Journal of Internet Banking and Commerce

An open access Internet journal (http://www.icommercecentral.com)

Journal of Internet Banking and Commerce, August 2015, vol. 20, no. 2

Measurement on Usage of the Internet Banking in Colombia

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Abstract

Internet Banking is a set of financial services through internet platforms. Its measure is oriented towards infrastructures more than users. For such a reason, it is required to understand the needs of strengthening measurements in Internet Banking uses. In Colombia, there were no studies identified in measurement of Internet Banking most used service and motivating factors for such uses. Therefore, the purpose of this study herein is to present the results on the measurements of Internet Banking uses in Colombia in order to explore which of those services are the most used in the country and which most important aspects influence such uses. Method used for this study is composed by a

conceptual framework and an assessment process divided into a design and implementation of an adequate measurement system and presentation of results. These results have shown that bank statement and account statement are the most used Internet Banking based services in Colombia. Moreover, quality, familiarity, use and usability and trust are the most influencing factors in the use of Internet Banking in this country.

Keywords: **E-banking; Internet banking; Measurement; Usage; Colombia**

INTRODUCTION

Current world is within a new age of economic and social development through Information and Communication Technologies (TIC). This is known as the "Information Society." Measuring its advances in several sectors is one of the great interests in governments, researchers and supra-national organizations, all whom propose a set of variables and indicators as a control mechanism. Likewise, there is a need to establish improvement strategies [1-6].

In accordance with the National Administrative Department of Statistics [7] a variable is a feature, characteristic or quality in a unit of analysis that varies or changes with the pass of time and within a space, for instance, age, sex, socio-economic level, etc. An indicator is a qualitative or quantitative observable expression that would allow describing features, characteristics, behaviors or phenomena from the reality through a relationship established between one or several variables. Moreover, Sánchez Torres [1] refer a variable as any aspect possible to measure within a set of study, while an indicator is a numeric representation of a variable.

Between the several sectors existing in an information society, there is the banking sector. This sector offers a set of electronic channels of financial services named as e-Banking [2,6].

Services offered by e-banking are a set of financial services through internet platforms. This is named as Internet Banking [6].

In accordance with the several identified and classified variable and indicator systems by Bustamante and Sánchez Torres [2] and also Rodríguez and Sánchez Torres [6], most variables and indicators measure infrastructure aspects and not many related to users, which would require to have a higher and more powerful measurement on the use of Internet Banking including the most used services by users and factors influencing such uses, which were NOT identified in the aforementioned previous research works.

Worldwide, the use of internet financial channels is not homogeneous [8-11]. While countries such as Canada, Island and Norway, users rather use banking services through internet platforms instead of using ATM's or physical banking offices, in countries such as Nigeria, Greece, and Romania users rather use ATM's or physical banking offices [8-10]. In Colombia users rather make their financial transactions in physical offices before using internet platforms [11]. In the same manner, the use of Internet Banking is not homogeneous [12]. In India, online shopping is the most widely used services through Internet Banking, while checking and account management is the least used service, although there is an easy access to transactions, this is the main reason to use Internet Banking [9,12]. In Nigeria the most used Internet Banking service is bill or invoice payment, followed by account consultation, financial advisory and claims and complaints through chat services in the financial websites [9]. In Colombia no research studies were identified measuring most used Internet Banking services and aspects encouraging or stopping their uses.

Due to the aforementioned reasons, the purpose of this paper consists of presenting the results of measuring Internet Banking services in Colombia in order to explore what are the most used Internet Banking services in this country, and moreover, what would be the most influencing factors or reasons for use. This paper is divided into three sections:

The first section describes the method used in this research work. The second section consists of showing results of the method presented in the former section. The third section shows a discussion upon the results attained. Finally, conclusions and future research works are presented.

METHODOLOGY

The method used in this research work herein is composed by two phases or stages. The first one consisted of a conceptual framework on the concepts or understandings of e-banking, internet banking and measurement categories on the Internet Banking based on a benchmarking process of variables and indicators according to a prior review that was made on the available documents. Classification of variables and indicators collected based on a set of identified dimensions or categories within the documents reviewed. Finally, analysis of classification results: design of a measurement system, implementation of such a system and then, presentation of final results.

The first step was to make the design of a measurement system on the Internet Banking in Colombia. Such measurement system comprehends a set of dimensions and indicators giving a reference frame upon the needed to know aspects for the measures applicable to the Internet Banking.

Second step was the implementation of a measurement system consisting of a

selection of population and samples make a validity analysis on the above mentioned system via the use of pilot test and review by experts. Data were collected through a previously validated questionnaire. For the sample selection a convenience sampling method was selected due to its easy way to apply and accessibility.

Finally, the third step was the presentation of results and findings including proposed strategies by users in order to improve Internet Banking operations in Colombia.

The E-banking and the internet banking

According to Rodríguez and Sánchez Torres [6], financial services in general have allowed an important growth in economic, human and social development. In accordance with the statements by Katz and Hilbert [13] e-banking is a sector within the Information Society. According to sources reviewed, e-banking comprehends two types of definitions: one is wide, the other is specific. The wide definition comprehends e-banking as an integrated set of electronic channels to do financial transactions (internet, mobile or smart phones, ATM's, home phone) with the purpose of taking advantage of those services 24 – 7 without the need of going to a banking physical office [14-29].

On the other hand, the specific definition is associated to the concept of Internet Banking, which consists of a technologic channel offering financial services through the net with the goal of attracting customers and also "withholds" those already existent. Such a definition rose thanks to the internet revolution of the end of the 90's [14-29] (Table 1).

Both definitions are according to OECD [30]. Selecting one definition or the other depends on the study approach [31]. OECD [30] proposed that within the studies of the Information Society, it would be necessary to use wide definitions in several sectors (banking, learning, government, health, etc.) in order to understand economic and social changes generated by each of those. This is the reason why e-banking is defined as the integrated set of electronic channels (internet, mobile and smart phones, ATM's and home phone) that are used with the goal of offering financial services 24-7 without the need of going to a banking physical office. These all have an impact on Society, while the set of internet financial services shall be understood better as Internet Banking.

Categories of measurement in the usage of the internet banking

To define measurement categories on Internet Banking, 30 studies were collected, which identified 124 indicators and 81 variables. Table 2 shows the amount of indicators and variables identified in each of those studies [32-57] (Table 2).

Table 1: Definitions of e-Banking according to literature sources

Author Author	**E-Banking specific definition**	**Wide e-Banking definition**
Taleghani [23]	X	
P.Paul [20]		X
Zhao, Koenig-Lewis, Hanmer-Lloyd, Ward [25]		X
Ochuko, Cullen, Neagu [19]		X
Ahmad Bello, Dogarawa [14]		X
Gurau, Calin [15]	X	
Universidad Católica de Chile [16]	X	
Yousafzai, Pallister, Foxall [24]	X	
Rodriguez y Sanchez Torres [6]		X
Shah, Siddiquib [21]	X	
Liao Z [17]		X
Stamoulis D [22]		X
Muñoz,Luque [18]		X
Pasharibu [26]	X	
International Monetary Fund [27]		X
Aponte, Ruiz [28]	X	
Hernandez, Mazzon [29]	X	

By adapting the measurement system proposed by González and Sánchez Torres [58] to study e – inclusion in Colombia, measuring the Internet Banking use was classified into enabling factors and participation ones.

Enabling factors cover aspects that enable or allow the use of Internet Banking. Those are classified into four aspects: Access to TIC, features of a user, digital skills and motivation.

User characteristics: These comprehend the particular conditions of a user (whether individuals or companies). Within such conditions there are aspects of age, gender, marital status, education level, name of the company, employee number, etc.

Table 2: Amount of indicators and variables identified for each study

Studies	**Indicator**	**Variable**	**Total**

Robinson [63]	4	2	6
The Latin American Association of Integration (ALADI) [47]	1	2	3
Arnaboldi,Claeys [48]	4		4
Azouzi [50]	1	2	3
Burneo,Vallejo [51]		37	37
National Department of Statistics (DANE) [53]	25	1	26
IFC [58]	4	6	10
First Data [56]		2	2
Organization of Economic Cooperation and Development [30]	2		2
Telefónica [69]	1	3	4
United Nations [71]	1		1
High Level Group – Comisión Europea [57]	1		1
E-Business Watch [55]		1	1
Orange Foundation [62]	3		3
L@red [60]	1	3	4
Society of Information Benchmarking Information Statistics [67]	1		1
Safeena Kammani [64]	3		3
Spanish Association of IT Companies [66]	1		1
Understand [72]	2		2
Tecnocom [68]	4	5	9
Universidad Complutense Madrid (UCM) [70]	3		3
United Nations Conference on Trade and Development (UNCTAD) [71]	11		11
Internet User Association (AUI) [49]	13	4	17
San Jose, Iturralde, Maseda [59]		3	3
Science and Technology Indicator Network (RICYT) [61]	4		4

Vidales [54]	15		15
Capgemini [52]		4	4
Yiu, Chi Shing, Grant ,Edgar [45]	1	1	2
Muñoz Leiva Luque Martínez [18]	8	5	13
Sánchez Torres, González, Bustamante, Rodríguez [65]	10		10
Total	**124**	**81**	**205**

TIC access: Comprehends aspects of access to an IT infrastructure (Desktops, internet platforms, mobile phone platforms, etc.).

Digital skills: Comprehends competences a user could have to use Internet Banking.

Motivation: This is associated to factors encouraging or stopping a user to use Internet Banking. Such aspects could be quality, familiarity, trust, possibility to use and usefulness.

Quality: Covers aspects influencing the satisfaction with the services received such as performance in online financial transactions, contents published, appearance of websites, and attention to users by the financial entities by using tools such as chat [18,23,59-61].

Trust: According to literature sources reviewed, trust is associated to the perception of security, risk and privacy of information generated by the use of Internet Banking [5,18,20,23,59,61-67].

Familiarity: This is associated to the degree of knowledge and experiences with Internet Banking through the use of several TIC and financial services [18,23,58,61,64,65].

Possibility to use: This refers to the easiness a user could have when using Internet Banking services [65-69].

Usefulness: Refers to the perception of being useful or added value that could be generated by the use of Internet Banking [67-71].

On the other hand, participation factors make reference to the use of financial services and Internet Banking. According to Moraga, Blanco and Campos [72]

the use of Internet Banking is associated to the use of financial services. Therefore, within participation factors there are two aspects:

Participation or use of financial services: This refers to the use of several financial services (for instance, savings account, current account, credit cards, debit cards, etc.).

Participation or use of internet banking services: This refers to the use of several services offered thorough Internet Banking platforms divided into two layers: an information layer referring just to check information and a transactional layer in executing financial transactions through a website.

According to dimensions, enabling and participation factors have a bigger number indicator than the one of variables. However, enabling factors have a bigger number of variables than the participation factors, while participation ones have a bigger number of indicators than enabling factors (Figure 1).

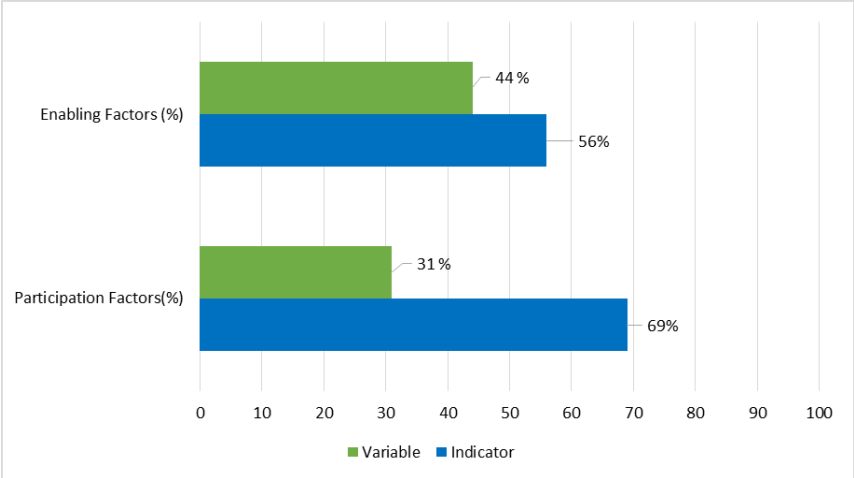

Figure 1: Percentage of Variables and Indicators according to dimensions

In accordance with classification aspects, proportions of variables and indicators of enabling factors are not homogeneous. Aspects such as digital skills and user features have a bigger proportion of variables than indicators. Other aspects such as motivation and TIC access have a bigger proportion of indicators than variables (Figure 2).

In contrast, both participation aspects have a bigger proportion of indicators than variables. Nevertheless, participation in financial services has a bigger number of variables than participation in Internet Banking services, while the Internet Banking service participation has a bigger number of indicators than the aspect of participation in financial services (Figure 3).

Design of a measurement system

Based on the classification and categories of the Internet Banking uses previously identified, a measurement system was designed and composed by four aspects, which at the same time are classified in two dimensions: enabling and participation factors.

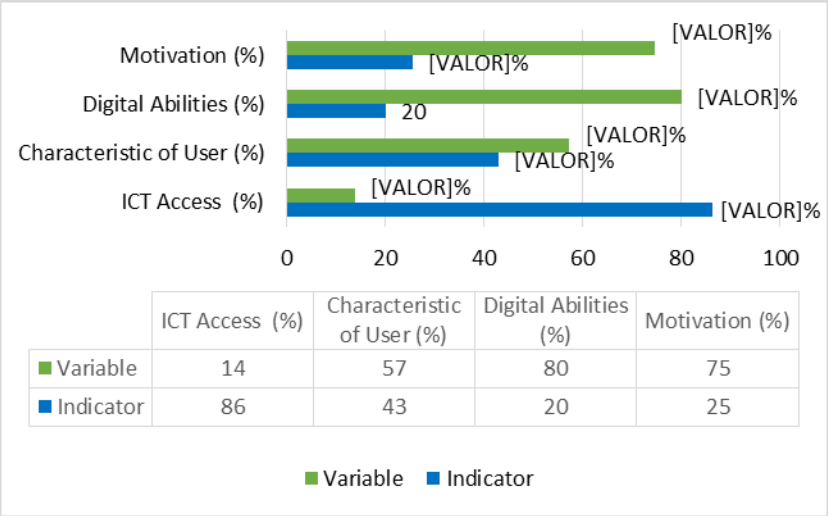

Figure 2: Percentage of Variables and Indicators according to Enabling Factors

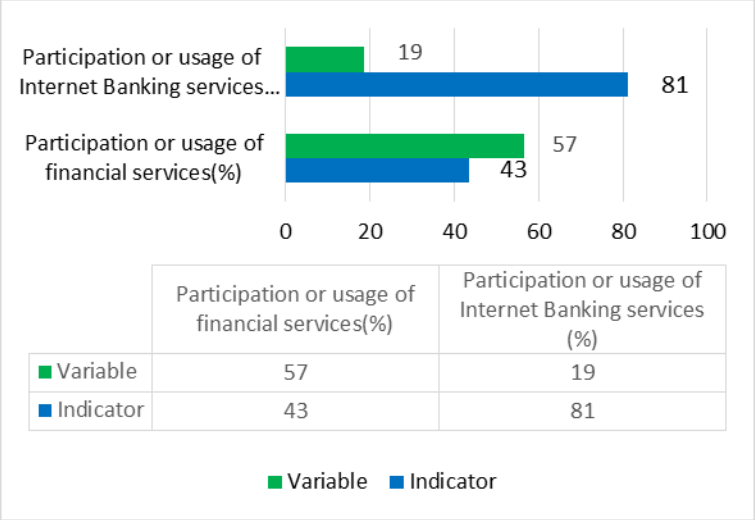

Figure 3: Percentage of Variables and Indicators according to Participation Factors.

Enabling factors cover those aspects that make an easier use or allow Internet Banking use. These are composed by Information and Telecommunication Technology (TIC), joined with digital skills and motivation covering aspects such

as quality, familiarity, familiarity, possibility to be used and trust. User Characteristics aspect identified in the categorization phase was considered within the demographic profile analysis.

Participation factors refer to the use or participation of financial services and Internet Banking. These are composed by access to several financial services through electronic channels. For instance, savings accounts, debit and credit cards. Internet banking participation refers to the use of several of those services through online channels (Table 3) (Transferences, Payments, Checks, etc.).

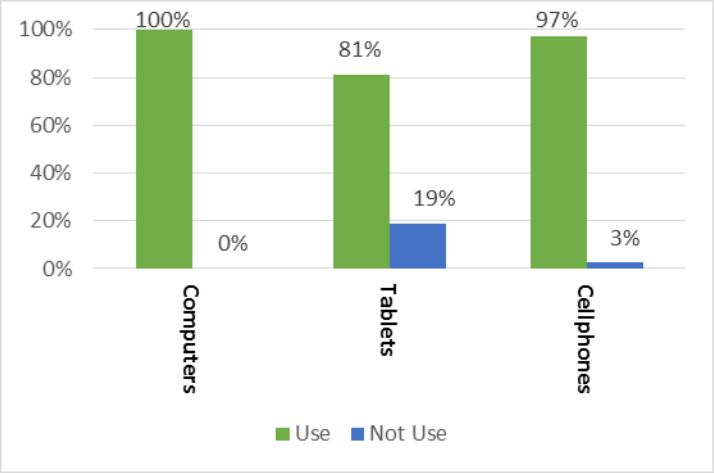

Figure 4: The most used devices by the sample population

Each dimension has a set of associated indicators. In general, 33 indicators were proposed. Five of those are associated to TIC, which measure the number of people with access to digital computing devices and internet, frequency of use, experience time and number of different devices used for such purposes. Seven indicators are associated to the participation in financial services, these measure the number of users using those services (debit and credit), and access to their virtual online banking branches, frequency of use, experience time, number of online services accessed, credits and debits used and number of those users with services in two or more financial institutions. Five indicators were related to the participation in Internet Banking that measure the percentage of those users using e-banking services, and Internet Banking according to the devices and Internet Banking services available. There were other 16 indicators associated to digital skills and motivation, which measure the degree of trust, quality, usability, usefulness, and familiarity using the Likert Scale 1 to 6.

Table 3: Dimensions for the measurement of the usage of Internet Banking

Dimension	**Aspect**	
Enabling Factor	Access to ICT (AICT)	
	Digital ability and Motivation (DIGMOT)	Quality
		Familiarity
		Usability and utility
		Trust
Participation Factor	Participation or usage of financial services (PARFS)	
	Participation or usage of Internet Banking services (PARIB)	

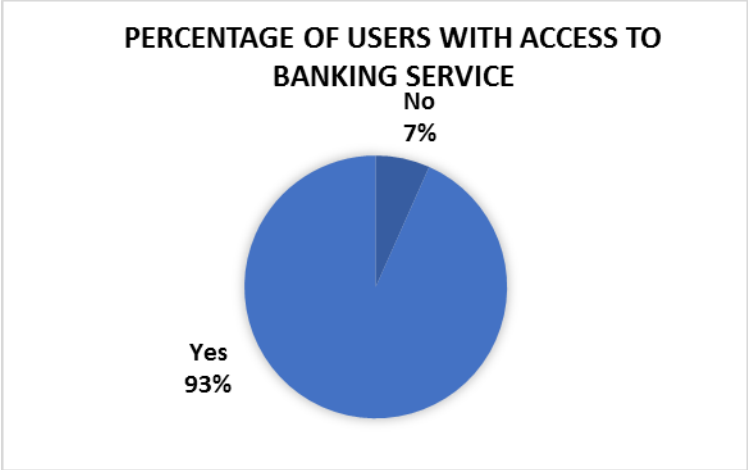

Figure 5: Percentage of users with access to banking services

Implementation of a measurement system

For the application of this research work, 150 people were selected. These people had access to several techno devices and internet with a minimum age of 18, several education levels, salaries, socio-economic levels and type of work (independent or free-lance, employee or unemployed). They were selected by a convenience sampling method with a sample range of 99 to 330 people according to the number of proposed indicators.

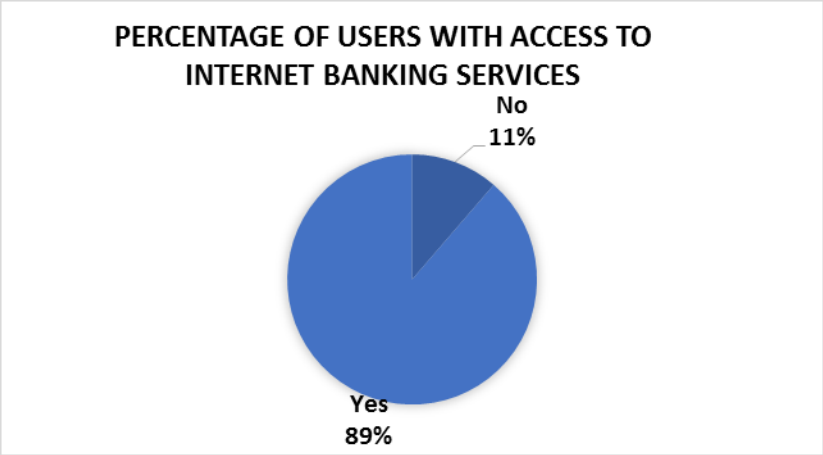

Figure 6: Percentage of users with access to Internet Banking Services

For data collection a questionnaire was designed and validated through the application of a pilot test and an expert review. For implementation of the pilot test, 12 people were selected with similar characteristics to the sample population. In parallel, the questionnaire was reviewed by an Internet Banking expert and students of master's and Ph.D. courses of the National University of Colombia. They belong to the Research Group of Management and Organizations (GRIEGO).

As a result of the aforementioned test, new indicators were proposed, others were grouped and others were deleted. In general, 37 new indicators were proposed, out of which seven were associated to TIC access, eight to participation in financial services, five to participation in Internet Banking, and 17 associated to the measurement of digital skills and motivation. Details of indicators and classification or discrimination aspects can be found in Annex 1.

For data collection a form was created through Google Forms, which was released to 500 people through e-mail and social networks. During a month of review and notification through an only reminder, finally 150 people answered the survey. This is consequent with the sample expected. Results were extracted in an Excel format file, analyzed, and validated by using graphs and dynamic charts.

RESULTS AND FINDINGS

Table 4 shows the demographic profiles of the surveyed population. 57% of the mentioned population was men, while 43% were women. According to ages, most of the surveyed are in a range between 26 and 40 (65%). In regard to socio-economic level, most belong to level 3 (57%), with university education (49%), employees (83%) and wages between 3 to 6 minimum monthly legal

salaries in Colombia (Table 4).

Table 4: Demographic Profiles of the Surveyed Population.

Demographic profile	**Count**	**Percentage**
Gender		
Male	85	57%
Female	65	43%
Age		
Between 26 to 40	97	65%
25 or less	37	25%
Between 41 to 55	14	9%
Above 56	2	1%
Social Class		
3	86	57%
4	32	21%
2	20	13%
5	8	5%
1	2	1%
6	2	1%
Grade of education		
University	74	49%
Specialization	29	19%
Magister	17	11%
Technical and Technologic	15	10%
High School Graduate	13	9%
Primary	2	1%
Salary (Colombian pesos)		
$1.800.001 to 3.600.000	46	31%
$616.000 to 1.800.000	31	21%
Less of $616.000	25	17%
$3.600.001 to 4.300.000	17	11%

$4.300.001 to 5.544.000	16	11%
Not receive a salary	11	7%
$ above 5.544.000	2	1%
Kind of worker		
Employee	125	83%
Independent or Free Lance	14	9%
Unemployed	11	7%

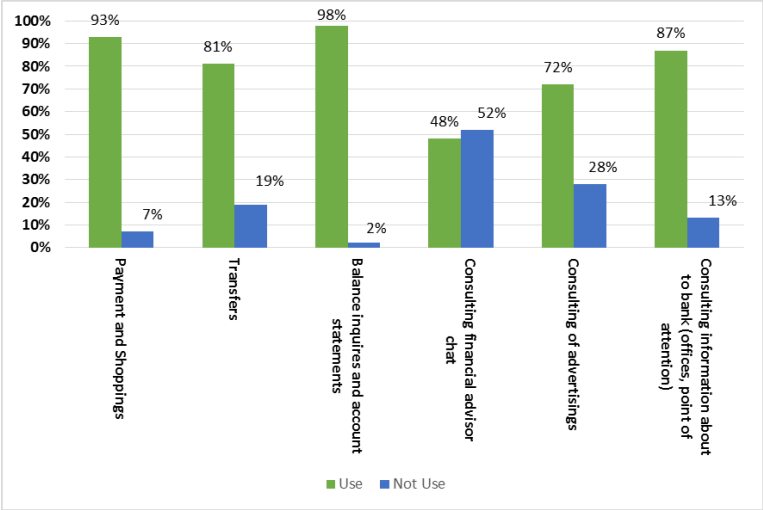

Figure 7: The most Internet Banking services used in Colombia

In regard to TIC access, the total of sample population has access to internet and computing devices. Desktop is the most used device (100%), while Tablet is the least used (81%). In the same way, surveyed have a bigger experience using desktops than cell or smart phones or tablets to access online financial services (Figure 4).

In relation to participation in financial services, most of the surveyed (93%) have access to financial services, out of which 99% use debit services (savings accounts, FTD (Fixed Term Deposit Certificates), etc, while 85% use credit services (credit cards, loans, etc.). Activities performed in physical banking offices, 93% of surveyed access those offices to make their transactions (payments, transferences, deposits, etc. 80% of surveyed make consultations or request information from real commercial banking advisors in those offices (Figure 5).

In Internet Banking services participation, most of the surveyed (89%) used Internet Banking. Checking on banking statements and account statements were the most used services. Asking a commercial advisor through chat tools was the least used service. In regard to computing devices, 100% of users know how and use Internet Banking in their desktops. 74% used cell or smart phones and 54% used tablets (Figures 6 and 7).

In digital skills and motivation, most of the surveyed considered that reputation and good will of the financial institution, website quality and speed in transactions are quality aspects encouraging the use of Internet Banking. Nonetheless, 75% of surveyed consider the quality of attention to users from chat services as not relevant or it does not have any influence in the use of Internet Banking (Figure 8).

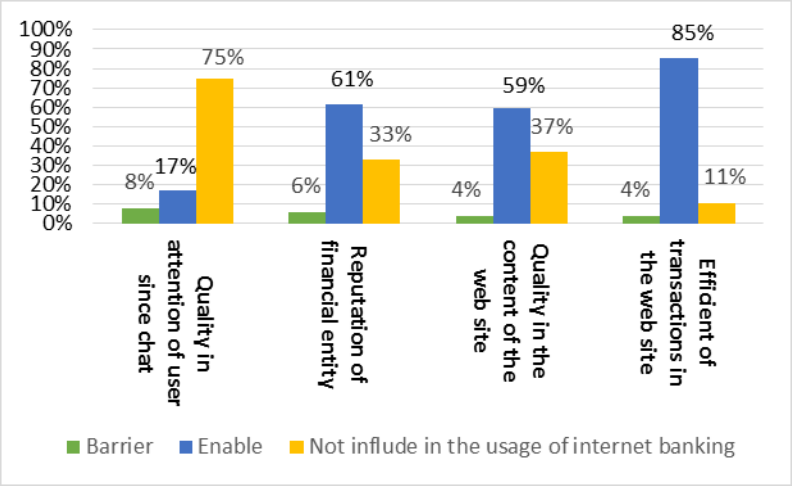

Figure 8: Aspects of quality that have influence in the usage of the Internet Banking

In the same manner, most of the surveyed consider that knowledge and experience in using computing devices and internet platforms, financial services and Internet Banking are aspects of familiarity that encourage the use of Internet Banking (Figure 9).

In usefulness and usability, most of the surveyed consider these are aspects that encourage the use of Internet Banking (Figure 10).

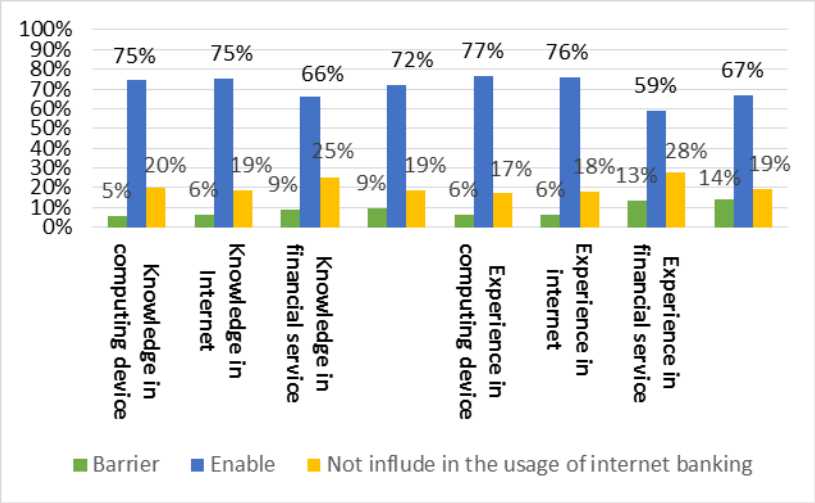

Figure 9: Aspects of familiarity that have influence in the usage of Internet Banking

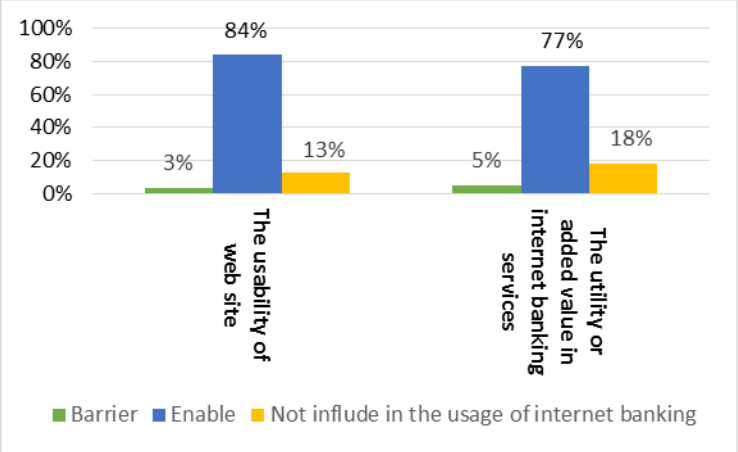

Figure 10: Aspects of usability and utility that have influence in the usage of the Internet Banking

Finally, most of the surveyed consider that security, safety and trust in financial online transactions and user information privacy management are really trust aspects encouraging or not the use of Internet Banking (Figure 11).

Proposal to improve internet banking in Colombia

In the end of the above mentioned questionnaire, a blank space was left where surveyed people could suggest their proposals to improve Internet Banking services in Colombia. Out of the total surveyed, only 22% of people made a statement in that space. As a result, 42% of surveyed considers that banking should guarantee safety, security and trust through several methods of online

activities, such as biometric identification, anti-fraud security and strengthen security when accessing through mobile devices. Moreover, 42% of surveyed considered that banks and other financial institutions should develop new functions or applications, and/or improve those already existent. For instance, functions such as more detailed bank statements, creation of pre-paid credit cards, Internet Banking service recording from websites or from phone banking instead of going in person to the physical offices, enable certain services 24 – 7, improve chat services and enable international purchasing. Finally, 16% of surveyed thinks that banking industry should develop better strategies of training in using Internet Banking services such as tutorials, advertising, and better access for elders and handicapped people.

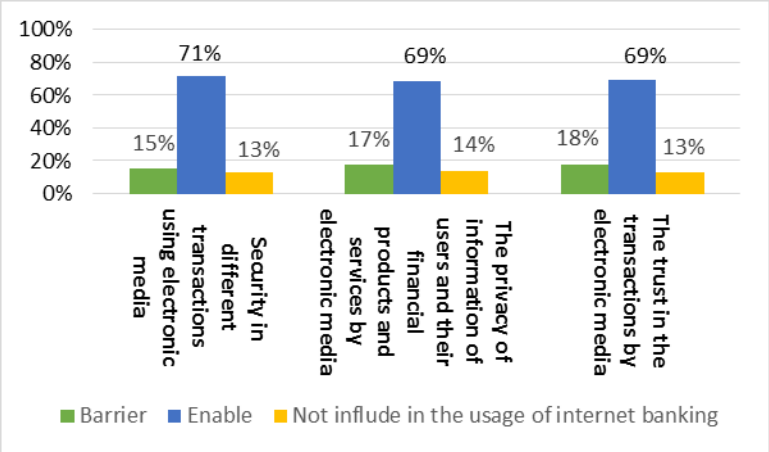

Figure 11: Aspects of trust that have influence in the usage of the Internet Banking

DISCUSSION

According to the proposals of Gonzalez and Sanchez Torres [58] and Moraga and Blanco [72], the results of this research work show that to measure the use of Internet Banking needs to take into consideration the use and access to TIC and the use of several financial services whether physically or through online access. This would imply that to strengthen Internet Banking use, it would be necessary that regulating institutions of TIC in Colombia and financial institutions make a better effort for the access of population to TIC and promote the use of financial services. This could be a first step to increase the use of Internet Banking services in this country.

CONCLUSIONS

Population with TIC access and financial services has a higher use of Internet Banking. Desktops are the most widely used devices and tablets are the least

used. Depending upon the financial services available for users, debit services are the most used financial ones, while credits are the least used. Additionally, checking on bank statements and account statements are the Internet Banking most used services by the surveyed population. Seeking for advice or checking with commercial financial advisors through chat tools are the least used services.

In regard to aspects influencing the use of Internet Banking, financial institutions and banks should strengthen their reputation and certify quality of their online banking services. This could be done through their contents and transaction speed. Furthermore, banking institutions should develop new online banking functions and applications and also improve those already existing, so that usability, usefulness and trust are guaranteed in relation to services offered through online activities. Finally, banks and other related institutions should design new and better training strategies to secure familiarity and good possibilities of use of the Internet Banking.

This research work would be the baseline to measure several Information Society sectors oriented to users, especially sectors belonging to e-banking. For future research works in regard to these topics, it would be important to measure the use of Internet Banking by populations with difficult access to Information Technologies, or a different population to the one selected in this research work, such as elders and those people in handicapped conditions. Finally, it would also be important to measure mobile banking in Colombia, also known as m-banking taking into account the definitions used in this work.

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