Relationship and digital marketing:
Evaluation of a digital information system using an integration of TAM, TTF and KMV models

Marketing digital e de relacionamento:
Avaliação de um sistema de informação digital usando uma integração da TAM, TTF e modelos KMV

Plínio Rafael Reis Monteiro, Raquel Vaz de Mello Strambi Zeringota
Universidade Federal de Minas Gerais.

ABSTRACT

The increasing popularity of internet promotes new forms of entertainment, communication and work, such as portals, which aim to disseminate information and foster relationships among stakeholders. This study sought to demonstrate how technological interaction portal of an Educational Institution affects attitudes (satisfaction, trust and commitment) and behavioral intentions (usage level, loyalty and positive communication) of students. From a survey designed by TAM, TTF and KMV mode1 ls the study showed that the characteristics and suitability of technology on perceived influence in moderating the portal and attitudes of behavioral intentions to study hospital use.

KEYWORDS: Portal; Digital, Evaluation of information retrieval system

RESUMO

A ascendente popularidade da internet prolifera formas de entretenimento, comunicação e trabalho, tais como os portais, que visam difundir informações e fomentar relacionamentos entre stakeholders. Este estudo buscou verificar como a interação tecnológica do portal de uma IES afeta atitudes (satisfação, confiança e comprometimento) e intenções comportamentais (utilização do portal, lealdade e comunicação positiva) dos discentes. A partir de um survey concebido pelos modelos TAM, TTF e KMV o estudo evidencia que as características e a adequação da tecnologia influenciam na utilidade percebida no portal e nas atitudes moderadoras de intenções comportamentais para a instituição estudada.

PALAVRAS-CHAVE: Portal; Digital, Avaliação de sistema de recuperação de informação

Contact

¹Plínio Rafael Reis Monteiro
Universidade Federal de Minas Gerais.
Belo Horizonte, MG.
Email: preisufmg@gmail.com
ORCID: http://orcid.org/0000-0002-5626-2945

1 INTRODUCTION

1.1   *Relationship marketing and digital marketing*

From the 1980s, with increased competition and the perception that keeping customers is cheaper, simpler, and more profitable than winning new ones, relationship marketing began to gain the attention of researchers (NAKAGAWA; GOUVÊA, 2006).

For Parvatiyar and Shelth (2001), relationship marketing is a business philosophy that focuses on the establishing, maintaining and improving of customers and partners' relations in a cost-effective way for both parties. The focus of relationship marketing is the long-term relationships between seller and buyer, and other stakeholders that maintain direct or indirect ties with the company and that are upheld on collaboration and cooperation between the parties.

It should be noted that the relationship between buyers and sellers is the ground for marketing in its relational or transactional approach. According to traditional marketing thinking, commercial exchanges occur in an impersonal way, through promotion and mass distribution. Companies operating in this logic offer products and services through intermediaries, while the customer offers money. In this "restricted" perspective, consumers are considered numbers, mere statistical data. At the same time, the purpose of relationship marketing is long-term exchanges that add value to both the buyer and the seller (GUMMESSON, 2002). In this scenario, the search for the conservation of relational exchanges gains impetus in the profusion of the internet and its importance in the daily life, both social and business, approaching the field of relationship marketing to the so-called digital marketing.

Digital marketing can be defined as the use of available online tools as way to meet the consumer demands and. For this, it is necessary to involve merchandising, propaganda and all the concepts already known in market theories (TORRES, 2009).

With the growth of users connected to the Internet, it is necessary to include digital marketing in the strategic planning of companies. The importance of studying corporate websites is the establishment, maintenance or consolidation of communication processes between the organization and the client, which may trigger a business transaction. (CARVALHO, CARVALHO, CARVALHO, 2007).

According to Agustini and Minciotti (2003), companies must create new relationships with the consumer and identify why they prefer to buy online rather than going to the store. The interactivity, offered by the Web 2.0, the connectivity, possible through online systems, and creativity, help to obtain information that aides at managing the client relationship. Establishing a continuous dialogue results in a lasting relationship in the knowledge of the client's psychographic profile, lifestyle and buying behavior.

A new challenge for the organizations arises: to work effectively in the virtual world, as consumers and new professionals who will enter the job market are born with a digital DNA and are familiar with these new tools (TERRA, 2010). On the internet, competitors are just a click away, making this environment even more competitive and vulnerable. Customers evaluate their experience online through comments and return to sites if their experience has been positive (FARIAS, 2006).

Currently, the competitive advantage of a company is closely linked to its relationship capital, which is translated by reputation, trust and networking. These concepts must be applied in the relationship between customers, suppliers, partners and employees. A study developed by Hernandez (2008) found that the lack of trust in e-commerce transactions was one of the first barriers to the growth of this area. The websites' Privacy Policy is a matter of concern to businesses and customers. Through the internet, it is possible to trace information about the behavior and profile of the Internet user; Relationships built over many years can be compromised if the consumer has their personal information displayed. (CARVALHO, CARVALHO, CARVALHO, 2007).

According to Alves, Lamounier and Jabur (1999), a breakdown in the online systems of companies causes significant damage to their image, scratches their credibility in the market and may be liable to a lawsuit by users. Balarine (2002) argues that opting for large investments in Information Technology in order to develop projects by impulses or trends, is risky.

The relationship between clients and organizations progressively permeates the interactions that take place in the virtual environment, in a way that relationship and digital marketing will be increasingly associated, making it impossible to devise shared value strategies of shared value generation without mediation of the Internet, through social media, websites, apps and portals (HOLLENSEN, 2010, LEEFLANG et al., 2014)

1.2 Portals

Portals are a way to retain and share knowledge and, above all, to overcome some challenges for organizations, such as maintaining a lasting relationship with the client through a digital platform and obtaining feedback on investments made for the developing and maintenance of a portal. They are characterized by the large amount of information they store, differing from the idea of a simple internet site, since a site tends to be more static, less interactive and does not present complementary services to the purpose activities of the organization, especially through the custom login areas. The portals also enable the creation and reuse of knowledge, content generation processes systematization and are sources of knowledge and interaction. However, in order to reach these goals, portals must offer reasons for users to visit them repeatedly, being more than mere channels of interaction and information, but also links that facilitate and make the services provided to users more dynamic (TERRA; GORDON, 2002).

Portals have the potential for companies to embark on meaningful transformations of their business models, providing a basis for the development of relationships beyond the boundaries of the company. Because of this approach, faster innovation cycles, better environments, better customer service, partnerships, higher revenues and lower costs occur. It can be added portals benefits: information and knowledge flow, greater integration, broad, coordinated and project-based approach, connections between people and between people and information (TERRA; GORDON, 2002).

Companies should be concerned with good usability, allowing the user to achieve their goal, reaching the desired result efficiently, that is, with quality and competence, without loss or wastage of time and without errors of course. (2005). Despite the great advances in information technology in the last decade, the matter of usability has not been able to keep up

with it, as this is a question of human behavior, and people do not change radically in just a decade (NIELSEN, LORANGER, 2007) .

Accessibility should also be considered when working with the global information network, the internet. One of the principles of accessibility for users with impaired vision - such as the elderly, those with myopia – is control over font size or, in the case of the blind, navigation with vocalizers.

For Nakagawa and Gouvêa (2006), the buying experience of an online consumer comprises three main elements: interface quality, meeting quality and execution quality, interpreted as process, experience and results, items in which the authors suggest excellence by organizations.

1.3   Information Technology Use Models

1.3.1   TAM Model

The lack of acceptance by the users has been a deterrent to the success of information systems. Davis (1989) proposed a technologic acceptance model (TAM) based on the principles of the Rationalized Action Theory, who argues that beliefs lead to attitudes that trigger intentions that culminate in behaviors. TAM aims to be a reference to the impact of external factors on internal beliefs, attitudes and intentions (Fishbein and Ajzen, 1975, apud Vasconcellos, 2008).

Image 1 showcases the TAM proposal. Attitudes that lead to the use of a system come from two beliefs: ease of use and perceived utility. SI design directly influences ease of use and perceived utility (DAVIS, 1989).

According to Davis (1989), ease of use can be understood for the user as how much effort a system will demand. Perceived utility is measured as how much the use of a system will improve the performance of the individual in performing a task.

According to a research conducted by Davis (1993), the perceived utility variable is more significant and stronger than perceived ease. Perceived Utility is influenced by several external factors, independent of the Perceived Facility. For example, if one of two systems equally easy to operate presents better results, it will be presented as having a better perceived utility than the other. A system that presents better results, but is more difficult to operate will be perceived as more useful than the one that does not show good results (SALEH, 2004).

TAM has a questionnaire that will be used in this research, whose questions were created from the indicators present in this model. They are defined as TAM indicators: ambiguity and interdependencies in the tasks, perceived utility, website use intention and characteristic of the technology.

Image 1. Technologic Acceptance Templates (TAM)
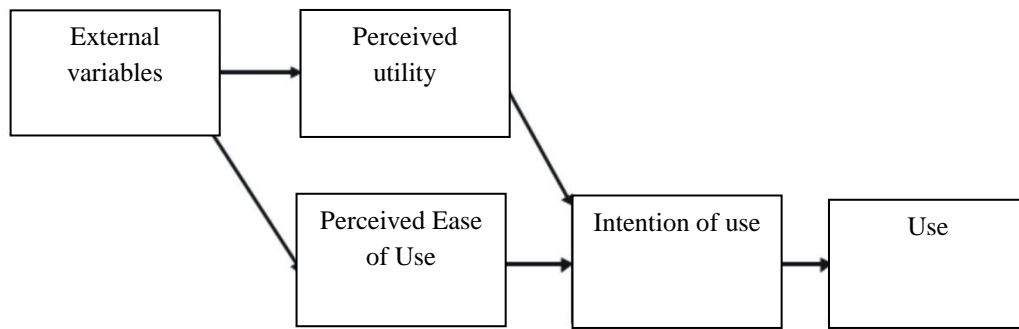
Source: DAVIS, 1989, p8

1.3.2 Task Technology Fit model (TTF)

The Task Technology Fit model proposes that the suitability of the technology to the task impacts the performance. The focus on adequacy has evidence in research that has demonstrated, after a series of laboratorial experiments that the impact on performance depends on the adequacy of the technology to the task. Information systems only have positive impacts on performance if there is an adequacy between their functionalities and the need required by the task (Goodhue; Thompson, 1995).

A connection between suitability of the system and its use is also suggested. At an organizational level, they are related: at the individual level, work adequacy is a strong construct that predicts the use of technology in a workstation (Goodhue; Thomas, 1995).

When adopted separately this model has some limitations. For some users, using some systems indicate more the designation of the work than its quality, utility or attitudes favorable to its use (Goodhue; Thomas, 1995).

The TTF model contains the following constructs: quality, access, autorization, compatibility, production time efficency, trust in the system, ease of use, training, consulting and user relations.

The quality indicator can be translated as how up-to-date, correct, and reliable is the information in the portal, with appropriate levels of detail for the user to use. Access refers to the easiness of finding data and understanding the language used. The authorization indicator can be understood as how much useful and important information is available. Compatibility portrays how much the presented information is coherent and aligned with other content sources.

The "production time efficiency" dimension indicates how fast important information is posted on the site. The "portal reliability" implies how much the system is available in the air, without frequent errors and slowness in its navigation. The "ease of use" indicates how much intuitive navigation the portal presents, being the logic the minimum effort to reach the proposed goal. "Consulting" is an indicator that aims to signal how much a student believes they will get the support of the computer department if need be. Finally, the "user-relationship" indicator of the TTF aims to demonstrate how much the site meets the demands of the students, through fast and certain answers.

Dishaw and Strong (1999, apud KOPPING AND MCKINNEY, 2004) demonstrated the effectiveness of combining TAM and TTF models in the adoption of technologies. Separately, TTF is more effective in explaining work tasks, but combined, they become a superior model capable of better explaining user behavior in adopting technology. TTF affects ease of use, but surprisingly does not affect the usability of use. In this research, the TAM model combined with the TTF model was used as shown in Figure 2.

Image 2. Combination of templates TAM + TTF -
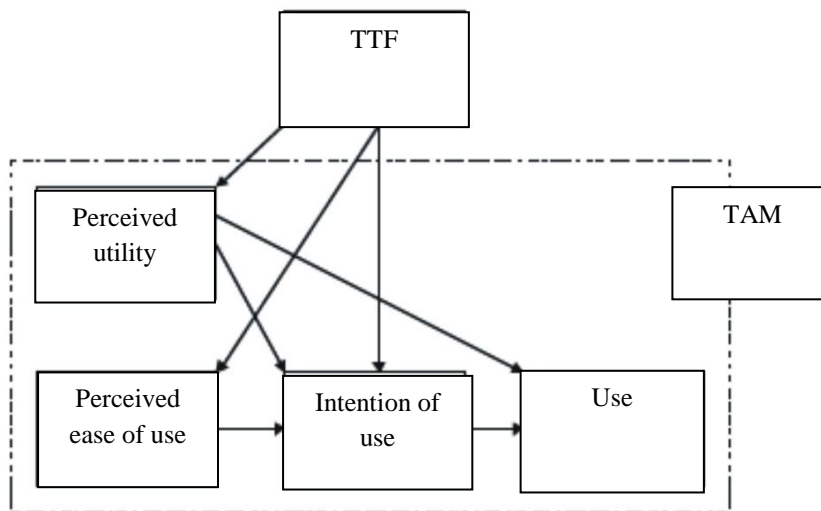
Source: Klopping and Mckinney (2004).

1.3.3   Relationship Key Moderators Template

The 1980s witnessed the biggest change in relationship marketing in both theory and practice. With the increasing conception of the predatory competition practices limitations, many companies are learning that they must work collaboratively with suppliers, distributors, and customers to ensure sustainable returns to members of a supply chain (MORGAN and HUNT, 1994).

This emerging philosophy presupposes that there is a foundation of mutual interests and agreements, in which the market is not a jungle, but a complex and interdependent and therefore fundamentally cooperative system (MORGAN and HUNT, 1994).

Maintaining and deepening customer relationships are tasks that express the principle of relationship marketing, where the essence is the profitable and lasting exchange among the participants. Dwyer, Schurr and Oh (1987, apud MORGAN, HUNT, 1994) propose that relationship marketing refers to all marketing activities aimed at establishing, developing and maintaining successful relational exchanges.

In the area of communication, a key construct is credibility, originally defined as trust in the speaker by the listener. Effectiveness in services depends on trust management because the customer buys a service before trying it. In companies, the requirement for trust is the basis of loyalty. Morgan and Hunt (1994) argue that partnering with one entails a share of risk and reward, and games aimed at both parties gaining requires mutual trust.

Trust influences commitment to relationships because trust-based relationships are so valuable that the parties want to commit to them (Morgan, Hunt, 1994).

After two decades of studies and researches on organizational field commitment, Morgan and Hunt (1994) identified the most important precursors of relationships based on trust and commitment: the costs of terminating relationships and benefits in relationships directly influence commitment. Also, values influence commitment and trust in relationships and communication and opportunistic behavior influence the trust that indirectly influences commitment (MORGAN; HUNT, 1994). This study considered the Hunt and Morgan model as the basis of relationship marketing research, using mediating variables (satisfaction, commitment and trust) and their consequences (propensity for loyalty and positive word of mouth), as consequences of the characteristics of technology and its applications, proposed in the TAM and TTF models.

1.4   Construction of research template

As shown previously, the basis of this model is the conjugation of technology adoption models (TAM + TTF) and relationship (KMV), under the premise that the digital technology, represented in this case by the portal, emerges as an important foundation in building the relational bases between the organization and its target audience.

According to Klopping and Mckinney (2004), both the technology adequacy, expressed in the TTF model, and its characteristics are relevant for its use. The combination of these research models originates the hypotheses originally conceived by Goodhue and Thompson (1995) and Davis (1989) in a structure proposed by Tolentino et al. (2007), giving rise to the hypotheses H1 to H4.

However, the claim of the importance of technology as antecedent and central point of relationship in relation to relationship marketing has recently been debated in the literature (HOLLENSEN, 2010, LEEFLANG et al., 2014, OKADA, SOUZA, 2011). These authors highlight the importance that digital tools exert to foster relationships between organizations and the target market (NAKAGAWA; GOUVÊA, 2006). These relationships necessarily cross key mediators in the context of relationship marketing (MORGAN; HUNT, 1994). In this sense, the integration proposal consists precisely in linking the adequacy and the of technology characteristics as a means of satisfaction, trust and commitment of the users/clients. This assertion supports the hypotheses H5 to H17 of the research model.

From the point of view of relationship marketing, the end variables typically represent behavioral consequences such as propensity for loyalty and positive communication (word of mouth). In the KMV model, it is suggested that satisfaction, but especially trust and commitment, represent the mediators of the transactional bases, in this case inherent in technology, for the expected results in relationship management. This finding, based on Alejandro et al. (2011) and Vieira, Monteiro and Veiga (2011), supports the hypotheses H19 to H21 and H23 to H25. Finally, hypotheses H22 and H18 refer to the direct impact of perceived utility on the system as a precedent of loyalty and positive word of mouth, consistent with the premise that utility refers to an attitudinal construct of cognitive origin (DAVIS, 1989), differently from satisfaction that has an affective nature. Thus, the conjugated models represent distinct but complementary behavioral antecedents of the effect of technology in fostering the relationship between students and the organization studied. The hypotheses cited are shown in Image 3, represented by the arrows in the structural model

tested, and detailed in Table 2.

2 METHODOLOGY

This was a descriptive, cross-sectional, quantitative study by the application of an online survey with students from a private university in a Brazilian capital. The unit of analysis of the study was the institution's new Internet portal, as well as its academic information systems, and 158 questionnaires were collected with undergraduate and graduate students through a convenience sample. The sample was considered satisfactory according to the criteria proposed by Chin (2000), which proposes that the number of observations in the sample is five times greater than the number of indicators of the construct with a greater number of items. In this study, the largest TTF construct includes 24 items, thus, the minimum sample required would be 120 cases.

The questionnaire used five-point Likert scales (1 to 5), sufficient amplitude to capture the variability of the constructs and able to generate clearer understandings of the response options, since all points were labeled (verbal scale). The scales were adapted from previous authors, seeking to modify the phrasing to adapt to the functionalities of the portal and to the Superior Education Institution's (SEI) profile. The scales comprised relational elements (Commitment, Satisfaction, Trust, Loyalty, Positive Mouth-to-Mouth Communication) and interaction/adoption of technology models (Task Characteristics, Technology Characteristics, Ease of Use, Technology Suitability, Utility), which are; Technology Acceptance Model (TAM) (LACERDA; MENDONÇA, 2009), Technology Adequacy Model (KLOPPING; MCKINNEY, 2004; GOODHUE; THOMPSON, 1995), Relationship Key Moderator Model (KMV) (VIEIRA; MONTEIRO; VEIGA, 2011; MORGAN; HUNT, 1994).

For data analysis, SPSS® and SmartPLS were used to analyze assumptions, adequacy, quality of measurements and to test the model through the modeling of structural equations. Structural equation modeling was used, which proved to be the most adequate to answer questions about multiple relationships between constructs while dealing with aspects associated with the quality of measurements. The definition by the PLS approach is due to the complexity of the model, restrictions on sample size and expected deviations from normality (HAIR et al., 2014).

3 DATA ANALYSIS

The analysis was initiated by debugging and evaluating the data adequacy, using the descriptive analysis of missing values, outliers (univariate and multivariate), data normality and linearity (TABACHNICK; FIDELL, 2007), where the potential problems were Considered acceptable after the treatment suggested in the literature (HAIR et al., 2010).

After analyzing the dimensionality through Exploratory Factorial Analysis (EFA), the reliability of the constructs was analyzed. For this purpose, Composite Reliability (CR) and the Cronbach's Alpha (CA) were used with a cut-off value of 0.700 (HAIR et al., 2010), achieved by all measurements. The reliability of the indicators was verified by the fact that all factor loads were higher than 0.500 (HULLAND, 1999). In order to analyze the quality of the measurement and average reliability of the indicators, the Average Variance Extracted (AVE) was used using as a cutoff value 0.500 (FORNELL; LARCKER, 1981).

In the confirmatory stage, the structural model was designed in the software SmartPLS2.0 aiming to test the construct validity of the measurements (NETEMEYER; BEARDEN; SHARMA, 2003). The convergent validity was supported by the finding that all factorial charges in the confirmatory stage's measurement model were significant ($p < 0.05$). The discriminant validity was tested by comparing the average variance extracted from the indicators (VME) with the variance percentage shared by the constructs (square of the correlations). In this case, with the exception of pair "04. Adequacy to technology" and "06. Satisfaction", all others presented discriminant validity. Nevertheless, according to the reliability interval criterion, the correlations corrected by the measurement errors (unattended correlation), method suggested by Netemeyer, Bearden and Sharma (2003), it was verified that the correlation reliability interval between the correlation of 99% of these constructs does not approximate of the unit value (1), that is, the correlation between them is less than 1. Thus, based on the proposed methods, it is possible to attest to the discriminant and convergent validity of the measures, as summarized in Table 1.
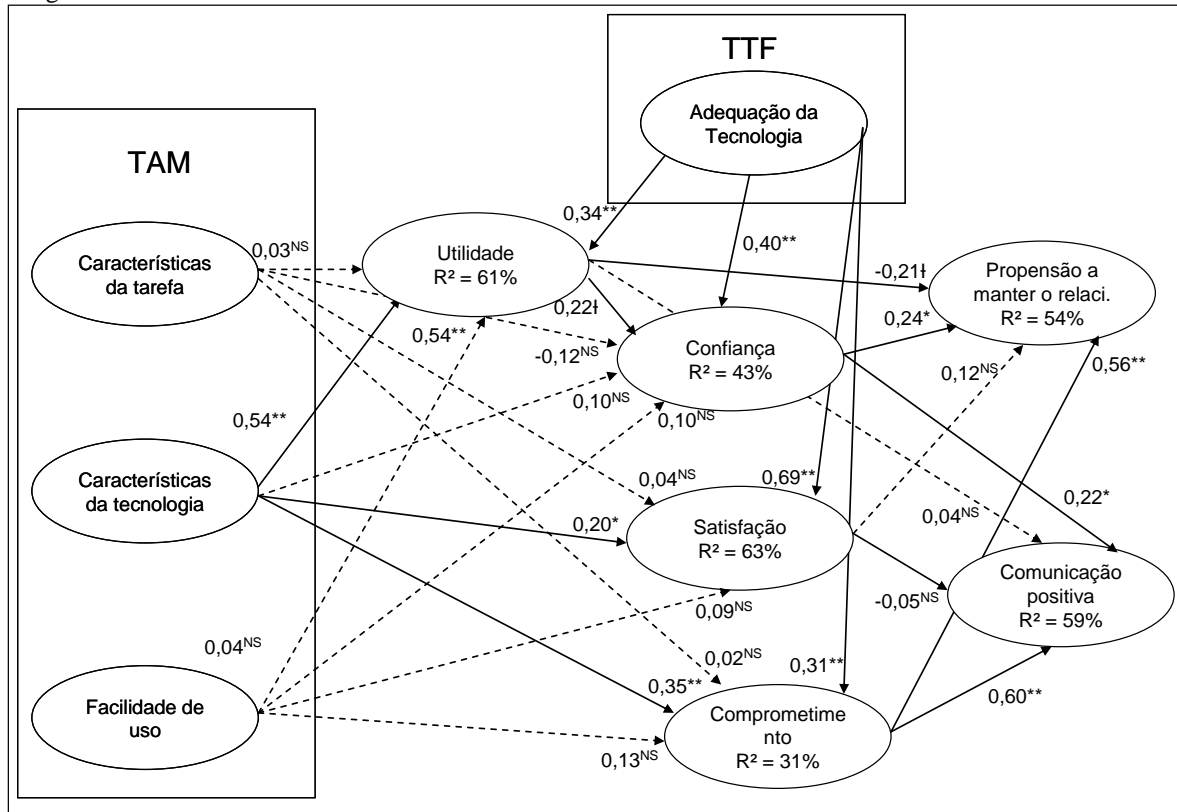
Table 1. Summary of the trust measures and its validity

Construtos	1	2	3	4	5	6	7	8	9	10
01. Task characteristics	0,83									
02. Technology characteristics	0,04	**0,62**								
03. Ease of use	0,31	0,16	**0,69**							
04. Technology adequacy	0,14	0,45	0,15	**0,47**						
05. Usability	0,03	0,55	0,08	0,45	**0,60**					
06. Satisfaction	0,05	0,38	0,06	*0,60*	0,38	**0,71**				
07. Commitment	0,01	0,25	0,01	0,23	0,24	0,33	**0,72**			
08. Reliability	0,08	0,26	0,05	0,38	0,30	0,38	0,55	**0,78**		
09. Loyalty	0,00	0,08	0,00	0,10	0,07	0,21	0,50	0,38	**0,73**	
10. Positive communication	0,04	0,18	0,03	0,24	0,18	0,21	0,57	0,43	0,47	**0,87**
Composite Reliability (CR)	0,91	0,86	0,87	0,87	0,82	0,88	0,93	0,92	0,89	0,95
Cronbach's Alpha (CA)	0,80	0,79	0,81	0,82	0,67	0,79	0,9	0,86	0,81	0,93
Average Variance Extracted (AVE)	0,83	0,62	0,69	0,47	0,6	0,71	0,72	0,78	0,73	0,87

Source: Research data.

After this analysis, the next step was the evaluation of the relations and hypotheses of the model by the Inner Path Model (HENSELER; RINGLE; SINKOVICS, 2009), which deals with a way of analyzing nomological validity (ANDERSON; GERBING , 1988). Robust standard errors were estimated using the bootstrapping procedure and were used to calculate single-tailed T tests with critical values of 1.655 for 5% significance and 2.355 for 1% significance. Using these parameters, the considerations and results of the study are constructed by presenting the hypotheses tested by the model and represented in Image 3, and those in bold were confirmed, as already reported.

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Image 3. Testes structural model.

Source: Research data.

In addition to graphically representing the model, the relations and hypotheses tested in hypothesis 2 are presented in detail.

Table 2. Model hypotheses tests

Exogenous Construct	Endogenous construto	Weight	Error	T value	Hypotheses test
01. Task characteristics	05. Usability	0,03	0,08	0,40	H1 – Rejected
02. Technology characteristics		0,54	0,10	*5,43*	H2 – Supported
03. Ease of use		0,04	0,09	0,49	H3 – Rejected
04. Technology adequasse		0,34	0,10	*3,38*	H4 – Supported
01. Task characteristics	06. Satisfaction	0,04	0,09	0,40	H5 – Rejected
02. Technology characteristics		0,20	0,12	*1,66*	H6 – Supported
03. Ease of use		0,09	0,08	1,09	H7 – Rejected
04. Technology adequacy		0,69	0,11	*6,50*	H8 – Supported
01. Task characteristics	07. Commitment	0,02	0,11	0,16	H9 – Rejected
02. Technology characteristics		0,35	0,11	*3,18*	H10 – Supported
03. Ease of use		0,13	0,12	1,07	H11 – Rejected
04. Technology adequacy		0,31	0,12	*2,53*	H12 – Supported
01. Task characteristics	08. Reliability	-0,12	0,11	1,05	H13 – Rejected
02. Technology characteristics		0,10	0,17	0,58	H14 – Rejected
03. Ease of use		0,10	0,13	0,75	H15 – Rejected
04. Technology adequacy		0,40	0,14	*2,81*	H16 – Supported
05. Usability		0,22	0,14	1,57	H17 – Rejected
05. Usability	09. Loyalty	-0,21	0,11	*1,86*	H18 – Supported
06. Satisfaction		0,12	0,12	1,00	H19 – Rejected
07. Commitment		0,56	0,11	*5,21*	H20 – Supported

08. Reliability		0,24	0,13	*1,94*	H21 – Supported
05. Usability		0,04	0,12	0,36	H22 – Rejected
06. Satisfaction	10. Positive	-0,05	0,09	0,57	H23 – Rejected
07. Commitment	communication	0,60	0,13	***4,53***	H24 – Supported
08. Reliability		0,22	0,12	*1,84*	H25 – Supported

Source: Research data.

Observations: a) Weight: is the standard weight obtained by the full sample; b) Error: is the estimated error of the estimative; c) T value: is the reason between weight not standard by its standard error.

The construct "05. Usability" presented an R² of 61%, and the constructs "01. Task Characteristics" (charge of 0.03 and p value > 10%) and "03. Ease of use" (charge of 0.04 and p value > 10%) did not present a statistically significant impact. However, the constructs "02. Technology Characteristics" (charge of 0.54 and p value <1%) and "04. Technology Adequacy" (charge of 0.34 and p value <1%) had statistically significant and positive impacts, whereas the first presented a charge of greater magnitude.

The construct "06. Satisfaction" presented an R² of 63%, and the constructs "01. Task Characteristics" (charge of 0.04 and p value> 10%) and "03. Ease of Use" (charge of 0.09 and p value> 10%) also did not present a statistically significant impact. In parallel, the constructs "02. Technology Characteristics" (charge of 0.20 and p value <5%) and "04. Technology adequacy" (charge of 0.69 and p value <1%) presented statistically significant and positive impacts, being the second of greater magnitude.

The construct "07. Commitment" had a slightly lower R², of 31%, and in this case, the constructs "01. Task Characteristics" (charge of 0.02 and p value > 10%) and "03. Ease of use" (charge of 0.13 and p value > 10%) also did not present a statistically significant impact. On the other hand, the constructs "02. Technology Characteristics" (charge of 0.35 and p value <1%) and "04. Adequacy to technology" (charge of 0.31 and p value <1%) presented statistically significant and positive impacts, being the magnitude of both very similar.

In the case of construct "08. Confidence", the R² presented was 43%, while the constructs that presented a statistically significant and positive impact were "04. Adequacy to technology" (charge of 0.40 and p value <1%) and "05. Usability" (charge of 0.22 and p value <10%). Meanwhile, the constructs "01. Task Characteristics" (charge of -0.12 and p value> 10%), "02. Technology Characteristics" (charge of 0.10 and p value> 10%) and "03. Ease of use" (charge of 0.10 and p value> 10%) did not present statistically significant impacts.

In the case of construct "09. Propensity to maintain the relationship", the R² was 54%, and the only construct that did not present a statistically significant impact was the "06. Satisfaction" (charge of 0.12 and p value> 10%). The other three "05. Usability" (charge of -0.21 and p value <10%), "07. Commitment" (charge of 0.56 and p value <1%) and "08. Confidence" (charge of 0.24 and p value <5%) presented statistically significant impacts. Commitment and Reliability had positive impacts, while the Usability had a negative impact, revealing that the higher the usability, the lower the loyalty, which goes against what was hypothesized. It is noteworthy that its critical T was significant at the 10% level, and there is a possibility that such a signal would have resulted from sample errors. Finally, the construct that presented the greatest magnitude was the "07. Commitment", indicating that it has the greatest relationship to loyalty. The other two presented charge of very similar magnitudes.

Finally, the construct "10. Positive Communication" presented a R² of 59%, while "05. Usability" (charge of 0.04 and p value> 10%) and "06. Satisfaction" (charge of -0.05 and p value> 10%) did not present a statistically significant impact. Meanwhile, the "07. Commitment" (charge of 0.60 and p value <1%) and "08. Confidence" (charge of 0.22 and p value <5%) were statistically significant and positive, and the first one presented a charge of greater magnitude.

It is also important to verify the quality of the adjustment. For this, Goodness of Fit (GoF) can be used, which can be calculated based on the formula proposed by Tenenhaus, Amato and Vinzi (2004) (2010), which is operationalized in the following way: should be verified the averages of AVEs and the R² of the model constructs and, then, verify the geometric average, which will result in the model's GoF. Such value ranges from 0% to 100%, and there are no cutoff values to consider an adjustment as good or bad. However, the closer to 100% the better the adjustment, and the GoF of the model was 60%, which indicates that the expected average variability in the model was 60%. Although there are no absolute quality criteria for this measure (VINZI; TRINCHERA; AMATO, 2010) and its use is controversial (HAIR et al., 2014), its value exceeds the 50% limit typically proposed (HULLAND, 1999).

In addition, the predictive capacity of the model in the Inner Path Model should be evaluated, using the Stone-Geisser's Q² measure, which postulates that the model must be able to adequately predict endogenous constructs as suggested by Hair, Ringle and Sarstedt (2011). In SmartPLS, this measurement is obtained through the procedure called Blindfolding, and the value *d* requested by the test must be between 5 and 10, as suggested by the authors, and attest that the measure called *cross-validated redundancy* should be preferred to the measure called *Crossvalidated communality*. Henseler, Ringle and Sinkovics (2009) show that when the measure is greater than 0%, the endogenous construct has a relevant predictive power. For that, a *d* of seven was adopted and such analysis was performed, and the TAB. 19 displays the result for the model constructs. The results reveal that all the endogenous constructs of the model have a Q² greater than 0%, which indicates that the endogenous constructs were adequately measured by the model.

Table 3. Measurements' general adjustment.

Endogenous constructs	*Q²*
05. Usability	36%
06. Satisfaction	45%
07. Commitment	22%
08. Reliability	33%
10. Loyalty	38%
11. Positive communication	51%
Model constructs average	**38%**

Source: Research data.

4 FINAL THOUGHTS

The aim of this research was to evaluate the role of technology interaction as a basis for relationship development, based on the conjugation of relational models (KMV) and Technology Adoption (TAM and TTF). Analyzing the results of the hypotheses, the Task Characteristic construct did not present itself as an antecedent of satisfaction, commitment, usability and reliability, that is, the presence (or absence) of complex and interdependent

tasks for Solution of academic and administrative problems in the institution researched had no impact on the key relational variables of the model. It should be noted that the means of the indicators of these constructs is less than 3, indicating that problems of this nature are perceived as rare.

Meanwhile, technology characteristics affects satisfaction, commitment and usability perceived by the portal users, so that a positive evaluation of the technology, in elements such as interface, content, website size, digital tools and services available for the user are instrumental to bring the student closer to the institution, much more than the mere use of the system. "Technology characteristics" did not explain, however, the reliability construct.

Ease of use does not explain usability, reliability, satisfaction, and commitment as well as it did not impact the use of a website and system. It is suspected by the high averages of this construct that the users, mostly young, do not feel difficulties and are versed in the use of similar technologies inside and outside the academic scope, determining a greater homogeneity and less impact of the ease of use as foment to the relationship between the institution and its public.

The "technology adequacy" construct of the TTF model had a positive impact on all of its relations. At this point, the adequacy assessment of the portal to the specific needs of each student in the academic everyday explains in large part the use of the system as the bases of the relationship (satisfaction, commitment and reliability).

The propensity to maintain a relationship (loyalty) was 54%, explained positively by commitment and reliability, while satisfaction was not significant, as expected by the KMV model, besides suffering a direct effect of usability. Positive communication was explained by 59% reliability and commitment (H25).

In general, it is observed that technology plays a fundamental role in fostering relationships in the researched institution, revealing the importance of having a portal compatible with long-term activities and relationships with student-clients. More generally, it is proposed that technological elements, especially those associated with the digital age, gradually become an integral and inseparable part of the strengthening of the ties between clients and organizations, from the point of view of relationship marketing. Therefore, attention should be paid to planning a site and its systems based on user expectations, highlighting the importance of knowing the profile and routine of activities so that the investment in digital technology becomes an effective relationship tool.

In particular, in the case of the Higher Education Institutions, that deal with a public that quickly adapts to technological issues and can quickly learn how a portal can be used to manage numerous activities in daily life, the central concern of developers is to find points of intersection in functionalities and applications that aim to bring the student closer to the Institution. Clearly, issues such as usability and ease of use seem to be secondary to this audience, with no significant impacts on building relationships. On the other hand, the system design and its application by the community as a tool to approximate the student-teacher-institution triad and shared value creation, possibly transcending administrative and classroom management issues, deserve special attention.

Among the limitations of these findings, we highlight the non-probabilistic sample, which limits generalizations and the performance only in an organization of the educational

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segment. The analysis of data applied by the PLS approach also does not allow to verify the adherence of the model as a whole, only the predictive capacity. Thus, to better test the model, it would be necessary to seek a larger sample and, perhaps, the use of robust methods to estimation deviations using the structural analysis by the covariance approach, using the typical indices of the model.

It is suggested to extend the relations proposed here to other scenarios, varying characteristics such as age (in this case characterized by young age groups), income (in this study, high income), degree of involvement (this is an industry with relatively stable links) and affinity with technology.

MARKETING DIGITAL Y RELACIÓN MARKETING: EVALUACIÓN DE UN SISTEMA DE INFORMACIÓN DIGITAL MEDIANTE UNA INTEGRACIÓN DE MODELOS KMV TAM, E TTF

RESUMEN: La creciente popularidad de Internet prolifera formas de entretenimiento, la comunicación y el trabajo, tales como portales, cuyo objetivo es difundir la información y las relaciones de crianza entre las partes interesadas. Este estudio tuvo como objetivo verificar como portal de interacción tecnológica del IES afecta a las actitudes (satisfacción, confianza y compromiso) y las intenciones de comportamiento (uso del portal, la lealtad y la comunicación positiva) de los estudiantes. A partir de una encuesta diseñada por modelos TAM, KMV TTF y el estudio muestra Que las características y la idoneidad de la tecnología de la influencia de la utilidad percibida en el portal y en la moderación de las actitudes de las intenciones de comportamiento de la institución estudiada.

PALABRAS CLAVE: Portal; Digital, Evaluación del sistema de recuperación de información

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