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Critical factors that impact purchase online of new telecom convergent services in the Mexican market (Factores críticos que impactan la compra en línea de nuevos servicios convergentes en el mercado Mexicano)

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Key words: Diffusion of innovations, electronic commerce, structural equations, Smart-PLS, technology acceptance

Abstract. The following article analyzes the principal factors that have an impact in the adoption of new telecom convergent services, through electronic commerce, that have been explored and studied primarily in developed markets such as the United States and that have been deemed as critical factors in the development and growth of online electronic transactions. Specifically, factors and latent variables of this study derive from the models of Technology Acceptance (Davis, 1989) and Diffusion of Innovations (Rogers, 2003). A summary of past empirical studies is provided deriving from the aforementioned theoretical models followed by results of an exploratory field study comprising of 253 valid observations randomly selected from within the population of urban internet users in Mexico. The methodology used to determine the causal relationship between variables (Betas) was factor analysis (Principal Components) and structural equation modeling, specifically Smart-PLS. The study determined that perceived utility and trust variables are statistically relevant and significant in determining purchase online of new telecom convergent services and the development of electronic commerce in the Mexican Market.

Palabras clave: Aceptación de la tecnología, comercio electrónico, difusión de las innovaciones, ecuaciones estructurales, Smart-PLS.

Resumen. Este artículo analiza los principales factores que influyen en la adopción de los nuevos servicios convergentes de telecomunicaciones, a traves del comercio electrónico, que han sido explorados y estudiados principalmente en mercados desarrollados como el de Estados Unidos y que han sido confirmados como factores críticos en el desarrollo y el crecimiento de las transacciones electrónicas en linea. Específicamente, los factores y

variables latentes en este estudio se derivan de los modelos de Aceptación de la Tecnología (Davis, 1989) y la Difusión de las Innovaciones (Rogers, 2003). Se presenta un resumen de los antecedentes de estudios empíricos derivados de los mencionados modelos teóricos, seguido de los resultados de un estudio exploratorio de campo que comprende 253 observaciones válidas seleccionadas en forma aleatoria dentro de la población de usuarios urbanos de Internet en México. La metodología utilizada para determinar las relaciones causales entre las variables (Betas) fue *análisis factorial* (Componentes Principales) y el *modelo de ecuaciones estructurales*, específicamente Smart-PLS. El estudio determina que las variables *percepción de utilidad* y *confianza* son estadísticamente relevantes y significativas en la determinación de compra en línea de nuevos servicios convergentes de telecomunicaciones y en el desarrollo del comercio electrónico en el Mercado Mexicano.

Introduction

The most direct precedent of the impact of social and cultural factors in the introduction of technological services is present in the lived experience of the American market during the 1994 to 2004 period. (Keystone, 2008).

This socio-economical phenomenon commonly referred to as the Internet Bubble, the Dot Com Disaster or the E-Commerce Failure (Horrigan, 2001; The Economist Group, 2000), enables the possibility of analyzing in retrospective how the lack of an in depth analysis of the critical success variables may lead to the creation of business models based on disruptive factors, which in turn without any precedent whatsoever, yield negative results in micro and macroeconomic terms.

It was subsequent to the bursting of the Internet Bubble that empirical research began to be conducted principally in the North American market to identify and evaluate the principal factors critically associated to the behavior of the consumer. This was intended to explain online purchase intent and the process of adopting technological innovations such as purchase/retail transactions in E-commerce.

The most relevant references in this context are: Ranganathan (2007), Keystone (2008), Gefen (2003), Heijden (2003), Lee (2001), Venkatesh (2000), Gefen (2000), Karahanna (1999), Moore (1996), Moore (1991).

E-Commerce in México

E-commerce in Mexico has not had the performance or growth that has been observed in other markets such as the United States, Canada and the

overall European markets, OECD (2007, p. 149-150) AMIPCI (2007, 2008). The consequences of this feeble development can be reflected in Mexican enterprises which have embarked into e-commerce business models only to experience frail and unsatisfactory results in their internet sale launch platforms. Albeit e-commerce in Mexico grew 70% in 2008, (AMIPCI, 2008), the market penetration level is straggled when compared to other economies (Mulpuru, 2009), both from developed countries such as USA and Canada and developing countries such as Brazil.

Table 1 illustrates a comparative framework of Mexico in relation to the aforementioned countries. It can be observed that when adjusted, in terms of population and purchasing power, the levels of e-commerce are 3.5 times higher in Brazil relative to the Mexican market.

Table 1

E-commerce 2008			
	(Thousand Million US Dólares)	**Proportion Higher**	**Adjusted ***
USA	141.3	87.2	8.3
Canada	14.1	8.7	9.0
Brazil	8.2	5.1	3.5
México	1.6	1.0	1.0

* Adjustment in terms of population and income per capita
Source: AMIPCI (2008), Forrester Research (Mulpuro, 2009) y and own calculations.

The number of sources containing empirical research in the context of the Mexican market that allow for an explanation of the low level of e-commerce acceptance and the sale of new convergent telecommunication services is scarce.

Garcia Murillo´s (2004, p. 216-217) more qualitative study determines that a possible cause for rejection of e-commerce purchase and retail schemes is due to the radical change of customs and habits that such models entail. Furthermore, the author derives from the theory of Institutional Economy an explanation that purchase pattern or behavior seen as an institution, can be induced to change stemming from technological transformations. Time required to induce such change depends on how

deeply rooted customs and habits are. Finally Garcia Murillo points out based on the Resource-based Theory on the Firm, the deficient internet infrastructure as a barrier for e-commerce adoption in Mexico.

Models, Variables and Critical Factors

Models. The previously mentioned empirical studies have extrapolated and sustained their analysis in two models or principal theories:

A. Technology Acceptance Model (TAM): Developed by Davis (1989), TAM considers *perceived utility* an *perceived ease of use* factors as critical variables in the process of adoption of a new technology.

B. Adoption and Diffusion of Innovation Model: Developed and updated by Rogers (2003), this model incorporates variables such as *compatibility* and other factors that most researchers such as Davis (1989), Gefen (2000, 2003) and Moore (1991, 1996) conclude are included in the TAM Model.

Variables. Researchers have studied factors surrounding *risk* and *trust* such as *integrity, privacy* and *security*, discovering that they are relevant variables to the study of e-commerce like Gefen (2000), Pavlou (2003), Gefen (2003), McKnight (2002), Gurung (2006), Heijden (2003) and Lee (2001).

Summary of Variables and Models	
Critical Factors	**Model**
Perceived Utility Perceived Ease of Use	Technology Acceptance
Compatibility Integrity	Adoption and Diffusion of Innovation Risk and Trust
Privacy Security	

The manifest variables defined to be introduced into the Model are derived from the identification of latent independent variables and its respective indicators.

Latent Variables	Manifest Variables	Indicators
Perceived Utility (Util)	$X1_a$	Faster
	$X1_b$	Cheaper
	$X1_c$	More Practical and Efficient
	$X1_d$	Very Useful
Perceived Ease of Use (Use)	$X2_a$	Easy to Learn and Use
	$X2_b$	Clear, Understandable and flexible
Risk and Trust (Trust)	X3, Privacy	Extract my personal information
		Trust to give my information
		Private and confidential treatment
		Mi privacy exposed
	X4, Security	Payments are safe
		Credit cards are risky
		Confidence seal gives me trust
		I feel safe purchasing online
	X5, Integrity	Supplier is reliable
		Supplier is honest
		I am going to be overcharged
		Supplier cares for the client
	X6, Compatibility	Used and recommended by family and friends
		Compatible with my lifestyle
Online Purchase Intent (OPI)	M_1	Intent to purchase in the upcoming weeks
	M_2	Intent to purchase my holiday presents
	M_3	Intent to download music or videos in the upcoming weeks
Adoption of Convergent Services (Y)	Y_1	Music over IP
	Y_2	Video over IP
	Y_3	Telephone service over IP

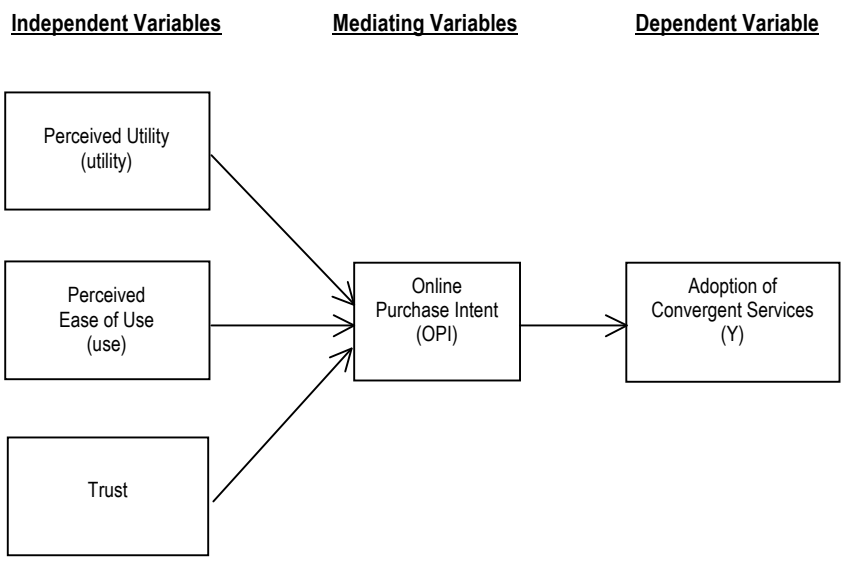
Telecom Convergent Services

Hypothesis, Objectives and Research Model

The relationship between the independent variables *perceived utility*, *perceived ease of use* and *trust*, the mediating variable *online purchase intent* and the dependent variable *adoption of convergent services* is illustrated below as a graphic representation.

The postulated hypotheses relevant to the proposed research model are derived from the presumption of the casual relationships between the independent variables, the mediating variables and the dependent variable and based in aforementioned existing theorical models and empirical research studies.

The hypothesis and specific objectives are formulated based on the premise that there is a significant relationship amongst variables and the non trivial assumption that the variables are critical factors with weights or Betas above 15%.



Research Hypothesis. The latent variables *perceived utility*, *perceived ease of use* and *trust* are critical factors in determining online purchase intent through e-commerce and the adoption of convergent services.

The null hypothesis and the alternative hypothesis are derived from the causal relationship of each independent variable. Such causal relationship is measured through the standardized regression coefficient (Beta).

Causal Relationship	Null Hypothesis	Alternative Hypothesis
Utility - Y	$\beta 1=0$	$\beta 1\neq 0$
Utility - OPI	$\beta 2=0$	$\beta 2\neq 0$
Use - OPI	$\beta 3=0$	$\beta 3\neq 0$
Trust - OPI	$\beta 4=0$	$\beta 4\neq 0$
OPI - Y	$\beta 5=0$	$\beta 5\neq 0$

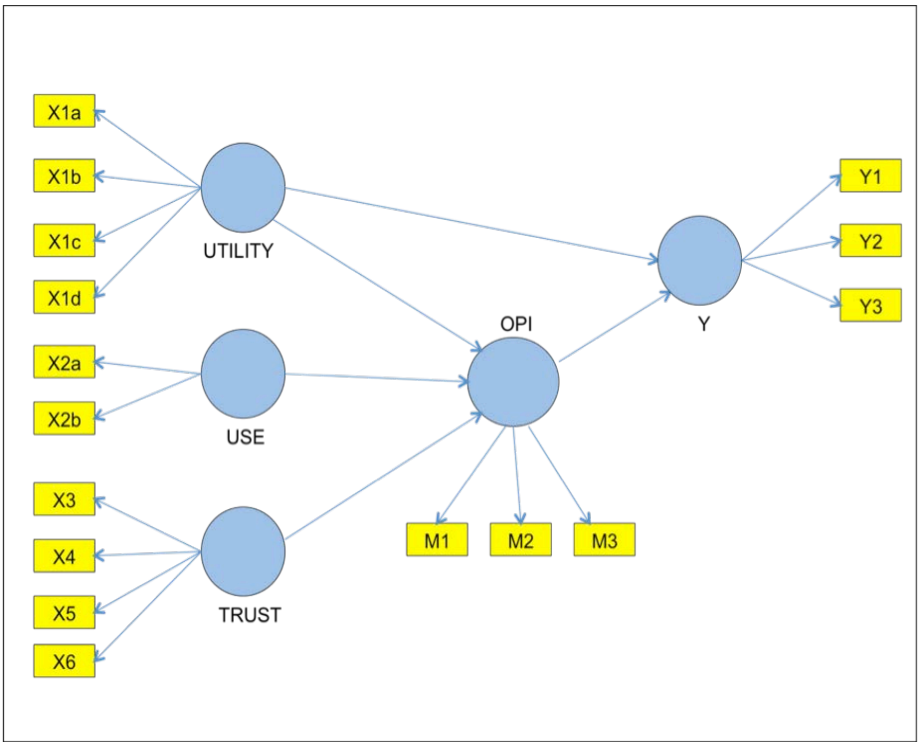
Specific Research Objective. To determine which latent independent variables have a relevant influence and are statistically significant in the development of electronic commerce and the adoption of new convergent services.

Methods and Techniques

Based on the definition of the variables of the model and their specific characteristics, it was decided to use the multivariable statistical method known as structural equation modeling (SEM)

The focus of this study is centered on statistically analyzing the structural model composed on the relationship of the latent variables. The selected program was Smart-PLS which analyzes the structural relationships and at the same time validates the measurement model comprised of manifest and latent variables.

Structural Model



Measurement Instrument

Surveys containing the relevant indicators to each and every variable and information needed were implemented. Surveys are considered the best and most common method to collect information and generate data. Surveys allow for handling a representative sample of a population that is too large and disperse to be directly observed. (Babbie, 2004 on Keystone, 2008).

Hence, the measurement instrument developed for this research is a survey based on previous studies that have been tested for equivalent variables considered for this project. A five level Likert scale was employed considering gradual intensity growth and uni-directionality of the descriptive levels of the indicators.

Table 2

Scale	**Descriptive Level**
1	Not agree
2	Somewhat agree
3	Agree
4	Very Much agree
5	Totally agree

Research studies have been identified in existent academic literature which have followed a rigorous empirical methodology for each one of the factors or variables consider in the present research model.

Table 3

Latent Variable	**Factor**	**Reference**
Utility		Keystone (2008), Davis (1989)
Ease of Use		Keystone (2008), Liu (2004), Davis (1989)
Trust	Privacy	Gurung (2006), KIM (2004)
	Security	Liu (2004), Moore (1991)
	Compatibility Integrity	Gefen (2003), Pavlou (2003), McKnight (2002), Gefen (2000)

The survey was developed through a commercial software platform designed for both numeric and qualitative questions and prepared for internet interaction. The platform named Survey Monkey can be accessed through the following internet site: www.surveymonkey.com.

The answers collected through this platform are coded and installed in a flexible database that can be exported to an Excel data file.

Results

From a 25,000 survey base randomly distributed across a sample of 140,000 internet users, 1496 valid answers were obtained. From those, it was adjusted to 253 complete and valid answers in order to be 100% representative of the total urban user population of Mexican internet users.

Information was subsequently fed to Smart PLS software, yielding the following results:

Quality and Reliability Indicators				
	Extracted Variance Larger than 50%	Composed Reliability Larger than 70%	Cronbach´s Alpha Larger than 70%	R2
Trust	0.7803	0.9342	0.90688	
OPI	0.6284	0.8346	0.70028	0.370
Use	0.8615	0.9256	0.84139	
Utility	0.6521	0.8811	0.81858	
Y	0.7029	0.8747	0.78294	0.444

The indicators of the average extracted variance, the reliability components, and the Alpha consistency yielded acceptable levels for all variables in order to qualify the model as adecuate and with a good consistency as per acceptable levels defined by Garson (2009), Chin (1998) and Ringle (2005).

The R^2=0.370 indicator that measures the proportion of *online purchase intent variance* and R^2=0.444 indicator that measures the proportion of adoption of convergent services variance explained by the independent variables, are placed within the moderate effect category.

The results corresponding directly to the standardized regression coefficients (Betas) as well as their T test significance indicators were calculated through the Smart PLS program that allowed for 200 multiple samples through Bootstrapping, technique necessary to estimate the mean, standard derivation and the T values presented below.

Causal Relationship Indicators

Causal Relationship	Betas *	Mean	Standard Deviation	T Test	P (α/2)
Utility - Y: β1	0.337	0.334	0.096	3.500	0.000
Utility – OPI: β2	0.138	0.144	0.122	1.138	0.127
T.E. Utility – Y: β1,β2	0.398	0.398	0.099	3.979	0.000
Use – OPI: β3	0.080	0.078	0.126	0.634	0.264
Trust –O PI: β4	0.448	0.449	0.099	4.528	0.000
T.E. Trust - Y	0.195	0.196	0.055	3.516	0.000
OPI – Y: β5	0.435	0.439	0.082	5.331	0.000

*Standarized ; T.E. = Total Effect

The following outcome derives from the results table:

- *Perceived utility* and *trust* are critical and relevant factors with weights of 39.8% and 19.5% respectively and significant at 95% confidence level regarding *disposition to adopt convergent services*.
- Trust is a critical and relevant factor with a weight of 44.8% and significant at 95% confidence level regarding *online purchase intent*.
- *Online purchase intent* is relevant with a weight of 43.5% and significant at 95% confidence level as mediating variable between *perceived utility* and *trust* with *adoption of convergent services*.

Hypothesis Testing

- The null hypothesis is rejected (H_o:β=0) at a 95% confidence level for:

Causal Relationship	Weight β
T.E. Utility – Y : **β1, β2**	39.8%
T.E Trust – Y : **β4, β5**	19.5%
Trust – PI : **β4**	44.8%
PI – Y : **β5**	43.5%

T.E.=Total Effect

- It is not possible to reject the null hypothesis (H_o:β=0) for the following variables at a 95% confidence level:

Casual Relationship	Weight β
Utility – Y : **β2**	13.8%
Use – OPI : **β3**	8.0%

Validation and Optimization

Validation. A specific mathematical model was designed as part of a confirmation process of the results obtained through the program Smart-PLS. This model can be consider an alternative method to solve the structural equations system previously presented.

The model was developed with the Excel based program Frontline *Solver* and was implemented through the *Opt-Quest* optimization engine based on the metaheuristic methodology of TABU SEARCH.

A description of the mathematical model used for result validation is presented:

Sets and Parameters:

N= Set of cases from the Structural Model sample ($\forall$ i $\in$ N, i = 1…253)

M= Set of manifest variables from the Structural Model ($\forall$ k $\in$ M, k = 1…16)

S_1 = Set of latent variables for the Regression Model of OPI ($\forall$ $S_1 \in$ 1…3)

S_2 = Set of latent variables for the Regression Model of Y ($\forall$ $S_2 \in$ 1…2)

X_{1A}, X_{1B}, X_{1C}, X_{1D} = Manifest variables of the latent independent variables (UTIL)

X_{2A}, X_{2B} = Manifest variables of the latent independent variable (USE)

X_3, X_4, X_5, X_6 = Manifest variables of the latent variables (TRUST)

M_1, M_2, M_3 = Manifest variables of the mediating latent variable (OPI)

Y_1, Y_2, Y_3 =Manifest variables of the dependent latent variable (Y)

Z = Total set of latent variables of the Structural Model $\forall$ Z $\in$ {UTIL, USE, TRUST, OPI, Y}

Decision Variables:

$-1 \le W_k \le +1$ $\forall$ k $\in$ M: Outer Weights for each manifest variable

$-1 \le B_j^{ICL} \le +1$ $\forall$ j $\in S_1$: Optimal Betas out of Regression Model for variable OPI

$-1 \le B_j^{Y} \le +1$ $\forall$ j $\in S_2$: Optimal Betas out of Regression Model for variable Y

X_i Bin $\forall$ i $\in$ N $\begin{cases} 0 \text{ i case not selected for optimal partition} \\ 1 \text{ i case selected for optimal partition} \end{cases}$

Linearity restrictions on the latent variables derived from manifest variables:

$$\text{UTIL} = \sum_{k=1A,1D,\ k\subseteq M} X_k W_k \quad (1)$$

$$\text{USE} = \sum_{k=2A,2B,\ k\subseteq M} X_k W_k \quad (2)$$

$$\text{TRUST} = \sum_{k=3...6,\ k\subseteq M} X_k W_k \quad (3)$$

$$\text{OPI} = \sum_{k=1...3,\ k\subseteq M} M_k W_k \quad (4)$$

$$\text{Y} = \sum_{k=1...3,\ k\subseteq M} Y_k W_k \quad (5)$$

$\forall$ Z $\in$ {UTIL, USE, TRUST, OPI, Y}

Mean and Variance Restrictions for Latent Variables:

$$\sqrt{\frac{\left(VL_Z - \overline{VL}_Z\right)^2}{n}} = 1, \qquad \forall\, Z \in \{\text{UTIL, USE, TRUST, OPI, Y}\} \tag{6}$$

$$\overline{VL}_Z = 0, \quad \forall\, Z \in \{\text{UTIL, USE, TRUST, OPI, Y}\} \tag{7}$$

Optimal Cases Partition Restriction (200 case mínimum):

$$\sum_{i=1\ldots253} \sum_{i \in N} X_i \geq 200 \tag{8}$$

Objective Function:

1. Maximize extracted variance (EV) from latent variables deriving from manifest variables. EV represents the Pearson Coefficients squared.
2. Maximize the determination coefficients (R^2) of dependent variables.

$$Maximize \sum_{\forall\, Z \in \{\text{UTIL, USE, TRUST, OPI, Y}\}} \sum_{\forall K \subseteq M} R^2\left(VL_Z \middle| \{VM_K\}\right) + R^2\left(Y, S_2\right) + R^2\left(OPI, S_1\right) \tag{9}$$

The aforementioned signifies that the relation between manifest variables versus latent variables should not be in terms of extracted variance (EV) but rather in the form of linear calculation and determined by the specific weight that each manifest variable has over the latent one.

In order to implement this new restricted view, the only thing required to do is to define the optimal weights that each measurable variable has over corresponding variables as decision variables. Having done that, the mathematical model calculates the new latent variables (now constrained) as the product sum of measurable variables by the optimal weights obtained via the optimization model. Hence, it is possible in this model to categorically state that the new latent variables are a linear relationship of measurable variables.

The results of this model are shown below:

Latent Variables	UTIL	USE	TRUST	OPI	Y	TOTAL
Extracted Variance (VE)	65.2%	86.3%	78.1%	70.3%	70.3%	71.6%
R^2				37.2%	44.5%	
Betas	0.1188	0.0803	0.4679	0.4242	0.3550	

In the COMPARATIVE MODEL RESULTS (table 4) it can be observed that the results of the goodness of fit indicators (factor loadings, extracted variance, R^2 of OPI and Y), of the beta coefficients between latent variables and the specific weights of manifest variables of the mathematical model MODMAT 253 are statistically equal to the results yielded by the Smart-PLS 253 Model. This result grants validity to the *Smart*-PLS optimization algorithm having as an objective to maximize the extracted information of observable variables through a factor analysis (Principal Components), and explained variance of the dependent variables through the independent variables measured through $R^{2.}$

Optimization. Once it was confirmed and validated that the mathematical model developed to optimize the results of the case study converges and produces the same results as *Smart*-PLS, it was proceeded to develop a model focused on the optimal selection of cases in a structural equation system.

The following structural equations model refers particularly to the problem of optimal case selection (i.e. optimal partition model). This is intended for elimination of outliers. In other words, it consists in finding an optimal partition of cases that allow to simultaneously maximize the extracted variance (EV) of the measurable variables as well as maximizing the R2 determination coefficients of the dependent variables. To achieve the previously stated result, a three stage strategy was implemented:

1. An optimization model with all the latent constrained variables for the totality of cases (MODMAT) is executed. This model contains the optimal weights W_{1J} that each measurable variable J has in the construction of variable K. This is done considering the total cases of the sample. The B_{1K} regression coefficients that describe the causal relationships between each latent variable K are obtained through this model.

2. Subsequently, a case selection model is executed for outliers identification purposes. This new model removes the identified cases keeping the same weights W_{1J} for the manifest variables that were obtained in the previous stage. Nevertheless, this new model re-optimizes the Beta variables to obtain new B_{2K} regressor coefficients. This with the finality of maximizing the R^2 regression coefficients of the dependent variables but now considering the optimal case partition. This model requires adding the binary variables for the optimal case selection. Decision variables for the B_{2K} Beta regressors are recalculated considering the new optimal partition.

3. This last stage executes a new run of the MODMAT optimization model. Nevertheless this time the only cases applied are those which have been selected by the optimal partition model of the previous step. As it is expected, this run will produce new optimal weights W_{3J} that each measurable variable J has in the corresponding latent variable K. The same happens referring to the re-calculation of the new B_{3K} Betas considering the optimal partition obtained in stage two.

The obtained results can be seen in the MODMAT 200 case column, in the **COMPARATIVE RESULTS OF MODELS** (table 4) where it can be observed that considerably larger results in terms of R^2 of OPI and Y are produced by eliminating 53 outliers. Also the calculations of Betas (4 out of 5) are strengthen whilst the measurement model represented by the outer weights do not show significant differences. These results may be observed in the Comparative Model Results table comparing the column MODMAT 200 cases with MODMAT 253 cases.

As a complementary measure we proceeded to perform an inverse validation of the mathematical model. This was done by loading in Smart-PLS the optimized base of 200 cases. As can be observed in the Comparative Model Results table, the 200 case results of Smart-PLS are practically the same as the MODMAT 200 cases.

Comparative Result of Models

Table 4

		MODMAT 253 Casos	SMART-PLS 253 casos	MODMAT 200 Casos	SMART-PLS 200 casos
FUNCION OBJETIVO A OPTIMIZAR	Maximizar Total Varianza Extraída (R2 - AVE)	W = 1		W = 1	
	Maximizar Coef. Determinación R2 (ICL, Y)	W = 1		W = 1	
VARIABLES A OPTIMIZAR	PESOS de Variables Medibles (Outer Weights)	X		X	
	Coeficientes de Regresión Betas	X		X	
	Variables Binarias Selección de Casos (Partición Óptima)				
RESTRICCIONES	Normalidad en Variables Latentes	X		X	
	Coeficientes de Determinación R2 (ICL, Y)	F.Obj		F.Obj	
	Ortogonalidad Variables Independientes	Libre		Libre	
	Selección Mínima de Casos				
INDICADORES DE AJUSTE	Suma Total de Cargas Factoriales (Coef R)	13.47	13.47	13.44	13.44
	Suma Total de Varianza Extraída (R2 - AVE)	11.46	11.45	11.43	11.43
	% Total de Varianza Extraída	71.61%	71.54%	71.45%	71.43%
	Coeficiente Determinación R2 (ICL)	37.16%	37.03%	63.05%	63.01%
	Coeficiente Determinación R2 (Y)	44.46%	44.36%	72.11%	71.76%
Coeficientes Betas: Regresión ICL	Utilidad	0.1188	0.1385	0.2691	0.2719
	Uso	0.0803	0.0799	0.1755	0.1801
	Confianza	0.4679	0.4484	0.4328	0.4212
Coeficientes Betas: Regresión Y	ICL	0.4242	0.4348	0.5403	0.5470
	UTILIDAD	0.3550	0.3375	0.3777	0.3662
Y	Y1	0.4345	0.4407	0.4333	0.4391
	Y2	0.4323	0.4357	0.4394	0.4341
	Y3	0.3140	0.3013	0.3108	0.3100
ICL	M1	0.4140	0.4104	0.4286	0.4321
	M2	0.4631	0.4376	0.4257	0.4136
	M3	0.3815	0.4163	0.3987	0.4078
UTILIDAD	X1a	0.2585	0.3243	0.2738	0.3246
	X1b	0.3546	0.3517	0.3785	0.3497
	X1c	0.3431	0.3154	0.3437	0.3296
	X1d	0.2715	0.2380	0.2471	0.2452
USO	X2a	0.5412	0.6008	0.5475	0.5951
	X2b	0.5352	0.4744	0.5389	0.4905
CONFIANZA	X3	0.2503	0.2357	0.2576	0.2451
	X4	0.2881	0.2845	0.2867	0.2828
	X5	0.2544	0.2603	0.2650	0.2694
	X6a	0.3372	0.3488	0.3068	0.3181

Conclusions and Recommendations

Main Findings. It is relevant to point out as a main finding of this study that there exist critical factors different to the structural variables of every market that explain and determine in a generic manner the behavior of the Mexican consumer. This is the case when the consumer faces a new technology or an innovative way of acquiring and consuming products and services such as electronic commerce and convergent telecommunication services.

It is not enough for the Mexican market or the economy as a whole to merely satisfy availability and accessibility requirements of internet infrastructure and drive competition through quality and price to secure the development and growth of new market such as e-commerce.

There is a need to take into consideration the variables and psycho-social and cultural factors that influence human behavior in the presence of a new technology or innovation that implies a change in habits and behavior patterns.

It is clear and evident from the obtained results that the *perceived utility* and *trust* variables are critical in determining online purchase intent. These results are congruent and consistent with empirical studies carried out in the e-commerce market of the United States (Keystone (2008); Renganathan (2007), Gefen (2000, 2003, 2004)).

Within the variable *trust*, the indicator relating to *compatibility (X6),* which denotes cultural attributes such as customs and habits of Mexicans, has the highest weight (W=35%) or influence in the development of E-commerce and in the adoption of new telecom convergent services.

The variable *perceived ease of use* did not yield relevant nor significant results. This means that this variable is not an obstacle to the development of e-commerce*. Internet users acknowledge that E-commerce platform is easy to learn and use.*

Once the outliers (53 cases) are eliminated, the sample optimization allows to review the model´s strength or degree of fitness deriving from the growing R^2 that improves from 44% to 72% for the dependent variable *Y* and eventually leads to a reconsideration of the causal relationship of *perceived utility* with *online purchase intent*, now being relevant (Beta 27%) and significant at 95%.

Nevertheless, such review must consider reservations and precautions in overestimating specific results when manipulating data collected from a sample.

Recommendation. It is prudent and recommended to realize a detailed and congruent analysis that will allow to confirm statistically that by eliminating outliers the new resulting sample will be representative and without bias of the target population.

Once the mathematical model MODMAT is validated against the Smart-PLS program, it is recommended to use the MODMAT model to carry out group analysis of internet users identified by different control variables such as:

1. Gender
2. Socio Economical level
3. Age
4. Occupation
5. Attitude towards technology

These additional analysis will lead to a sound confirmation of the level of impact of the critical factors and a deep understanding of how the influence of these factors is modify depending on the profile of the internet user.

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