ni
211	TERMIUM	Manager	lgarcia@ternium.com
212	Industria Centro América de Arcillas Chiltepe S.A.	Operation Manager	chiltepe.dal@gmail.com
213	Universidad Evangelica Nicaraguense	Vice- president	omarcastro@uenicmlk.edu.ni
214	Universidad Hispanoamericana	Director	eloy.romero@uhispam.edu.ni
215	Columbus Auto Repair	Manager	jofercell@yahoo.ca
216	CICAIRE	Sales Manager	salaventas-nic@ciraire.com
217	SERLISA	Executive Director	efonseca@groserlisa.com.ni
218	SINTERSA	Marketing Manager	ksotomayor@sinter.com
219	Nicamerica Clothing S.A.	Logistic Manager	analuciaaragon@gmail.com
220	Seguros Nicaragua S.A.	Finance Manager	alejandronarvaez@mapfre.com.ni
221	Central American PIPE S. A. Capsa industrial Nicaraguense	Owner	comercial1@capsa.com.ni jbrinquis@gmail.com
222	Carrion Cruz Construcciones S.A.	President	gerenciageneral@carrioncruz.com
223	El Castillo del Cacao S.A.	President	milton@elcastillodelcacao.com
224	Hilo producciones y publicidad S.A.	General Manager	adela.tapia@hilopublicidad.com.ni
225	Universidad Nacional Agraria	IT Advisor	blandino_un@una.edu.ni
226	Televisora Nicaraguense S.A.	General Manager	alvaro.rocha@tn8.tv

227	ASP Consultores S.A.	Country Director	mponce@aspconsultores.hn
228	Taller de Mecánica Guanuca	Owner	arlenmarcello29@yahoo.com
229	Almacen de todo	Owner	noelticonoco@gmail.com
230	Sagsa Disagro S.A.	Sales Director	amachado@disagro.com
231	El Nuevo Diario	General Manager	asomarriba@elnuevodiario.com.ni
232	Auto Star S.A.	General Manager	walter.cabrales@autostar.com.ni
233	Instrumentos musicales La Voz, Tropical Music	Sales Manager	enrique@lavoz-ni.com
234	Desarrollo Urbanos de Casa	Director	shdimas@vallesantarosa.com
235	Gnetcyber	Owner	ljoelgarcia@gmail.com
236	Comercialización de granos	Owner	melvinm@gmail.com
237	Happy Travels	Manager	happytravel@yahoo.es
238	Tienda Yamila	Owner	joaquin@gmail.com
239	Valentis Pizza	Manager	d.valenti@valentispizza.com.ni
240	Hotel Casa San Francisco	Manager	manager.est@gmail.com
241	Oficentro S.A. Librería Bolivar	Manager	oficentroravausa@yahoo.com
242	Libreria San Jeronimo S.A.	Accounting Manager	contabilidadclibsanjeronimo@com
243	Empresa Nicaraguense Alemana S.A.	Manager	emicalsa@turbonett.com.ni
244	Global Communities	Subdirector	rsosa@globalalcommenities.org.ni
245	Aeromundo	Marketing and Sales Manager	darwin.orozco@aeromundo.com.ni
246	Bicasa	Manager	administracion@bicasa.com.ni
247	El granjero S.A.	Marketing Manager	jcárcamo@granjero.com
248	Camara Nacional de Turismo CANATUR	Vice president	lvalenti@livenicaragua.com
249	Productos Naturales	Manager	veronicabarreto@gmail.com
250	Oro travel	Manager	pascal@orotravel.com
251	Criptos	Human Resources Manager	ventas@criptos.net
252	Alex Shoes	Manager	www.alex1-shoes.com
253	Hamacas Esperanza	Manager	hamacasesperanza@hotmail.com
254	Joya de Nicaragua	Manager	jdni@ibw.com.ni
255	Kaltex Argus	Manager	kaltex-argus@gmail.com
256	Esponic S.A.	Commercial Manager	info@esponic.com
257	Comestibles S.A.	Accounting Manager	carolina.ortiz@grupoportes.com
258	Cisa Agro	Human Resources Manager	cisabox@cisagro.com.ni
259	Tecnosol	Marketing Manager	tecnosol@ibw.com.ni
260	Pintura Modelo	Sales Manager	pintura@modelo.com.ni
261	La casita de Madera	Manager	silviomontalvanc@gmail.com
262	Grupo Amanco Internacional /Hotel Barcelo Managua	Human Resources Manager	javierortega@managuadirsec
263	Hotel Crown Plaza	Marketing and Sales Manager	managua@ihg.com
264	Hotel Real Intercontinental	Sales and Marketing Manager	danielle.francines@-hr.com
265	Venta de repuestos Mery Acevedo	Owner	mery_acevedo@yahoo.com
266	SITEL S.A.	General Manager	fran2006@turbonett.com
267	Construmarket	Country Director	gerenciageneral.ni@grupoconstrumark.com
268	Suministros industriales de oriente S.A.	Administrative Manager	finanzas@suminsa.com.ni
269	Grupo Invercasa	Administrative Manager	mjackson@grupoinvercasa.com.ni
270	Ferreteria Luby	Accounting Manager	luvybetancohurt35@yahoo.es
271	Repuestos Karina	Owner	respuestoskarina@hotmail.com
272	Ferreteria Kuan	Manager	maeli33@hotmail.com
273	Targa Industrial S.A.	General Director	targae@targaind.com

274	Suni Solar S.A.	General Manager	rodolfo.raudez@sunisolar.com
275	Condor Comunicaciones	Marketing Manager	ivado@condor.com.ni
276	Durman Esquivel Industrial de Nicaragua S.A.	General Manager	almartinez@durman.com
277	ITCM	Administrative Manager	emiliadomal@hotmail.com
278	Literato Tienda de Libros	General Manager	alfredo.guzman@literato.com.ni
279	MOFE S.A. y Connect Internacional LLC	President	jmontealegre@ci-mga.com
280	Urbina y Compañia Limitada (leiman Invest)	Public Relations Manager	lydia.leimaninvest@gmail.com
281	Sabina de ingenieria S.A. Asociación Nicaraguense de productores Exportadores de Nicaragua APEN	Export/Import Director Marketing and International Rel. Manager	grthomas@sabina-agrorl.com ssomarriba@apen.org.ni
282			
283	Escuela Spanish Corner School	Owner	chrisrodriguez80@gmail.com
284	Nica Spanish	Owner	info@nicaspanish.com
285	Latin American Spanish School	Director	leylavanessagranados@hotmail.es
286	Hostal Pacha Mama	Associates	info@hostelpachamama.com
287	Restaurante el Timon	Associates	www.wltimonsanjuandelsur.com
288	Restaurante Brisas Marinas	Manager	restaurantebrisasmarinas@gmail.com
289	Restaurante Vivian	Owner	restaurantevivian@hotmail.com
290	Hotel Casa Marina	Executive Assistant	www.bedandbreakfast.com
291	Hostel Esperanza	Executive Assistant	hostelesperanzasjs@gmail.com
292	Chocolates Momentos	Manager	mirafloresindustrialsa@hotmail.com
293	Dolce Café	Manager	berthau88@hotmail.com
294	Repuestos Alvarado	Manager	duarte.olga@gmail.com
295	Miraflores Industrial S.A.	Human Resources Manager	mirafloresindustrialsa@hotmail.com
296	AMNET	Manager	infoni@amnetcorp.com
297	Sumni	Manager	ventas@sumni-nic.com
298	Hotel Estancia Mar Dulce	Owner	hotellaguasyvolcanes@hotmail.com
299	Eskimos S.A.	Manager	mta@eskimo.com.ni
300	La Casa del Pan	Human Resources Manager	venta@lacasdelpan.com.ni
301	Hotel Posada San Martin	Executive Director	reservacionescasa san martin@yahoo.com
302	Hotel la Gran Francia	Human Resources Manager	eventos@lagranfrancia.com
303	Hotel Casa Vivaldi	Manager	italianricky@latinmail.com
304	Hotel Alhambra	Manager	granadaturistica@hotmail.com
305	Hotel Dario	Manager	info@hoteldario.com
306	Cian Electronic, S.A.	Vice-manager	leocanes@hotmail.com
307	Comercial M & B	Manager	elisamembreno@hotmail.com
308	SINSA	Production Manager	sinsa@gmail.com
309	Cadisha Rechuting Agency	Owner	crta@yahoo.com
310	CopyFast	IT Director	q840ar@mac.com
311	AJAR Production	Owner	amadoralberto@yahoo.com
312	Café Soluble S.A.	Accounting Manager	fmoraga86@yahoo.com
313	Cocina Mi Fogón	Owner	juang@hotmail.com
314	Universidad Centroamericana	Manager	planificacion@ns.uca.edu.ni
315	Nicalapia S.A.	Manager	nicalapia@cablenet.com.ni

Type of product and service (Question Number 2 in questionnaire)

Type of product and/or service of the company	Nº
Industrial, agricultural, motorcycles, vans tires sales	1
Packing Cigars	1
9999	28
Accommodation services, bar restaurant, events room	1
Accommodation	10
Accommodation & gift shop	1
Accommodation and food	2
Accommodation and food services	3
Accommodation and transport	1
Accommodation, events and food	1
Accommodation, food & events services	1
Accommodation, recreation zone and sale of ornamental plants	1
Accommodation, restaurant	1
Adhesive labels and stickers	1
Advertising	2
Advertising and Journalism	1
Advertising services	1
Advertising, Digital Printing y Offset	1
Advisory service, training, food, crafts design	1
Agricultural machinery and construction	1
Agroindustrial equipment	1
Air conditioning sale, repair and maintaining	1
Airlines tickets sales	1
Airlines tickets, tour packages, hotels, car rentals	1
Aluminum glass, windows, sliding doors	1
Assistance foreign investors	1
Audio and Musical Instruments	1
Automotives services	1
Automotives, technology services and distribution of consumption products	1
Automotives accesories sale	1
Bakery	3
Basic grains	1
Basic granes and coffee sales	1
Beauty	1
Bed and mattresses, furniture comfort	1
Beer, water, juice and milk	1
Books	1
Books & Technology	1
Broadcasting	1
Broadcasting, internet, networks, GPS	1
Brokers	1

Business Union	1
Capacity Development & Building partnerships	1
Car repair, sale of spare parts	2
Car wash	1
Cereal production	1
Cereals, coffee, pasta and dyes industry	1
Chocolate	1
Chocolate manufacturing	1
Clay based products (tiles, bricks, blocks, flats)	1
Clothes, shoes and toys	1
Coffee and donuts sales	1
Coffee shop	1
Commercialization and installation of renewable energy systems	1
Commerce	1
Commercialization	1
Communication and public relation	1
Communication services	1
Communication strategies,advertising campaigns	1
Construction	1
Construction and sealed product	1
Construction materials	1
Construction, home appliance	1
Corporate and individual transportation	1
Courier	1
Cosmetics	1
Country Industry Consulting	1
Credits for different segments	1
Design of leather bags and accesories	1
Design, banners, video editing	1
Design, Manufacturing, Marketing of home products	1
Developer	1
Development cooperation	1
Digital impression	1
Digital Printing, Screen printing embroidery	1
Diplomatic Mission	1
Distribuitor of electrical material, industrial material and hydroelectric	1
Distribution and Marketing of energy	1
Education	8
Education (Spanish language School)	3
Elaboration/Production of chili	1
Electronic lottery	1
Entretainment	1
Equipment and industrial accessories	1
Exchange of information and graphic design	1
Fertilizers and agrochemicals inputs sales	1
Fiberglass for industrial water treatment	1
Finance	1

Finance project in the North of Nicaragua	1
Financial Product, Commercial Banking and Investment	1
Financial services	1
Food	1
Food (Breakfast & Lunch)	1
Food and Beverages	1
Food and customer service	1
Food and Products, Marketing of products for Human consumption	1
Food for animals	1
Food Industry	1
Food retailer	1
Food Services	4
Food, communications, brokerage, coffee farm, starches	1
Gold production	1
Hammocks sales	1
Handmade candles production	1
Health Services	1
High Education, bachelor and postgraduate	1
Higher Education	8
Honey commercialization	1
Honey production	1
Hospitality	14
Housekeeping	1
Ice cream and milk production	1
Import, sale, installation, maintenance of systems and equipment	1
Improvement	1
Industrial machinery, chemical, mineral and spare parts	1
Industrial products and machinery	1
Insurance	2
Internet data	1
Internet service provider	1
Ironmongery	1
IT products	1
IT Services	2
Kitchen manufacturing	1
Laboratory of final product analysis	1
Laces and uniform making	1
Legal	2
Lettering	1
Life insurance and pension	1
Magazine	1
Management consultancy customer perception	1
Manual water pumps, water and sanitation, training	1
Manufacturing painting	1
Manufacture and sale of cements, agreggate and concrete pre mixed	1
Manufacture of handmade cigars	1

Manufacture kids furniture	1
Manufacture of foam polymethane	1
Manufacture of footware	1
Manufacture of hammocks	1
Manufacture of jeans and accesorize	1
Manufacturing of equipment for seed processing	1
Manufacturing of pipes and accesorize PVC, polyethylene, polypropylene	1
Market Research	1
Marketing of products for construction, mechanical seals	1
Meat and dairy	1
Medical Services	1
Medicine sale	1
Medicines and Consumption	1
Mexican Fast Food	1
Microcredit Finance	1
Microcredit, training and health	1
Mobilephones accesories and mobile breakouts	1
Motorcycle spare parts	1
Multifunctional copiers sale	1
Natural Products	1
News advertising	1
Newspapers and advertising	1
Non profit association	2
Nonprofit organization	2
Nonprofit civil association	1
Ondeman programming	1
Optical product and services	1
Outsourcing cleaning services, call center, post services	1
Pastry & Bakery	1
Personalized physical assistance	1
Planting and processing of fruit pulp, jellies, marmalades and concentrates	1
Preparation of gourmet beer	1
Print	1
Printing	1
Private security, physical security, electric security	1
Product INCASA y product M2	1
Production and export of coffee	1
Production and marketing natural fertilizers for plants for agriculture	1
Products and travel services	1
Professional trainning	1
Project design	1
Publicity	1
Quality control of medicines	1
Raw material, fabric, glassware and jewelry	1
Real Estate	3
Recruitment of staff for touristic boats	1

Renewable energy	1
Rental Cars	1
Repair and maintenance of vehicles	1
Reproduction of documents and graphic design	1
Research	1
Research on economic issues, local, institutional and policy evaluation	1
Restaurant	2
Retail (clothes, shoes, technology, house)	1
Rubber footwear	1
Sale of air conditioner	1
Sale of computer equipment	1
Sale of equipment and products for integrated pest	1
Sale of health care products	1
Scales	1
School and office shop	1
Seafood export	1
Second hand clothes import and repacking for export	1
Security	2
Semafonics materials, Control access, Control systems assists	1
Services	1
Social projects	1
Software development	1
Sound systems and musical instruments commercialization	1
Spairs and repairs	1
Spare part sales for heavy vehicles	1
Spare parts for light and heavy vehicles	1
Specialized publication	1
Steal, plates, perlines products	1
Suplement agriculture and livestock	1
Technical education	2
Techno industry	1
Telecommunication	1
Textil clothing for women	1
Tour operator	1
Tourism services eMarketing & booking	1
Tourism Services National and International	1
Tractors, excavators	1
Trade and manufacture of pipes PVC accesories	1
Training & Education	1
Training, technical assistance, business intelligence, transport	1
Transport and customs agency	1
Transportation services	1
Travel Agency	1
Travel Agency and Operators	1
Turism and hospitality	1
Vehicles spare parts sales	1

Vertical and horizontal construction	1
Veterinary	1
Website design, Consulting & graphic design	1
Young business support	1
Total	**315**