



**COLOMBIAN CONSUMER WILLINGNESS TO ADOPT INNOVATIVE  
TECHNOLOGY PRODUCTS AND SERVICES**

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## Table of Contents

1. Figures.....	3
2. Tables.....	4
3. Appendixes .....	5
4. Abstract.....	6
5. Keywords.....	7
6. Introduction and Current Problem .....	7
7. Theoretical Framework .....	10
8. State of the Art.....	22
9. Objectives .....	25
9.1 General Objective.....	25
9.2 Specific Objectives.....	25
10. Hypothesis.....	26
11. Methodology.....	29
12. Results .....	30
12.1 Assessment of Reliability and Validity .....	30
12.2 Hypothesis Testing.....	38
12.3 Market Segmentation.....	50
13. Conclusions and Recommendations.....	55
14. Limitations of the Study.....	59
15. Future Research .....	60
16. References.....	61
17. Appendixes.....	64

## 1. Figures

Figure 1. Original TAM proposed by Fred Davis (Davis, 1986, p.24).....	16
Figure 2. Components of Technology Readiness (Colby, 2014).....	19
Figure 3. Five Factor Model of personality Traits. Source: Authors Own.....	20
Figure 4. Pyramid Model of Services Marketing.....	22
Figure 5. Hypotheses on Causality Relationship for the TRI 2.0, Source: Authors Own.....	29

## 2. Tables

Table 1. Sample Profile. ....	32
Table 2. Correlation and Cronbach Alpha Coefficients for the TRI 2.0 Constructs. ....	33
Table 3. Correlation and Cronbach Alpha Coefficients for the Personality Traits. ....	34
Table 4. Summary Statistics for the TRI 2.0 and its components. ....	35
Table 5. Summary Statistics for the TIPI Scale Components in Colombia (Personality Traits). ....	36
Table 6. Score Comparison for Colombian TIPI Scale and TIPI Norms. ....	37
Table 7. Hierarchical Multiple Regression Explaining the Intention of Adopting Technology Products and Services. ....	47
Table 8. Hierarchical Multiple Regression Explaining the Intention of Adopting Technology Products and Services. ....	48
Table 9. Hierarchical Multiple Regression Explaining the Intention of Adopting Technology Products and Services. ....	49
Table 10. Hierarchical Multiple Regression Explaining the impact of Personality Traits on TRI 2.0 Dimensions. ....	50
Table 11. Technology Readiness Segments (Mean Scores). ....	51
Table 12. Table 12 - Technology Readiness Segments by Presence of the Attributes. ....	51
Table 13. Demographic and Personality Segments Profile. ....	54

### **3. Appendixes**

Appendix #1 - Spanish Questionnaire measuring TRI 2.0, Personality and Culture.....	63
Appendix #2 - Complete Hierarchical Multiple Regression Analysis.....	73

#### **4. Abstract**

This study has the goal to test the validity of the updated version of the Technology Readiness Index (TRI 2.0; Parasuraman and Colby, 2014) in Colombia and the impact of individual personality traits in the four dimensions of the TRI. For this purpose, a first hypothesis was formulated in order to test predictability of demographics and the TRI 2.0 score with the intention to adopt technological products and services. A second hypothesis was described to validate the existence in Colombia of the five-cluster segmentation scheme proposed in the TRI 2.0 research. Finally, the third hypothesis seeks to test any kind of correlation between the personality traits and the TRI 2.0 score of an individual and its impact on the intention of adopting technological products or services. The survey was answered by 364 people, 338 of which were Colombians, so 26 people were discarded from the analysis, most of the respondents live in Bogota (83,4%) while the capital only hosts 16,3% of Colombia population. The department/region that follows Bogota is Santander since it adds up the 6,5% of the sample while it only represents the 4,3% of inhabitants of the country. The rest of the regions are under-represented when comparing the relative participation within the sample among the general population of the country. The survey was conducted in Spanish using a professionally translated version of the updated 16-item TRI 2.0 (Parasuraman & Colby, 2014) and the Ten-Item Personality Inventory (TIPI; Gosling, Rentfrow, & Swann, 2003).

The findings of this study confirmed the validity of the TRI 2.0 when applied to a Colombian consumer sample and the significance of attitudinal variables in order to partially predict the intention to adopt technology innovations. It also partially demonstrated the correlation between the personality traits of an individual and his/her TRI 2.0 score which implies that certain traits

influence the willingness for a consumer to adopt innovative technology products and services. Finally, when performing a K-mean cluster analysis with the collected data for the current research, authors found the existence of five meaningful segments in the Colombian Sample Market, the same segments as Parasuramman and Colby (2015) found in U.S. market, such segments are “Explorers”, “Pioneers”, “Hesitators”, “Skeptics” and “avoiders”

## **5. Keywords**

Technology Readiness Index (TRI), Technology Adoption, Market Segmentation, Colombia, Innovation, Personality, Demographics, Latin America, Demographics versus Attitude, Developing Countries, Technology Adoption, Emerging Markets.

## **6. Introduction and Current Problem**

In the era of digital economy, marketers more than ever need to understand correctly the different kinds of consumers and their decision drivers that companies target by segmenting local markets based on their willingness to adopt technology innovations.

Globalization and the Digital Economy have accelerated the launch of innovative products and services at a rate faster than ever. Not only the consumer technology market has become extremely competitive for the past decade but other industries such as banking, travel, and media and practically any other business today is subject of fast innovation and is exposed to disruptive competitors who create a more dynamic-than-ever environment.

Illustrations of this new reality can be found everywhere: Uber revolution in the taxi industry around the world (Gillmor, 2014), Airbnb jeopardizing the hospitality market shifting travelers to stay at regular homes instead of traditional hotel brands (Guttentag, 2015) and Netflix replacing



TV viewing habits are three of the most popular examples of innovative services today. While the previous companies relate to startups who were born in the Internet Era, this also applies to firms in almost all industries that in recent years, have conducted a number of initiatives to explore new digital technologies and to exploit their benefits (Matt, Hess, & Benlian, 2015).

While social interactions are an important element for adoption of new products in every country, the strength of their impact on adoption varies across countries based on culture (Yalcinkaya, 2008), it is essential for marketers not only to understand a market demographics but its willingness to adopt innovative technology, their cultural values and personality traits in order to focus its efforts on specific segments when positioning their products and services and be more successful on the execution of a marketing strategy (Yalcinkaya, 2008).

The aforementioned factors and trends have changed not only the buying and working habits of people worldwide, but also the way how they are approaching to products and services to make their buying decisions, which is a key factor for companies seeking venture into markets through innovative strategies. Generating this knowledge is relevant and important for companies, since having a strong understanding of consumer and employee behavior, will help them to identify the elements and factors that are important for individuals, and at the same time allow to answer many questions that entrepreneurs have about what items are the consumers buying, why they buy, how often they buy, and all the variables that influence consumer decisions.

Even though technology is almost onmi present in our current society, individuals may have different reactions toward it. For instance, a person may enjoy exploring and using new technological devices, others may feel intimidated and tend to reject the new developments “until

they are really safe”. Thus, exploring who are those in each group, what are the best ways to describe them may be an interesting asset for companies.

Technology vendors of products or services considered innovative in the market, face a low success-rate when marketing its portfolio to an inappropriate segment of the population or when they position such products or services in a way that is not correctly perceived by the audience (Dutta, 1999)

When new products, systems or services are frequently launched in multiple countries, it is not uncommon for products to have high rates of adoption in particular countries but low rates in others. Consequently, for suppliers of innovative products and services it is becoming increasingly important to know to what extent companies and consumers in a particular region are more receptive to certain types of innovations than companies and consumers in other countries (Van Everdingen & Waarts, 2003).

As a developing region, the economies of Latin America have been experimenting sustained growth during the latest years. Colombia, in particular, with a 3,1% GDP growth in 2015 (DANE, 2016) has become a very attractive market for both local and international companies which plan to launch new products and services. Because of this, companies of different industries selling products and services based on new technological developments need to understand not only how Colombian consumers behave in relation to the willingness to adopt new technology but how do different groups of the population exist in terms of technology readiness.

Taking into consideration the context explained above, the current research project aims to solve the following research question.

*“How to segment the Colombian consumer market by analyzing the Technology Readiness Index (TRI) and the personality dimensions of the population to predict which groups have higher probability to obtain and use certain products and services which are considered innovative”.*

## **7. Theoretical Framework**

Today, human race is living an era that some technology industry leaders such as Google’s Eric Schmidt have begun to call the “New Digital Age” (Schmidt & Cohen, 2013). Under this vision, the Internet is *“the largest experiment involving anarchy in history since hundreds of millions of people are creating and consuming an untold amount of digital content in an online world that is not truly bound by terrestrial laws”.*

Through the power of technology, age-old obstacles to human interaction, like geography, language and limited information, are falling and a new wave of human creativity and potential is rising (Schmidt & Cohen, 2013).

The proliferation of communication technologies has advanced at an unprecedented speed. In the first decade of the 21st century the number of people connected to the Internet worldwide increased from approximately 350 million in 2000 to more than 2.4 billion in 2012 (Takhar, 2014). In a period of 20 years, from 1990 to 2010 the number of mobile phones increased over 381 times from 11 million in 1990 to 4.2 billion in 2012 and over 7 billion in 2014 (ITU, 2013). In other words, today there are probably more in-use cell phones than there are people on the planet.

A series of new technologies based on Internet, Social and Mobile have emerged to help establish this digital economy. The impact of such innovative digital tools and the revolution it brings is

vast since they can transform new economic and social values which create huge opportunities for developing new products and services (Soava & Duteanu, 2013).

As described above, the adoption of new technologies is happening really quickly, so fast that some sociologists have defined new human generations based among other characteristics on their relationship with technology. Specifically, digital generation has been defined by sociologists and Organizational Development professional as Generation Y, sometimes also called the "Millennials," which is a generation of people born between early 1980s to the early 2000s who became known for their technology and multitasking skills - their uncanny ability to walk, talk and text all at the same time (Weil, 2008).

It is very logical then, that multiple academics and even the industry have been trying to understand for decades now the relationship between users and technology. Understanding the factors that lead consumers to adopt new technologies is relevant, both from a business standpoint and from the point of view of research on consumer behavior (Ferreira, Rocha, & Silva, 2014). Explaining why some individuals accept technology while others don't, has been the focus of a significant amount of research over the past few years.

In this section, three different models are explained in order to help understand the human reaction to technology:

- Technology Acceptance Model (TAM)
- Technology Adoption Propensity Index (TAP)
- Technology Readiness Index (TRI)

It is important at this point, to explain the difference between Acceptance and Readiness:

Technology acceptance: “Voluntary intention to use a technology followed by its actual adoption and use, with cognitive constructs (perceived usefulness and perceived ease of use) as antecedents of an individual's attitude regarding the adoption of a technology. (Davis, 1986).

Technology readiness: “Combination of beliefs and feelings related to technology that, together, determine an individual's overall predisposition to adopt technology products and services (Parasuraman, Technology readiness index (TRI): A multiple-item scale to measure readiness to embrace new technologies., 2000).

So the difference falls in that readiness is much more comprehensive than acceptance because it covers not only cognitive but also emotional attributes from consumers.

Considering the fact that users “become emotionally involved with the products and services they use, experiencing a broad spectrum of emotions during their experiences with the product/service, and feeling pleasure, excitement, frustration — or even fear (G., Mick D.; Fournier, S., 1998), and also due to the fact that the TRI has recently gone through a complete redefinition to include impactful emerging technologies such as cloud computing (Parasuraman & Colby, 2014), the authors of this project will focus on applying the Technology Readiness Index 2.0 throughout the research.

### **Why is innovation so high on the agenda?**

The “innovation” term can be a very subjective one since it has hundreds of valid definitions depending on its context (Amidon, 2003). Technologies that today could be considered innovative will likely not be considered like that in 10 or 20 years and the period of time in which they can

be considered as mainstream may vary depending on the region, industry and size of the organization.

Also, innovation has become a very abused and somewhat cliché term. As Gerard Gaynor states in his article “The Innovation Dilemma”, 2012, pages 5-6: *“While much is said and written about innovation, organizations struggle to do innovation. Part of the difficulty arises, because we lack an agreed upon definition of innovation. We confuse invention with innovation. We treat innovation as some Eureka moment. We hear people speak of innovation in science and engineering; such usage of the word innovation leads to confusion”*.

Innovation definitions range from early and straightforward such as: *“Innovation is the generation, acceptance and implementation of new ideas, processes products or services”* (Thompson, 1965) and start having variations which arise from different disciplines’ perspectives including Business and Management, Economics, Technology, Marketing and Entrepreneurship among others (Baregheh, Rowley, & Sambrook, 2009).

So, even though there is still no single, standardized, universally accepted definition of innovation, there have been some scholarly efforts to propose a multidisciplinary definition of innovation. For instance, Baregheh, et al (2009) argue that *“Innovation is the multi-stage process whereby organizations transform ideas into new/improved products, service or process, in order to advance, compete and differentiate themselves successfully in their marketplace.”*

If we analyze the definition starting from the words “*competing and differentiating*” it is obvious that the concept of innovation encapsulates an overall strategic goal for organizations in an increasing competing environment.

One of the reasons of such increased is because executives of firms around the world could be finally realizing that the pace of collaboration, problem solving, innovation, and value creation has been increasing as new enabling tools emerge, resulting in a cycle in which innovation leads to new inventions in many fields (Markman & Wood, 2009).

### **Challenges on technology adoption**

Parasuraman (2000) noted that although new technologies have been penetrating the population at increasing rates, there is ample evidence that suggests signs of growing consumer frustration and disillusionment. Such signs of frustration and disillusionment may help explain why while many consumers readily embrace newly introduced or also called innovative technologies, some high-tech products have shown disappointingly slow adoption rates despite optimistic forecasts (McCartney, 2002).

Two critical uncertainties associated with new-technology introductions are whether and when the target market will adopt them. Both uncertainties pose serious challenges for marketing managers planning a technology’s production, pricing, distribution, and promotion (Morwitz, Steckel, & Gupta). Although some studies examine the relationships between technology readiness and technology adoption, the long-term survival and substantial success of firms rely on the continued use of such technology rather than first use (Son & Han, 2011).

However, technology adoption poses challenges not only to adopting users but also to companies who offer and sell technology including software vendors: *“Effectively segmenting and targeting customers based on their likelihood to purchase and use new technologies could help firms better capitalize on their high-tech investments by maximizing the effectiveness of marketing spending and minimizing losses due to returned merchandise and underutilized service delivery systems”*. (Ratchford & Barnhart, 2011)

Considering the adoption process as *“the process through which an individual passes from gaining initial knowledge of an innovation, to forming an attitude toward the innovation, to making a decision to adopt or reject, to implementation of the new idea, and to confirmation of this decision”* (Cavusgil, 2007), companies who develop and market Enterprise information systems should take into consideration the individual technology adoption process for increasing the effectiveness of their sales processes.

### **Technology Acceptance Model (TAM):**

Davis (1986) proposed the Technology Acceptance Model as an adaptation of the Theory of Reasoned Action (Ajzen & Fishbein, 1980), which identifies consumer beliefs about perceived usefulness and ease of use as the primary drivers of consumers' attitudes toward new technologies (Davis, 1986).

The technology acceptance model (TAM) was designed specifically to explain computer-based information systems usage behaviour and with the goal of providing the theoretical basis for a practical “user acceptance testing” methodology. (Davis, A technology acceptance model for empirically testing new enduser information systems: Theory and results., 1986).



There are two central determinants in TAM:

- 1) Perceived usefulness: which refers to "the degree to which a person believes that using a particular system would enhance his or her job performance"
- 2) Perceived ease of use: which refers to "the degree to which a person believes that using a particular system would be free of effort".

As shown in the Figure 1, these perceived constructs should influence the attitude and consequently the intentions of a person to use a specific information system, such intention would in turn influence actual system usage. This causality relationship follows the logic that when the ease of use of an information system is improved, the usefulness perception is also increased since the efforts to use such system are reduced. (Davis, Bagozzi, & Warshaw, 1989).

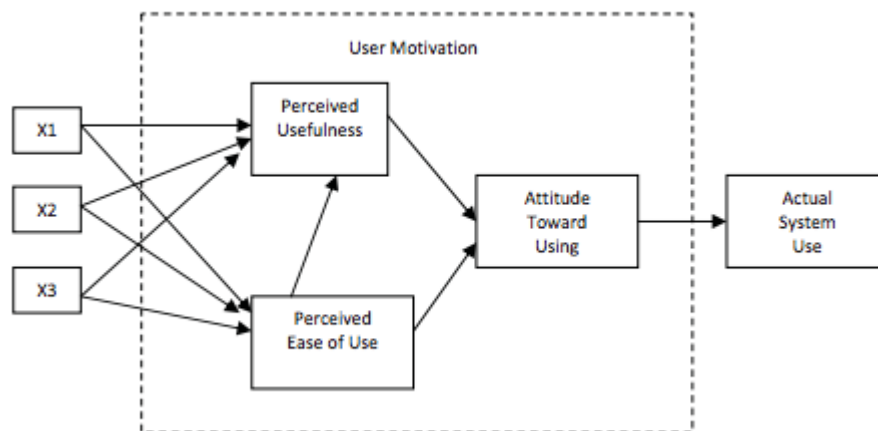


Figure 1. Original TAM proposed by Fred Davis (Davis, 1986, p.24)

With this logic in mind the TAM model could arguably be used for predicting adoption of new technologies based on its acceptance and continuous improvement through time, however it falls short in this area since this was not its main objective when developed.

The TAM model has received considerable support over the years. It has been validated over a wide range of systems, perceived usefulness and perceived ease of use have proven to be reliable and valid cognitive dimensions (Lee, Kozar, & Larsen, 2003) however it is a model that was developed almost 30 years ago which may have implications for applying it in the current environment.

### **Technology Readiness Index (TRI):**

More than ten years later after the TAM concept emerged, the Technology Readiness Index (TRI) came through (Parasuraman, 2000) which “*measures readiness to embrace new technologies for accomplishing goals in home life and at work*”. The construct can be viewed as an overall state of mind resulting from a gestalt of mental enablers and inhibitors that collectively determine a person’s predisposition to use new technologies. (Parasuraman, 2000).

Eight paradoxes have been identified (G. & Fournier, 1998) based on peoples’ reactions to technology, which are described below and help understand why technology may trigger both positive and negative feelings:

1. control / chaos
2. freedom / enslavement,
3. new / obsolete
4. competence / incompetence

5. efficiency/inefficiency
6. fulfills/creates needs
7. assimilation/isolation
8. engaging/disengaging.

Based on the previous eight paradoxes, people can be positioned on a hypothetical technology beliefs continuum (positive feelings propel people toward new technologies, negative feelings may hold them back) which is expected to correlate with their propensity to embrace and employ technology (i.e., their technology readiness) (Parasuraman, 2000).

The main deliverable of the TRI study is the National Technology Readiness Survey (NTRS), a nonproprietary, non-client-sponsored study for developing a general technology-readiness scale based on responses from a United States countrywide cross section of adult consumers.

Such NTRS originally consisted of 28 items clustered into the following four categories (Parasuraman, 2000):

Drivers of technology readiness:

1. Optimism (10 items): A positive view of technology and a belief that it offers people increased control, flexibility, and efficiency in their lives.
2. Innovativeness (5 items): A tendency to be a technology pioneer and thought leader.

Inhibitors of technology readiness:

1. Discomfort (8 items): A perceived lack of control over technology and a feeling of being overwhelmed by it.

2. Insecurity (5 items): Distrust of technology and skepticism about its ability to work properly.

Such 4 categories are depicted below in Figure 2.

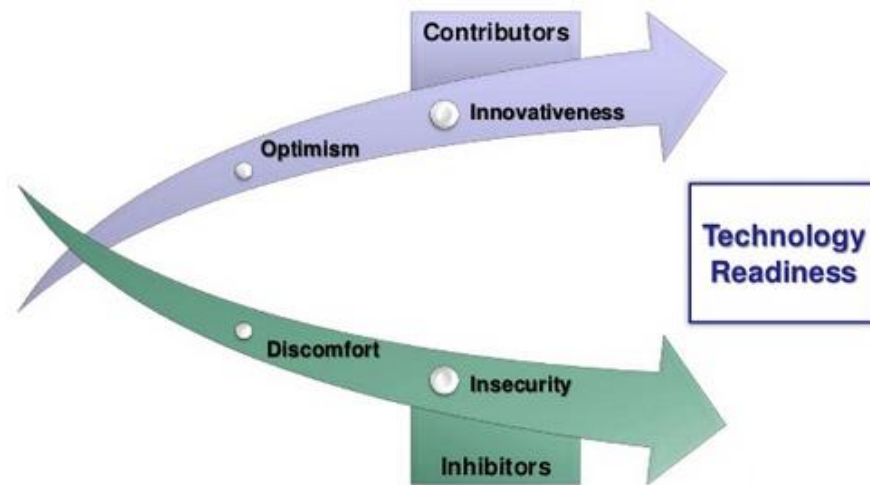


Figure 2. Components of Technology Readiness (Colby, 2014)

In conclusion, the TRI index, is a construct that allows to address the following questions which are key for the main objective of the current research (Parasuraman, 2000):

- How ready are people to embrace and effectively use new technologies?
- What are the primary determinants of technology readiness?
- Is it possible to group people into distinct segments on the basis of their technology readiness, and, if so, do those segments differ meaningfully on demographic, lifestyle, and other criteria?
- What are the managerial implications for marketing to and serving customer segments that differ on technology readiness?

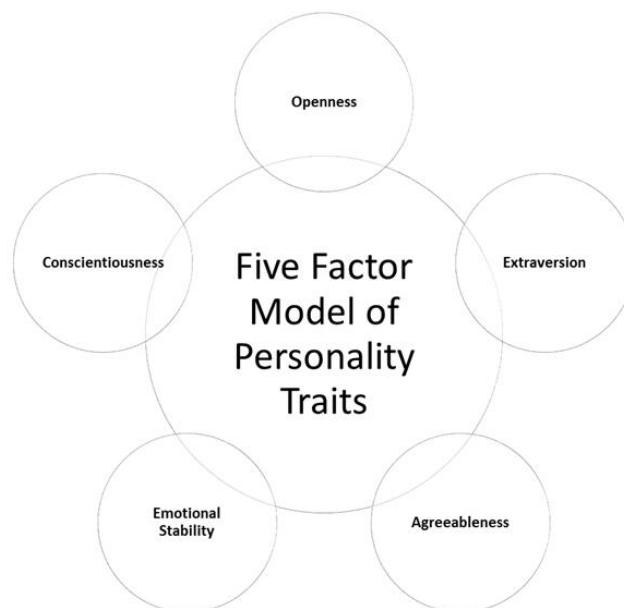
## TRI 2.0

Based on insights from extensive experience with the TRI and given the significant changes in the technologies, such as mobile commerce, social media, and cloud computing that are now pervasive and significantly impacting people’s lives, the authors of Technology Readiness Index undertook a two-phase research project to update and streamline the TRI (Parasuraman & Colby, 2014).

The TRI 2.0, produced recently has been rewritten based on the original TRI and represents an advancement in terms of content, structure, and psychometric properties.

### **Personality**

Personality researchers contend that all generalized personality traits fall within five dimensions, known as the five-factor model (Buss, 1996) of personality. The five dimensions—Extraversion, Agreeableness, Conscientiousness, Emotional Stability (Neuroticism), and Openness to Experience (Intellect), are enduring, with most people varying between the extremes (Goldberg, 1981, 1992; Hofstee, De Raad, & John, 1990).



*Figure 3. Five Factor Model of personality Traits. Source: Authors Own*

According to the five factor model theory, highly extraverted individuals are assertive and sociable, rather than quiet and reserved. Agreeable individuals are cooperative and polite, rather than antagonistic and rude. Conscientious individuals are task-focused and orderly, rather than distractible and disorganized. Emotional Instable individuals are prone to experiencing negative emotions, such as anxiety, depression, and irritation, rather than being emotionally resilient, and finally, highly open individuals have a broad rather than narrow range of interests, are sensitive rather than indifferent to art and beauty, and prefer novelty to routine.

The five factor model (FFM) was developed to represent as much of the variability in individuals' personalities as possible, using only a small set of trait dimensions. Many personality psychologists agree that its five domains capture the most important, basic individual differences in personality traits and that many alternative trait models can be conceptualized in terms of the FFM structure.

For the purpose of this research project, the authors decide to use a brief measure of the big five factor model named TIPI scale, the TIPI is a 10-item personality measure of the Big Five (or Five-Factor Model) dimensions. When time is limited, researchers may be faced with the choice of using an extremely brief measure of the Big-Five personality dimensions to meet the need for a very brief measure, 5 and 10-item inventories were developed and evaluated by Gosling, S. D., Rentfrow, P. J., & Swann, W. B., Jr. (2003).

In an ideal world, personality researchers would have sufficient time and resources to exploit the superior content validity and reliability of well-established multi-item instruments. Unfortunately, circumstances are often not ideal and researchers may be faced with a stark choice of using an extremely brief instrument or using no instrument at all. For example, one Internet-based study

used a single-item measure to obtain ratings of self-esteem from participants who would be unlikely to do well at the website long enough to complete a multi-item questionnaire (Robins, Trzesniewski, Tracy, Gosling, & Potter, 2002).

As Gosling, Rentfrow, & Swann describes in their article “A very brief measure of the Big-Five personality domains”, the central benefit of the TIPI is that it extends the scope of studies in which the Big Five can be measured. A second potential benefit of the scale is that by providing a standard instrument for use by the research community, knowledge about its psychometric properties and its external correlates can accumulate. And finally, a third benefit is that very brief measures eliminate item redundancy, reducing participant boredom and the oft-expressed frustration about “answering the same question again and again.” This benefit can ameliorate the psychometric costs of short measures (Burisch, 1984), and may explain why the TIPI performed so well.

## 8. State of the Art

As Parasuraman (2000) states, examining the TRI scores of a company’s current customers can help answer a variety of questions related to the company’s technology strategies and to the effective management of the customer-technology link in the pyramid model.

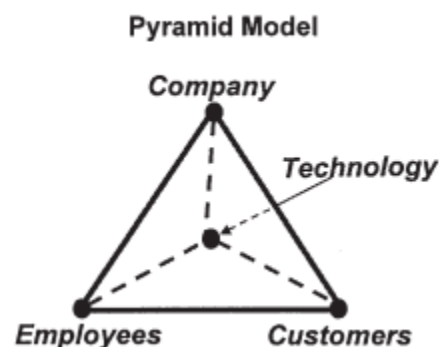


Figure 4. Pyramid Model of Services Marketing

For instance, the following questions could be answered by applying correctly the TRI methodology (Parasuraman, 2000):

- What is our customer base's overall level of readiness to interact effectively with technology-based products and services?
- How does it compare with the technology readiness of the public at large?
- Are there distinct segments in our customer base that differ in terms of technology readiness?

Regarding applications for analyzing personnel, Parasuraman suggests the TRI can be used to assess the technology readiness of internal customers (i.e., employees). As in the case of external customers, gaining a good understanding of the technology readiness of employees is important for making the right choices in terms of designing, implementing, and managing the employee-technology link (Parasuraman, 2000). He goes as far as implying the TRI can serve as a supplementary screening device, along with traditional people-skills assessments, in selecting personnel for specific roles within the organizations.

Since its inception in 1999, researchers have used and applied the Technology Readiness Index in a variety of contexts in over two dozen countries (Parasuraman & Colby, 2014). It has been licensed to over 120 scholars for carrying out investigations in areas such as financial services, retail, telecommunications, travel, e-government and healthcare (Colby, 2014).

For instance, the abbreviated TRI was found to be a useful segmentation tool as it allows managers to form cohesive customer segments, each with a particular attitude toward technology and each with its own demographic. In 2009, the TRI helped demonstrate the distinct differences that occur between U.S. hotel guests based on their technology readiness. Within the hospitality domain, an



initial set of generalizations was provided about using the abbreviated TRI for customer segmentation. (Victorino, Karniouchina, & Verma, 2009).

If we start moving towards the technology domain, there have been multiple studies related to products and services that are considered innovative at some level, for example in 2013, a study on self-scanning technology found in retail stores assessed the impact of consumer technology readiness on perceived reliability and perceived fun of using such technology (Elliott, Hall, & Meng, 2013). Also, in South Africa a study that measured “Readiness for banking technologies in developing countries” (Petzer, 2010) evaluated the use of banking channels such as ATM banking, Cellphone banking, SMS notifications and online shopping via banking reward schemes among others, reaching the conclusion that South Africa, as a developing economy, faces challenges on technology adoption due to the fact that urban consumers score 2.53 on TRI while a developed economy such as USA, scores 2.88 (Parasuraman, 2000).

Since we plan to apply the TRI in Colombia, the cross-cultural validity of the TRI is definitely an issue worth exploring. Considering the Technology Readiness Index scale was developed using a study sample consisting of 1,000 random adults from all over the United States (Parasuraman, 2000) the question of whether the relevant constructs in one culture can also be applied to other cultures is completely valid. On 2010, a study aimed to assess the cross-cultural validity of the TRI concluded that the Technology Readiness Index is a cross-culturally valid measurement scale for both American and Chinese consumers. The same four technology-readiness dimensions exist for both consumer groups. (Meng, Elliott, & Hall, 2010).

Colby and Albert (2003) looked at how Technology Readiness differs across ethnic and racial groups (whites, African Americans, and Latinos) within the U.S. and found a higher proportion of

pioneers among African Americans than among whites. Latinos had the highest percentage of skeptics with whites and African Americans following in descending order. Interestingly though, the overall level of technology readiness was equal for all three groups. (Meng et al, 2010)

There is evidence of some research performed in Latin America applying the TRI methodology, in 2011, a descriptive study was conducted to identify the preliminary level of technology readiness in the city of Catalão (State of Goiás) - Brazil which used a sample of 368 subjects. After performing the analysis, it was possible to determine the applicability of the TRI scale in the context of the target city, created a profile of the investigated sample and identify their level of readiness to technology, which presented consumer characteristics of "Pioneers" (Bevilacqua & Rocha, 2011).

## **9. Objectives**

### **9.1 General Objective**

To assess the validity of the Technology Readiness Index (TRI 2.0) in the Colombian consumer market while measuring the impact of personality traits on the propensity of an individual to adopt innovative products and services.

### **9.2 Specific Objectives**

10. To determine the Technology Readiness Index (TRI) for a representative sample of Colombian consumers
11. To determine the personality traits for a representative sample of Colombian consumers based on the TIPI scale (Ten Item Personality Measure)

12. To establish which demographic variables on the Colombian population, influence and predict the willingness of a Colombian consumer to adopt innovative products and services
13. To establish how the different personality traits on the Colombian population affect the intention to adopt technological innovations.
14. To establish the dimensions of the TRI index that are relevant to predict the willingness of a Colombian consumer to adopt innovative products and services.
15. To perform a market segment analysis for the Colombian market based on their intention to adopt technological innovations

## **10. Hypothesis**

Market segmentation has been widely used in the development of strategic planning to satisfy diverse consumer demands (Dibb, 2005; Saunt, 2005). One of the most popular approaches to customer segmentation is population demographics and the theory shows that there is a long tradition of focusing on innovations' demographic variables and characteristics as the primary predictors of innovation (Rogers, 1995).

However, even if there is evidence of the correlation between demographics and technology adoption, it is important to first understand more generalized attitudes toward technology, because this will allow researchers to more fully capture underlying motivation (Bobbit & Dabholkar, 2003).

Technology Readiness Index (TRI) seeks to provide a more precise predictor of technology adoption since it was designed specifically to measure the "people's propensity to embrace and

use new technologies for accomplishing goals in home life and at work” (Parasuraman, Technology readiness index (TRI): A multiple-item scale to measure readiness to embrace new technologies., 2000). The updated and streamlined version of the TRI also known as TRI 2.0 published in 2015 has been included to take into account the impact of several revolutionary technologies such as mobile commerce, social media and cloud computing.

Therefore, the following hypotheses are formulated:

*Hypothesis 1: TRI 2.0 (Technology Readiness Index 2.0) is more important than demographic variables in explaining the intention to adopt technological innovations*

While some studies have been performed since 2000 to confirm the taxonomy of the five clusters of the original TRI in different markets such as the UK, Taiwan and Chile, none has been found in the literature to the date that allows to test for the taxonomy of the reviewed segments of the TRI 2.0 published in 2015.

A replication and extension of the original study was performed in the UK by Tsikriktsis (2004). Although he confirms the original structure related to the four dimensions of the TRI, he does not confirm the existence of the five-cluster taxonomy since the “paranoid” segment was not existent with the U.K. Data.

Rojas & Parasuraman (2014) performed a very similar study with a representative chilean sample and their conclusion was also analogous. They found a four cluster solution for grouping the respondents into meaningful segments and also the “paranoids” were missing

Finally, Yen (2005) carried out a technology readiness market segmentation study for Taiwanese consumers using the TRI tool and her results only displayed three out of five segments (again “paranoids were not found and this time also “laggards” were inexistent).

With this information, the second hypothesis is formulated:

*Hypothesis 2: The Colombian Data will yield the same five segments found by Parasuraman and Colby (2015) when based on U.S. data*

There are some studies that analyze the relationship between personality traits of an individual and his/her willingness to adopt technology innovations. However such research has been focused to very specific devices or services such as E-book readers (Bt Khalid, 2013) and Intranet Portals (Shambare, 2013) and while there is empirical evidence of a correlation between some high rated traits like agreeableness and extraversion with the people’s propensity to embrace and use new technologies (Vishwanath, 2005). There is no research that links the results of a personality dimension score with the Technology Readiness Index of an individual.

Therefore, the final hypothesis is formulated:

*Hypothesis 3: Personality traits of an individual are a valid predictor for his/her TRI 2.0 score and ultimately for his/her intention to adopt technological innovations*

Hypotheses 1 and 3 can be depicted as shown in the graphic below:

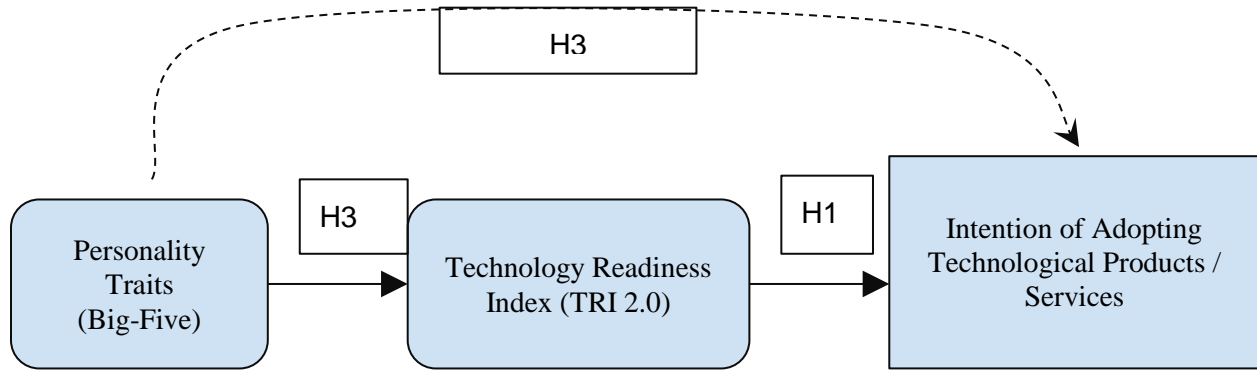


Figure 5. Hypotheses on Causality Relationship for the TRI 2.0, Source: Authors Own

## 11. Methodology

The methodology for this research project is based on cross-sectional surveys with a non-probabilistic sample of the population. This allowed a proper data collection for the research.

Since the research is aimed to cover not only TRI scores but includes a wider scope, a combined questionnaire with 34 questions was built in such a way that it covered the following subjects:

- Demographics (5 questions)
- Technology Readiness Index 2.0 (16 questions)
- Personality (10 questions)
- Ownership and/or willingness to acquire/use different technologies (3 questions for 28 different technologies)

The complete questionnaire is included as an Appendix #1. It was delivered in Spanish language as it was targeted for Colombian nationals.

The questionnaire was administered via email to a database of 8.229 people that were either Colombian or lived in the country, from this pre-qualified database, a total number of 364 answers were obtained which represents a 4.42% response rate.

Since there was some concern regarding the length of the questionnaire and the time needed by respondents to fill it up, several tests were realized by the researchers with an average response time of 7:34 minutes.

The technology readiness scale items used in this study were adopted and translated from the TRI 2.0 (Parasuraman, 2014). The original questionnaire was developed in English and then translated into Spanish for the data collection to be carried out in Colombia. Back translation was performed to ensure consistency in translation and questions were randomized to prevent response bias due to question order. To measure personality traits authors used the TIPI scale, a 10-item personality measure of the Big Five (or Five-Factor Model) dimensions, also developed in English but professionally translated in order to apply it in Colombia.

## **12. Results**

### **12.1 Assessment of Reliability and Validity**

Based on the methodology used for the current research, it is important to compare the profile of the people who answered the questionnaire (sample) against the characteristics of the overall population in Colombia as reported by the National Administrative Department of Statistics (DANE, 2016).

As shown in Table 1, the geographic distribution of the population is not followed by the sample as most of the respondents live in Bogota (83,4%) while the capital only hosts 16,3% of Colombia population. The department/region that follows Bogota is Santander since it adds up the 6,5% of the sample while it only represents the 4,3% of inhabitants of the country. The rest of the regions are under-represented when comparing the relative participation within the sample among the general population of the country.

Regarding other demographic variables such as gender and age there is a significant but controlled difference between the sample and the Colombian population. While the male and female ratio in Colombia is of 49,4%/50,6%, the sample had a 60,5%/39,2% which creates a more masculine vision for the results of the research. When analyzing age groups, there are groups that are very alike to the Colombian census such as the ones 15-24 years old as well as the combined group of people from 35 to 64 years. However, the group of 25-34 years old is over represented and the group of 65+ year's old group is practically non represented.

Finally, the education level does represent a very large distortion when comparing our sample with the population of Colombia. While 3 out of each 4 respondents in the research have graduate or postgraduate studies, only 11,9% of the inhabitants in Colombia have achieved this level of studies according to the DANE.



Characteristics	Frequency	% in the Sample	% In Population
<b>Department</b>			
Antioquia	9	2,7	13,4
Atlántico	3	0,9	5,1
Bogotá, DC	282	83,4	16,3
Bolívar	2	0,6	4,4
Boyacá	1	0,3	2,6
Caldas	0	0,0	2,0
Caquetá	0	0,0	1,0
Cauca	0	0,0	2,9
Cesar	0	0,0	2,1
Córdoba	0	0,0	3,5
Cundinamarca	8	2,4	5,6
Chocó	0	0,0	1,0
Huila	2	0,6	2,4
La Guajira	0	0,0	2,0
Magdalena	0	0,0	2,6
Meta	2	0,6	2,0
Nariño	0	0,0	3,6
Norte De Santander	1	0,3	2,8
Quindio	0	0,0	1,2
Risaralda	0	0,0	2,0
Santander	22	6,5	4,3
Sucre	0	0,0	1,8
Tolima	1	0,3	2,9
Valle Del Cauca	4	1,2	9,6
Arauca	0	0,0	0,5
Casanare	0	0,0	0,7
Putumayo	0	0,0	0,7
San Andrés	0	0,0	0,2
Amazonas	1	0,3	0,2
Guainía	0	0,0	0,1
Guaviare	0	0,0	0,2
Vaupés	0	0,0	0,1
Vichada	0	0,0	0,1
Total Sample	338	100,0	100,0
<b>Gender</b>			
Male	201	59,5	49,4
Female	135	39,9	50,6
Other	2	0,6	N/A
<b>Education Level</b>			
None	0	0,0	10,2
Complete Basic Education	2	0,6	
Incomplete High School	2	0,6	41,9
Complete High School degree or incomplete technical educa	17	5,0	
Some college or complete technical studies	74	21,9	35,7
College graduate (bachelor degree)	100	29,6	
Graduate Degree (specialization, master or higher degree)	143	42,3	11,9
<b>Age</b>			
15-24 years old**	93	27,5	24,4
25-34 years old	120	35,5	21,2
35-44 years old	61	18,0	17,2
45-54 years old	41	12,1	15,7
55-64 years old	22	6,5	11,2
65 + years old	1	0,3	10,2

Table 1. Sample Profile.

\*\*The age range of this population group were defined by DANE, authors adopt this range taking into account that the survey was applied only for adults, that means Colombian people over 18 years old.

As shown in Table 2, all dimensions of the TRI 2.0 have good or acceptable fit. According to Huh, Delorme & Reid (2006) the value of reliability in exploratory research measured by Cronbach alpha must be equal to or greater than 0.6; in confirmatory studies should be between 0.7 and 0.8. In any case coefficients for TRI 2.0 dimensions in Colombia are greater than 0.7, except for

discomfort dimension which has a coefficient of 0.61, which is still higher than 0.6. The overall reliability coefficient (Cronbach alpha) is 0,746. The following are the cronbach's alpha for each of the four TRI 2.0 Dimensions in Colombia: Optimism 0.77; Innovativeness 0.78; Discomfort 0.61; Insecurity 0.71. Discriminant validity refers to the extent to which certain dimensions that are not supposed to be related are, in fact, unrelated. A test for discrimination is to investigate if the correlation between one scale and another is not as high as each scale's Cronbach's coefficient alpha (Andleen, 1995; Gaski & Nevin, 1985). The results displayed in Table 2 reveal that there is enough support of good reliability, considering that correlations between those constructs were below the coefficient cronbach's alpha of individual constructs, additionally,

	<b>Optimism</b>	<b>Innovativeness</b>	<b>Discomfort</b>	<b>Insecurity</b>
Optimism	<b>0,77</b>			
Innovativeness	0,53**	<b>0,78</b>		
Discomfort	-0,07	-0,15**	<b>0,61</b>	
Insecurity	-0,25**	-0,16**	0,38**	<b>0,71</b>

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Main diagonal shows the Cronbach alpha coefficients

*Table 2. Correlation and Cronbach Alpha Coefficients for the TRI 2.0 Constructs. Source: Authors Own*

A similar analysis is performed on the constructs for the Personality Five-Factor Model (FFM). The results displayed in Table 3 reveal that Cronbach alphas coefficients are significantly low. The reliability coefficient (Cronbach Alpha) for each of the four factors is as follows: Extraversion 0.18; Agreeableness 0.04; Conscientiousness 0.19; Emotional Stability 0.49; Openness to Experiences 0.33.

Despite the low scores on Cronbach alpha coefficients shown in Table 3, the authors maintained the results and found it valid for the study, based on Gosling, Rentfrow, & Swann note on alpha

reliability and factor structure statement, who claim that the TIPI was not designed with these criteria in mind; and in fact, the TIPI was designed using criteria that almost guarantee it will perform poorly in terms of alpha and Confirmatory Factor Analysis or Exploratory Factor Analysis indices. *“It is almost impossible to get high alphas and good fit indices in instruments like the TIPI, which are designed to measure very broad domains with only two items per dimension and using items at both the positive and negative poles. For this reason, some researchers have pointed out that alphas are misleading when calculated on scales with small numbers of items (Wood & Hampson, 2005, 373-390, Gosling, Rentfrow, & Swan, 2003, 504-528)*

As noted in the original TIPI manuscript (Gosling et al., 2003), the goal of the TIPI was to create a very short instrument that optimized validity. The goal was NOT to create an instrument with high alphas and good CFA fits. Criteria like alpha and clean factor structures are only meaningful to the extent they reflect improved validity. In cases like the TIPI (using a few items to measure broad domains), they don't.

	<b>Extraversion</b>	<b>Agreeableness</b>	<b>Conscientiousness</b>	<b>Emotional Stability</b>	<b>Openess to Experiences</b>
Extraversion	<b>0,18</b>				
Agreeableness	,216**	<b>0,04</b>			
Conscientiousness	,337**	,366**	<b>0,19</b>		
Emotional Stability	,209**	,594**	,341**	<b>0,49</b>	
Openess to Experience:	,306**	,305**	,349**	,317**	<b>0,33</b>

\*\* . Correlation is significant at the 0.01 level (2-tailed).

*Table 3. Correlation and Cronbach Alpha Coefficients for the Personality Traits. Source: Authors Own*

Table 4 shows some statistics for the TRI score of the Colombian sample which are worth analyzing. The overall score is 3.20 (The overall TRI score for each respondent was obtained by averaging the scores on the four components, after reverse coding the scores on the discomfort and insecurity components). While this value by itself does not mean anything, it is worth mentioning

that this score is 6% (5.96%) higher than the mean overall score of the US population (3.02; Parasuraman & Colby, 2014) and 15% (14.6%) higher than the Chilean population mean TRI score (2.79) according to Rojas-Mendez & Parasuraman (2015). In both cases, after running a proportion test analysis, differences on TRI means are significant at 99% level of confidence (Colombian TRI mean 3,20, n=338; vs US TRI mean 3,02, n=524; t-value=12,73; p-value=0,00000. Colombian TRI mean 3,20, n=338; vs Chilean TRI mean 2,79, n=501; t-value=28,99; p-value=0,00000).

For Colombians, the highest score for the TR components is Optimism (3.83), followed by Insecurity (3,66), Innovativeness (3.47) and Discomfort (2,84).

TR Components	Mean	S.D.	Skewness	Kurtosis	Correlation Coefficients**			
					Innovativeness	Optimism	Discomfort	Insecurity
Innovativeness	3,47	0,87	-0,18	-0,69	1,00			
Optimism	3,83	0,79	-0,25	-0,73	0,53**	1,00		
Discomfort	2,84	0,78	0,00	-0,08	-0,15**	-0,07	1,00	
Insecurity	3,66	0,89	-0,42	-0,30	-0,16**	-,25**	0,38**	1,00
Overall TRI 2.0	3,20	0,55	0,32	-0,35	0,70**	0,69**	-0,58**	-0,69**

Note: All mean values are on a 5-point scale where 1 = strongly disagree and 5 = strongly agree. The overall TRI score for each respondent was obtained by averaging the scores on the four components (after reverse coding the scores on the discomfort and insecurity components).

\*\* All Correlations are significant at the 0.01 level (2-tailed).

Table 4. Summary Statistics for the TRI 2.0 and its components. Source: Authors Own.

There is a pattern between Colombia (3.66), U.S (3.58) and Chile (4.14) regarding the results obtained in the Insecurity dimension of the TRI 2.0, for all the three countries the score obtained in Insecurity dimension it is higher than the overall TRI score. This means that Colombians still has some concerns about safety, privacy or other negative consequences of technology (Parasuraman & Colby, 2012) but in comparison Chilean people feel more unsecure adopting technology products or services than American and Colombian people. According to the results of the Colombian sample, Colombians are more likely to adopt innovativeness products and services, they want to try new developments that could increase control, flexibility and efficiency in their lives due the status in society that gives to have the latest technological advances.

Colombian has a low score in discomfort, so that means that they feel comfortable adopting, buying, using and trying technological devices or developments, they don't feel technology will take off their life's control or will overwhelmed by it. Despite this, the Colombians are still skeptical of some technological developments or innovative products, although they are open to try and test them, they still do from the distrust of proper operation and functionality.

Results for the TIPI scale for Colombian sample are shown in Table 5. Unlike the TRI 2.0, the TIPI scale does not have an aggregate result, however, results should be analyzed for each of the dimensions. This analysis is done by comparing the results obtained in each dimension for the Colombian sample, with the results of the norms or standards for the ten item personality inventory (Gosling, Rentfrow, & Potter, 2014). These norms are based on a sample of 1.813 respondents of a survey applied around the world.

TIPI Components	Mean	S.D.	Skewness	Kurtosis	Correlation Coefficients**				
					Extraversion	Agreeableness	Conscientiousness	Emotional Stability	Openness to Experiences
Extraversion	4,02	1,06	-0,05	-0,40	1,00				
Agreeableness	5,26	1,03	-0,21	-0,31	0,22**	1,00			
Conscientiousness	5,50	1,03	-0,47	-0,06	0,34**	0,37**	1,00		
Emotional Stability	5,13	1,22	-0,47	0,01	0,21**	0,59**	0,34**	1,00	
Openness to Experiences	5,30	1,05	-0,68	0,89	0,31**	0,31**	0,35**	0,32**	1,00

Note: All mean values are on a 7-point scale where 1 = strongly disagree and 7 = strongly agree. The overall TRI score for each respondent was obtained by averaging the scores on the four components (after reverse coding the scores on questions 2,4,6,8 and 10).

\*\* All Correlations are significant at the 0.01 level (2-tailed).

Table 5. Summary Statistics for the TIPI Scale Components in Colombia (Personality Traits). Source: Authors Own.

The dimension with the highest score in the Colombian sample was Conscientiousness with an average score of 5.50, this means a medium high score compared with the 5.4 average score of the norm (Gosling, Rentfrow, & Potter, 2014). On the other hand, the lowest score was obtained in Extraversion dimension, with a medium low score (4.02) compared with the norm (4.44). Comparison between results for Colombian case and overall norms are shown in the Table 6.

The high score on the conscientiousness is an indication that the sample of this study tends to be organized and dependable, show self-discipline, act dutifully, aim for achievement, and prefer planned rather than spontaneous behavior.

<b>TIPI Components</b>	<b>Extraversion</b>	<b>Agreeableness</b>	<b>Conscientiousness</b>	<b>Emotional Stability</b>	<b>Openness to Experiences</b>
Colombian Sample	4,02	5,26	5,50	5,13	5,30
TIPI Norms	4,44	5,23	5,40	4,83	5,38
Norm Description	Medium Low	Medium High	Medium High	Medium High	Medium Low
t-value	-5,94	0,42	1,41	4,24	-1,13
p-value	0,0000**	0,6716	0,1582	0,00003**	0,2587

\* For Colombian Sample N=338, For TIPI Norms N=1.813. Confidence Level: 95%

\*\* Significantly different for  $p < 0,01$

*Table 6. Score Comparison for Colombian TIPI Scale and TIPI Norms. Source: Authors Own.*

After comparing the average results obtained in each of the variables of the TIPI using test comparison of means (t-test) with a confidence level of 95%, it can be concluded that in general the scores for the dimensions of conscientiousness, agreeableness and openness to experiences, are no significantly different with the TIPI norm of each dimension. However, the dimensions of extraversion and emotional stability have statistically significant differences respect to the TIPI standard in each case (See Table 6).

The Colombian society represented in the sample of this study, tends to be more efficient and organize, and prefer planned rather than spontaneous behavior given its medium - high level of Conscientiousness, this leads us to think that people in Colombia, make decisions to adopt technology or innovative products/services but first learn and know in detail the characteristics of the devices they will acquire or services will take. However, despite the medium - high level of conscientiousness, people in Colombia tend to be also open to new experiences. So they are not closed to the possibility of experimenting with new products or technological services after having validated its functionality and features. This is consistent with the results obtained in the

dimensions of innovativeness and optimism for TRI 2.0, according to the results of the sample, the Colombians are open to new experiences and assume optimistically that technology will help them gain more control and efficiency as well as flexibility.

The medium – high score in agreeableness (5.26 vs 5.23 of the TIPI Norm) obtained by the Colombian sample, describes the persons of the country as friendly and people with trusting and helpful nature. Finally, it is important to note the result in the dimension of emotional stability (5.13 vs 4.83 of the TIPI Norm, significantly different for  $p < 0,01$ ). Compared to the TIPI norm, Colombian people represented in the sample tend to be more emotionally controlled, and manage better their impulses, which clearly influences their purchasing decisions. This may be influenced by the particular characteristics of the sample of the Colombian population under study. 42% of respondents have a degree of specialization, master's or higher; and better yet, when 94% of respondents have at least a degree of technical or professional. This makes that decisions are taken more informed and that the way to approach different situations and manage emotions is different from what one might think of Colombian society.

## 12.2 Hypothesis Testing

The first (H1) and third (H3) hypotheses were tested using hierarchical multiple regression, and the second one (H2) was reached by means of cluster and discriminant analyses.

To test the impacts of demographic, personality and technology readiness variables on the intention to adopt new technology based products or services, a hierarchical regression, enter procedure, was used. The independent variables were grouped in three separate blocks; demographic variables (age, gender, education level and Profession related with IT) were grouped

in the first block, in the second block TRI 2.0 dimensions (innovativeness, optimism, discomfort and insecurity), and finally in the third one were situated the personality dimensions (extraversion, agreeableness, conscientiousness, emotional stability and openness to experiences). It is important to note, that the score for each factor was calculated using the mean of the variables comprising each factor.

In order to measure the influence of demographic variables, personality traits and technology readiness on the intention to adopt new products or technological services they were defined twenty-eight items segmented into three major groups: 1. Possession or intent to purchase certain technological products or services (The question in this group was "Regarding to the following products or services, please tell us if you currently have, if you are Considering buying in the next 12 months, or if you do not plan to buy": a Cable TV, a tablet or Smartphone, Internet Banking, Wearables, Transportation services by Internet, TV on demand over the Internet, Music on demand over the Internet, Hotel Reservation Services over the Internet), 2. Use of technological products or services to make some transactions (The question in this group was "Please tell us if You have done any of These transactions During the last 12 months, if you plan to do it in the next 12 months, or if you will not use them": Bought a plane ticket online, Make payments of public services by ATM or Internet, bought or sells products online, check a map to plan a trip over the Internet, Used an application to check the traffic in real time, Buy an item at a lower value to COP \$ 60.000 on the internet, Buy any item with a value Between COP \$ 60.000 and \$ 150,000 (USD 20 to USD 50) on the internet, Buy an item with a price higher than COP \$ 150,000 (USD 50) on the internet), and 3. Perception or desire to have certain products or use certain technology-based services (The question in this group was "Please tell me if the product or service I mention it is" very desirable ", " desirable ", " if your feedback is neutral, "or if the product or service" is not desirable "or"



absolutely not desirable ": Informative Website on the Internet, Shopping at the supermarket cashiers served by robots, See interactive television program and choose Their content, Buy large items: such as a car or furniture through Internet, Make a phone call with video or a video conference, Send a voice message over the Internet, Using the TV to connect to the Internet rather than through the computer, Taking classes online, Read a book from an electronic device, Allow a computer to diagnose and treat a medical problem, Applying for a online loan, Having an emergency device That Allows you to Quickly locate a person).

Twenty-Eight separate regressions were run for the dependent variables that relate the intention of adopting technological products or services, results are presented in Tables 7, 8 and 9.

The three blocks of independent variables (Demographics, Technology Readiness and Personality) explain some of the variation in the dependent variables, on average the whole model (this means, the effect of the three blocks of independent variables on the dependent variables) explains between 2.2% to 26.2% of the variance in the dependent variables. Demographic variables explain between 0.3% to 16.5% of the variance of the dependent variables, while Technology readiness variables explain between 0.5% to 13.6%. In the same way, Personality variables explain between 0.3% to 4.1%.

The dimensions of attitude towards technology are by far better predictors than the demographics and personality traits. These dimensions are better predictors in seventeen out of twenty eight dependent variables (“...if you currently have, if you are considering buying in the next 12 months, or if you do not plan to buy: a Tablet or a Smartphone, a Wearable device, Transportation services by Internet, TV on demand over the Internet, Music on demand over the Internet”, “...if you have done any of these transactions during the last 12 months, if you plan to do it in the next 12 months,

or if you will not use them: bought or sells products online”, “...if the product or service I mention it is very desirable, desirable, if your opinion is neutral, or if the product or service is not desirable or absolutely not desirable: Information Website on the Internet, Shopping at the supermarket with cashiers served by robots, See interactive television program and choose their content, Buy large items such as a car or furniture through Internet, Make a phone call with video or a video conference, Send a voice message over the Internet, Taking classes online, Read a book from an electronic device, Allow a computer to diagnose and treat a medical problem, Applying for a loan online, Having an emergency device that allows you to quickly locate a person”).

For five dependent variables demographics are better predictors (“...if you currently have, if you are considering buying in the next 12 months, or if you do not plan to buy: Internet Banking, Hotel Reservation Services over the Internet”, “...if you have done any of these transactions during the last 12 months, if you plan to do it in the next 12 months, or if you will not use them: Buy an item at a lower value to COP \$ 60,000 on the internet, Buy any item with a value between COP \$ 60,000 and \$ 150,000 (USD 20 to USD 50) on the internet, Buy an item with a price higher than COP \$ 150,000 (USD 50) on the internet”), in the same way, for five dependent variables personality traits are better predictors than demographics and TR (“...if you currently have, if you are considering buying in the next 12 months, or if you do not plan to buy: Cable TV”, “...if you have done any of these transactions during the last 12 months, if you plan to do it in the next 12 months, or if you will not use them: Make payments of public services by ATM or Internet, Check a map to plan a trip over the Internet, Used an application to check the traffic in real time”, “...if the product or service I mention it is very desirable, desirable, if your opinion is neutral, or if the product or service is not desirable or absolutely not desirable: Using the TV to connect to the

Internet rather than through the computer”). Finally, one dependent variable is equally predicted by both demographics and personality traits (“Bought a plane ticket online”).

Among the Demographic variables, “Education level” resulted to be the most significant independent variable. It is significant in twelve out of twenty-eight regressions run. Higher education levels incentive the intention of adopting technological product or services innovations, they are significantly related and have a positive relation with the intention to buy or use a Tablet or a Smartphone, use internet Banking, buy a Wearable device, use Transportation services by internet, consume TV on demand over the internet, make a Hotel reservation over the internet, Buy an item at a lower value than COP \$ 60,000 on the internet, Buy any item with a value between COP \$ 60,000 and \$ 150,000 (USD 20 to USD 50) on the internet, Buy an item with a price higher than COP \$ 150,000 (USD 50) on the internet, take online classes, Read a book from an electronic device and Applying for a loan online. So, the higher education level that was attained by respondents the higher the willingness to adopt the correspondent product or service.

Another important demographic variable to analyze is the Age, it is significant in 10 out of twenty eight regressions run. Surprisingly, results shows that the relationship is positive, meaning that the older the respondents are, the most intention to adopt developments, or new technology based products and services they have. The above conclusion contrasts with the results obtained by Rojas-Mendez & Parasuraman, 2015 for Chilean people, they conclude that younger people tend to report higher levels of willingness to adopt technological innovations, curious contrast, given that both countries are in Latin America and may even share certain cultural traits. Of the twenty-eight regressions run for Age; five were negative (not significant). That is, older people are less

likely to buy music on demand online, buy plane tickets online, buy or sell products online, check a map to plan a trip and buy expensive items such as cars or furniture online.

Other demographic variables have lowest level of significance, gender were significant in seven out of twenty eight regressions run, showing that in the sample, Colombian males have higher willingness to buy a tablet or a smartphone and a wearable device. They also would be open to shop at a supermarket with cashiers served by robots, assists an interactive television program and choose their content, buy large items such as a car or furniture through Internet, allow a computer to diagnose and treat a medical problem and apply for a loan online. Finally, the demographic variable “A profession related with IT” were significant in six out of twenty eight regressions run. All six regressions has a negative relation, showing that people with a profession related with IT are less likely to buy a wearable like a smartwatch, use transportation services online, Shop at the supermarket with cashiers served by robots, assists interactive television program and choose their content, Buy large items such as a car or furniture through Internet, and Allow a computer to diagnose and treat a medical problem.

Among independent technology readiness (attitudinal) variables, the dimension of Innovativeness is significant in twenty-one out of twenty eight regressions run, Optimism in twenty, and Insecurity and Discomfort in seventeen and eleven regressions respectively. The first two dimensions, Innovativeness and Optimism, have a positive impact in all the significant regressions acting as motivators to adopt technology based innovations, while discomfort and insecurity because of their inhibitors nature have a negative effect on the dependent variables. Analyzing the results obtained in the regressions, it's possible to state that it seems that this Colombian sample have a strong positive view of technology and a belief that it offers increased control, flexibility and efficiency

in their lives, given the high level of significance obtained in the dimension of Optimism. All the relations on these dimensions are positive indicating a directly relationship between independent and dependent variables, it means that higher levels of optimism and innovativeness contribute to higher levels of intention to adopt new technology based developments of products of services.

Regarding inhibitors, it is important to show that despite the high level of optimism and innovativeness perceived by Colombian people, the sample presents a significant level of insecurity too, related with seventeen significant regressions with a negative relation, in which it could be highlighted: buy a tablet or a smartphone, use internet banking, buy a wearable device, use online Transportation services, buy TV programs on demand over the Internet, make hotel reservations services online, buy an item with a price higher than COP \$ 150,000 (USD 50) online, use an informative website on the internet, shopping in a supermarket with cashiers served by robots, buy large items such as a car or furniture through Internet, make a phone call or a videoconference, send a voice message over the internet, take online classes, read a book from an electronic device, allow a computer to diagnose and treat a medical problem, Applying for a loan online, and having an emergency device that allows you to quickly locate a person.

There are some insights here, first all the dependent variables are internet based products or services and involve two principal characteristics: low human contact in the service and remote support (access to some services online like apply to a loan, cashiers served by robots, among others), and products or services that involves monetary transactions with some level of uncertainty (internet banking transactions, online payments, among others), this could be driven by the high level of uncertainty avoidance that according to Hofstede Colombian people has. A high score 80/100 which means that as a nation Colombians are seeking mechanisms to avoid

ambiguity. A high UAI (Uncertainty Avoidance) means that it is difficult to change the status quo, unless a figure of authority is able to amass a large group of people and lead them towards change.

And finally related to personality traits, results from this study showed that there is a low significance on the impact regarding the intention of adopting new developments and innovations in technology based products or services. However, Openness to experiences was the most significant variable in explaining the intention of adoption innovations in technology based products or services in the Colombian sample, with four out of twenty-eight regressions run, it have a positive impact on the intention to buy a wearable device, bought or sell products online, Make a phone call with video or a video conference, and Using the TV to connect to the Internet rather than through the computer; all the four significant regressions are related to new forms of do some things that are considered normal, like change the traditional telephone to make calls in order to use a computer or a tablet to make a video, or an app of videoconference. Extraversion, agreeableness, and Conscientiousness all three variables showed 2 significant regressions. Extraversion presents negative relations in its two significant regressions showing that the higher extraversion levels the lower intention to make hotel reservations online and buy an item online with a price higher than COP \$ 150,000 (USD 50); Agreeableness have a positive impact on the intention to make a phone call with video or a video conference, and send a voice message over the Internet, meaning that the higher agreeableness level the higher the intention to adopt these two online services. Conscientiousness presents a mixed effect in its two significant regressions, by one side it has a positive impact on the intention to buy a wearable device, but by the other side it shows a negative relation with the intention to use an application to check the traffic in real time. Finally, Emotional Stability were not significant in any regression.

As mentioned earlier in this text, the whole model explains some of the variation in the dependent variables, on average (this means, the effect of the three blocks of independent variables on the dependent variables) explains between 2.2% to 26.2% of the variance in the dependent variables. Demographic variables explain between 0.3% to 16.5% of the variance in the dependent variables, while Technology readiness variables explain between 0.5% to 13.6%. In the same way, Personality variables explain between 0.3% to 4.1%.

Analyzing the overall results shown in tables 7, 8, and 9, could be argued that for the Colombian sample in study, demographics are better predictors of technology adoption where there is a transactional or financial operation involve, like use internet banking services, make hotel reservations, bought tickets online and buy items online with prices between COP\$ 60.000 and COP\$ 150.000 or higher. It is expected that the adoption of developments in banking, online payments, transactional products, fintech products, and similar can be better explained by traditional demographic variables such Educational Level and Age. On the other side, attitudes towards technology (technology readiness dimensions) are better predictors for the adoption of new technological devices such smartphones, tablets, and wearables in general; also for the adoption of innovations in products and services that solve problems and optimize daily life of Colombians studied in the sample, such as online access to music or TV depending on your preferences, making video calls and send messages over the Internet, read books in electronics devices, transportation, security and community apps, and disruptive developments like cashiers serves by robots and applications design for medical purposes; particularly influenced by the contributors of innovativeness and optimism.

Finally, regarding personality traits, it can be stated that they are better predictors for developments and innovations that modify the way Colombian society (studied in the sample) do some traditional actions, this means that personality influences the way people plan a trip online or offline, or the way they select the daily route to work in an mobile app or just take any route, or the use they give to the television to connect to internet instead of using a laptop or a PC. This leads to the conclusion that H1 is partially supported.

Regarding to the following products or services, please tell us if you currently have, if you are considering buying in the next 12 months, or if you do not plan to buy								
	Cable TV	Tablet or Smartphone	Internet Banking	Wearable	Transportation services by Internet	TV on demand over the Internet	Music on demand over the Internet	Hotel Reservation Services over the Internet
<b>Demographics</b>								
Age	0,015	0,052	0,202**	0,160**	0,150**	0,136*	-0,027	0,290**
Gender	-0,027	0,110*	0,098	0,127*	-0,009	0,049	-0,051	0,010
Education Level	-0,019	0,147**	0,353**	0,125*	0,219**	0,155**	0,085	0,389**
Profession Related with IT	0,044	-0,046	-0,100	-0,270**	-0,123*	-0,081	-0,106	-0,048
<b>R<sup>2</sup></b>	<b>0,003</b>	<b>0,034</b>	<b>0,133</b>	<b>0,093</b>	<b>0,060</b>	<b>0,032</b>	<b>0,028</b>	<b>0,165</b>
<b>TRI 2.0 Dimensions</b>								
Innovativeness	0,038	0,204**	0,275**	0,346**	0,274**	0,321**	0,299**	0,165**
Optimism	0,097	0,209**	0,221**	0,205**	0,260**	0,256**	0,169**	0,170**
Discomfort	-0,008	-0,177**	-0,141**	-0,085	-0,178**	-0,102	-0,106	-0,211**
Insecurity	-0,041	-0,204**	-0,263**	-0,250**	-0,283**	-0,264**	-0,102	-0,251**
<b>R<sup>2</sup></b>	<b>0,013</b>	<b>0,068</b>	<b>0,075</b>	<b>0,098</b>	<b>0,120</b>	<b>0,136</b>	<b>0,092</b>	<b>0,064</b>
<b>Personality Traits</b>								
Extraversion	-0,028	-0,071	-0,084	0,007	-0,087	-0,105	-0,071	-0,203**
Agreeableness	0,018	-0,027	0,104	0,090	0,023	0,092	0,097	0,059
Conscientiousness	0,088	-0,008	-0,037	0,116*	0,027	0,018	0,004	-0,018
Emotional Stability	-0,055	-0,052	0,078	0,101	-0,001	0,059	-0,018	0,069
Openness to Experiences	-0,028	0,094	-0,003	0,126*	0,076	0,053	0,073	0,030
<b>R<sup>2</sup></b>	<b>0,022</b>	<b>0,028</b>	<b>0,030</b>	<b>0,008</b>	<b>0,018</b>	<b>0,023</b>	<b>0,039</b>	<b>0,034</b>
<b>Total R<sup>2</sup></b>	<b>0,039</b>	<b>0,130</b>	<b>0,237</b>	<b>0,199</b>	<b>0,198</b>	<b>0,191</b>	<b>0,159</b>	<b>0,262</b>

\*. Correlation is significant at the 0.05 level (2-tailed).

\*\*. Correlation is significant at the 0.01 level (2-tailed).

Table 7. Hierarchical Multiple Regression Explaining the Intention of Adopting Technology Products and Services. Source Authors Own



Please tell us if you have done any of these transactions during the last 12 months, if you plan to do it in the next 12 months, or if you will not use them

	Bought a plane ticket online	Make payments of public services by ATM or Internet	bought or sells products online	Check a map to plan a trip over the Internet	Used an application to check the traffic in real time	Buy an item at a lower value to COP \$ 60,000 on the internet	Buy any item with a value between COP \$ 60,000 and \$ 150,000 (USD 20)	Buy an item with a price higher than COP \$ 150,000 (USD 50) on the
<b>Demographics</b>								
Age	-0,035	0,081	-0,007	-0,047	0,044	0,152**	0,030	0,163**
Gender	-0,051	-0,013	0,000	-0,026	-0,106	-0,005	-0,008	0,059
Education Level	-0,055	0,060	0,045	-0,065	-0,022	0,195**	0,163**	0,220**
Profession Related with IT	0,064	0,043	-0,022	0,048	0,024	-0,039	-0,082	-0,076
<b>R<sup>2</sup></b>	<b>0,008</b>	<b>0,010</b>	<b>0,003</b>	<b>0,006</b>	<b>0,017</b>	<b>0,043</b>	<b>0,034</b>	<b>0,055</b>
<b>TRI 2.0 Dimensions</b>								
Innovativeness	0,025	0,064	0,127*	-0,043	-0,007	0,122*	0,130*	0,068
Optimism	0,027	0,023	0,096	0,024	0,025	0,136*	0,089	0,044
Discomfort	0,044	0,036	0,000	0,043	0,127*	0,073	0,017	-0,041
Insecurity	0,043	-0,058	-0,038	0,016	0,012	-0,101	-0,075	-0,166**
<b>R<sup>2</sup></b>	<b>0,006</b>	<b>0,013</b>	<b>0,018</b>	<b>0,005</b>	<b>0,016</b>	<b>0,030</b>	<b>0,016</b>	<b>0,013</b>
<b>Personality Traits</b>								
Extraversion	0,015	-0,039	0,066	0,053	-0,049	-0,055	-0,043	-0,110*
Agreeableness	-0,031	-0,008	-0,015	0,085	-0,004	0,075	0,041	-0,007
Conscientiousness	-0,039	-0,098	-0,010	0,060	-0,134*	-0,028	-0,043	0,002
Emotional Stability	0,013	0,096	-0,006	0,060	-0,003	0,037	0,047	-0,019
Openness to Experiences	0,037	-0,089	0,114*	0,023	-0,051	-0,057	-0,064	-0,105
<b>R<sup>2</sup></b>	<b>0,008</b>	<b>0,041</b>	<b>0,014</b>	<b>0,011</b>	<b>0,026</b>	<b>0,021</b>	<b>0,028</b>	<b>0,023</b>
<b>Total R<sup>2</sup></b>	<b>0,022</b>	<b>0,064</b>	<b>0,035</b>	<b>0,022</b>	<b>0,059</b>	<b>0,094</b>	<b>0,078</b>	<b>0,092</b>

\*. Correlation is significant at the 0.05 level (2-tailed).

\*\*. Correlation is significant at the 0.01 level (2-tailed).

Table 8. Hierarchical Multiple Regression Explaining the Intention of Adopting Technology Products and Services. Source: Authors Own.

Please tell me if the product or service I mention it is "very desirable", "desirable", "if your opinion is neutral," or if the product or service "is not desirable" or "absolutely not desirable"

	Information Website on the Internet	Shopping at the supermarket cashiers served by robots	See interactive television program and choose their content	Buy large items such as a car or furniture through Internet	Make a phone call with video or a video conference	Send a voice message over the Internet	Using the TV to connect to the Internet rather than through the	Taking classes online	Read a book from an electronic device	Allow a computer to diagnose and treat a medical problem	Applying for a loan online	Having an emergency device that allows you to quickly locate a
<b>Demographics</b>												
Age	0,049	0,048	0,008	-0,015	0,075	0,050	0,081	0,150**	0,173**	0,080	0,210**	0,067
Gender	0,047	0,255**	0,111*	0,193**	0,059	0,024	0,050	0,055	0,028	0,149**	0,114*	0,100
Education Level	0,106	0,082	-0,015	0,063	0,069	0,071	0,041	0,165**	0,152**	0,096	0,293**	0,023
Profession Related with IT	0,038	-0,184**	-0,112*	-0,159**	-0,081	-0,054	0,041	-0,094	-0,104	-0,109*	-0,044	-0,068
<b>R<sup>2</sup></b>	<b>0,017</b>	<b>0,085</b>	<b>0,022</b>	<b>0,059</b>	<b>0,013</b>	<b>0,007</b>	<b>0,012</b>	<b>0,038</b>	<b>0,042</b>	<b>0,035</b>	<b>0,101</b>	<b>0,015</b>
<b>TRI 2.0 Dimensions</b>												
Innovativeness	0,062	0,266**	0,200**	0,282**	0,253**	0,225**	0,110*	0,225**	0,267**	0,179**	0,165**	0,172**
Optimism	0,191**	0,247**	0,224**	0,224**	0,258**	0,249**	0,169**	0,200**	0,279**	0,188**	0,278**	0,268**
Discomfort	-0,035	-0,211**	0,024	-0,124*	-0,092	-0,010	-0,012	-0,112*	-0,072	-0,131*	-0,195**	-0,142**
Insecurity	-0,119*	-0,327**	-0,047	-0,187**	-0,167**	-0,152**	-0,088	-0,126*	-0,196**	-0,174**	-0,329**	-0,154**
<b>R<sup>2</sup></b>	<b>0,039</b>	<b>0,109</b>	<b>0,050</b>	<b>0,065</b>	<b>0,086</b>	<b>0,081</b>	<b>0,033</b>	<b>0,052</b>	<b>0,094</b>	<b>0,041</b>	<b>0,108</b>	<b>0,082</b>
<b>Personality Traits</b>												
Extraversion	-0,069	-0,059	-0,067	0,016	0,048	0,019	-0,047	-0,095	0,004	0,072	-0,054	0,064
Agreeableness	0,022	0,101	0,044	0,063	0,219**	0,141**	0,105	0,056	-0,032	-0,045	0,034	-0,004
Conscientiousness	-0,004	-0,067	-0,039	0,010	0,029	0,012	-0,006	-0,065	0,027	-0,022	-0,014	-0,007
Emotional Stability	0,021	0,095	0,069	0,053	0,102	0,016	-0,012	0,059	-0,004	-0,019	-0,008	0,046
Openness to Experiences	-0,013	0,072	0,048	0,081	0,112*	0,080	0,115*	0,056	0,068	-0,003	-0,031	0,036
<b>R<sup>2</sup></b>	<b>0,010</b>	<b>0,023</b>	<b>0,032</b>	<b>0,003</b>	<b>0,036</b>	<b>0,025</b>	<b>0,041</b>	<b>0,030</b>	<b>0,017</b>	<b>0,022</b>	<b>0,019</b>	<b>0,009</b>
<b>Total R<sup>2</sup></b>	<b>0,066</b>	<b>0,217</b>	<b>0,104</b>	<b>0,127</b>	<b>0,135</b>	<b>0,113</b>	<b>0,086</b>	<b>0,121</b>	<b>0,153</b>	<b>0,098</b>	<b>0,228</b>	<b>0,107</b>

\*. Correlation is significant at the 0.05 level (2-tailed).

\*\*. Correlation is significant at the 0.01 level (2-tailed).

Table 9. Hierarchical Multiple Regression Explaining the Intention of Adopting Technology Products and Services. Source: Authors Own.

As shown in Table 10, personality traits have an impact on technology readiness dimensions. Four regressions were run for each variable of the TIPI scale, founding eleven significant and positive regressions (Impact of extraversion, agreeableness, conscientiousness, emotional stability, and Openness to experiences on innovativeness and optimism; and the impact of extraversion on insecurity). The influence of personality in the attitudes toward technology adoption is evident particularly in the “motivators”: 19.3% of the variance in Innovativeness is explained by personality traits as well as 14.6% of the variance in Optimism. In contrast, the “inhibitors”: Discomfort and Insecurity are very low impacted by personality traits with only 2.9% and 4.7%, respectively. It is curious to found that for Colombian people studied in the sample, the higher extraversion level, the higher insecurity toward technology adoption.

Related to the H3 - Personality traits are valid predictors for the attitude towards technology adoption particularly in the motivators variables, so H3 is partially supported.

<b>Personality Traits</b>	<b>Innovativeness</b>	<b>Optimism</b>	<b>Discomfort</b>	<b>Insecurity</b>
Extraversion	0,205**	0,275**	0,077	0,191**
Agreeableness	0,205**	0,252**	0,013	-0,005
Conscientiousness	0,161**	0,278**	0,009	0,039
Emotional Stability	0,231**	0,247**	-0,063	-0,041
Openness to Experiences	0,419**	0,234**	-0,096	0,087
<b>R<sup>2</sup></b>	<b>0,193</b>	<b>0,146</b>	<b>0,029</b>	<b>0,047</b>

\*\*Correlation is Significant at the 0.01 Level (2-Tailed).

*Table 10. Hierarchical Multiple Regression Explaining the impact of Personality Traits on TRI 2.0 Dimensions.*

*Source: Authors Own.*

### 12.3 Market Segmentation

Previous studies have demonstrated that technology readiness can be used to segment markets (Rojas-Mendez and Parasuraman, 2014). Parasuraman and Colby (2001) developed a segmentation scheme combining the four dimensions of TRI 1.0, using K-mean clusters and compound of five segments: Explorers, Pioneers, Skeptics, Paranoids and laggards. Later in 2015, Parasuraman and Colby modified the five cluster segmentation, and the segments were labeled as follows:

1. Skeptics: tend to have a detached view of technology, with less extreme positive and negative beliefs.
2. Explorers: tend to have a high degree of motivation and low degree of resistance.
3. Avoiders: tend to have a high degree of resistance and low degree of motivation.
4. Pioneers: tend to hold both strong positive and negative views about technology.
5. Hesitators: stand out due to their low degree of innovativeness.

When performing a K-mean cluster analysis with the collected data for the current research, authors found the existence of five meaningful segments in the Colombian Sample Market, the

same segments as Parasuramman and Colby (2015) found in U.S. market, such segments are “Explorers”, “Pioneers”, “Hesitators”, “Skeptics” and “avoiders” and their TR scores and frequency are described with further detail in Tables 11 and 12.

Attributes	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Sample Mean
Innovativeness	4,28	3,68	4,10	2,59	3,13	3,47
Optimism	4,50	3,60	4,47	3,29	3,50	3,83
Discomfort	3,16	2,06	2,08	2,88	3,49	2,84
Insecurity	3,71	4,18	2,39	3,33	4,56	3,66
<b>Frequency</b>	<b>72,00</b>	<b>44,00</b>	<b>56,00</b>	<b>85,00</b>	<b>81,00</b>	<b>338,00</b>
<b>Percentage</b>	<b>21,3</b>	<b>13,0</b>	<b>16,6</b>	<b>25,1</b>	<b>24,0</b>	<b>100,0</b>

Table 11. Technology Readiness Segments (Mean Scores). Source: Authors Own

	Cluster 1 Pioneers (21,3%)	Cluster 2 Hesitators (13%)	Cluster 3 Explorers (16,6%)	Cluster 4 Skeptics (25,1%)	Cluster 5 Avoiders (24%)
Innovativeness	High	High	High	Low	Low
Optimism	High	Low	High	Low	Low
Discomfort	High	Low	Low	High	High
Insecurity	High	High	Low	Low	High

Table 12. Table 12 - Technology Readiness Segments by Presence of the Attributes. Source: Authors Own

The details of these five segments are included in Table 13 and some highlights include the following findings for Colombian segments:

Segment 1, comprising 21,3% of the respondents is called Pioneers. Pioneers are mainly males (72%), with an average age of 35 years old and a high education level with a college degree or higher in the 78% of the segment. 51,4% of the respondents do not have a profession related with IT while 48,6% have one. They have high levels of innovation, optimism, discomfort and insecurity. Regarding personality traits, they show a medium low extraversion level while they have medium high levels for Agreeableness, conscientiousness, emotional stability and openness to experiences.

Segment 2, comprising 13% of the total sample is called Hesitators. These are mainly Males (68%), but have a 30% female presence and 2% of other genres. 73% of the respondents do not have a profession or labor related with technology. Hesitators presents a medium high educated level, they score high in innovativeness and insecurity while have low scores in optimism and discomfort. This segment scores medium low on extraversion and agreeableness, and medium high in conscientiousness, emotional stability, and openness to experiences, explaining the reason why this segment tends to have a dubious vision of technology developments.

Segment 3, grouping 16,6% of the total sample is called Explorers. This segment is mainly comprised by Males (75%), Explorers average age is 35,4 years old and they are a high educated segment with 93% of respondents with complete college or postgraduate degree. This segment is the segment with the highest proportion (55%) of people with a profession related with IT than any other cluster. They score high in innovativeness and optimism and low in Discomfort and Insecurity, these results reinforce their attitude toward technology developments and its intention to test or adopt new products or technology-based services. Explorers are people with medium high levels of agreeableness, conscientiousness, emotional stability and openness to experiences, but medium low extroverted.

Segment 4, comprising 25,1% of the total sample is called Skeptics. This segment is more gender balanced, with 52% of females and 48% of males who are 35 years old on average. Skeptics have a medium high education level, 27% of the respondents has some complete or incomplete college or technical studies and 82% of the segment do not have a profession related with IT. This segment scores low in innovativeness, optimism, and insecurity, but high in discomfort, these characteristics are not exactly the same as Parasuramman and Colby (2015) found for Skeptics however, it is very close to its description and authors found valid to maintain the segment name

for Colombian Sample. Skeptics punctuate medium low in all five personality traits, extroversion, agreeableness, conscientiousness, emotional stability and openness to experiences.

Finally, segment 5, grouping the 24% of the total respondents is called Avoiders. Avoiders are comprised of 54% of females and 44% of males (1% of other genders), as well as Hesitators (29 years old on average), Avoiders are youngest than the other segments (30 years old on average). 81% of the segment do not have a profession related with IT. They show high levels of discomfort and insecurity but low levels of innovativeness and optimism. Due to these characteristics, Avoiders tend to stave off new technology based developments and even they feel drawn for testing on such products. In terms of personality traits, Avoiders punctuate medium low on Extraversion, Agreeableness and Openness to experiences, while in conscientiousness and emotional stability the score was medium high.

To take into account, when using the segmentation result of this research to apply it to real cases; 38% of respondents correspond to Hesitators (13%) and Skeptics (25%) segments. This poses a major challenge for entrepreneurs and companies seeking to develop technology-based products or services, as they have in front of them a significant percentage of people who do not easily adopt technology and think that it can affect comfort and security. Now the challenge becomes more complex if one takes into account that in addition to the two segments listed above, 24% of the surveyed sample corresponds to people in the Avoiders segment, it means people who have a high degree of resistance towards technology and a very low level of motivation to adopt it. Focalized strategies for this segments must be developed.

Curiously, in segments 4 (skeptics) and 5 (avoiders) – 49% of the total sample – the percentage of females is higher than the rest of the segments (as can be seen in Table 13), this insight shows that

there is a work to do with Colombian women regarding the adoption of technological products and services, it is important to explore in depth their needs and expectations, as there are probably unmet needs that can be met with innovative products or services specially designed for them.

Variables	Pioneers	Hesitators	Explorers	Skeptics	Avoiders
<b>Demographic</b>					
Gender	Females 28% Males 72%	Females 30% Males 68% Other 2%	Females 25% Males 75%	Females 52% Males 48%	Females 54% Males 44% Other 1%
Age Means	35,5	29,5	35,4	35,1	30,1
Education Level	High Educated (Complete College or Postgraduate studies: 78%)	Medium High Educated (Some College or Technical studies or Postgraduate studies: 93%)	High Educated (Complete College or Postgraduate studies: 93%)	Medium High Educated (Some College or Technical studies or Postgraduate studies: 91%)	Medium High Educated (Some College or Technical studies or Postgraduate studies: 94%)
Profession Related with IT	51,4% do not have a profession related to IT. 48,6% have a profession related to IT	73% do not have a profession related to IT 27% have a profession related to IT.	45% do not have a profession related to IT 55% have a profession related to IT.	82% do not have a profession related to IT 18% have a profession related to IT.	81% do not have a profession related to IT 19% have a profession related to IT.
<b>TRI 2.0 (Mean Scores)</b>					
Innovativeness	4,28	3,68	4,10	2,59	3,13
Optimism	4,50	3,60	4,47	3,29	3,50
Discomfort	3,16	2,06	2,08	2,88	3,49
Insecurity	3,71	4,18	2,39	3,33	4,56
Overall TRI 2.0 Score	3,48	3,26	4,03	2,92	2,65
<b>Personality (Mean Scores)</b>					
Extraversion	4,34	4,28	4,01	3,53	4,11
Agreeableness	5,42	5,20	5,63	4,94	5,22
Conscientiousness	5,63	5,48	5,85	5,17	5,51
Emotional Stability	5,17	5,38	5,66	4,76	4,98
Openness to Experiences	5,59	5,60	5,71	4,65	5,28

Table 13. Demographic and Personality Segments Profile. Source: Authors Own

In order to determine the comparability of results obtained in terms of the segments between the US and Colombia, the authors have made a mean comparison analysis or proportion test (t-test) in order to corroborate the differences between the segments found in each sample (Table 14). Results obtained in this analysis shows that in two segments (Explorers and Hesitators) there are not significant differences between means due to the different size of each sample (US = 524, Colombia = 338). On the contrary, Skeptics, Pioneers and Avoiders segments shows that there are significant differences at 99% level of confidence between the two countries.

Segment	US Sample	US (Segment % in Total Sample)	Colombian Sample	Colombia (Segment % in Total Sample)	t-value	p-value
Explorers	524	18%	338	17%	-0,9899	0,3229
Skeptics	524	38%	338	25%	-9,1217	0,0000***
Pioneers	524	16%	338	21%	3,7477	0,0002***
Hesitators	524	13%	338	13%	0,0000	1,0000
Avoiders	524	16%	338	24%	5,6569	0,0000***

\*\*\*Means are significantly different at 99%,  $p < 0,01$

Tabla 14. US and Colombian Samples proportions by Segment.(t-test). Source: Authors Own

According to the analysis above, and taking into account that authors found the existence of five meaningful segments in the Colombian Sample Market, and that those segments were the same as Parasuramman and Colby (2015) found in U.S. market, it's possible to state that H2 is accepted.

A discriminant analysis, using stepwise procedure was conducted for prediction purposes, the prediction accuracy is shown in the diagonal of Table 15. For segment 1, it is 98,6%, for segment 2, it is 95,5%, for Segment 3, it is 98,2%, for Segment 4, 92,9% and for Segment 5 it is 98,8%, thus achieving an overall of 96,7% for the correctly predicted cases.

Actual Groups	Number of Cases	Pioneers	Hesitators	Explorers	Skeptics	Avoiders
Pioneers	72,00	71 98,6%	0 0,0%	0 0,0%	1 1,4%	0 0,0%
Hesitators	44,00	0 0,0%	42 95,5%	0 0,0%	2 4,5%	0 0,0%
Explorers	56,00	0 0,0%	0 0,0%	55 98,2%	1 1,8%	0 0,0%
Skeptics	85,00	0 0,0%	0 0,0%	0 0,0%	79 92,9%	6 7,1%
Avoiders	81,00	1 1,2%	0 0,0%	0 0,0%	0 0,0%	80 98,8%

96,7% of original grouped cases correctly classified.

Tabla 15. IPredicted Segment Membership. Source: Authors Own

### 13. Conclusions and Recommendations

The current study allows to assess the validity of the updated and streamlined version of the Technology Readiness Index referred as TRI 2.0, in Colombia. As this new version was published in 2015 there is no evidence to the date as far as applications of the TRI 2.0 in developing countries



of Latin America. The results of the four dimensions of the TR are valid which gives external validity.

One of the conclusion of the study is that Demographic variables are still relevant when explaining people's willingness to adopt new technology based products and services. Especially, among demographic variables in the Colombian Sample, Educational level is the most consistent predictor for the intention to embrace and use new technology based developments. In contrast with the results obtained by Rojas-Mendez, J, & Parasuraman, A, 2015, for a Chilean sample using TR 1.0. Age, despite being a valid predictor, in the Colombian Sample is not the principal regarding demographic variables. High Education and masculine predominance levels tend to have a positive influence in the attitudes toward the adoption of technology based products and services, results show that segments like Pioneers and Explorers presents high education levels and higher percentage of males. According to Hofstede Colombia is a Masculine society highly success oriented and driven, with an average score of 64 points in the cultural scale. Colombians are competitive and status-oriented, yet collectivistic rather than Individualist.

Females are less willingness to adopt technology based developments, this insight shows that there is a work to do with Colombian women regarding the adoption of technological products and services, it is important to explore in depth their needs, expectations and preferences regarding their adoption experience, as there are probably unmet needs that can be met with innovative products or services specially designed for them.

This study also reveals that attitude toward technology, personality and demographic variables complement each other as predictors of the intention to adopt and use technology based products

and services. There is evidence that in general, attitude gets more importance than personality and demographics, this Colombian sample have a strong positive view of technology and a belief that it offers more control, flexibility and efficiency in their lives, given the high level of significance obtained in the dimension of Optimism. It means that higher levels of optimism and innovativeness contribute to higher levels of intention to adopt new technology based developments of products and services. Regarding inhibitors, it is important to show that despite the high level of optimism and innovativeness perceived by Colombian people, the sample presents a significant level of insecurity too. There are some insights here, first all the dependent variables are internet based products or services and involve two principal characteristics: low human contact in the service delivery and remote support (access to some services online like apply to a loan, cashiers served by robots, among others), and products or services that involves monetary transactions with some level of uncertainty (internet banking transactions, online payments, among others), this could be driven by the high level of uncertainty avoidance that according to Hofstede Colombian people has. A high score 80/100 which means that as a nation Colombians are seeking mechanisms to avoid ambiguity. A high UAI (Uncertainty Avoidance) means that it is difficult to change the status quo, unless a figure of authority is able to amass a large group of people and lead them towards change. It means that in general Colombians tend to follow public figures or political leaders when they see they are using or promoting technology based products, they have strong faith in word of mouth opinions even more if these opinions come from their social circle, family, or friends.

Related to personality traits, results showed that there is a low significance on the impact regarding the intention of adopting new developments and innovations in technology based products or services. However, Openness to experiences was the most significant variable in explaining the

intention of adoption innovations in technology based products or services in the Colombian sample, it have a positive impact on the intention to buy a wearable device, bought or sell products online, Make a phone call with video or a video conference, and Using the TV to connect to the Internet rather than through the computer; these results are related to new forms of do some things that are considered normal or traditional, like change the traditional telephone to make calls using a computer or a tablet to make a video, or an app of videoconference.

In summary, analyzing the overall results, could be argued that for the Colombian sample in study, demographics are better predictors of technology adoption where there is a transactional or financial operation involve. It is expected that the adoption of developments in banking, online payments, transactional products, fintech products, and similar can be better explained by traditional demographic variables such Educational Level and Age. On the other side, attitudes towards technology (technology readiness dimensions) are better predictors for the adoption of new technological devices, also for the adoption of innovations in products and services that solve problems and optimize daily life situations; particularly influenced by the contributors of innovativeness and optimism.

Finally, regarding personality traits, it can be stated that they are better predictors for developments and innovations that modify the way Colombian society (studied in the sample) do some traditional actions, this means that personality influences the way people plan a trip online or offline, or the way they select the daily route to work in a mobile app or just take any route, or the use they give to the television to connect to internet instead of using a laptop or a PC. Colombians show great respect for traditions and a focus on achieving quick results according to their characterization on the long term orientation dimension of Hofstede, this mean that it is fundamental that new developments on technology based products and services in Colombia has to meet people needs

in the short term, the first product or service version have to have robust specifications always aligned with people expectations, otherwise, the level of adoption in Colombia will be low.

Although there are significant differences in some consumer segments between Colombia and the United States, given in part by differences in the samples used and some demographic variables, it is important to note that this study leads to the conclusion that beyond these differences the existence of these segments was confirmed in both countries. This lead authors to conclude that the understanding of attitudes to technology adoption and its correlation with demographic variables and personality of individuals, are essential to design strategies both in local and global markets.

Companies can understand their consumers from the perspective of the characterization of the segments, and design both digital and offline marketing strategies in order to increase and / or maintain the adoption and usage of their technology-based products and services. Also this tool could be useful to apply internally in the companies with the aim of measure the level of acceptance or adoption of new technology tools by employees, and design campaigns to promote the usage and the optimization of processes by utilizing these technological developments.

#### **14. Limitations of the Study**

The most important limitation of this study is related to the sample. As described in the “*Assessment of Reliability and Validity*” section of this document, it does not resemble very well the profile of the population revealed by the latest accepted census in Colombia in terms of gender and age but most importantly in terms of education level.

Due to the fact that the questionnaire was delivered via email there may also be a sample distortion since the research only focused on people who had access to computing devices, Internet connection and an email account so the entry barrier to technology adoption was already set high.

### **15. Future Research**

While this document is intended to present one of the first researches that allows to cross-cultural validate the TRI 2.0 results for developing countries such as Colombia, other countries in Latin America such as Peru, Mexico or Chile could be subject of further analysis to establish if other countries in the region also respond positively to the findings exposed here.

Besides personality traits, future studies could also test the correlation between cultural values and the scores on the different dimensions of the Technology Readiness Index (TRI 2.0) which can ultimately predict the intention to adopt technological products and services. Such study could be carried out on a national level for Colombia but also segmenting the different regions of the country since they present diverse personality traits.

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## 17. Appendixes

### Appendix #1 - Spanish Questionnaire measuring TRI 2.0, Personality and Culture

#### Adopción de Nueva Tecnología

Completar este cuestionario tardará menos de 10 minutos y sus respuestas serán anónimas y confidenciales. Es parte de un estudio académico que busca relacionar ciertas características de personalidad y cultura con la adopción de tecnología innovadora en el consumidor colombiano.

\*Obligatorio

**1. Las nuevas tecnologías contribuyen a una mejor calidad de vida \***

*Marca solo un óvalo.*

	1	2	3	4	5	
Muy en desacuerdo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Muy de acuerdo

**2. Otras personas acuden a mí para pedir consejo sobre nuevas tecnologías \***

*Marca solo un óvalo.*

	1	2	3	4	5	
Muy en desacuerdo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Muy de acuerdo

**3. Cuando recibo servicio técnico para un producto o servicio de alta tecnología por parte de un proveedor, en ocasiones siento que alguien que sabe más se está aprovechando de mí \***

*Marca solo un óvalo.*

	1	2	3	4	5	
Muy en desacuerdo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Muy de acuerdo

**4. La gente es demasiado dependiente de la tecnología para hacer las cosas por ellos mismos \***

*Marca solo un óvalo.*

	1	2	3	4	5	
Muy en desacuerdo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Muy de acuerdo

**5. La tecnología me da más libertad de movimiento \***

*Marca solo un óvalo.*

	1	2	3	4	5	
Muy en desacuerdo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Muy de acuerdo

6. **En general, me encuentro entre los primeros en mi círculo de amigos en adquirir una tecnología nueva una vez aparece \***

*Marca solo un óvalo.*

1      2      3      4      5

---

Muy en desacuerdo                  Muy de acuerdo

7. **Las líneas de soporte técnico no son útiles porque no explican las cosas en términos que yo pueda entender \***

*Marca solo un óvalo.*

1      2      3      4      5

---

Muy en desacuerdo                  Muy de acuerdo

8. **Demasiada tecnología distrae a la gente al punto que es perjudicial \***

*Marca solo un óvalo.*

1      2      3      4      5

---

Muy en desacuerdo                  Muy de acuerdo

9. **La tecnología da a las personas más control sobre su vida diaria \***

*Marca solo un óvalo.*

1      2      3      4      5

---

Muy en desacuerdo                  Muy de acuerdo

10. **Normalmente puedo aprender a manejar productos o servicios de alta tecnología sin la ayuda de otros \***

*Marca solo un óvalo.*

1      2      3      4      5

---

Muy en desacuerdo                  Muy de acuerdo

11. **A veces, pienso que los sistemas de tecnología no están diseñados para ser usados por gente del común \***

*Marca solo un óvalo.*

1      2      3      4      5

---

Muy en desacuerdo                  Muy de acuerdo

12. **La tecnología disminuye la calidad de las relaciones humanas mediante la reducción de la interacción personal. \***

*Marca solo un óvalo.*

	1	2	3	4	5	
Muy en desacuerdo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Muy de acuerdo

13. **La tecnología aumenta mi productividad en mi vida personal \***

*Marca solo un óvalo.*

	1	2	3	4	5	
Muy en desacuerdo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Muy de acuerdo

14. **Me mantengo actualizado con los desarrollos tecnológicos más recientes en mis áreas de interés \***

*Marca solo un óvalo.*

	1	2	3	4	5	
Muy en desacuerdo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Muy de acuerdo

15. **No existe un manual para un producto o servicio de alta tecnología que esté escrito en un lenguaje sencillo \***

*Marca solo un óvalo.*

	1	2	3	4	5	
Muy en desacuerdo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Muy de acuerdo

16. **No me siento seguro haciendo negocios en un sitio que es exclusivamente "online" \***

*Marca solo un óvalo.*

	1	2	3	4	5	
Muy en desacuerdo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Muy de acuerdo

## Personalidad

Las siguientes expresiones le describen a usted con más o menos precisión. Por favor elija un número para cada una de las siguientes expresiones, indicando así hasta qué punto está de acuerdo o en desacuerdo en cómo cada característica lo describe a usted.

17. **Me veo a mi mismo/a como a una persona - Extrovertida, Entusiasta \***

Marca solo un óvalo.

	1	2	3	4	5	6	7	
Muy en desacuerdo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Muy de acuerdo

18. **Me veo a mi mismo/a como a una persona - Colérica, Discutidora \***

Marca solo un óvalo.

	1	2	3	4	5	6	7	
Muy en desacuerdo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Muy de acuerdo

19. **Me veo a mi mismo/a como a una persona - Fiable, Auto-disciplinada \***

Marca solo un óvalo.

	1	2	3	4	5	6	7	
Muy en desacuerdo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Muy de acuerdo

20. **Me veo a mi mismo/a como a una persona - Ansiosa, Fácilmente alterable \***

Marca solo un óvalo.

	1	2	3	4	5	6	7	
Muy en desacuerdo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Muy de acuerdo

21. **Me veo a mi mismo/a como a una persona - Abierta a nuevas experiencias, Polifacética \***

Marca solo un óvalo.

	1	2	3	4	5	6	7	
Muy en desacuerdo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Muy de acuerdo

22. **Me veo a mi mismo/a como a una persona - Reservada, Callada \***

Marca solo un óvalo.

	1	2	3	4	5	6	7	
Muy en desacuerdo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Muy de acuerdo

23. **Me veo a mi mismo/a como a una persona - Comprensiva, Amable \***

Marca solo un óvalo.

	1	2	3	4	5	6	7	
Muy en desacuerdo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Muy de acuerdo

24. **Me veo a mi mismo/a como a una persona - Desorganizada, Descuidada \***

Marca solo un óvalo.

	1	2	3	4	5	6	7	
Muy en desacuerdo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Muy de acuerdo

25. **Me veo a mi mismo/a como a una persona - Serena, Emocionalmente estable \***

Marca solo un óvalo.

	1	2	3	4	5	6	7	
Muy en desacuerdo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Muy de acuerdo

26. **Me veo a mi mismo/a como a una persona - Tradicional, Poco imaginativa \***

Marca solo un óvalo.

	1	2	3	4	5	6	7	
Muy en desacuerdo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Muy de acuerdo

## Cultura

Por favor marque la opción de respuesta que mejor represente su opinión respecto de cada una de las siguientes afirmaciones.

27. \*

Marca solo un óvalo por fila.

	Muy en desacuerdo	Parcialmente en desacuerdo	Neutral	Parcialmente de acuerdo	Muy de acuerdo
Las desigualdades entre las personas son esperadas y deseadas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Todas las personas crecen para cuidarse solamente a sí mismos y a su familia más cercana	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
El dinero y las cosas materiales son importantes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Estrés alto y sensaciones subjetivas de ansiedad son frecuentes entre las personas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
La disposición a subordinarse uno mismo para cumplir un propósito es normal	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Las personas menos poderosas deberían depender de los más poderosos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Las personas se identifican independientemente de los grupos a los que pertenecen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Se supone que los hombres son asertivos, ambiciosos y fuertes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
El miedo a las situaciones ambiguas y a riesgos desconocidos es normal	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
La gente debería ser perseverante para obtener resultados a largo plazo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Las desigualdades entre las personas deberían minimizarse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Un miembro de la familia extendida debe ser protegido por otro miembro a cambio de lealtad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Los valores dominantes en la sociedad son el cuidado de los demás y la preservación	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
La incertidumbre es una característica normal de la vida y cada día debe ser aceptado como venga	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Posesión o Intención de Comprar Tecnología

Con relación a los siguientes productos o servicios, por favor díganos si los tiene actualmente, si está pensando en comprarlos/contratarlos en los próximos 12 meses, o si no tiene pensado hacerlo.

28. **Con relación a los siguientes productos o servicios, por favor díganos si los tiene actualmente, si está pensando en comprarlos en los próximos 12 meses, o si no tiene pensado comprarlos \***

*Marca solo un óvalo por fila.*

	Lo usó en los últimos 12 meses	Piensa usarlo en los próximos 12 meses	No piensa usarlo
Televisión por Cable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tablet o Smartphone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Servicios Bancarios por Internet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wearable (Ej: Apple Watch)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Servicios de Transporte por Internet (Ej: Uber)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Televisión por demanda a través de Internet (Ej: Netflix)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Música por demanda a través de Internet (Ej: Spotify)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Servicios de Reservas Hoteleras por Internet (Ej: Despegar.com, Airbnb)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

29. **La siguiente es una lista de formas en las que usted puede realizar transacciones comerciales. Por favor díganos si usted ha realizado alguna de estas transacciones durante los últimos 12 meses, si piensa realizarla en los próximos 12 meses, o si no piensa utilizarlas. \***

*Marca solo un óvalo por fila.*

	Hizo alguna transacción durante los últimos 12 meses	Piensa realizar alguna transacción durante los próximos 12 meses	No piensa realizar ninguna transacción
Compró un ticket de avión por Internet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Realizó pagos de servicios públicos domiciliarios por cajero automático o Internet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Compró o vendió productos por Internet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Consultó algún mapa por Internet para planear un viaje	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Utilizó una aplicación que consulta el tráfico en tiempo real (Ej: Waze)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Compró en Internet algún artículo por un valor inferior a COP \$60.000 (USD 20)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Compró en Internet algún artículo por un valor entre COP \$60.000 y \$150.000 (USD 20 y USD 50)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Compró en Internet algún artículo por un valor superior a COP \$150.000 (USD 50)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



30. **A continuación hay una lista de productos o servicios tecnológicos que podrían estar disponibles para usted. Para cada una de ellas, dígame por favor si el producto o servicio que le mencionaré es "muy deseable", "deseable", "si su opinión es neutral", o si el producto o servicio "no es deseable", o "absolutamente no deseable". \***

*Marca solo un óvalo por fila.*

	Muy deseable	Deseable	Opinión Neutral	No es deseable	Absolutamente no deseable
Página Web informativa en Internet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Compras en el supermercado con cajeros robots	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ver un programa de televisión interactivo y elegir su contenido	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Comprar artículos de gran tamaño, como un auto o muebles, por Internet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hacer una llamada telefónica con videoconferencia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enviar un mensaje de voz por Internet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Usar el televisor para conectarse a Internet en lugar de hacerlo a través de la computadora	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tomar clases por Internet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Leer un libro desde un dispositivo electrónico	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Permitir a una computadora diagnosticar y tratar un problema médico	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Solicitar un préstamo por Internet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tener un dispositivo de emergencia que permita ubicar rápidamente a una persona	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Información Demográfica

Esta última sección presenta algunas preguntas demográficas que nos ayudarán a clasificar sus respuestas. Tenga la seguridad que sus respuestas serán anónimas y se utilizarán solamente para analizar estadísticamente los datos. Por favor marque para cada pregunta la alternativa de respuesta que mejor lo represente.

31. **Edad \***

.....

32. **Nacionalidad \***

*Marca solo un óvalo.*

- Colombiano(a)  
 Otro: .....

33. **Ciudad de Residencia \***

.....

34. **Género \***

*Marca solo un óvalo.*

- Masculino  
 Femenino  
 Otro: .....

35. **¿Tiene usted en una profesión u ocupación relacionada con la tecnología como, por ejemplo, computación, programación, ingeniería de sistemas, asesor de sistemas o ventas de tecnología? \***

*Marca solo un óvalo.*

- Si  
 No

36. **¿Cuál es el nivel de educación más alto que ha completado usted? \***

*Marca solo un óvalo.*

- Educación básica incompleta  
 Básica completa  
 Educación secundaria incompleta  
 Educación secundaria completa; o técnica incompleta  
 Algo de estudios universitarios o estudios técnicos de nivel superior completos  
 Universitaria completa  
 Postgrado

