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Kybernetes

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Journal:	*Kybernetes*
Manuscript ID	K-07-2018-0350
Manuscript Type:	Research Paper
Keywords:	gamification, flow, e-commerce, Millennial, behavior, technology acceptance model

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ABSTRACT.

Purpose:

This research has three main objectives. First, it examines influence of gamification on the behavioral intention to use an e-commerce platform. Second, it analyzes the role of the flow state given its importance in terms of behavior in online environments. Finally, the study aims to detect and analyze differences between Millennials and Generation X.

Design:

The theoretical basis for this study stems from Technology Acceptance Model (TAM). The extended model incorporates gamification and the optimal state of intrinsic motivation, flow state, as additional constructs. An online consumer panel was used to collect data from 253 Spanish Amazon users. A structural equation modeling, partial least squares (PLS), is proposed and multi-group moderation was studied.

Findings:

Gamification in Millennials has positive and significant indirect effects on behavioral intention through the flow state. In the case of the Generation X it has been detected that flow interferes in its perception of ease of use. The behavioral intention of using the web-page is directly correlated with the purchase intention. Companies should offer a fun interface to Millennials and an environment easier to use to the Generation X, for gamification to be successful.

Originality/Value:

This study expands the research scope in gamification by focusing on e-commerce sector, a field where scientific research is still scarcely developed. It emphasizes the importance of flow as mediator. Age differences confirm the need for segmentation when applying gamification and marketing strategies in e-commerce.

Keywords: gamification, flow, e-commerce, Millennial, behavior, technology acceptance model

Type: Research paper

1. INTRODUCTION

Gamification is “the use of game design elements in non-game contexts" (Deterding *et al*., 2011) to make a product, service or application more fun, engaging, and motivating. Gamification is being implemented in different business areas: for example, in commerce and marketing to achieve greater customer engagement and loyalty and to increase sales (Hamari, 2017); and in other sectors such as education to promote behavioral changes (Christy and Fox, 2014). Spain, together with the US, is the country with the most gamification projects per capita in the world according to the organizers of Gamification World Congress 2015 (Marca España, 2015).

It has been proven that although the increasing interest in gamification, reflected in the academic context (Hamari *et al*., 2014), begins to be transferred to the field of e-commerce (Aydin, 2015; Bilgihan *et al*., 2016), the number of scientific publications in this area is still small. Although the motivational effect of rewards on gamified environments has been shown in sectors such as education, working environment and marketing, however, there is still an absence of a coherent and ample body of empirical evidence that would confirm such effect (Hamari, 2017), specially in the case of e-commerce.

Gamification tools can be used on e-commerce web pages for different purposes, such as content generation, increasing conversion and promoting user loyalty (Bilgihan et al., 2016). Large companies such as Amazon or eBay are taking advantage of the positive aspects that are contributed by game elements, using them on their web pages to encourage the activity of their users. Precisely one of the purposes of this work is to analyze the influence of gamification on the users of the e-commerce platform www.amazon.es. This platform uses a reputation points system (RPS) that includes points, badges and leaderboards (PBL) as elements of gamification, which reflect the results of users' actions in their "online reputation.”

Business-to-consumer (B2C) e-commerce continues to increase annually in Spain. At present in Spain, 21.4% of the population belongs to the millennial generation (born between 1982 and 2003) (INE, 2017). They are the segment that purchases the most from the Internet relative to the general Spanish population, although their spending on purchases tends to be lower than the spending of others. Furthermore, Millennials are especially familiar to the game elements through their direct and frequent contact with video games. Therefore, another objective of this study is to analyze the influence of gamification and reward systems on Amazon users according to their age, distinguishing between Millennials and Generation X (born between 1961 and 1981). Another characteristic of gamers, and therefore a large proportion of Millennials, is how easy it is to achieve

what is known as a state of flow, which is a term that frequently appears in the online commerce context. Researchers have recognized that flow is an important construct in explaining consumer behavior in the context of computer-mediated environments (Hsu *et al*., 2012). Moreover, consumers with prior gaming experience, specially the younger ones, judge gamification as more useful and perceived more flow and enjoyment than the older age group. Another goal of this research is ratify the mediator influence of flow state in the relationship between gamification and behaviour intention (BI), considering, at the same time, the age of the consumer as a control variable.

In parallel, to analyze the influence of gamification on the user's intention to use the web to purchase, this study adopts the technology acceptance model (TAM) in e-commerce. Originally proposed by Davis (1989), the TAM is considered to be the main research approach for exploring the determinants of the behavior of accepting and using information systems (IS) (Aydin, 2015). Although the TAM has been widely accepted and tested, the current research seeks to confirm the consistency of its relationships and to detect if it is still valid given the technological and generational changes that have occurred in recent years.

2. THEORETICAL FRAMEWORK

2.1 Gamification in e-commerce: the use of PBL systems

Although gamification can take many forms and can combine game design elements in many different ways, it is generally predominantly associated with points, levels and classification tables (Hamari *et al.*, 2014). In most of the gamified applications of e-commerce, it is common to find the set of gamification elements that are commonly called PBL. Badges, leaderboards (rankings) and public status are particularly recommended to maximize engagement and other user activities on an online retailer's website (Razavi *et al*., 2012).

Obtaining points can have social effects such as obtaining status or gaining reputation based on the assessments of other users. The Reputation Points System (RPS) is the most complex system, and it indicates the degree of integrity and consistency of the user. The Amazon RPS is based on the useful votes that are received and the percentage of the utility of the comments that are made by the user with regard to products that are available online. In the user profile they include these scores, the badges that have been obtained when commenting and the position that a user occupies in the ranking of opinions (leaderboard).

Badges are a visual representation that is obtained by completing a particular activity; it serves as a user status symbol within the system and is a type of reward. They can have different functions: a representation of achievements, an indication of a user's integrity and reliability in terms of the content that they generate, and user identification within a group (Antin and Churchill, 2011).

Leaderboards are lists of users, which are ordered according to certain parameters (points, utility), which allow individuals to compare their position against others and foster competitiveness (Costa *et al.*, 2013).

In our study, the PBL triad is considered to be a whole, forming the gamification (GAM) construct, which reflects the user's reputation. The use of PBL may motivate more comments or better quality. Nevertheless, we do not know if the RPS has sufficient impact on the intention of use (BI) of a web page that includes gamification elements. This unknown leads us to propose the following hypothesis:

H1: Gamification PBL elements positively influence the intention to use the web. GAM-BI

2.2 Flow

Flow refers to the state in which a person acts with total involvement, becoming completely absorbed in the task that is being performed. Flow is considered to be an optimal state of intrinsic motivation. Flow theory (Csikszentmihalyi, 1975) has been investigated in multiple contexts: in online shopping (Bilgihan *et al*., 2014), in the interaction of humans with computers (Siekpe, 2005), with web pages in general (Skadberg and Kimmel, 2004) and video games (Klasen *et al.*, 2012).

In relation to IS, the experience of flow is considered to be a multidimensional construct although its composition is diverse according to the authors. Based on the common elements of the literature, flow is conceptualized as a second-order construct formed by the following first-order constructs: concentration, perceived enjoyment or entertainment and temporal distortion (Ghani and Deshpande, 1994; Skadberg and Kimmel, 2004; Kwak *et al.*, 2014).

Concentration, or so-called focused attention, implies a high level of abstraction in activity, a loss of self-awareness, and limited attention to small stimuli (Webster *et al.*, 1993). For users to enter into flow they must be already engaged and concentrated in the activity (Novak *et al.*, 2000). When users browse on an e-commerce page, they will concentrate on the products, comments, prices, and information that is offered by the web. In the area of e-commerce flow presents hedonistic components that are associated with the pleasure of

shopping. Hence, flow is often found to be associated with entertainment or perceived enjoyment (Kamis *et al*., 2010). Enjoyment is defined as the extent to which the use of a system is perceived as being agreeable, regardless of any consequence that results from its use (Venkatesh, 2000). According to Koufaris (2002), shopping enjoyment, as the main component of flow, predicts the consumer's intention to return. While individuals are in flow they lose the notion of time. This temporal distortion is usually obtained by playing games, playing sports or browsing the Internet (Skadberg and Kimmel, 2004).

Users of the web who comment on products often claim that they do so for altruistic reasons; however, there may also be selfish motives that can be associated with the satisfaction of different psychological needs (Mathwick and Mosteller, 2017). Whatever their motivation, gamification can affect users' concentration, their temporal distortion and their perceived entertainment, which can produce a flow state during the overall experience of using a webpage. The verification of this effect constitutes the following hypothesis of this work:

H2: Gamification PBL elements have a positive influence on the state of flow of web users. GAM - FL

Furthermore, it has been confirmed that flow may influence the attitudes and intentions of those who purchase online (Hsu and Lu, 2004; Bittner and Schipper, 2014). In particular, the perceived entertainment directly influences the intended use (Verkasalo, 2010). BI is comparable to the state in which a person has formulated conscious plans to develop a certain conduct. In this research, BI has been considered the intention of use the web (which is, as it will be after demonstrated, directly correlated with making online purchases). Because this variable is a determinant of technological acceptance, we establish the relationship between flow (FL) and BI and propose the following hypothesis:

H3: The flow state has a positive influence on the intention of user of a website. FL-BI.

2.3 Technology Acceptance Model (TAM)

IS researchers have studied the behavior of online consumers in relation to online shopping. The most widely used adoption model is the technology acceptance model (TAM) (Davis, 1989; Wu and Liao, 2013; Aydin, 2015). The TAM has been applied in the study of the acceptance of various technologies such as e-mail, the Internet and specifically e-commerce (Fayad and Paper, 2015; Luo and Chea 2017). The TAM is Davis et al.'s (1989) adaptation of the theory of reasoned action (TRA) (Fishbein and Ajzen, 1975) to predict the adoption of

a technology. The model has two main elements: perceived usefulness (PU) and perceived ease of use (PEOU). PU is the degree to which a person believes that using a technology would improve the performance of a job, while PEOU is the degree to which a person believes that a technology is free of effort. According to the TAM, PU and PEOU beliefs influence intention-to-use (BI) (Venkatesh and Davis, 1996; Van der Heijden, 2003), and they are the most important constructs when predicting IS acceptance (Jun-Yi and Pei-Wen, 2011; Abdullah *et al.*, 2017). The validity of a TAM will be verified through the following hypotheses:

H4: Perceived usefulness positively influences the intention to use the web. PU-BI.

H5: Perceived ease of use positively influences the intention to use the web. PEOU - BI.

H6: Perceived ease of use positively influences the perceived usefulness of the web. PEOU - PU.

In subsequent revisions of the TAM, new intrinsic factors have been incorporated to improve the value of the model. Several studies include the flow state into the TAM (Koufaris, 2002; Hsu and Lu, 2004). Specifically, Koufaris (2002) tested the effects of FL on the intention to return to the web of online consumers who obtain good results. Additionally, Yi and Hwang (2003) proposed the possible influence of intrinsic motives, such as enjoyment, on PU. Venkatesh (2000) conceptualized the intrinsic enjoyment, characteristic in FL as an antecedent of PEOU. The psychological and intrinsic pleasure that technology can offer, coupled with the extrinsic benefits (i.e., PU), can lead a user to try it, even if there is no positive attitude towards it (Sánchez-Franco, 2006). Given these relationships between flow and the TAM, the following hypotheses are considered:

H7: The flow state positively influences the perceived utility of the web. FL-PU

H8: The flow state positively influences the perceived ease of use of the web. FL-PEOU

The RPS reflects the status of the user on his performances as a reviewer. The implementation of the RPS on the web can influence the perception of the global usefulness of a webpage. In the same way it could have repercussions on the degree to which a user perceives the web as being easy to use. The possible influence of gamification on the main variables of the TAM is proposed by the following two hypotheses:

H9: Gamification elements positively influence the perceived usefulness of the web. GAM-PU

H10: Gamification elements positively influence the perceived ease of use of the web. GAM-PEOU

The proposed research model is shown below in Figure 1.

FIGURE 1 Research model and hypotheses

3. METHODOLOGY

3.1 Data Collection and Sample

In this study, a questionnaire was used and administered as a pre-test in a sample of 40 individuals, which was subsequently expanded to a sample of 253 Spanish nationals. To obtain the sample an online consumer panel was used with the consulting company Iddealia Consulting, that is supported by AEDEMO (Spanish Association of Market Studies, Marketing and Opinion), ESOMAR World Research (European Society for Opinion and Marketing Research) and ISO (International Organization for Standardization). The use of the consumer panel guaranteed the chosen sample size, its quality and a greater reliability of the results. Specifically, we selected e-commerce users in Spain who visited the www.amazon.es page during the week prior to the questionnaire (the first week of January 2016) and who wrote reviews of products on the web (thus ensuring direct contact with the elements of gamification and the RPS). Different profiles of individuals were chosen according to age (in order to analyse differences between both, Millennials and Generation X), gender, social status, level of education, and the frequency of online purchases so that the sample was as representative and proportionate as possible. The sample universe of the analysis consisted of men (53.7%) and women (46.3%) Spaniards, over 18 years of age, distributed by age in 51.4% (Millennials) and 48.6% (Generation X). In addition to the questions on demographic variables, some questions were asked about the frequency of writing product reviews on the web, whether the individuals read reviews and whether they evaluate other users, and the degree of importance that they give to comments and their familiarity with video games, among other issues. Some of the descriptive statistics of the sample are shown in Table 1. To identify the significant differences between both generations, hypotheses testing of the equality of two proportions were conducted. The results of these tests are included in the last column of Table 1.

TABLE 1 Characteristics of respondents.

Summarizing and taking into consideration the results obtained from these tests, the profile of the Millennials, can be described in comparison with Generation X. Concretely, the Millennial is single, a video gamer, obviously younger, with a lower social status, a bit higher education level and a higher activity with

regard to making comments, reading product reviews and the reviews or other users, which they consider more important than the Generation X does.

To analyse the relationship between the BI and the purchase intention, the Pearson linear correlation coefficient between the variables "number of visits to the web" and "the number of purchases was computed". The value of this coefficient, 0.56 (p-value=0.000), ratified a positive relationship between the frequency of visiting the web and the number of purchases. Therefore, BI of using the web can be directly relationed with the purchase intention.

3.2 Instrument and Measures

A survey was used to obtain the information. The development of the instrument was based on a literature review to identify the measures for each construct. The research instrument consists of 30 items, and the sources are shown in the Appendix. PBL are used to measure the GAM construct, which includes 10 self-developed items. Concentration, enjoyment and time distortion are used to measure flow state by using 9 items adapted from Ghani and Deshpande (1994) and Skadberg and Kimmel (2004). A total of 11 statements were proposed for the TAM based on Davis (1989) for PU and PEOU and on Agarwal and Karahanna (2000) for BI. For the questions related to gamification, the flow state and the TAM, a Likert scale was used to evaluate the responses to the elements. The Likert scale measures the degree of acceptance or rejection of the presented statements. All items are the 5-point Likert-type items ranging from 1 for "strongly disagree" to 5 for "strongly agree" with the statement.

3.3 Data analysis

To test the research model and the proposed hypotheses this paper applies partial least squares (PLS) path modeling and variance-based structural equation modeling (SEM) (Roldán and Sánchez-Franco, 2012). PLS permits the assessment of the reliability and validity of the measures of the theoretical constructs and the estimation of the relationships that are posited between the constructs (Barroso *et al.*, 2010). We selected PLS primarily because the constructs that form the research model correspond to a composite measurement model. Both the theoretical contributions and the empirical simulation studies uphold the use of PLS for the composite models.

4. RESULTS

4.1 Evaluation of global model fit

Henseler et al. (2016) suggest assessing the global model fit as the preliminary step of PLS models assessment. If the model fails to fit the data, it implies that the data contains more information than the model conveys. For this purpose, we used ADANCO 2.0.1 (Henseler and Dijkstra, 2015) to perform several tests of model fit based on the bootstrapping: (i) a standardized root mean squared residual (SRMR), (ii) an unweighted least squares discrepancy (dULS), and (iii) a geodesic discrepancy (dG). If any of these tests exceeds bootstrap-based 95% (HI95) and 99% (HI99) percentiles, it is uncertain that the research model is precise. Our results (Table 2, first column) show that the three tests of model fit are below HI95 and HI99. This finding indicates that the model is accurate and cannot be rejected (Henseler *et al.*, 2016). Additionally, we rely on the SRMR as an approximate model fit criterion that reveals how significant the discrepancy between the model and the empirical correlation matrix is (Table 2). Our research model attains a satisfactory value of 0.071, which is well below the 0.08 threshold level recommended by Henseler et al. (2016).

TABLE 2 Tests of model fit

4.2. Measurement model

The evaluation of the measurement model shows satisfactory results. First, the indicators meet the requirement of individual item reliability because the outer loadings are, generally, greater than 0.707 (Table 3) and only some of the outer loadings are slightly under this critical level. Nevertheless, the decision is to retain them to support the content validity of the scale. Second, all of the constructs satisfy the requisite of construct reliability, as their Jöreskog's rho and Cronbach's alpha are greater than 0.7 (Table 3). Third, the latent variables reach convergent validity because their average variance extracted (AVE) is over the 0.5 critical level (Table 3). Finally, Table 4 discloses that all the constructs attain discriminant validity following the heterotrait-monotrait ratio (HTMT) criterion (Henseler et al., 2015), which indicates that values should be under the threshold of 0.85 (Kline, 2015).

TABLE 3 Individual item reliability, construct reliability and convergent validity

TABLE 4 Discriminant validity

4.3. Structural model

Consistent with Hair *et al.* (2014) recommendation, this paper employs a bootstrapping technique (5000 re-samples) to generate standard errors and t-statistics that allow the assessment of the statistical significance for the considered relationships within the research model. Tables 5 and 6 comprise the main parameters that are obtained for the two structural models that are under assessment. Table 5 involves the structural model results for sample 1 - Millennials- and Table 6 contains the results for sample 2 - Generation X-. The coefficient of determination (R^2) is assumed to be the main criterion for the explained variance, which is shown in the dependent construct, as the path coefficients are depicted in the distinct considered models. These results confirm that the structural model has acceptable predictive relevance for the endogenous constructs FL, PU and BI.

The results from PLS analysis show that there are significant differences between the two structural models. First, while in sample 1 we find support for the direct GAM-FL and FL-BI relationships and for the GAM-BI an indirect link, these ties are non-significant in sample 2 with the exception of GAM-FL. In addition, both models reveal a negative direct link, which is statistically significant only in sample 1, between GAM and BI. Hence, we cannot argue that there is a positive direct link between GAM and BI. However, the links between the variables that shape the TAM – PEOU, PU and BI – are positive and significant in both samples (Figure 2).

TABLE 5 Structural model results for sample 1 (Millennials)

TABLE 6 Structural model results for sample 2 (Generation X)

FIGURE 2 Summary of structural model results

To test the moderating effect of the group – Millennials versus Generation X – this paper relies on the nonparametric confidence set multi-group analysis (MGA) approach. This method serves as a remedy to the flaws of previous methods (Sarstedt *et al.*, 2011). In conformity with this test, it is possible to directly compare the sample-specific bootstrap confidence intervals (Table 7).

This method is performed as follows: (i) run the PLS path modeling algorithm separately for each subsample; (ii) construct the bootstrap-based 95% bias-corrected confidence intervals (BCCI) for the two

subsamples; and (iii) check whether the estimated parameter for a path relationship of subsample 1 falls within the corresponding confidence interval of subsample 2 or vice versa. If this happens, it can be assumed that there are no significant differences between the sample-specific path coefficients. Similarly, if such overlap is not observed, one can assume that the sample-specific path coefficients are significantly different (Sarstedt *et al.*, 2011). Table 7 shows that there are significant differences, and hence, there is a group moderating role of the GAM-FL, GAM-BI, FL-PEOU, FL-BI and PEOU-PU.

TABLE 7 Nonparametric Confidence Set Approach Multi-Group Analysis (MGA)

5. DISCUSSION

There are significant structural differences between the two generational models that mainly originated based on the behavior of the relationships between gamification and flow state with respect the other variables. The relationships between the TAM variables behave similarly in both models.

This study confirms that gamification does not *per se* have a positive impact on Millennials' intended use. Rather, on the contrary, its impact tends to be negative, except in the case in which gamification leads the Millennials to a flow state. Therefore, the results suggest that flow is a mediating variable (mediation hypothesis) in the GAM-BI relationship. The results showed that GAM causes positive and significant indirect effects on BI. This fact underscores the importance of the flow state in the Millennials in their interaction with an e-commerce platform. The inclusion of GAM elements will boost the flow state, increasing the enjoyable experience that is generated by the web page itself. The RPS, the rewards, received feedback, competition and collaboration that are present in the GAM favor the perceived enjoyment, concentration and temporal distortion present in FL. The e-commerce website should allow the Millennials to reach the state of flow so that the Gamification has effects on behavioral intention. Regarding the relationships between the TAM variables (PU, PEOU and BI), the model for the Millennials fits quite well. All of the hypotheses are accepted, which demonstrate that this model is still valid for e-commerce and that the utilitarian component of the web is important for Millennials. It should be noted that the hypotheses on the influence of FL on the pillars of the TAM (PU and PEOU) were rejected. In view of the results, for the Millennials, the intrinsic pleasure of the flow state (i.e., enjoyment) when using the web does not improve the perception of a utilitarian extrinsic-motivation

such as the PU or PEOU; however, it does influence BI. That is, FL does not distort the Millennials' perceptions of utilitarian aspects. FL provokes favorable evaluations of the web page in terms of both utilitarian and hedonic aspects depending on the sources of the flow experience, thus we reaffirm that for this Generation FL supports the hedonic hypotheses. However, the hypothesis that linked GAM with PU and PEOU was not accepted. In addition, the elements of gamification apparently have no impact on the usefulness or on the perceived effort of the user when using the platform. Therefore, it is observed that the GAM is aimed at invoking hedonic experiences and intrinsic motivations because they have no repercussions on utilitarian factors.

In the case of the Generation X, GAM does not directly influence its BI, and it is observed that GAM has direct effects on FL, which coincides with the millennial model. However, the main difference with regard to the Millennials is that FL does not cause direct effects on BI; however, it is indirectly mediated by PEOU. The influence of FL on PU is rejected as in the millennial model; however, FL influences PU, which is again mediated by PEOU. Thus, the mediation of the PEOU variable in the Generation X is essential. For this group of individuals the hedonistic factors that are derived from FL are the antecedents of the utilitarian component PEOU, which coincides with Venkatesh (2000). FL in this group is influenced, in addition to the hedonic aspect, by utilitarian web attributes. Since they are not as accustomed to the use of technologies as Millennials are, FL can make them more sensitive to other perceptions. The hypotheses that relate the variables of the TAM are accepted, and the elements of gamification do not have direct repercussions on the variables PU and PEOU, as it did with the millennial group.

6. CONCLUSIONS

Gamification consists of points, badges and leaderboards that form a Reputation Points System, which represents a good construct that can be applied as a unit in later studies. Companies can apply standardized packages of gamification on their web pages that include multiple elements and mechanics; however, not all applications are valid for e-commerce. This research finds that PBL can be perfectly grouped and have direct repercussions on the flow state of users regardless of their age. However, one of the most important revealed implications is that the PBL do not directly affect the intended use of an e-commerce page. The simple use of a RPS by itself does not guarantee its success. In the case of Millennials, the e-commerce platform must promote users to enter into a flow state so that the gamification may have repercussions on the intention to use. Even for

Millennials who do not experience flow, gamification can have negative consequences on their behavioral intention. If they are not enjoying the web or appropriately concentrated, the gamification can distract or bore them, which creates a sense of rejection. In the case of generations of higher ages, the gamification also does not affect the intention to use and, as with the Millennials, the flow state is required to produce positive effects.

Points and badges serve as extrinsic rewards for reviewers and, combined with their intrinsic motivations, affect their overall flow state and simultaneously act as drivers for the behavior. The connection with flow is found in the hedonistic features of gamification (i.e., autonomy, competence, social relatedness, fun, entertainment, competition, collaboration) that accompanies the perceived enjoyment (in online shopping) that is present in flow state. Gamification fulfills the goal of motivating the user towards utilitarian purposes through hedonic modes, which is an intrinsically motivated behavior. For Millennials, the pleasurable features that are related to the fun, playfulness and pleasure that they experience are important for creating positive online customer experiences. Based on the proper characteristics of gamification the approach is of interest towards the target Millennials.

It is recommended that companies pay special attention to the flow state given its transcendental role, because it acts as an excellent mediator of the relationship between the gamification and behavioral intention in Millennials. The e-commerce platforms must seek to generate the flow state as a priority in its users so that it has positive repercussions on behavioral intention and subsequently affects the actual use of the system. E-commerce companies that study the state of flow gain a competitive advantage over the rest of their competitors as they create optimal and full experiences for the user.

The hedonic features such as exciting designs and entertaining website features are expected to create a flow experience and must be present in the e-commerce platform. Without them, gamification will have no effect. E-commerce platforms should focus on the three pillars on which flow is based: it should foster a fun and exciting experience (perceived enjoyment), focus the user highly in the activity (concentration) and create an experience that makes the time pass quickly (time distortion) this way the gamification will work under such conditions. Web attributes such as novelty (that excites curiosity) or interactivity (that increases control, curiosity, and interest) induce experiential flow. As a possible improvement, it is also recommended that elements be included such as curiosity, control or the intrinsic interest to define a more complex flow experience, which thus helps companies to further study the flow construct.

The technology acceptance model is perfectly valid in the case of the millennial sample. However, the utilitarian perception of technology in Millennials appears to be isolated from the hedonistic part, because neither the gamification nor the flow state interfere in the perceptions of usefulness and ease of use. Gamification and the flow state do not distort the perception of the utility or the effort that is generated through the use of the web. The utilitarian benefits that are offered by a website such as comparing prices, obtaining more information about products through reviews, and easy navigation, as they are not affected by gamification or flow, lead the Millennials to have a clearer opinion, about the consistency and reliability of the usefulness of the web. In the case of the Generation X it has been detected that flow interferes in its perception of ease of use, which makes them believe that the web is easier to use when they are in a state of optimal experience. The Millennials' continued technological exposure may make them likely to be more experienced with flow than others, hence the utilitarian perceptions of hedonists may be better differentiated. Companies should know which utilitarian aspects are most important to Millennials and directly empower them, because their opinion of them cannot be altered by more pleasant psychological states.

Having verified that there are differences between generations in the form of the acceptance of e-commerce, it is recommended that segmentation based on age by companies be used. The use of marketing strategies specifically designed on the basis of age may generate good results in this regard. In particular, it is recommended that different web user interfaces be used depending on the generation to which an individual belongs. Thus, while the Millennials can be offered a more fun interface by quickly providing greater perceived enjoyment, the Generation X should be provided with an environment that would equally favor their enjoyment but make it easier to use, more intuitive and less complex, based on the findings. In this sense, different landing pages could be offered depending on age, according to the engagement in online purchasing or the level of involvement of the user or the reviewer's profile.

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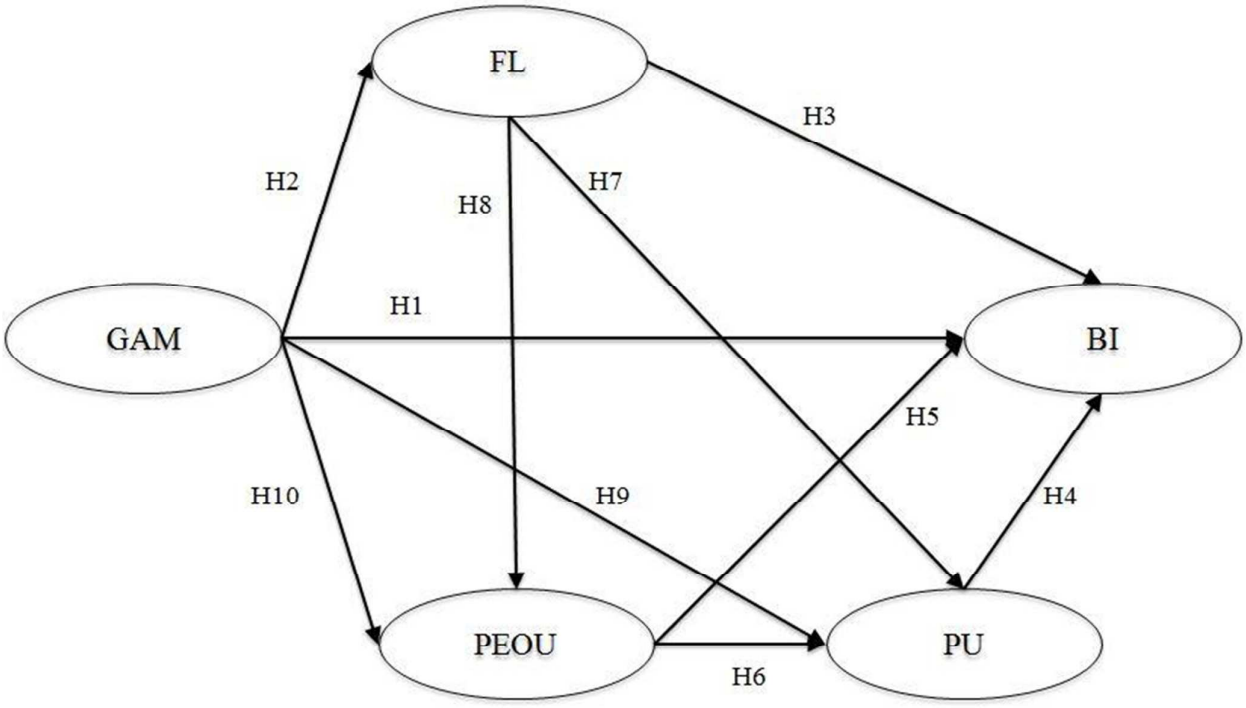
APPENDIX

CONSTRUCTS, ELEMENTS, MEASURES AND SOURCES

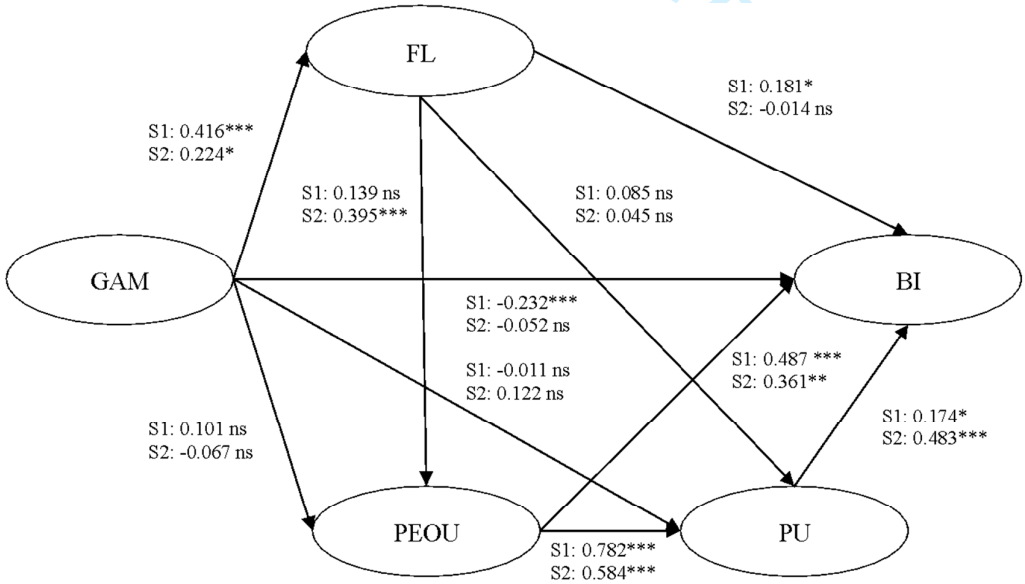
Construct	Element	Measure
Gamification (GAM)	Points	Receiving votes for considering my comments helpful rewards my efforts
		The points/votes system correctly reflects my efforts to comment on products
		The way points/votes are received when commenting on products is understandable
	Badges	The badges that can be obtained from Amazon (for example: Top Reviewer 1000) reflect the good work done as a reviewer
		The badges that can be obtained are perfectly defined
		My efforts to comment on products are perfectly reflected in the reputation that I have on Amazo
	Leaderboards	The ranking of Top Reviewers is well designed
		The reputation that I have as a reviewer can be easily checked
		The ranking of Top Reviewers reflects my status when I comment
		I think that it is important to know the percentage in which users consider my comments helpful, so that I can compare with others
Based on: Werbach & Hunter (2012). Self-developed.		
Flow (FL)	Concentration	The activity on the web required a lot of concentration
		I was fully concentrating on my activity
		I was absorbed (focused) intensely in the activity
	Enjoyment	Using the web was a fun experience
		Using the web was exciting
		I enjoyed using the web
	Time Distortion	Using the web time passed quickly
		At some point I lost track of time
		Time went by faster than usual
Adapted from: Ghani & Deshpande (1994); Skadberg & Kimmel (2004)		
Perceived Usefulness (PU)		Amazon is useful for buying online
		Amazon offers me a good service search and purchase items
		Amazon allows me to find products faster than other platforms
Adapted from: Davis (1989)		
Perceived Ease Of Use (PEOU)		Amazon is easy to use
		Buying through Amazon does not involve much effort
		When I interact with Amazon processes are clear and understandable
Adapted from: Davis (1989)		
Behavioural Intention (BI)		I intend to buy online using Amazon in the future
		I intend to make some purchase in the next months at Amazon
		I believe that my intention to use Amazon to make online purchases will continue in the future
		I will recommend this online store to others
		I think this store will be my first choice when I go shopping online
Adapted from: Agarwal & Karahanna (2000)		

FIGURE 1 Research model and hypotheses



** GAM: Gamification (Points, Badges and Leaderboards - Reputation Point System); FL: Flow; PEOU: Perceived Ease of Use; PU: Perceived Usefulness; BI: Behavioral Intention*

FIGURE 2 Summary of structural model results



Notes: S1=sample 1; S2=sample 2; ***p b .001; **p b .01; *p b .05; ns = not significant.

TABLE 1 Characteristics of respondents.

Demographic	Group	Frequency	Percentage
Age	18-34 (Millennials)	130	51.4%
	35-55 (Generation X)	123	48.6%

		Millennials		Generation X		
Gender		Frequency	Percentage	Frequency	Percentage	p-value (Py-Px)
	Male	72	55.4%	64	52.0%	
	Female	58	44.6%	59	48.0%	0.593
Education						
	High school diploma	4	3.1%	13	10.6%	**0.017**
	College diploma	48	36.9%	51	41.5%	0.460
	Master's degree	54	41.5%	44	35.7%	0.347
	More than master's degree	24	18.5%	15	12.2%	0.168
Social status						
	High	10	7.7%	23	18.7%	**0.009**
	Medium-high	39	30.0%	58	47.2%	**0.005**
	Medium	65	50.0%	36	29.3%	**0.001**
	Medium-low	14	10.8%	4	3.2%	**0.020**
	Low	2	1.5%	2	1.6%	0.956
Marital status						
	Single	101	77.8%	22	17.9%	**0.000**

Characteristic		Frequency	Percentage			
		Millennials		Generation X		
		Frequency	Percentage	Frequency	Percentage	p-value (Py-Px)
Make product reviews						
	Sometimes	90	69.2%	102	82.9%	
	Always	40	30.8%	21	17.1%	**0.011**
Read product reviews						
	Never	0	0.0%	2	1.6%	0.144
	Sometimes	20	15.4%	44	35.8%	**0.000**
	Always	110	84.6%	77	62.6%	**0.000**
Reviews of other users						
	Never	34	26.2%	33	26.8%	0.903
	Sometimes	67	51.5%	69	56.1%	0.467
	Always	29	22.3%	21	17.1%	0.296
Importance of reviews						
	Not important/indifferent	5	3.8%	15	12.2%	
	Important/Very important	125	96.2%	108	87.8%	**0.014**

Videogame Player					
Yes	108	83.1%	58	47.2%	
No	22	16.9%	65	52.8%	**0.000**

TABLE 2 Tests of model fit

	Value	HI95	HI99
SRMR	0.071	0.073	0.078
$\mathbf{d_{ULS}}$	0.720	0.740	0.888
$\mathbf{d_G}$	0.599	0.880	1.079

TABLE 3 Individual item reliability, construct reliability and convergent validity

Construct/Indicator	Outer loading	Weight	Jöreskog's rho (ρ_c)	Cronbach's alpha(α)	AVE
Gamification (GAM)			0.701	0.858	0.779
PO	0.863	0.340			
BA	0.853	0.355			
LD	0.931	0.433			
Flow (FL)			0.705	0.874	0.799
ENJ	0.839	0.398			
CON	0.930	0.419			
TD	0.910	0.304			
Perceived ease of use (PEOU)			0.711	0.892	0.822
PEOU1	0.892	0.387			
PEOU2	0.899	0.343			
PEOU3	0.929	0.373			
Perceived usefulness (PU)			0.703	0.862	0.784
PU1	0.912	0.409			
PU2	0.905	0.381			
PU3	0.838	0.337			
Behavioral intention (BI)			0.766	0.871	0.693
BI1	0.689	0.174			
BI2	0.776	0.238			
BI3	0.877	0.217			

BI4	0.900	0.299
BI5	0.806	0.292

Note: AVE: average variance extracted.

TABLE 4 Discriminant validity

Construct	GAM	FLOW	PEOU	BI	PU
GAM					
FLOW	0.173				
PEOU	0.025	0.033			
BI	0.003	0.042	0.366		
PU	0.022	0.049	0.634	0.299	

Note: Heterotrait-Monotrait (HTMT) criterion.

TABLE 5 Structural model results for sample 1 (Millennials)

Coefficient of determination (R2)			R^2_{FL}=0.173	R^2_{PEOU}=0.041	R^2_{PU}=0.639	R^2_{BI}=0.429
Direct effects	**Path coefficient**	**t-value**	**p-value**	**95% BCCI**		**Significance**
				2.5%	**97.5%**	
GAM → FL	0.416	4.289	0.000	0.225	0.610	Sig.
GAM → PEOU	0.101	0.977	0.165	-0.101	0.311	Nsig.
GAM → BI	-0.232	3.100	0.001	-0.360	-0.072	Sig.
GAM → PU	-0.011	0.164	0.435	-0.126	0.124	Nsig.
FL → PEOU	0.139	1.316	0.094	-0.064	0.345	Nsig.
FL → BI	0.181	2.060	0.020	-0.005	0.340	Sig.
FL → PU	0.085	1.248	0.106	-0.041	0.213	Nsig.
PEOU → BI	0.487	3.295	0.001	0.200	0.764	Sig.
PEOU → PU	0.782	17.024	0.000	0.685	0.862	Sig.
PU → BI	0.174	1.749	0.027	-0.222	0.556	Sig.
Indirect effects	**Path coefficient**	**t-value**	**p-value**	**95% BCCI**		**Significance**
				2.5%	**97.5%**	
GAM →	0.058	1.191	0.117	-0.031	0.162	Nsig.

PEOU						
GAM → BI	0.175	2.130	0.017	0.022	0.346	Sig.
GAM → PU	0.159	1.913	0.028	0.008	0.323	Sig.
FL → BI	0.097	1.353	0.088	-0.038	0.247	Nsig.
FL → PU	0.108	1.318	0.094	-0.053	0.269	Nsig.
PEOU → BI	0.120	0.743	0.229	-0.180	0.452	Nsig.

Notes: t-values in parentheses. Bootstrapping 95% confidence intervals bias corrected in square brackets (based on n = 5000 subsamples). ***p b .001; **p b .01; *p b .05 (based on t(4999), one-tailed test). t(0.05, 4999) = 1.645; t(0.01, 4999) = 2.327; t(0.001, 4999) = 3.092; ns = not significant.

TABLE 6 Structural model results for sample 2 (Generation X)

Coefficient of determination (R2)			R^2_{FL}=0.051	R^2_{PEOU}=0.149	R^2_{PU}=0.383	R^2_{BI}=0.562
Direct effects	**Path coefficient**	**t-value**	**p-value**	**95% BCCI**		**Significance**
				2.5%	**97.5%**	
GAM → FL	0.224	2.123	0.017	0.005	0.422	Sig.
GAM → PEOU	-0.067	0.625	0.266	-0.276	0.136	Nsig.
GAM → BI	-0.052	0.673	0.250	-0.206	0.095	Nsig.
GAM → PU	0.122	1.436	0.076	-0.035	0.285	Nsig.
FL → PEOU	0.395	4.472	0.000	0.213	0.540	Sig.
FL → BI	-0.014	0.167	0.434	-0.178	0.153	Nsig.
FL → PU	0.045	0.426	0.335	-0.179	0.240	Nsig.
PEOU → BI	0.361	3.037	0.001	0.122	0.578	Sig.
PEOU → PU	0.584	7.018	0.000	0.407	0.743	Sig.
PU → BI	0.483	4.925	0.000	0.281	0.670	Sig.
Indirect effects	**Path coefficient**	**t-value**	**p-value**	**95% BCCI**		**Significance**
				2.5%	**97.5%**	
GAM → PEOU	0.089	1.944	0.026	0.003	0.187	Sig.
GAM → BI	0.074	0.868	0.193	-0.093	0.245	Nsig.
GAM → PU	0.023	0.292	0.385	-0.132	0.176	Nsig.
FL → BI	0.276	3.766	0.000	0.114	0.403	Sig.
FL → PU	0.231	3.536	0.000	0.114	0.362	Sig.
PEOU → BI	0.282	3.642	0.000	0.143	0.459	Sig.

Notes: t-values in parentheses. Bootstrapping 95% confidence intervals bias corrected in square brackets (based on n = 5000 subsamples). ***p b .001; **p b .01; *p b .05 (based on t(4999), one-tailed test). t(0.05, 4999) = 1.645; t(0.01, 4999) = 2.327; t(0.001, 4999) = 3.092; ns = not significant.

TABLE 7 Nonparametric Confidence Set Approach Multi-Group Analysis (MGA)

Direct effects	Path coefficient Sample 1	Path coefficient Sample 2	95% BCCI 2.5%	95% BCCI 97.5%	Significance
GAM → FL	0.4164	0.2242	0.2245	0.6104	Sig.
GAM → PEOU	0.1009	-0.0670	-0.1008	0.3110	Nsig.
GAM → BI	-0.2322	-0.0521	-0.3600	-0.0722	Sig.
GAM → PU	-0.0105	0.1218	-0.1259	0.1235	Nsig.
FL → PEOU	0.1386	0.3953	-0.0643	0.3446	Sig.
FL → BI	0.1809	-0.0139	-0.0051	0.3399	Sig.
FL → PU	0.0849	0.0449	-0.0405	0.2126	Nsig.
PEOU → BI	0.4869	0.3613	0.1998	0.7640	Nsig.
PEOU → PU	0.7823	0.5841	0.6853	0.8621	Sig.
PU → BI	0.1537	0.4827	-0.2218	0.5561	Nsig.