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Facebook commerce usage intention: a symmetric and asymmetric approach

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Abstract
This study explores the antecedents of usage intentions to use Facebook commerce from an asymmetric point of view. The methodology consists of qualitative comparative analysis (QCA) asymmetric methods as well as structural equation methods (SEM). This study employs the SEM partial least squares analysis method to validate existing theories that examine the relationships between variables such as electronic word-of-mouth (eWOM), trust, perceived value, and usability of the new technology discussed in this study. The results from the fuzzy-set QCA show that not all the variables are necessary conditions for influencing F-commerce usage intention, with the variables of usability × perceived value × trust being the most important for obtaining valid and useful results, while in SEM analysis, trust, perceived value and eWOM have been shown to be influential variables in usage intentions. The novelty of this study has to do with an analysis of a growing context such as e-commerce through Facebook, in order to contribute to its understanding so that such information is useful for the management of this context of social networks, for a better use in terms of trade, improving the effectiveness and efficiencies of management decisions.

Keywords Facebook · Usage intention · S-commerce · Social networks · Symmetric · Asymmetric

1 Introduction

The term social commerce (SC) is frequently confused with social business (SB). The problem is that there are several definitions and explanations of SB. In this regard, Turban et al. [1] reviewed the different meanings and usages of the term SC, considering the importance of the e-commerce concept. The authors concluded that the term social business refers to electronic transactions (associated with e-commerce) within a social media environment that originated from social media marketing, enterprise social commerce, technology, and support, as well as the integration of social aspects, software tools, (blogs, wikis), management and organization. Along similar lines, Liang and Turban [2] define social commerce as the use of Web 2.0 applications to support people's interactions in an online context, where users' contributions may aid in the acquisition of services and products. More specifically, social commerce can be defined as applications that combine online purchasing and social networks [3], as explained by Stephen and Toubia [4], who describe it as the integration of social network features in the basic functions of electronic commerce websites to allow people to actively participate in the commercialization and sale of products and services. Lastly, Huang and Benyoucef [5] and Huang and Benyoucef [6] define social commerce as a recent branch of e-commerce emerging as a result of the popularity of social networking sites, such as Facebook, LinkedIn, and Twitter, as well as wikis and microblogging.

A recent report by Chui et al. [7] estimates that the use of social technologies can contribute between $900 billion and $1.3 trillion in value and that up to 1/3 of consumer spending is subject to influences from social commerce.

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Social commerce (S-commerce) provides a collaborative environment that allows a network of interactions among stakeholders (i.e., institutions, businesses, individuals and organizations) to co-create value [8], to generate content, to provide feedback and to disseminate information [9]. Another of the main differentiating features of social commerce is that the environment is based on a community of buyers and sellers who are driven by different motivations [10]. The buyer is interested in relationships with other buyers and sellers to seek or share information that will help him or her make a better buying decision; in contrast, the seller is interested in raising buyer awareness and cooperating or competing with other sellers [4]. Therefore, social commerce allows customers to have interpersonal relationships with other customers to exchange information, experiences, advice, etc. [11], resulting in social relationships that do not occur in other forms of e-commerce [2], favoring customer engagement in social commerce [12].

In this new environment, Facebook has become the most popular social network in our society, on both a national and an international level, as it is a generalist network with a fairly extensive user base. At the present time, after 10 years of existence, Facebook has over 1.4 billion users around the world (Facebook 2015). According to a recent report by Business Insider [13], this social network has broken the barrier of the virtual world and has established itself in the daily lives of millions of people who, until now, hardly had any contact with the network. Facebook is the top social commerce platform, driving more than two-thirds of mobile e-commerce traffic and boosting social media's quickly growing share of e-commerce web traffic. Currently, there are various definitions for F-commerce. Facebook commerce is a natural evolution of SC, which maximizes online business by selling goods and services through Facebook business pages (Facebook fan pages) without needing to resort to additional investments or to expanding the infrastructure of the business [14]. Shin [15] defined F-commerce as a subcategory of S-commerce that utilizes Facebook, a social network service that facilitates user contributions and social interaction, to support the online selling and buying of services and products. Leong et al. [16] defined F-commerce as a subgroup of social commerce whereby business and commercial activities are performed using Facebook to support the online buying and selling of services and products, while the transactions can be done on the Facebook site or by using third-party websites. In our case, we will understand F-commerce as a derivative of electronic commerce that uses Facebook as a sales channel for the commercialization of products and services, favoring the social relations derived from the environment where the economic transaction is generated.

Companies now can use different formulas to sell on Facebook [17–20]. (1) The storefront: this is the most static version of Facebook commerce. This type of solution allows for the organization of a complete catalogue of products or services within a Facebook page, that is, to integrate the offer showcase within Facebook so that when the consumer wants to make a purchase, he or she is redirected to the traditional online store. As a result, the purchase process is not performed entirely on Facebook, and the time of purchase of the product occurs through the traditional e-commerce channel. (2) The Facebook store: the Facebook store is an evolution of the storefront that allows you to complete the entire shopping process on Facebook. In this way, it allows the integration of a catalogue of products or services while also making it easier for users to buy, without having to leave the social network. (3) Smart Facebook store or "smart" Facebook stores: at the top level, there are applications that not only integrate the entire shopping process within Facebook but also offer a personalized shopping experience based on each user's profile. These types of solutions are based on the information that users register and share through Facebook to recommend the products that best suit their tastes and interests.

We chose the social network Facebook to perform this research for two reasons. First, from a theoretical point of view, the participation of customers in social networks is very important because it naturally facilitates conversations between customers, as well as between customers and companies, which improves engagement; additionally, the high number of Facebook users make it the world's leading social network regarding the number of users. Second, from a practical point of view, marketing agencies often use social networks and Facebook to improve brand engagement beyond the number of likes [21].

It is obvious that social networks have changed the way people communicate currently. However, which factors determine the usage intention of online social networks (Facebook, in our study) to purchase goods and services? The aim of this paper is to address those questions and to analyze the usage intention antecedents of products and services available through F-commerce by introducing a new theoretical framework that acknowledges the relationships between eWOM, electronic word-of-mouth, perceived value, trust and usability. In addition, this study also provides a new research methodology framework by performing asymmetric models of data assessment along with the partial least squares analysis method, enhancing discussion in the area of knowledge targeted by this research. This approach makes it possible to better understand the context of e-commerce on a platform such as Facebook which, unlike other e-commerce contexts that were born with this objective, has varied its initial social network objective by incorporating this possibility of creating a new context of commerce, which taking into account the growth of Facebook in the number of users, can set a trend in the e-commerce sector as well as foresee

similar behaviours on platforms that lend themselves very much to it, such as Instagram.

2 Scientific literature review and research proposals

A behavioral model explaining the process of S-commerce adoption and its key role in F-commerce is developed from the traditional models regarding technology acceptance as well as from a literature review of previous studies. Although the case of research on s-commerce is broader, the number of studies on F-Commerce is very small; in this sense, the studies related to this field are detailed in Table 1 below. None of the mentioned articles use any kind of asymmetric methodology to assess the causality of individual behavior.

2.1 Effects of usability

While the website may seem cold and distant compared to a traditional establishment, it also offers new and interesting possibilities [22]; in our case, this possibility also may occur in the case of F-commerce. Numerous studies suggest that the perceived usability of a website is a fundamental element in the image of the company's online store and that it can influence purchasing behavior in a similar way to that of traditional stores [23]. Consumers use a website or social network to find product information, to make online payments and to complete purchases; a well-designed online environment with high usability (for example, ease of navigation) will improve a consumer's online shopping experience by increasing usability. Usability refers to several aspects such as the ease of learning to manage the system, the ease of remembering basic functions, the degree of error avoidance, and the general satisfaction of the user regarding manageability [24]. In this regard, this study introduces the following research hypotheses:

Hypothesis 1 Usability of F-commerce platforms greatly and positively influences usage intention.

2.2 Effects of trust

The lack of social signals due to spatial separation leads to trust playing a key role in online purchasing [25]. Trust in the online business implies that companies will always fulfill their obligations; this is a subjective belief and a major factor in online purchases affected by uncertainty, where users of e-commerce risk losing their money [26]. Hence, companies will try to alleviate consumer uncertainty to improve usage intention [27–29]. In this regard, Everard and Galletta [30], Zhou [31] and Bansal et al. [32], among others, conclude that improved trust toward F-commerce platforms will likely increase usage intention. Therefore, this study introduces the following research hypothesis:

Hypothesis 2 Trust in F-commerce platforms positively influences usage intention.

2.3 Effects of electronic word-of-mouth

The term electronic word-of-mouth (eWOM) refers to the exchange of information on a product or service of a company on the Internet [33]. Essentially, eWOM comprises any positive or negative statement made by potential, actual or former customers about a product or company, which is made available to a multitude of people and institutions via the Internet [33]. The most relevant analysis in the scope of this research (Facebook and other social networks) is that these statements influence customer behavior while improving usage intention of the F-commerce platform. This affirmation becomes patently clear after analyzing the adoption of other technology innovations such as social network games [34], tourism destination [35] and, among others, the adoption of electronic commerce [36]. In our case, the interactions that occur within the social network derived from the user's own contacts on Facebook will allow us to improve the information that consumers have about the related products and to establish a broader set of considerations [37], thus improving the intention to use these platforms [38]. We therefore propose the following research hypothesis:

Table 1 Prior studies of behavior in F-commerce

Keywords, objectives and proposed variables	Author
Trust in E-retailer, trust in Facebook-shopping, trust in Facebook and purchase intention on Facebook	[22]
Experience, enthusiasm, material resources, market, social navigation, value of awareness, social gratification, information, and purchase intention in S-commerce	[23]
Trust, recommendations and references, qualifications and comments, and purchase intention	[24]
Perceived ease of use, usefulness, self-efficiency, and intention to use	[25]
Big Five Model, urge to purchase, urgency, impulse purchase	[26]
Social image, subjective norms, perceived usefulness, perceived trust, E-Wom, perceived value and intention to use	[27]

Hypothesis 3 eWOM in F-commerce platforms positively influences usage intention.

2.4 Effects of perceived value

According to Zeithaml [39], customers' perceived value refers to a tradeoff between benefits and sacrifices, essentially the perception of what is received and what is given. Ruiz-Molina [40] also affirms that customers' perceived value of commercial transactions has a subjective nature since it means an evaluative judgment. Therefore, most studies in this area consider multiple variables to determine the importance of customers' perceived value. In addition, there is a significant relationship between customer perceived value and usage intention. Favorable customer perceived value toward F-commerce positively influences the usage intention of the platform. Previous studies corroborate this statement, marking the importance of attaining a distinct perceived value to influence the acceptance of new technology [41–44]. In the context of social commerce, users not only seek utilitarian and hedonic values, such as comfort and enjoyment, but also pursue social value, such as interaction with others and self-realization, which is why we consider it essential to define the relationship that the perceived value maintains the intention [45, 46]. In this regard, this study introduces the following research hypothesis:

Hypothesis 4 Customers perceived value toward F-commerce holds a significant, positive relationship with the usage intention of F-commerce platforms.

The proposed model is shown in Fig. 1.

3 Method

The analysis process is performed in two stages. The first stage consists of validating the measurement scales and verifying the hypotheses presented through partial least squares (PLS) in a model of structural equations (SEM) using the SmartPLS software [47]. A qualitative comparative analysis of fuzzy sets (fsQCA) is performed in the second stage. Quantitative comparative analysis (QCA) considers all logically possible combinations of conditions that produce the expected result (intention to use). In this way, fsQCA, unlike PLS, will allow us to explore complex patterns in which different causal or independent variables can produce the same result through different combinations with a limited number of cases [48, 49]. Therefore, QCA makes it possible to obtain, for a result of interest, which combinations of the different variables are the most relevant to arrive at that result. For this purpose, the software takes into account combinations of both variables and their negation (or, what is the same, high values and low values of the same variable), i.e., it can combine usability and perceived value in one way and non-usability and non-perceived value (low levels of usability and low levels of perceived value) in another.

PLS relies on a sequence of regressions to identify symmetric relationships, and QCA allows the asymmetry of relationships to be captured, which can be an advantage in the analysis system. Both methods are complementary, but together, they allow us to analyze behavior from different perspectives, thus obtaining a better understanding of the case. Thus, while PLS is recommended when the researcher wants to perform predictive analysis and to identify key variables that explain behavior [50], QCA is suitable for examining complex causal combinations because different combinations of variables can lead to the same result [51] and because the presence and absence of a given result may require different explanations.

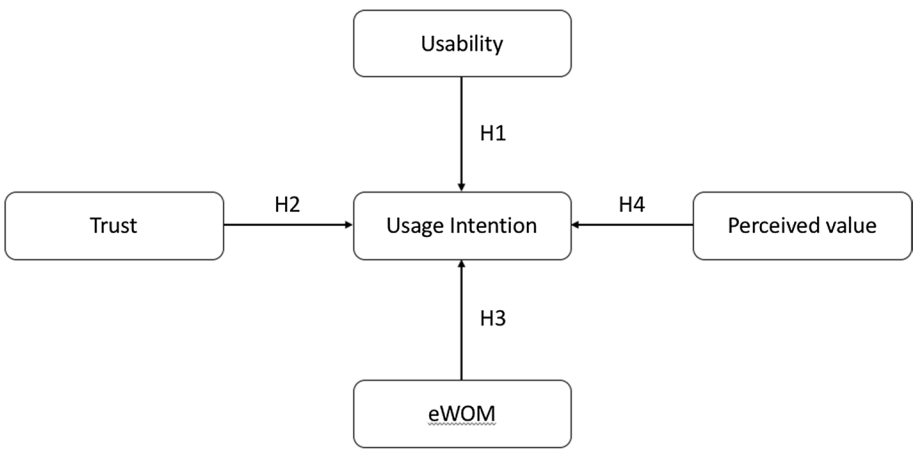

Fig. 1 Proposed model

The QCA methodology is asymmetric; the opposite result is not necessarily obtained through the same underlying causes that explain the positive result. QCA also implies equifinality; the same result could be obtained due to a combination of alternative variables as long as they are not necessary. Finally, the results of causality are circumstantial; a single condition does not determine the result but rather the combination of variables that explains the expected result. The importance therefore lies in the effect of relationships and combinations and not in the net effect of relationships [52]. Therefore, the inclusion of the QCA method has the following advantages [51]. QCA has no limitations on the number of interaction effects, unlike the PLS or regression models. The results are more detailed and are not limited by the number of analysis cases, such as the models based on structural equations [53–55]. In short, using both methods of analysis will provide us with a broader and a more complete view, which is a new contribution to the academic literature in the processes of adopting social purchasing technology.

3.1 Surveys and measure scales used

The design of the experimental stage of our research was performed in a simulated web environment using a Facebook profile. The users had to watch a video explaining the social purchasing process, while the video also described how the technology works as well as the benefits derived from its usage ("Appendix 1", https://youtu.be/zjkm1l9tdjI). This social network simulation included a series of modifications, such as a timer to start the web survey after the users had watched the explanation of the proposed platform for 90 s.

Before entering the web, users explicitly were informed that they had to remember a promotional code (321) appearing at the end of the video to ensure that they watched the complete video. For the research, we only used the users who could remember the code correctly. According to Wells [56], any information processed consciously or unconsciously activates the memory, which can increase the likeliness of remembering the message to which we were exposed. To determine whether the users had paid attention to the advertisements at the conscious or unconscious level, we measured the impact of advertising on the explicit memory through assessment measures of spontaneous and aided recall. Thus, we were able to know if the respondent had paid attention to the advertising and to what extent. This recall has been used widely as a variable for measuring advertising efficiency in terms of knowledge [57, 58]. A random sample of participants with active profiles on Facebook answered an online questionnaire.

The measurement scales used in the questionnaire were adapted from prior studies ("Appendix 2"). Research analysis involves adapted measurement scales from different e-marketing experts, such as the usage intention scales from Shin [59] and Liébana-Cabanillas et al. [60], the usability scale from Flavián et al. [22], the trust scale by Pavlou [61] and Liébana-Cabanillas et al. [60], the eWOM scale from Chu and Kim [62], and the perceived value scale by Kim et al. [63] and Dai et al. [64]. Fieldwork in this research began on the May 1 and ended June 1. Survey participation was completely voluntary, with the initial data set comprising 217 submissions. Response time values served as a data cleaning method, rejecting data from participants taking either too much or too little time to complete the questionnaires (affecting 12 submissions in this research). The resulting data sample comprised 205 valid submissions, 53% of which were from women. Approximately half of the total number of participants had a college degree and an average monthly income of approximately 1800 Euros (approx. $2000 according to current exchange). More than half of the total number of participants were 31 years old or older. The profile of the final sample is shown in Table 2.

In the first step of the analysis, missing values were removed from the data base, and then rare, uncommon values were analyzed with the Mahalanobis distance (D2) method. Finally, calibration of the variables was performed. Calibration is the process through which our survey data must be transformed into a fuzzy-set variables [65], and this study determined their degree of relevance within a certain subset. To complete the calibration process, first we must delete all missing values and once done, all constructs are calculated by multiplying their item scores [51, 66] to recalibrate variables into three different centiles [67]; in QCA two values are established at the beginning: the value 1 means to possess the category being valued and the value 0 means not to possess it. However, in order to calibrate the software so that the results it generates are valid and reliable, according to the author of the methodology [55] the values must be recalibrated to establish 3 points, including the value 1 and 0 mentioned above, and adding the value 0.5 as the midpoint. To this end, a series of centiles are established as a reference, in this study were 5th percentile, 50th percentile and 95th percentile of the data values following the suggestion of Woodside [67]. The details of this procedure are shown in Table 3.

Table 2 Profile of the sample used in the analysis

Variable	Number	Percentage (%)
Sex		
Men	75	36.58
Women	130	63.41
Age		
Under 18	8	3.90
From 19 to 25	22	10.73
From 26 to 30	25	12.20
From 31 to 35	61	29.76
From 36 to 40	46	22.44
From 41 to 45	14	6.83
From 46 to 50	13	6.34
From 51 to 55	1	0.49
From 56 to 60	8	3.90
From 61 to 65	2	0.98
Over 65	5	2.44
Level of studies		
Primary studies	16	7.80
Professional training	13	6.34
Graduate studies	72	35.12
University studies	104	50.73
Activity		
Unemployed	15	7.32
Student	40	19.51
Retired	9	4.39
Employed by others	108	52.68
Self-employed	33	16.10
Family income level		
Less than 1100 Euros per month	35	17.07
From 1101 to 1800 Euros per month	62	30.24
From 1801 Euros to 2700 Euros per month	57	27.80
Over 2701 Euros per month	51	24.88
Purchasing experience on social networks		
Yes	47	22.93
No	158	77.07

4 Results

Prior to the testing of the hypothesis, we proceed to test that the measuring instruments are free from random errors (reliability of the items and variables) and that the constructs have the capability to show real differences between the objects in relation to the characteristic being measured (discriminant and convergent validity). First, this study checks that all the item loads have a value higher than 0.7 in the EFA analysis. The analysis concludes that both the KMO (Kaiser–Meyer–Olkin) (0.8590) index and the Bartlett test of sphericity ($p < 0.000$) carry higher values than the recommended values. All the Cronbach's alpha analysis values are higher than 0.9, as observed in Table 4.

4.1 Path analysis (SEM)

The model of measurement regarding variables and items is analyzed with the PLSc method. This study finds that both the factorial loads' reliability values and the composite reliability values (> 0.9 and > 0.94 respectively) are higher than the recommended values in the literature [68]. The HTMT (heterotrait-monotrait ratio of correlations) [69], the extracted variance (AVE > 0.8), and the Fornell-Larcker criteria [70] methods analyze and confirm discriminant and convergent validity. Regarding the evaluation of the structural model (also in Table 4), the R^2 index shows a high variance, explained by the usage intention model ($R^2 = 0.809$). In the same way, the Q2 index was estimated by running a blindfolding procedure (omission distance = 7) ($Q^2 = 0.718$), as both Stone [71] and Geisser [72] reported. This study also employs the standardized root mean square residual (SRMR) indicator, with a value of SRMR = 0.052 [73]. In addition, the model is analyzed by estimating size effect values (f^2) [54].

Concerning the contrast of the hypotheses employing the SEM methodology, the only hypothesis that this study was unable to support was the hypothesis regarding

Table 3 Descriptive analyses and calibration values

		Trust	Perceived value	eWOM	Usab	Intention
N	Valid	205	205	205	205	205
	Missing	0	0	0	0	0
Mean		2011	387.48	40.09	10,893.55	78.03
Median		576	192	18	2304	32
SD		2958	474.81	59.33	16,697.96	86.87
Min		1	1	1	1	1
Max		16,807	2401	343	117,649	343
Calibration values						
Percentile 5		16	2	1	9.6	2
Median		576	192	18	2304	32
Percentile 95		7056	1080	125	32,400	216

Usab usability, *Intention* usage intention

Table 4 Evaluation of the model: Cronbach's alpha (Ca), correlation (R^2), Stone-Geisser test (Q^2), effect size (f^2), composite reliability (CR), extracted variance (AVE) and factorial loads

Construct	Ca	R^2	Q^2	f^2	CR	AVE	Factorial loads
Trust	0.976			0.031	0.976	0.891	0.902–0.962*
Percv. value	0.974			0.117	0.974	0.905	0.933–0.969*
eWOM	0.943			0.044	0.943	0.846	0.894–0.940*
Usability	0.973			0.012	0.982	0.902	0.925–0.970*
Intention	0.962	0.809	0.718				0.925–0.968*

Percv. value perceived value

*Significant at $p < 0.001$

Table 5 Necessary conditions for fsQCA to identify the relationships between trust, identification, perceived value, usability, and eWOM for the occurrence (and no occurrence) of F-commerce usage intention

	Usage intention		~ Usage intention	
	Consistency	Coverage	Consistency	Coverage
Trust	**0.801**	0.770	0.559	0.584
~ Trust	0.617	0.593	0.775	0.709
Usability	0.780	**0.896**	0.535	0.591
~ Usability	0.643	0.590	**0.806**	0.798
eWOM	0.780	**0.847**	0.568	0.594
~ eWOM	0.626	0.601	0.754	0.788
Perceived value	**0.858**	**0.899**	0.544	0.548
~ Perceived value	0.569	0.565	**0.889**	**0.859**

The highest values for the necessary conditions are shown in bold

the influence of Usability on Usage Intention ($\beta = 0.142$, $p = 0.270$), while the influence of trust ($\beta = 0.174$, $p = 0.028$), perceived value ($\beta = 0.452$, $p = 0.001$), and eWOM ($\beta = 0.157$, $p = 0.007$) was contrasted, being the perceived value the variable with the greatest predictive weight.

4.2 fsQCA results

The causality test regarding usage intention shows that none of the considered variables are a necessary condition because the consistency coefficients are below 0.90 [55]. Table 5 shows that both the Trust and Perceived variables are most likely to carry high values when estimating F-commerce usage intention.

Table 6 FsQCA analysis results

Frequency cutoff: 2; consistency cutoff: 0.893; all variables are present	Raw coverage	Unique coverage	Consistency
eWOM × Trust	0.696	0.028	0.912
eWOM ~ Usab × Percv	0.542	0.038	0.937
Usab × Percv × Trust	0.728	0.070	0.939

Usab usability, *Percv* perceived value

Solution coverage: 0.805; solution consistency: 0.909

Following this analysis, the appropriate causal configurations are decided, with a minimum consistency threshold of 0.8 and a frequency cutoff value of 2 [55]. The results of this particular analysis procedure, using both SEM and fsQCA methods, indicate a sufficient relationship between the usage intention and a certain subset of conditions. According to Woodside [67], a model studied with the fsQCA method is informative when the solution consistency value is above 0.74 and when the raw coverage value is between 0.25 and 0.65 [55], as long as small variances are allowed [74]. The results of the intermediate solution that our research employs show a consistency cutoff value of 0.893 (coverage = 0.805; consistency = 0.909). The configurations used are: (1) eWOM × Trust (raw coverage: 0.696; consistency: 0.912), (2) Ewon × ~ Usability × Perceived value (raw coverage: 0.542; consistency: 0.937) and, (3) Usability × Perceived value × Trust (raw coverage: 0.728; consistency: 0.939). The last causal combination employed is the most relevant, as it shows the highest raw coverage values. All the causal conditions in this study explain 80% of the empirical evidence [75] (see Table 6).

5 Discussion and conclusions

The level of penetration of the different social networks in our society is astounding [13], and the relevance of social commerce has rapidly increased during the past few years [7]. Facebook commerce can be considered an evolution of social commerce that has a profound degree of acceptance. This phenomenon is explained by the large and ever-growing popularity of Facebook. The number of companies and brands offering their business through F-commerce and those enjoying an increased popularity as well as improved sales figures is also increasing at a high rate (Coca-Cola, Lady Gaga, Warner Bros, Starbucks…). This phenomenon is the main reason for the in-depth research and methodology used in this study, analyzing the usage intention antecedents of products and services available through F-commerce by introducing a new theoretical framework that acknowledges the relationships between eWOM, perceived value, trust and usability. In addition, this study also provides a new research methodology framework by performing asymmetric models of data assessment along with the partial least squares analysis method, enhancing discussion in the area of knowledge targeted by this research.

The research methodologies employed in this study were divided in two stages. The first step aims to validate both the scales and the structural modeling, and the last step is used to examine influence and causality relationships. According to reports from Hair et al. [68] and Henseler et al. [69], values obtained regarding reliability (simple correlations and composite reliability) and validity scores (variance analysis, composite reliability index, Fornell-Larcker criterion and HTMT) demonstrate that scales are adequate. The resulting scores indicate that this research model has an adequate adjustment. Regarding the contrast in relationships, all of them show significant p-values, except for one, which was the relationship between usability and usage intention. The main focus of this research is the asymmetric analysis through QCA of previous studies on usage intention (in contrast to the traditional, symmetric analysis and the SEM method) based on four variables found during the literature review stage.

SEM analysis fails to confirm the existing relationship between usability and usage intention, mostly due to the specific nature of Facebook, the platform this paper studies. Facebook enjoys a social presence close to 100%, with an ever-growing activity level; the perceived level of usability that users believe they have with the F-commerce platform is irrelevant because Facebook users do not consider this relationship as a distinct, important factor in their planned usage intention. However, users greatly value the rest of the relationships discussed in this study.

According to the results obtained from the SEM analysis, both the perceived value and the community itself impact the usage intention of the platform, as they share online purchasing experiences within the contact network of the community and positively influence planned usage intention. In light of the above information, companies willing to adopt social purchasing platforms and technologies should provide customers with the necessary tools to share their purchasing experiences with other users. Companies also should actively and publicly promote the utility of these technologies and the benefits they provide for their users, developing a positive influence with other contacts of the community while encouraging the use of the social purchasing technologies available in the network. Companies can take advantage of their own contact network to fulfill these objectives. Companies are likely to reach a positive usage intention from their users by sharing previous, positive purchasing experiences and resources, including tutorials and promotional videos, with the community, as the analysis of the three key variables discussed in this research confirms.

Comparing the different qualitative analyses, the SEM analysis method shows a value of 0.809 regarding R^2, close to the score the QCA method offers (0.805). However, the QCA modeling method shows that the combination of usability, perceived value and trust is a sufficient condition for favorable usage intentions, an affirmation supported by 72% of the sample of participants interested in F-commerce in the

survey conducted by this research. Furthermore, 7% of users with favorable usage intentions for F-commerce exclusively refer to this exact configuration of variables.

As a summary, this study has carried out an analysis by means of two different methodologies, on the one hand, the modeling of structural equations and on the other hand, the comparative qualitative analysis, with the intention of knowing the influence of predictive variables such as perceived value, electronic recommendation, confidence and usability on the future intentions of using the Facebook platform, analysed in this case as an electronic commerce platform. The use of both methodologies allows us to approach this research topic from different perspectives, and the novelty of the methodology means an incremental contribution to the research.

This contribution proves that the proposed model is adequate and that the relationships are significant, except in the case of usability. These results make it possible to contribute information to a relatively new area of knowledge, such as the study of the Facebook platform as an e-commerce platform, arising from its function as a social network. In addition, this information is useful for marketing managers, as it allows them to know how the variables that may be involved in users using the Facebook platform to carry out their buying and selling operations are related, and therefore provides information on which aspects should be worked on more specifically to obtain the expected results. This contribution is an interesting contribution to a field of study that will obviously continue to grow, more and more companies will promote the use of this type of trading platforms with a social component, where you can share information, create contacts… so this type of studies allow us to help understand how they work, for a better business use of these platforms.

Appendix 1: Website form used

Factors affecting consumer purchases on social networks

The University of Granada is performing research on the level of acceptance of online purchasing systems in social media; this research is specifically targeting the users of Facebook. We are kindly asking you to spend a few minutes responding to a simple survey after viewing an online video that explores the use of online purchasing systems in social media.

As you already know, social media has become part of our daily lives and is fully integrated in our daily routines. We are wondering about the quick, easy and simple process that users approach when purchasing through business pages of social networks.

The following explanatory video shows the different advantages and features that the different social networks might contribute to the field of electronic commerce.

All the collected data will be processed in aggregated form and will be evaluated in full confidence, in compliance with the technical and organizational measures required by current data protection regulations. If you have any questions or doubts about this research, please contact us through the following e-mail addresses: franlieb@ugr.es.

Your participation in this research study should not take longer than 6 or 7 min.

Appendix 2: Scales used

Perceived value [63, 64, 76, 77]

Regarding the viewed F-commerce platform, score your level of agreement or disagreement on a scale of 1 to 7:

- The time it would take to make purchases on F-commerce platforms is very reasonable (PerVal1).
- The effort associated with the use of these platforms to make online purchases is worth it to me (PerVal2).
- The perceived experience in the use of platforms F-commerce is positive (PerVal3).
- I would find the use of F-commerce platforms to be valuable (PerVal4).

Usage intention [59, 78]

Regarding the possibility of using an F-commerce platform, score your level of agreement or disagreement on a scale of 1 to 7:

- I would use F-commerce in the future to make online purchases (IntUse1).
- I would recommend that other consumers use F-commerce to make online purchases (IntUse2).
- My intention is to use F-commerce in the future as an online purchase tool (IntUse3).

E-wom [62, 79]

- In the purchasing of products, I generally buy brands I think other people will approve of (EW1).
- If other people can see me using a product, I frequently buy the brand they expect me to buy (EW2).
- I find a sense of belonging through buying the same products and brands that others buy (EW3).

Trust [61, 78, 80]

- I believe that F-commerce platforms will keep the promises and commitments they make (Trust1).
- F-commerce platforms are trustworthy (Trust2).
- I would rate F-commerce platforms as honest (Trust3).
- I think that the F-commerce is responsible (Trust4).
- Generally, I have confidence in the F-commerce platforms (Trust5).

Usability [22]

- In the F-commerce platform, everything is easy to understand (USA1).
- Finding the information, I need to make the purchase is easy in the F-commerce platforms (USA2).
- The structure and content are easy to understand (USA3).
- In F-commerce platforms, everything is easily understandable (USA4).
- The organization of contents of this type of platform allows me to know where I am when I browse its pages (USA5).
- I feel that I control what I can do when I use these platforms (USA6).

References

1. Turban E, Strauss J, Lai L (2015) Social commerce: marketing, technology and management. Springer, Cham
2. Liang T-P, Turban E (2011) Introduction to the special issue social commerce: a research framework for social commerce. Int J Electron Commer 16:5–14. https://doi.org/10.2753/JEC1086-4415160201
3. Tedeschi B (2006) Like shopping? Social networking? Try social shopping. N Y Times 11:9
4. Stephen AT, Toubia O (2010) Deriving value from social commerce networks. J Mark Res 47:215–228. https://doi.org/10.1509/jmkr.47.2.215
5. Huang Z, Benyoucef M (2013) From e-commerce to social commerce: a close look at design features. Electron Commer Res Appl 12:246–259. https://doi.org/10.1016/j.elerap.2012.12.003
6. Huang Z, Benyoucef M (2015) User preferences of social features on social commerce websites: an empirical study. Technol Forecast Soc Change 95:57–72. https://doi.org/10.1016/j.techfore.2014.03.005
7. Chui M, Manyika J, Bughin J et al (2012) The social economy: unlocking value and productivity through social technologies. McKinsey Glob Inst 4:35–58

8. Hajli N, Shanmugam M, Papagiannidis S et al (2017) Branding co-creation with members of online brand communities. J Bus Res 70:136–144. https://doi.org/10.1016/j.jbusres.2016.08.026
9. Busalim AH, Hussin ARC (2016) Understanding social commerce: a systematic literature review and directions for further research. Int J Inf Manag 36:1075–1088. https://doi.org/10.1016/j.ijinfomgt.2016.06.005
10. Xiao B, Huang M, Barnes AJ (2015) Network closure among sellers and buyers in social commerce community. Electron Commer Res Appl 14:641–653. https://doi.org/10.1016/j.elerap.2015.10.001
11. Zhang H, Lu Y, Gupta S, Zhao L (2014) What motivates customers to participate in social commerce? The impact of technological environments and virtual customer experiences. Inf Manag 51:1017–1030. https://doi.org/10.1016/j.im.2014.07.005
12. Molinillo S, Liébana-Cabanillas F, Anaya-Sánchez R (2018) A social commerce intention model for traditional e-commerce sites. J Theor Appl Electron Commer Res 13:80–93. https://doi.org/10.4067/S0718-18762018000200107
13. Smith C (2015) Facebook is leading the way in social commerce. In: Bus. Insid. http://www.businessinsider.com/social-commerce-2015-report-2015-7. Accessed 13 Dec 2016
14. Marsden P (2011) The f-commerce FAQ. In: Digit. Wellbeing. https://digitalwellbeing.org/f-commerce-faq-all-you-ever-wanted-to-know-about-facebook-commerce-but-were-afraid-to-ask/. Accessed 8 Mar 2016
15. Shin D-H (2013) User experience in social commerce: in friends we trust. Behav Inf Technol 32:52–67. https://doi.org/10.1080/0144929X.2012.692167
16. Leong L-Y, Jaafar NI, Ainin S (2018) The effects of Facebook browsing and usage intensity on impulse purchase in f-commerce. Comput Human Behav 78:160–173. https://doi.org/10.1016/j.chb.2017.09.033
17. Marsden P (2010) A new age of enlightenment. In: Marketing (00253650). http://socialcommercetoday.com/. Accessed 23 June 2016
18. Gajewski AS (2013) A qualitative study of how Facebook storefront retailers convert fans to buyers. Walden University
19. Bucci L (2014) From e-commerce to social commerce: exploring global trends. LUISS Guido Carli
20. Heinemann G, Gaiser C (2015) Social commerce as base factor no. 1 for SoLoMo. In: Heinemann G, Gaiser C (eds) Social—local—mobile: the future of location-based service. Springer, Berlin, pp 13–54
21. Lee D, Hosanagar K, Nair HS (2018) Advertising content and consumer engagement on social media: evidence from Facebook. Manag Sci 64:5105–5131. https://doi.org/10.1287/mnsc.2017.2902
22. Flavián C, Guinalíu M, Gurrea R (2006) The role played by perceived usability, satisfaction and consumer trust on website loyalty. Inf Manag 43:1–14. https://doi.org/10.1016/j.im.2005.01.002
23. Liang T-P, Lai H-J (2002) Effect of store design on consumer purchases: an empirical study of on-line bookstores. Inf Manag 39:431–444. https://doi.org/10.1016/S0378-7206(01)00129-X
24. Thakur R (2018) The role of self-efficacy and customer satisfaction in driving loyalty to the mobile shopping application. Int J Retail Distrib Manag 46:283–303. https://doi.org/10.1108/IJRDM-11-2016-0214
25. Zhou L, Zhang P, Zimmermann H-D (2013) Social commerce research: an integrated view. Electron Commer Res Appl 12:61–68. https://doi.org/10.1016/j.elerap.2013.02.003
26. Lu Y, Yang S, Chau PYK, Cao Y (2011) Dynamics between the trust transfer process and intention to use mobile payment services: a cross-environment perspective. Inf Manag 48:393–403. https://doi.org/10.1016/j.im.2011.09.006
27. Hsiao K, Chuan-Chuan Lin J, Wang X et al (2010) Antecedents and consequences of trust in online product recommendations: an empirical study in social shopping. Online Inf Rev 34:935–953. https://doi.org/10.1108/14684521011099414
28. Liébana-Cabanillas F, Sánchez-Fernández J, Muñoz-Leiva F (2014) Antecedents of the adoption of the new mobile payment systems: the moderating effect of age. Comput Human Behav 35:464–478. https://doi.org/10.1016/j.chb.2014.03.022
29. Li H, Gupta A, Zhang J, Sarathy R (2014) Examining the decision to use standalone personal health record systems as a trust-enabled fair social contract. Decis Support Syst 57:376–386. https://doi.org/10.1016/j.dss.2012.10.043
30. Everard A, Galletta DF (2005) How presentation flaws affect perceived site quality, trust, and intention to purchase from an online store. J Manag Inf Syst 22:56–95. https://doi.org/10.2753/MIS0742-1222220303
31. Zhou T (2011) An empirical examination of initial trust in mobile banking. Internet Res 21:527–540. https://doi.org/10.1108/10662241111176353
32. Bansal G, Zahedi FM, Gefen D (2016) Do context and personality matter? Trust and privacy concerns in disclosing private information online. Inf Manag 53:1–21. https://doi.org/10.1016/j.im.2015.08.001
33. Hennig-Thurau T, Gwinner KP, Walsh G, Gremler DD (2004) Electronic word-of-mouth via consumer-opinion platforms: what motivates consumers to articulate themselves on the Internet? J Interact Mark 18:38–52. https://doi.org/10.1002/dir.10073
34. Hansen SS, Lee JK (2013) What drives consumers to pass along marketer-generated eWOM in social network games? Social and game factors in play. J Theor Appl Electron Commer Res 8:53–68. https://doi.org/10.4067/S0718-18762013000100005
35. Jalilvand MR, Samiei N (2012) The impact of electronic word of mouth on a tourism destination choice: testing the theory of planned behavior (TPB). Internet Res Electron Netw Appl Policy 22:591–612. https://doi.org/10.1108/10662241211271563
36. Hsu C, Chuan-Chuan Lin J, Chiang H (2013) The effects of blogger recommendations on customers' online shopping intentions. Internet Res 23:69–88. https://doi.org/10.1108/10662241311295782
37. Hung KH, Li SY (2007) The influence of eWOM on virtual consumer communities: social capital, consumer learning, and behavioral outcomes. J Advert Res 47:485–495. https://doi.org/10.2501/S002184990707050X
38. Ali SY, Hussin ARC, Ghazali M (2018) Antecedents and consequences of eWOM in social commerce. J Theor Appl Inf Technol 96:149–161
39. Zeithaml VA (1988) Consumer perceptions of price, quality, and value: a means–end model and synthesis of evidence. J Mark 52:2–22. https://doi.org/10.1177/002224298805200302
40. Ruiz-Molina ME (2009) Valor percibido, actitud y lealtad del cliente en el comercio minorista. Universia Bus Rev 1:102–117
41. Wu L-Y, Chen K-Y, Chen P-Y, Cheng S-L (2014) Perceived value, transaction cost, and repurchase-intention in online shopping: a relational exchange perspective. J Bus Res 67:2768–2776. https://doi.org/10.1016/j.jbusres.2012.09.007
42. Okazaki S, Blas SS, Castañeda JA (2015) Physicians' adoption of mobile health monitoring systems in Spain: competing models and impact of prior experience. J Electron Commer Res 16:194–217
43. Hajli N, Shanmugam M, Powell P, Love PED (2015) A study on the continuance participation in on-line communities with social commerce perspective. Technol Forecast Soc Change 96:232–241. https://doi.org/10.1016/j.techfore.2015.03.014

44. Yang H, Yu J, Zo H, Choi M (2016) User acceptance of wearable devices: an extended perspective of perceived value. Telemat Inform 33:256–269. https://doi.org/10.1016/j.tele.2015.08.007
45. Gan C, Wang W (2017) The influence of perceived value on purchase intention in social commerce context. Internet Res 27:772–785. https://doi.org/10.1108/IntR-06-2016-0164
46. Doha A, Ghasemaghaei M, Hassanein K (2017) Social bundling: a novel method to enhance consumers' intention to purchase online bundles. J Retail Consum Serv 35:106–117. https://doi.org/10.1016/j.jretconser.2016.11.008
47. Ringle C, Wende S, Becker J-M (2015) SmartPLS 3. SmartPLS, Hamburg
48. Alonso Dos Santos M, Calabuig Moreno F, Rejón Guardia F, Pérez Campos C (2016) Influence of the virtual brand community in sports sponsorship. Psychol Mark 33:1091–1097. https://doi.org/10.1002/mar.20943
49. Eng S, Woodside AG (2012) Configural analysis of the drinking man: fuzzy-set qualitative comparative analyses. Addict Behav 37:541–543. https://doi.org/10.1016/j.addbeh.2011.11.034
50. Hair JF, Ringle CM, Sarstedt M (2011) PLS-SEM: indeed a silver bullet. J Mark Theory Pract 19:139–152. https://doi.org/10.2753/MTP1069-6679190202
51. Villanueva L, Montoya-Castilla I, Prado-Gascó V (2017) The importance of trait emotional intelligence and feelings in the prediction of perceived and biological stress in adolescents: hierarchical regressions and fsQCA models. Int J Biol Stress 20:355–362. https://doi.org/10.1080/10253890.2017.1340451
52. Lisboa A, Skarmeas D, Saridakis C (2016) Entrepreneurial orientation pathways to performance: a fuzzy-set analysis. J Bus Res 69:1319–1324. https://doi.org/10.1016/j.jbusres.2015.10.099
53. Calabuig Moreno F, Prado-Gascó V, Crespo Hervás J et al (2016) Predicting future intentions of basketball spectators using SEM and fsQCA. J Bus Res 69:1396–1400. https://doi.org/10.1016/j.jbusres.2015.10.114
54. Chin WW (1998) The partial least squares approach to structural equation modeling. Mod Methods Bus Res 295:295–336
55. Ragin CC (2009) Redesigning social inquiry: fuzzy sets and beyond. University of Chicago Press, Chicago
56. Wells WD (2014) Measuring advertising effectiveness. Psychology Press, London
57. Beerli A, Martín J (1999) Técnicas de medición de la eficacia publicitaria. Ariel, Barcelona
58. Crespo E (2011) Eficacia de la promoción de ventas on-line. Influencia del tipo de incentivo promocional y la experiencia de uso web. Universidad de Granada
59. Shin D-H (2009) Towards an understanding of the consumer acceptance of mobile wallet. Comput Human Behav 25:1343–1354. https://doi.org/10.1016/j.chb.2009.06.001
60. Liébana-Cabanillas F, Muñoz-Leiva F, Sánchez-Fernández J, Viedma-del Jesús MI (2016) The moderating effect of user experience on satisfaction with electronic banking: empirical evidence from the Spanish case. Inf Syst E-bus Manag 14:141–165. https://doi.org/10.1007/s10257-015-0277-4
61. Pavlou PA (2002) A theory of planned behavior perspective to the consumer adoption of electronic commerce. MIS Q 30:115–143
62. Chu S-C, Kim Y (2011) Determinants of consumer engagement in electronic word-of-mouth (eWOM) in social networking sites. Int J Advert 30:47–75. https://doi.org/10.2501/IJA-30-1-047-075
63. Kim DJ, Ferrin DL, Rao HR (2008) Trust and satisfaction, two stepping stones for successful e-commerce relationships: a longitudinal exploration. Inf Syst Res 20:237–257. https://doi.org/10.1287/isre.1080.0188
64. Dai H, Luo X, Liao Q, Cao M (2015) Explaining consumer satisfaction of services: the role of innovativeness and emotion in an electronic mediated environment. Decis Support Syst 70:97–106. https://doi.org/10.1016/j.dss.2014.12.003
65. Llanos-Contreras O, Alonso-Dos-Santos M (2018) Exploring the asymmetric influence of socioemotional wealth priorities on entrepreneurial behaviour in family businesses. Eur J Int Manag 12:576–595. https://doi.org/10.1504/EJIM.2018.094458
66. Giménez-Espert M del C, Prado-Gascó VJ (2018) The role of empathy and emotional intelligence in nurses' communication attitudes using regression models and fuzzy-set qualitative comparative analysis models (fsQCA). J Clin Nurs 27:2661–2672. https://doi.org/10.1111/jocn.14325
67. Woodside AG (2013) Moving beyond multiple regression analysis to algorithms: calling for adoption of a paradigm shift from symmetric to asymmetric thinking in data analysis and crafting theory. J Bus Res 66:463–472. https://doi.org/10.1016/j.jbusres.2012.12.021
68. Hair JF, Hult GTM, Ringle C, Sarstedt M (2016) A primer on partial least squares structural equation modeling (PLS-SEM). Sage, Thousand Oaks
69. Henseler J, Ringle CM, Sarstedt M (2015) A new criterion for assessing discriminant validity in variance-based structural equation modeling. J Acad Mark Sci 43:115–135. https://doi.org/10.1007/s11747-014-0403-8
70. Fornell C, Larcker DF (1981) Evaluating structural equation models with unobservable variables and measurement error. J Mark Res 18:39–50. https://doi.org/10.1177/002224378101800104
71. Stone M (1974) Cross-validatory choice and assessment of statistical predictions. J R Stat Soc Ser B 36:111–133. https://doi.org/10.1111/j.2517-6161.1974.tb00994.x
72. Geisser S (1975) The predictive sample reuse method with applications. J Am Stat Assoc 70:320–328. https://doi.org/10.1080/01621459.1975.10479865
73. Henseler J, Dijkstra TK, Sarstedt M et al (2014) Common beliefs and reality about PLS: comments on Rönkkö and Evermann (2013). Organ Res Methods 17:182–209. https://doi.org/10.1177/1094428114526928
74. Aguilera-Caracuel J, Fedriani EM, Delgado-Márquez BL (2014) Institutional distance among country influences and environmental performance standardization in multinational enterprises. J Bus Res 67:2385–2392. https://doi.org/10.1016/j.jbusres.2014.02.005
75. Woodside AG (2014) Embrace perform model: complexity theory, contrarian case analysis, and multiple realities. J Bus Res 67:2495–2503. https://doi.org/10.1016/j.jbusres.2014.07.006
76. Mathwick C, Malhotra N, Rigdon E (2001) Experiential value: conceptualization, measurement and application in the catalog and Internet shopping environment. J Retail 77:39–56. https://doi.org/10.1016/S0022-4359(00)00045-2
77. Lin H-H, Wang Y-S (2006) An examination of the determinants of customer loyalty in mobile commerce contexts. Inf Manag 43:271–282. https://doi.org/10.1016/j.im.2005.08.001
78. Liebana-Cabanillas F, Muñoz-Leiva F, Sanchez-Fernandez J (2015) Payment systems in new electronic environments: consumer behavior in payment systems via SMS. Int J Inf Technol Decis Mak 14:421–449. https://doi.org/10.1142/S0219622015500078
79. Rejón Guardia F (2014) La respuesta del consumidor a la publicidad en redes sociales: análisis del efecto de la presión publicitaria y la experiencia. Universidad de Granada
80. Muñoz Leiva F (2008) La adopción de una innovación basada en la web. Análisis y modelización de los mecanismos generadores de confianza. Universidad de Granada