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Theory of a *Human Ecology of Communication*: empirical evidence of the Internet consumption ecosystem in Ecuador

Daniel Fernando López Jiménez
daniell@uhemisferios.edu.ec
Dean of the School of Communication. Los Hemisferios University. Ecuador

Javier Odriozola Chéné
javiero@uhemisferios.edu.ec
Aggregate full professor. School of Communication. Los Hemisferios University. Ecuador

Juan David Bernal Suárez
juandavidb@uhemisferios.edu.ec
Director of Communication's degree. School of Communication. Los Hemisferios University. Ecuador

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Abstract

Since 2010 we have been analyzing Internet consumption indicators in Ecuador, characterized by the rapid growth in relation to nearby countries. This phenomenon, that transcends the statistical explanation, has been conducted in more than ten research reports published by the Research Center of Communication and Public Opinion (CICOP) of the Faculty of Communication at the Universidad de Los Hemisferios, who leads in the country the World Internet Project -WIP- project. This "transgression" suggests an interdisciplinary explanation, according to the complexity of human social ecosystem, to understand "how" it is possible to discern political and economic different and specific behaviors in social communication, according to sociodemographic characteristics, in a society like Ecuador, where the classic paradigms of communication theory breaks. In this sense we present the theoretical proposal entitled "*Human Ecology of Communication*" from the Internet consumption research conducted during the years 2010-2014 in Ecuador.

Keywords

Human Ecology, communication, Internet, habits, consumption, Ecuador

1. Introduction

This paper presents a theoretical proposal: "*Human Ecology of Communication*", from the findings of the longitudinal study of the World Internet Project-Ecuador –WIP, from the years 2010, 2011, 2012, 2013 and 2014, based in the characterization of consumption in Internet by the population in the country and considering the different variables related to the consumption habits of Internet.

The theoretical proposal "*Human Ecology of Communication*" offers a transdisciplinary explanation of high and accelerated consumption of Internet in Ecuador, where economics, sociodemographics, and politics characteristics, stimulate an ecosystem of relationships and the appropriate conditions for a local microsystem (Ecuador) influenced by a macrosystem (regional and international). The phenomenon takes

distance from the statistical explanations (universals and generalists) and forces the analysis to a disciplinary transgression of the communication to understand the "how" and the "why" Internet consumption in Ecuador is well above expectations and trends of academic researchers and public organizations. This situation creates an understandable discussion that can be dissected from different epistemic approaches.

As a contribution to the scientific discussion, we propose that it is possible to understand the phenomenon of high consumption of Internet in Ecuador from the theoretical model we have called "*Human Ecology of Communication*". The model is based on five years of empirical study of the project called: "Typology of the digital future: An international longitudinal study" that measures the impact of Internet and wireless technology (*World Internet Project* –WIP). The Center of Communication and Public Opinion (CICOP), which is part of Universidad de los Hemisferios' Faculty of Communication, is the organism in charge of conducting the study in Ecuador.

The World Internet Project (WIP) started in 2000, at the Center for Political Communication at the University of California (UCLA). The project is associated with the School of Communication Sciences from the UNT in Singapore, and the Italian Observatory Internet, from the Bocconi University in Milan. Currently it is directed by the Center for the Digital Future from the School of Communication "Annenberg" of the University of Southern California -USC-. Its founder and current director is Jeffrey Cole. Today, the project has the participation of 34 countries, including Ecuador. The study includes 95 variables of consumption in Internet.

2. Theoretical framework and the Human Ecology of Communication

There are many researchers studying in depth the phenomenon of Internet consumption from the theoretical and empirical analyzes. Among these researchers we can find Castells (2001, 2003), Morales (2004), Turkel (1997), Bell (2000), Islas & Gutiérrez (2003), Cabrera & Cupaiuoli (2010) and Serrano & Martinez (2003).

2.1. *The Media Ecology vs. Ecology of Communication*

However, for the theoretical analysis proposed here -as a starting point- we will bring up some of the outstanding thinkers of the *Media Ecology*, lead mainly by the ideas of the Canadian School headed by Marshall McLuhan. The members of this communicative thought have promoted the study of media from an ecological conception regarding their influence and their social relations in the fields of education, politics, industry, community, culture, and arts. That way, the fundamental principle of the Media Ecology says: "a medium is a technology within which a culture grows; that is to say, it gives form to a culture's politics, social organization, and habitual ways of thinking (Postman, 2000: 10).

It is important to remark the significant contributions made by the following thinkers: Carpenter and McLuhan's (1956) studies on the new mass language radio, television and newspapers; Eisenstein (1983) and Havelock's (1981) studies of print culture with its revolutionary model for the interpretation of Western philosophy; Langer's (1967) symbolism; Ellul's (1970) ecology of politics; Innis' (1999) studies of communication as a decisive determinant of society; Postman's (1988) critics to education, technology effects and media ecology; and Mumford's (1967) urgency of humanization of technique. In general, they all affirm that media forms its own ecosystems according to the human ecology in which they develop: for example, the film industry, the artistic culture, news information system, institutional, civic and political communication, and social networks on the Internet. They are unique ecosystems that may differ from each other according to their characteristics and dynamics. However, "many problems with media ecology theories cannot be adequately dealt with here, from its adherents' interest in grand theories to its underlying and

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uncritically reiterated Judeo-Christian ethical framework to its penchant for sweeping conclusions and acolyte-like attention to its earlier scribes" (Schofield, 2008: 23).

Faced with this position from Media Ecology, David Altheide (1994) proposes the concept of Ecology of Communication. The aim of this proposal "is to become more aware of this interaction between ITs [information technology], formats and activities in order to recognize significant social processes that are transforming our lives" (Altheide, 1994: 668). This communication development is conditioned in many industrial societies for cultural background of bureaucratic coordination and efficiency, which is derived in an increased need for control and surveillance of citizens/consumers (Altheide, 1994: 681-682).

2.2. *Cultural globalization and its impact on Internet development*

The concept of cultural globalization must be associated with the category of common culture, whereby "a given group tends to share an entire worldview, manifesting a coherent and distinctive pattern of values across a wide range of topics" (Inglehart & Carballo, 1997: 35). In this new environment "communication and education have gone to a non-issue but merely articulating presence, strategic" (Barbero, 2003: 19).

With the establishment of cultural globalization is important to note that identities are no longer built just from the roots of each culture. We must consider a new dimension defined as "moving roots", which refer to networks and cultural currents of migration and mobility fruit, uprooting traditional cultural identity (Barbero, 2003: 21). Thereby, common behaviors are encouraged between societies with a similar economic, cultural and political development (Inglehart & Carballo, 1997: 35).

In the field of communication there is a growing concern about the effects and impacts of the Internet on the individuals, organizations and society in general (Islas & Gutiérrez, 2003). Studies indicate that there is a generational and technological convergence. First of all, there is an increasing usability of information and communication technologies, and secondly, there are new patterns of communication behavior of young people and children, more oriented to multimedia and interactivity offered by the global social networks (López, 2004; López, 2010; Lopez & Eguiguren, 2011; Lopez, Callejo, Rodrigo & Cajiao, 2013).

2.2.1. *Globalization and Internet in Latin America*

Studies of Latin America must consider that "latinoamerican countries are currently result of sedimentation, juxtaposition and interweaving of indigenous traditions (especially in the Mesoamerican and Andean areas) of Catholic colonial hispanicism and modern political, educational and communication actions" (García-Canclini, 2001: 86). This Latin American identity has traditionally been characterized by a divorce between the symbolic and socioeconomic modernism; however, this actually changes from the decade of the nineties, when both positions begin to evolve together (García-Canclini, 2001: 104).

This new insight has also been extrapolated to the Internet user. Throughout the Latin American environment it has experienced an exponential growth of Internet use. By 2009, Internet experienced a 30% penetration, representing a growth of 861% compared to 2000 (Dyjament, 2010: 51). This growth "is overcoming barriers of socioeconomic and cultural creating a new constellation of issues and concerns that are emanating to stay" (Dyjament, 2010: 48).

2.3. *Ecuador: a distinct ecosystem*

2.3.1. *Sociodemographic characteristics*

In Ecuador's case, the population stands at around 15 million people (INEC, 2014), who are divided into five socioeconomic levels: A = 1.9%, B = 11.2%, C + = 22.8%, C=49.3%, and D =

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14.9%. The analysis of these data serves to show that: the four highest levels involve the 85.2% of the population and they live in Ecuador's major cities (Quito, Guayaquil and Cuenca); the 95% of the population lives in the coastal region and in the Ecuadorian highlands; and 67% of Ecuadorians live in urban areas. Moreover, national policies and governmental promotion programs of Internet access show a technological revolution: from 9% connectivity in 2008 to 47.7% in 2014.

In addition, it is valid to note that "urban town overflowing increasingly permeates the rural world" (Barbero, 2003: 23). The reconfiguration of traditional cultures intensifies communication and interaction with other communities in their immediate environment as far in space too. The result of this new connection is the transformation of a single national identity to multiple identities's with multilingual transterritorial (pp. 22-23).

2.3.2. *Studies of Internet consumption in Ecuador*

In Ecuador, the information on these topics is limited. In addition to the project WIP-Ecuador, is valid to emphasize the study called "The Interactive Generation in Ecuador" (Bringué & Sádaba, 2011), commissioned by the Ministry of Telecommunications and Information Society of the country. This study aims to know, empirically, the use and valuation that Ecuadorian children and adolescents give to new Information Technologies and Communication and the impact these cause in familial and social environments. The research analyzed a group of 4000 school children (aged 6 to 18 years) over 2000 schools in the country. The study is part of the project "Interactive Generation," which in the past three years has surveyed more than 150,000 students in Argentina, Spain, Chile, Peru, Colombia, Brazil, Venezuela and Mexico.

In Ecuador, the project aims to use the information obtained to develop guidelines and educational activities that promote ICT`s as a tool that promotes youth development, minimizing the risks they present and maximizing opportunities to create a better society. Meanwhile, the Ministry of Telecommunications -MINTEL- published the "Annual Report of Statistics on Information Technologies and Communications" measuring 2009, 2010 and 2011 (Mintel, 2010; Mintel, 2011; Mintel, 2012). The quantitative study focuses on the Internet and cell phones, which for the purpose of this study serves as a reference of connectivity for better understanding of the phenomenon of their respective consumption. By the end of 2012, the report founded that 54% of population has access to the Internet. Based on this indicator, the report of *Internet World Stats* (international site that provides information about accessing the Internet worldwide and conducts research in more than 233 countries worldwide) announced that in 2012 Internet in Ecuador reached a penetration of 43.8% nationwide (Internet World Stats, 2012).

2.4. *The necessity of a new explanatory model for Internet consumption in Ecuador*

In the last five years the results of investigations of WIP-Ecuador have raised questions among members of the academic community around the "how" and "why" of the high and accelerated growth of Internet consumption. In this section, we present the theoretical proposal we have called *Human Ecology of Communication* given the metaphorical similarity with human social ecosystem, for the analysis of the communicative reality.

Demonstrations of empirical studies and factual realities of Internet phenomenon has been evident in all areas of society: social relationships, communication, politics, education, economics, among others (Castells, 1999) and also in studies by country performed since 2000 by the World Internet Project. This currently brings together 34 countries on 5 continents, with the guidance of Professor Jeffrey Cole, and coordination of Michael Summan, from the University of Southern California.

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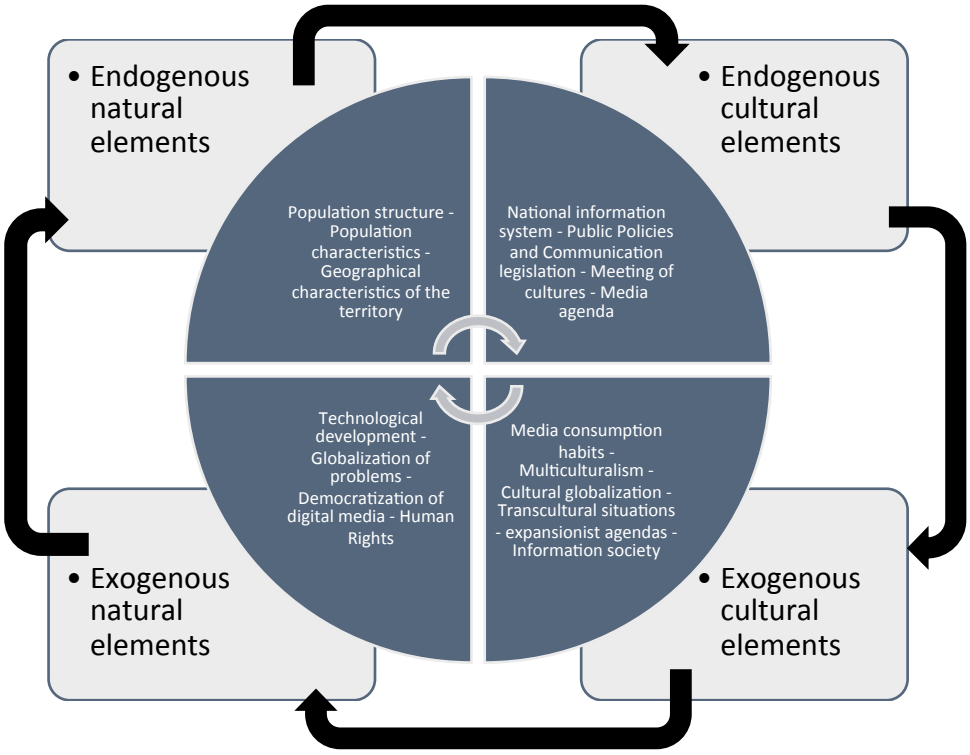
However, from our point of view, the contributions of the *Media Ecology* are appropriate to explain the complex phenomenon of Internet consumption in Ecuador. Causality and understanding do not refer to a single unique ecosystem, but to an ecology composed of different communicational ecosystems, as a complex reality (Morin, 1994). Internet as a mass medium it is also an inappropriate theoretical explanation of the phenomenon, because Internet is a channel, not a medium as has been defined by Media Ecologists.

We affirm that the system of *Human Ecology of Communication* considers four key components that interact with each other, creating dependency relationships and shaping a particular ecosystem: homogeneous or heterogeneous, open or closed; this must be in accordance of the social reality that it is going to be analyzed. These components are: 1. Endogenous natural elements; 2. Endogenous cultural elements; 3. Exogenous natural elements; 4. Exogenous cultural elements. This model goes beyond the positions of Postman (1988), who believes that the media generate a human ecosystem around its dynamics and interplay of media reduces dependence into the technological determinism.

Figure 1. The System for Human Ecology of Communication



The system itself is not a phenomenon; is a theoretical model that facilitates the understanding of a particular communicative reality. The communicative reality is not the same in South Korea than in Finland, the political acts presented in the second decade of the century are different for each country. And, at the same time, the communicative reality of indigenous Huaorani settled in the Amazon Region in Ecuador is different from the people settled in the city of Cuenca in the southern part of the same country. However, we need a model that finds the wires or the objectification of action and communication. It is important to find a scheme for all communication realities of different societies that maintains and respects its own particularities. Without being deterministic, Mumford (1967)

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warns the risks of technology, and without despising its benefits, he does not distinguish differences between human groups and their communicative relationships.

Endogenous natural elements include the characteristics of a particular group of people (communities, towns, organizations, countries, etc.) that are not necessarily related by a communicative origin, but they are related by a demographic and even geographic origin, which determine the natural stage of development of communication. Generational differences between adolescents, adults and seniors, can determine the consumption habits and the use of media with radical differences between them. The differences of the territory's natural landscapes can determine the technological expansion and access to the media that this entails (Mumford, 1967). So, the endogenous cultural elements develop their own communication characteristics of each human group, defined by the national information system: structure of private and public media, legal system of communication, policies and programs for the development of communication (Ellul, 1970). These characteristics determine the frameworks of human intervention and the communication flows that occur in relation to the Endogenous natural elements.

If these two elements do not receive a dependence external influence, we can say that it as a closed ecological system of communication. So, the indigenous people that remain isolated in the Amazonian jungle could fit within this description.

Exogenous natural elements are those characteristics associated with the anthropology of human society: the need of solving environmental problems through technological development; or the need to understand problems from a global perspective (like for example the effects of the media and the environmental degradation); the general needs of communication facilitated by the recent democratization of digital media; and the promotion of Human Rights, as a road map for the exercise of freedom. Nonetheless, exogenous cultural elements contemplate the global dynamics of communication, evidenced in media consumption habits, and derived from multiculturalism media pressures, causing a cultural globalization (Carpenter & McLuhan, 1956). The process of acculturation is measurable in media, political and economic agendas and in the structural features of the new information society.

These two exogenous factors affect social groups, causing dependency relationships from the outside to the inside. Besides, external behaviors eventually become part of the behavior of self-communication of these groups (Postman, 1988). This ecological dynamics depends on the status of group communication that can receive external influences, voluntarily or involuntarily, imperceptible to the dynamics of society.

The four elements of the model, in an open communication ecosystem are interrelated, causing the imperceptibility of their status in the social group (Innis, 1999). However, each group will behave differently according to their own endogenous characteristics. It may happen that the pressure of external elements is greater than the resistance of endogenous conditions, which could generate communicative globalization characterizations, not necessarily originated in the local culture. This will depend on the acceptance of cultural identity of social groups. Within a society, as a national ecological system of communication, there may be heterogeneous ecosystems of communication. Even in countries characterized by certain homogeneity, individual characterizations which classify heterogeneous ecosystems are presented.

To understand the system model of *Human Ecology of Communication* we can just take the family social group or also an entire country. In the first case, each member of the family keeps endogenous natural and cultural elements, such as age and sex of each and their own behaviors. In addition, each position and political authority, involves the creation of a status social norms, through a system of information and family communication. However, this system is not closed, because it receives external influences of the society to which it belongs. This is the case of the media and how it tends to get into the family's routine. This

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does not means that in communicative terms a family is exactly like another family. Instead, we find that each family is a particular ecological system of communication, although we discover that the four constituent elements of the model of *Ecology Communication* are found in all families. At a country level, the different peoples or nations, communities or cities, are particular ecosystems, parts of a macro system called country.

3. Hypothesis

The main hypothesis of this research asserts that Internet consumption in Ecuador is much higher than expected by the economic development values, social and cultural facts (associated with the logic of globalization); so it becomes necessary to establish a new theoretical model that helps us to explain the high Internet consumption rate.

Furthermore, we also try to find that the habits of Internet users in Ecuador are not uniform, but they use different formats depending on their interests.

4. Methodology

This research is longitudinal, descriptive, quantitative and qualitative. It uses a standard structured questionnaire for the 34 countries in which the WIP is currently present. The principal goal of the study is to determine statistically the significant differences of the population Internet consumption during the years 2010-2014 in relation to the following variables:

Chart 1. Study variables

SOCIODEMOGRAPHIC DISTRIBUTION	**CATEGORIES**
City	Name of the city
Age	Age intervals
Gender	Men/Women
CONSUMPTION: INTERNET USERS	**CATEGORIES**
Are you currently on the Internet?	Yes / No
CONSUMPTION: HABITS ON INTERNET	**CATEGORIES**
Email consultation	**Time scale:** Several times a day Once a day Weekly Monthly Less than once per month Never
Using instant messaging	
Chats participation	
Making phone calls	
Making blogs	
Photo publishing	
Online Gaming	
Download/Listen music	
Download/Watch videos	
Visit sites of religious content	
Listen to *online* radio	
Gambling *online*	
Search through search engines	
Visit sites of sexual content	
Visit sites of Social Media	
Find product information	
Shopping *online*	
Bill Payment *online*	
Online banking	
Search for academic information	
Participation in courses *online*	
Consulting online news	
Search for travel information	
Search online for a job	
Search for funny/entertainment information	

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The structure analysis and validation criteria were determined with over 700 individuals required for a population of 15,000,000 inhabitants, with approximately 2,800,000 households samples. In 2010, it was used a sample of N = 1,628 for the 25 major cities; in 2011, a sample of N = 813 was used for the 16 major cities; and in 2012 a sample of N = 713 was applied for three major cities: Quito, Guayaquil and Cuenca, since these three cities together represent about 50% of the total population. In 2013, no surveys were applied, since the questionnaire was being adapted to the new dynamics of consumption. Since 2014, the application of the instrument was reactivated with a sample of N = 841, in the same three major cities. In addition to this, the 14 remaining cities that took part of 2014 sample were discarded because of the structure of the country's population (in which 63% of it lives in urban areas and the remaining population lives in rural areas). However, the concept of rural in Ecuador is different from what might be expected in countries like Colombia. In Ecuador "rural" means live in a village or small town, it doesn't mean living in the countryside. Following the idea mentioned above, according to 2010 Census the Amazonian jungle occupies half of the territory and it is home of the 5% of the population.

The sample was made following these standards: reliability level Z = 1.96; Confidence level = 95%; Standard Deviation S = 1 (for values greater than 50,000) and> 1 (for values less than 50,000); and MPE = 3%.

Chart 2. Sample by location

City	Year								
	2010	% sample	2011	% sample	2012	% sample	2013	2014	% sample
Tulcán	46	2,8%	50	6,0%					
Ibarra	46	2,8%	20	2,4%					
Quito	132	8,1%	166	19,8%	300	42%		325	39%
Sto.	102	6,3%	19	2,3%					
Latacunga	66	4,1%	64	7,6%					
Ambato	66	4,1%	26	3,1%					
Guaranda	67	4,1%	14	1,7%					
Riobamba		0,0%	62	7,4%					
Azogues	66	4,1%		0,0%					
Cuenca	54	3,3%		0,0%	113	8%		381	45%
Loja	41	2,5%		0,0%					
Esmeraldas	71	4,4%	49	5,8%					
Portoviejo	65	4,0%	65	7,8%					
Babahoyo	67	4,1%	27	3,2%					
Guayaquil	236	14,5%	152	18,1%	300	42%		135	16%
Santa Elena	66	4,1%	25	3,0%					
Machala		0,0%	59	7,0%					
Tena	66	4,1%		0,0%					
Orellana	46	2,8%		0,0%					
Puyo	66	4,1%	19	2,3%					
Morona		0,0%	21	2,5%					
Zamora	135	8,3%		0,0%					
Nueva Loja	66	4,1%		0,0%					
San Cristóbal	58	3,6%		0,0%					
Golondrinas		0,0%		0,0%					
	1628	100,0%	838	100,0%					

* 2010 Riobamba, Machala, Orellana, Morona, and Las Golondrinas, although they were surveyed, the data are not recorded because of errors detected by the audit. Likewise in 2011, Azogues, Cuenca, Loja, Tena, Orellana, Zamora, Nueva Loja, San Cristóbal and las Golondrinas. In 2012 nearly 200 surveys were discarded to present data inconsistency. And by 2014 just 5 surveys were canceled by data inconsistency. Source: Own elaboration.

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Chart 2 records the number of samples per city for the analyzed years. Although the sample is representative for the population of domestic households, it is not representative for the city. Therefore, the data are analyzed only from a national perspective.

In 2010 samples were taken of persons, men and women, over the age of 12, interviewed by telephone. And, on average, the calls lasted 18 minutes. Since 2012, the sample was stratified into five zones. Phone directories of the different cities were used to achieve a randomic selection of respondents: at every 10 pages a name was chosen, this person was called and interviewed in 2010 and he/she was visited in 2011-2012. In 2014, the sample was applied to the persons of the five stratified sectors of each city, according to their economic status. In the cases in which they did not answer to the phone or the person who answered did not want to answer to the questions, we proceeded to make a new selection and a new call, taking the name of another person on the same page of the directory. The survey was executed between May 15 and June 15, 2010, 2011 and 2012, respectively, and in October 2014.

The variable type was taken into account for the analysis of the obtained data, so the relevant statistical was applied for each case. This is how the following statistics were used: (a) *d Somers*, calibrated by the Chi-square as a goodness of fit statistic to determine differences between groups of nominal variables; and (b) Gamma, also calibrated by the Chi-Square to determine associations between nominal and ordinal variables. In all cases a minimum confidence interval of 95% was contemplated, meaning that association whose significance (*p*) was less than 0.05 was accepted. Survey data was analyzed with the support of the *Scientific Program for Social Sciences* - SPSS® due to its versatility for exploration, comparison, diagnosis and synthesis of categorical and numerical data.

5. Findings

5.1. *Internet consumption in Ecuador*

The sample of the consulted population was composed as follows: in 2010, 69.4% were Internet users; in 2011 the amount increased to 84.5% and in 2012 it remained in 84.4%. Finally, in 2014, 85.9% were Internet users. Of these percentages, in 2010 the 43.2% of the consulted population were students; in 2011 it increased to 56.8%, and in 2012 it decreased to 37.6%. On the other hand, in 2010 the 50.6% represented the male and 48.5% the female Internet consumers; in 2011, the percentages changed to 46% and 54%, respectively; and in 2012, 51.9% were male and 48.1% were female. In 2014, the distribution by gender was settled in 45.8% of men versus 54.2% of women.

Chart 3. Internet Users

Users on Internet				
2010	2011	2012	2013	2014
69,40%	84,50%	84%	-	85,90%
10.4100.00	12.675.000	12.600.000	-	12.885.000

Source: Own elaboration

This study focuses on the concept of "user", which is determined by what we asked in the questionnaire: ¿Are you currently on the Internet? As mentioned above, the sample is stratified and randomly applied. The category of "user" away from the concepts of "penetration" or "connectivity", traditionally used in quantitative studies that count the number of physical Internet connections, which are supplied to the different properties: homes, offices, shopping malls, etc. The concept is based on a qualitative approach that aims

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to differentiate the "users" from the "non-users". In this category, you may perform a mathematical calculation, in which each point of access, wired or wireless can connect one or more persons. In Ecuador, the estimated penetration in 2014 was 54% according to the Ministry of Telecommunications, and according to our study, the total number of users was 85.8%. The difference between the two figures is that in our study we estimate for every connection point 1.5 users. To maintain the representativeness of the data found, statistical tests are applied in order to find the significance between data of different groups in the analysis is divided: men, women, young adults, etc.

5.2. *Internet consumption habits*

The frequency of Ecuadorian Internet users for checking the email, once a day or several times in the day shows a falling fluctuating evolution along the years. The drop recorded in the daily consumption can be understood because of the increase of new media, showing a rising of the phone usage versus the moderate consumption of the email.

Chart 4. Frequency of e-mail checking

	Daily	Many times per day
2010	*35,0%	*26,4%
2011	*24,6%	*19,2%
2012	*34,8%	*24,0%
2013	-	-
2014	*17%	*14,0%

*P=<0,05

Source: Own elaboration

The use of Internet instant messaging by Ecuadorians has also declined over the studied period. The daily consultation increased until 2012, but between 2012 and 2014 it decreased. This significant drop in consumption of instant messaging could also be understood because of: the significant growth of telephone calls, forums participation and personal publishing blogs.

Chart 5. Frequency using instant messaging

	Daily	Many times per day
2010	*26,4%	*24,1%
2011	*25,9%	*18,8%
2012	*31,4%	*30,8%
2013	-	-
2014	*13,6%	*17,5%

*P=<0,05

Source: Own elaboration

The frequency of participating in chat rooms, once a day or many times per day, shows a mixed but rising trend. Clearly, this consumption is related to the increased availability of smartphones among the younger population.

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Chart 6. Frequency of participating in chat rooms

	Daily	Many times per day
2010	*13,4%	*7,1%
2011	*19,1%	*18,6%
2012	*17,1%	*7,0%
2013	-	-
2014	*18,1%	*18,3%

*P=<0,05

Source: Own elaboration

The frequency of making Internet phone calls, one or several times per day, was consolidated in 2014 by doubling the consumption of previous years. This significant increased was based on the emergence of new free applications like Viber, Tango and even Facebook. And the usage was consolidated because Ecuador has a significant percentage of immigrants in other countries like Spain and the United States. Despite this fact, Internet phone calls are also used for local communication among friends and family members. Free phone calls have become a viable alternative for digital communication

Chart 7. Frequency of making Internet phone calls

	Daily	Many times per day
2010	*8,9%	*7,5%
2011	*14,8%	*13,2%
2012	*11,6%	*8,0%
2013	-	-
2014	*22,1%	*12,7%

*P=<0,05

Source: Own elaboration

Working on blogs, one or several times per day, was not significant until 2012. However, in 2014 it grew significantly, maybe because college and university's classrooms started introducing these communication resources as production centers of public opinion, journalism and artistic works. Blogs, by nature, promote the collective expression of a specialized subject, this allows a group of people with same interest to start a thematic discussion or debate in a blog.

Chart 8. Frequency of working on blogs

	Daily	Many times per day
2010	*7,4%	*3,7%
2011	*15,3%	*8,7%
2012	*7,0%	*2,3%
2013	-	-
2014	*21%	*10,7%

*P=<0,05

Source: Own elaboration

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The frequency of Internet photo publishing, one or more times a day, was also consolidated in 2014. This significant growth could have happen due to the proliferation of mobile devices like smartphones and tablets, which allow real-time upload photos to networks as Facebook or Instagram. This digital habit could have also been a cause of the lower email consumption. Having the facility of uploading photos to a social network without using the email was a new possibility that these devices brought.

Chart 9. Frequency of photo publishing on the Internet

	Daily	Many times per day
2010	*12,3%	*4,8%
2011	*14,4%	*14,3%
2012	*11,8%	*9,5%
2013	-	-
2014	*23,9%	11,8%

*P=<0,05

Source: Own elaboration

Taking 2014 data, a fluctuating tendency of frequency of online gaming is observed. Draws our attention the repetitive consumption, which can be associated with the development of a gamming community. The data does not show the nature of the game.

Chart 10. Frequency of Online Gaming

	Daily	Many times per day
2010	*10,3%	*6,2%
2011	*22,6%	*10,8%
2012	*8,0%	*7,0%
2013	-	-
2014	*21,0%	*17,6%

*P=<0,05

Source: Own elaboration

About the frequency of download or listen to online music, once or several times a day, no significant differences were observed, except in a once a day consumption in 2014. On the other hand, a sustainable habit among a specific community of consumers emerges. In 2014, the Spotify application came to Ecuador, which could explain the variation in consumption in 2014.

The frequency of Downloading/Watching online videos has increased over the years. This growth can be understood because of the increasing consumption of TV series and movies that are offered by new applications like Netflix.

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Chart 11. Frequency of download or listen to online music

	Daily	Many times per day
2010	*17,0%	*8,5%
2011	*18,6%	*11,1%
2012	*22,8%	*7,8%
2013	-	-
2014	*23,1%	*7,4%

*P=<0,05

Source: Own elaboration

Chart 12. Frequency of Downloading/Watching online videos

	Daily	Many times per day
2010	*13,7%	*5,1%
2011	*10,6%	*11,1%
2012	*17,8%	*5,5%
2013	-	-
2014	21,0%	8,3%

*P=<0,05

Source: Own elaboration

Observing the daily frequency of visiting websites that contain religious themes, in 2014 a fluctuating but consolidated behavior is observed. This significant growth can be understood because of the spiritual needs of Latin American people, which are guaranteed by the religious freedom policies that ruled most of the countries. However, the data does not specify certain aspects like: what religion is practiced by the cybernauts, or what are their beliefs, etc.

Chart 13. Frequency of visiting religious content websites

	Daily	Many times per day
2010	*2,9%	*3,6%
2011	*17,2%	*10,8%
2012	*4,3%	*1,0%
2013	-	-
2014	18,0%	21,4%

*P=<0,05

Source: Own elaboration

The frequency of listening once a day to an online radio is consolidated among Ecuadorian Internet users. This significant growth could be understood due to the exponential online evlotion of radio programming all around the world. This motivation

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could be encouraged by the lack of national legislation that regulates operating licences, among others.

Chart 14. Frequency of listening to an online radio

	Daily	Many times per day
2010	*6,0%	*5,9%
2011	*11,5%	*14,3%
2012	*11,1%	*1,8%
2013	-	-
2014	14,3%	22,4%

*P=<0,05

Source: Own elaboration

The frequency of online gambling, once a day or more times per day, has also been consolidated over the years. The significant growth of online gambling could be understood due to a possible rising level of confidence in credit cards and other bank payment systems that may have improved in the last years. Likewise, it could be related to the increased level of social uncertainty, which should be determined by studies associated to the topic.

Chart 15. Frequency of online gambling

	Daily	Many times per day
2010	3,8%	3,6%
2011	8,3%	16,6%
2012	3,0%	,5%
2013	-	-
2014	13,3%	37,2%

*P=<0,05

Source: Own elaboration

About the frequency of web searching, a downward dynamic is observed. This decrease might be caused by changes in the consumption habits occurred due to the launch of new media. This could determine the emergence of new Internet consumer profiles because of its specific consumption or visit sites.

Chart 16. Frequency of Web searching

	Daily	Many times per day
2010	*17,0%	*17,9%
2011	*24,2%	*15,9%
2012	*29,5%	*29,8%
2013	-	-
2014	14,5%	10,3%

*P=<0,05

Source: Own elaboration

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A significant increase of the consumption of sexual content was observed. It is not easy to determine the cause, since a study of social behavior is required to understand this fact.

Chart 17. Frequency of visiting sexual content websites

	Daily	Many times per day
2010	*1,5%	*4,5%
2011	*8,0%	*18,2%
2012	*1,7%	*1,7%
2013	-	-
2014	16,4%	37,2%

*P=<0,05

Source: Own elaboration

The use of social networks, once or several times a day, has increased in a significant way. A possible cause could be the wide variety of alternatives that social networks offer. An example of this is Facebook, which allows users to make phone calls, chat in the messenger, download photos and videos. This "all in one" services could be the triggers of the increasing amount of visits that social networks are having day by day.

Chart 18. Frequency of visiting Social Networks websites

2010	*11,6%	*9,9%
2011	*14,3%	*14,7%
2012	*17,3%	*8,8%
2013	-	-
2014	15,7%	14,3%

*P=<0,05

Source: Own elaboration

The frequency of Ecuadorians looking for products information on the Internet has been consolidated, as the data in Chart 19 shows. Through search engines the product information is directly related to Web browsing. Also, it depends on the development of the electronic market of the country. This slow but growing trend could be a scene of constant observation by digital companies that advertise and sell online products.

Chart 19. Frequency of looking for products information

	Daily	Many times per day
2010	*9,2%	*5,6%
2011	*12,5%	*9,6%
2012	*11,1%	*6,7%
2013	-	-
2014	17,8%	9,9%

*P=<0,05

Source: Own elaboration

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Regarding the frequency of online daily purchases, an erratic behavior is observed by Internet users in Ecuador. These high statistical differences suggest a non-regular behavior about online shopping, and this could be related to the time of the year when the survey was applied. In 2014, the questionnaire was applied in the last weeks of October, pretty near to Christmas holidays; this may be the reason why products were so highly demanded. The previous years the survey was applied between April and May each year, during "cold" shopping seasons. In addition to this, may be the reason why the last year online shopping increased so much is due to the fact that credit card and other payment systems increased their safety protocols too.

Chart 20. Frequency of online shopping

	Daily	Many times per day
2010	*2,6%	*3,6%
2011	*7,7%	*13,4%
2012	*2,3%	*1,8%
2013	-	-
2014	21,3%	17,0%

*P=<0,05

Source: Own elaboration

Looking at the “frequency of online bill payment” chart we can analyse that there is a significant growth in the habit of paying bills online. This important increase may lie in the development of secure platforms for public services companies. It could also lie in the consumer’s discovery of the benefits and conveniences that electronic payment offers.

Chart 21. Frequency of online bill payment

	Daily	Many times per day
2010	*3,9%	*1,9%
2011	*5,1%	*12,5%
2012	*2,0%	*2,2%
2013	-	-
2014	*16,8%	*22,6%

*P=<0,05

Source: Own elaboration

The daily use of online banking presents an important consolidated growth. This growth may be attributed by the accelerated digital modernization offered by banks; and by the improved security system that is offered through Internet banking portals.

The daily frequency of looking for information for academic purposes has increased considerably, especially among those users who perform this practice once a day. This growth could be understood by the positive evolution of Internet information, due to the development of selection and production criteria. Wikipedia has become more than a simple "wiki", now is the world's largest encyclopedia. It is not coincidence that schools and even

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university professors consult and recommend the information provided by Wikipedia under quality and reliability parameters.

Chart 22. Frequency of online banking

	Daily	Many times per day
2010	*5,0%	*3,1%
2011	*10,0%	*9,3%
2012	*6,7%	*3,2%
2013	-	-
2014	14,6%	18,1%

*P=<0,05

Source: Own elaboration

Chart 23. Frequency of academic information searching

	Daily	Many times per day
2010	*18,0%	*9,0%
2011	*20,8%	*10,6%
2012	*24,8%	*13,0%
2013	-	-
2014	36%	11,2%

*P=<0,05

Source: Own elaboration

The daily frequency of participation in distance education modules has grown significantly over the last five years. This growth may be a consequence of the wide variety that e-learning offers. Also, the reputation of these programs has improved, allowing students who live in remote regions or outside the country to start developing their professional careers.

Chart 24. Frequency of participation in online courses (e-learning)

	Daily	Many times per day
2010	8,4%	5,1%
2011	21,8%	
2012	10,6%	6,0%
2013	-	-
2014	18,8%	22,8%

*P=<0,05

Source: Own elaboration

In 2014 the frequency of consulting online news experienced a turnaround: the number of users drastically decreased. This significant decline may be the consequence of 2012

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scenario produced by the communication conflict due to the approval of the Communication Law (*Ley Orgánica de Comunicación*), which led to a gradual accommodation of the media to the new information standards. This dynamic could have generated a lack of credibility in journalism in general.

Chart 25. Frequency of consulting online news

	Daily	Many times per day
2010	*20,9%	*7,8%
2011	*12,8%	*10,0%
2012	*41,1%	*12,6%
2013	-	-
2014	17,4%	6,9%

*P=<0,05

Source: Own elaboration

Daily Ecuadorian searches for travel information has shown an upward trend. However, this significant growth may depend on the time of the year in which the survey was made: October 2014. In this month many Ecuadorian families make planes for the Holiday vacations. In order to understand the survey results, it is necessary to know that in previous years the questionnaire was applied in April and May respectively.

Chart 26. Frequency of travel information searching

	Daily	Many times per day
2010	*6,2%	*2,9%
2011	*15,4%	*11,4%
2012	*5,2%	*5,3%
2013	-	-
2014	24,4%	13,4%

*P=<0,05

Source: Own elaboration

The daily frequency of online job searching made by Ecuadorian users has experienced a significant growth. This could be due to a change in search sources of the interested people, who traditionally looked for jobs in the classified ads of the newspaper. In addition, it could be due to the facilities and benefits that professional social media offers: like LinkedIn who facilitates a professional visibility, and allows head hunter's companies to access in an easier way to different profiles.

Finally, the daily frequency search of humorous content is also showing a high growth over the years. This could be a consequence of the proliferation of "memes" through social networks, email, YouTube, instant messaging, etc. The humorous content founds optimal distribution channels all over the Internet.

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Chart 27. Frequency of online job searching

	Daily	Many times per day
2010	*5,4%	*2,1%
2011	*13,2%	*12,7%
2012	*7,2%	*3,8%
2013	-	-
2014	19,7%	21,3%

*P=<0,05

Source: Own elaboration

Chart 28. Frequency of funny/entertainment information searching

	Daily	Many times per day
2010	*8,8%	*3,7%
2011	*15,3%	*7,1%
2012	*12,3%	*4,7%
2013	-	-
2014	21,3%	13,0%

*P=<0,05

Source: Own elaboration

6. Discussion

According to measurements made by the WIP-Ecuador-CICOP, the percentage of Internet users in the country grew from 69.4% to 85.9% in 2014. This is significantly high in relation to consumption indicators of other countries in Latin American in 2013: Colombia 51.7%, 43.5% Mexico, Peru, 39.2%, Bolivia, Argentina 39.5% 59.9% (World Bank, 2014). However, it is necessary to clarify that "user" does not mean "connection". The same World Bank reported that in 2013 Ecuador's Internet penetration was 40.4%. Meanwhile, at the end of the same year the Ministry of Telecommunications of Ecuador established a 47.7% penetration of Internet "connections" and projected for 2014 a total of 54%. These indicators showed that for each connection point there were around 1.5 users, equivalent to 80% of users or consumers. Taking the error margin of 3% of WIP-Ecuador's study, the indicator could be between 83% and 77%.

If we take into account the last three indicators of the country we can say that Ecuador's Internet consumption is around the 85%. This would explain the high percentage of 'users' consumers in the country. On the other hand, the Internet World Stats' data, collected by SUPERTEL (Ecuador's internet), reached a penetration of only 27.7% in 2011; and a penetration of 43.8% nationwide in 2012. However, in 2014 the data showed that penetration had significantly increased by 74.4% (Internet World Stats, 2015).

According to 2010 statistics made by MINTEL the total amount of nationwide Internet connections was 3,998,362. In September 2011, the statistical amount reached 4,982,624 connection points. In accordance with La Superintendencia de Telecomunicaciones' report (Superintendencia de Telecomunicaciones, 2013), Pichincha is the region with better connectivity and it has 1.9 million of users; followed by Guayas province, with 1.3 million.

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As for Internet access modes, Mintel statistics reveal a substantial growth when comparing 2010 and 2011 statistics (MINTEL, 2012). The use of Internet from mobile devices had 1,322,854 users in 2010; while in September of 2011 it increased to 1,595,186 users. The use of Internet through fixed access had a greater increased than the mobile access: in 2010, it had 2,675,508 access points and by September 2011 it had 3,514,075. According to INEC, in December 2013: 27.5% of country households had a fixed computer, the 18.1% had a laptop and 86.4% had a cell phone. In terms of geographical location: in urban areas 37% of people had Internet access from their home and in rural areas 9.1% had Internet access from their home. National average of home connectivity is about 28.3% (INEC, 2012).

In Ecuador's report of the frequency of the use of Internet, the analysis showed statistical differences between the 25 variables of the research report. This supports the information exposed in both studies: the WIP as the Mintel, INEC and *Internet World Stats* about Internet consumption growth in the country.

Interestingly, the percentage frequency of the use of Internet shows a moderate growth from 2010 to 2011 and a decrease in the consumption levels of 2012, similar to the indicators of 2010. In 2014, the use of Internet grew in a significant way.

6.1. *Endogenous natural elements*

As attributes of understanding, the *Human Ecology of Communication* can be applied in Ecuador's reality in the following way. As for endogenous natural elements 95% of the population lives in the highlands and in the coastal region and the 67% of Ecuadorians live in the urban area. Only 5% of the population lives in the Amazonian region which constitutes the 50% of the country's territory. The 85.2% of Ecuadorians are part of the four highest levels of the socioeconomic pyramid. This population distribution within the territory is very particular, considering that 33% of Ecuadorians live in rural areas, which could hinder the access of Internet. However, the places where Ecuadorian families live are not exactly part of farm production areas; instead they live in cantons (towns or villages), head areas of the productive zones.

During the observation visits made by the investigators, they noticed that despite the country's village size, in most of the cases, the place had its own "Café Net" or "Parlour" with an Internet point access so people can use the service. Also, it is necessary to stand out that the majority of the Ecuadorian population is in the range of 15-60 years old, which means that they are potential Internet consumers.

6.2. *Endogenous cultural elements*

Talking about endogenous cultural elements, a technological revolution promoted by the public policy is registered. As a result of this, Internet connectivity increased from 9% in 2008 to 47.7% in 2014. It is estimated that for every Internet connection point there are about 1.5 users. Policies of the national government through the National Development Plan for Good Living 2009-2013 and 2013-2017, show a clear political will to achieve media and digital environment democratization. There is a public strong desire to close communication gaps between population members. Media and digital environment democratization have become key factors for the growth of Internet access.

6.3. *Exogenous natural elements*

Furthermore, speaking about the exogenous natural elements, the study shows that Ecuador has been influenced by Internet. The World Wide Web, besides being a channel, it has become the media of media, in which traditional mass media (radio, television and print media), personal traditional media (messaging, meetings, debates, forums, etc.), and

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traditional social networks (family, neighborhood, club friends, professional associations, etc.) converged.

6.4. *Exogenous cultural elements*

Finally, exogenous cultural elements reflect how Ecuadorians have become meaningful users of Internet media opportunities through the mass consumption of email, discussion forums, social networking, news, religious, humorous, travel information of work, academic consultations, musical entertainment, video, gaming and gambling, banking and purchasing products, among others. Among consumers, could be seen a certain cult of the Internet, a phenomenon already observed by Osicki (2012) in his reflection on "Internet as a new Temple" metaphor alluding addictive McLuhan on TV of the 60s and 70s.

7. Conclusions

7.1. *Human Communication Ecology: a new theoretical model for a particular ecosystem*

Ecuador is a country characterized by a growing and explosive consumption of Internet users, despite their average level of Internet connectivity. This means that for each Internet point access there are approximately 1.5 users. However, the country's high Internet consumption is not reflected as a consumption habit because there is still a high dispersion of consumption data.

Country's high Internet consumption can be understood from the perspective of the *Human Ecology of Communication*, which analyses Ecuador's natural and cultural endogenous and exogenous elements. In the last five years the quality of life of Ecuadorians people has substantially improved. In 2014 the unemployment rate was of 4.54%; 22.49% of the population were below the poverty line and 14,33% of the population were below the extreme poverty line; the illiteracy rate stood in 6.8% with a coverage of primary education of 98.9% for the whole country (Central Bank of Ecuador, 2014). Likewise coverage of high school and university education was also significantly expanded to 92% and 42% respectively (INEC, 2012).

It is clear that high Internet consumption in Ecuador is a communicative phenomenon that can be further developed through qualitative research, for a better understanding of the exponential dynamics of consumption. This phenomenon suggests a better understanding of all factors and elements involved in the dynamic. Also, it suggests a construction of theoretical explanations from the reformulation of communicative categories aligned with a "*Human Ecology of Communication*". This would enable certain explanations of some unthinkable acts like a highest Internet consumption in a poor and classified as "underdeveloped" and even "third world" country. Along the same line is Dennis Cali, professor at the University of Texas at Tyler, whose works warn about the emergence of more in-depth studies of Media Ecology that may explain particular phenomena. Since our epistemic mode of understanding, they could be addressed from the Human Ecology of Communication (Cali, 2012: 344).

For 2015, Ecuador's WIP sample focuses again in the three major cities. Also, the application of the questionnaire remains completely personally. Some elements are incorporated like stratification criteria for comparing socioeconomic levels and making associations founded on those criteria.

It should be noted that Internet new media consumption, like social networking, information query and entertainment may change over the years, and may not necessarily keep a homogeneous behavior (which depends critically on its own population characteristics based on the endogenous and exogenous elements of the *Human Ecology of Communication*). This could explain that each country, in accordance with its population

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structure, its educational level and its per capita income, could have its own Internet consumption type. This issue could be investigated by crossing or associating consumption series of new media and the aforementioned demographic and economic variables.

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