

Case study analyzing the relationship between the degree of complexity of a product page on an e-commerce website and the number of unique purchases associated with it

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Abstract

How are effective product pages designed for an e-commerce website? In the current economic context, Spanish companies must be able to justify all their investments. Therefore, so that they can compete effectively and obtain competitive advantages, they must know which elements generate value for the organization. This research analyzes the relationship between the degree of complexity of the product web pages and the number of unique purchases associated with them. The objective is to determine the most effective e-commerce merchandising strategies and techniques to help the companies in the food sector make the right strategic decisions, allowing them to increase the sales of their e-commerce websites. A case study research technique is used, the results of which conclude the importance of the visual aspects of the product web pages.

Key words

E-commerce merchandising, product page, case study, e-food.

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There is no doubt that sooner or later, mass market e-commerce will be consolidated in Spain

1. Introduction

Unlike what happens in other sectors and in other countries within the same sector, the definitive launch of mass-market e-commerce has yet to occur in Spain. However, the high growth rates of recent years indicate that this sector “can only grow; another matter is the pace, but no one questions whether sooner or later mass-market e-commerce will establish itself in Spain” (Delgado, 2016). These were the resounding words of Alfonso Delgado, New Business Manager at Nielsen in late 2016.

Online purchases represent 3.7% of sales in the mass-market sector around the world, but only 1% in the Spanish market. This is explained by the fact that the Spanish market is one of the least developed markets in terms of attraction and level of commitment by online shoppers. Only 14.4% of all households purchase products of this type over the Internet, as opposed to the 20% who make online purchases worldwide. Furthermore, the amount spent by Spanish families on the Internet accounts for barely 6% of their total mass market budget, while in the United Kingdom, where the most loyal online consumers are found, this figure is 20% (Kantar Worldpanel, 2014).

In recent years, it has proven especially complicated to promote winning formulas in a scenario clearly marked by weakening consumption, where even the mass market sector, which has always shown an enviable capacity for resilience, has experienced decreasing sales. More than ever, the new times require high levels of training and valuable information about consumers, markets and the main trends, as well as a large dose of innovation. Thus, it is important to commit to innovation, but from a multidisciplinary model that takes into account not only the novelty of the product, but also the service, the shopping experience and communication with the customer, among other aspects (Benlloch & Álvarez, 2014).

Given the current economic situation in which Spanish companies perform their activity, where there is an imperative need to justify each and every euro invested, companies must have accurate knowledge of the elements that ultimately generate value for the organization, in order to compete more effectively and obtain competitive advantages. Along these lines, the present research intends to shed light on the main factors to consider when prioritizing the application of certain e-commerce merchandising strategies, with the ultimate aim of assisting companies in the food-based mass market sector in making the right strategic decisions that would enable them to increase their e-commerce sales.

2. Theoretical framework

With an unchanging volume and market value and an inflationary context, the interests of consumers and the industry appear to be situated on the price axis, in spite of the fact that it is known that the focus on this variable prevents healthy market growth over the medium term. However, when faced with a situation like the present one, with a saturated market dominated by the demand, in which only one of four consumers demands exclusively price (Kantar Worldpanel, 2012), it is more logical to look for new domains than to engage in a price war (Andrés, 2010). Furthermore, the homogeneity of products and price specifications, customer preference for a product, brand or establishment owe to a large extent to the generation of greater value through the creation of new and better utilities for consumers in association with purchasing processes (De Juan, 2005).

Online Spanish shoppers increasingly perceive fewer real differences among products and appear less loyal to brands, among other reasons, because they can obtain comprehensive

The Spanish market is one of the least developed markets in terms of attraction and level of commitment by online shoppers

information on the products over the Internet, which allows for more intelligent purchases (Kotler & Keller, 2006). They want to shop online, but sometimes the brands do not make it easy for them, and therefore they are willing to reward those that help them by paying a premium (41%) or with their loyalty and prescription (Siegel & Gale, 2013).

As might be expected, in this new medium, it is even more necessary to intensively develop marketing strategies capable of persuading shoppers and influencing their purchasing decisions in order to increase sales, since in online purchases, users find themselves alone at the point of sale. There is no physical seller and the sensory experience is inevitably more reduced than in the offline environment, since the two-dimensional nature of the screen offers a limited amount of space in which to present the information. It is therefore necessary to promote e-commerce merchandising strategies, i.e., “psychological sales techniques that act on the mind of the shopper with the objective that he or she can satisfy the needs that led him or her to the point of sale, reminding about certain forgotten needs, as well as perceiving other new needs” (Escrivá & Clar, 2005).

In general, consumers use key factors in the selection of the point of sale, such as differences in products and prices, for example. However, when these are minimal between the different establishments, consumers need more discriminating criteria, and thus matters related to the point of sale become particularly relevant (Reinares & Calvo, 1999). This is true to the point that some authors have gone so far as to suggest that weather conditions may even be more influential than other marketing elements not found at the point of sale, and even have a greater influence on an individual's purchasing decisions than the product itself (Kotler, 1973-1974). A good atmosphere encourages customers to stay in the establishment and promotes visits to different sections, thus increasing the sales volume (Reinares & Calvo, 1999).

The influence of the factors defining the physical shopping environment on the emotional states and shopping behaviors of individuals is a fact that has been well established in the literature (Babin, Darden & Griffin, 1994; Baker, Parasuraman, Grewal & Voss, 2002; Baker, Grewal & Parasuraman, 1994; Belk, 1975; Bitner, 1992; D'Astous, 2000; Díez de Castro & Navarro, 2003; Donovan, Rossiter, Marcolyn & Nesdale, 1994; Donovan & Rossiter, 1982; Mehrabian & Russell, 1974; Sherman, Mathur & Smith, 1997; Sierra, Alíer & Falces, 2000; Spies, Hesse & Loesch, 1997; Turley & Milliman, 2000; Zorrilla, 2002). However, far less research has been done on the nature and effectiveness of web environments (Dailey, 2004; Eroglu, Machleit & Davis, 2001; Gómez & Lorenzo, 2006; Koernig, 2003; O'Cass & Fenech, 2003; Pascua, Román & Fernández, 2013; Puente, 2016; Yoh, Damhorst, Sapp & Laczniak, 2003), which is why this research is considered essential.

2.1. E-commerce in the food-based mass market sector

In a context in which the typology of the commercial formats has multiplied, competition has gotten tougher and therefore there are more shopping alternatives available to customers, expanded even further by Information and Communication Technology (ICT), retailers have made - and continue to make - efforts to win over consumers (Zorrilla, 2002). This has favored the search for new ideas to gain customer loyalty, given that formulas based on traditional marketing have become less effective, due to the very dynamism of the sector (Zorrilla, 2002).

In recent decades, the Internet has become a new shopping channel chosen by more and more customers. However, purchasing mass market products online is still a slowly growing phenomenon, since the items found in a supermarket are more difficult to market through this

More than ever, the new times require high levels of training and valuable information about consumers, markets and the main trends, as well as a large dose of innovation

channel (Müller-Lankenau, Wehmeyer & Klein, 2005; Raijas & Tuunainen, 2001) because they are tangible products with a variable potential for differentiation, unrepresentative and frequently purchased (Peterson, Sridhar & Bronnenberg, 1997). Furthermore, even though the shopping cart usually includes several items, the extra cost for home shipping can be relatively high for many customers as compared to the volume of the purchase.

On the other hand, a large part of the reluctance when it comes to buying mass market products over the Internet is related to the inability to have sensory experiences with the products, such as seeing how spongy the muffins are, the color and appearance of the cold-cuts or the flavor of the cheese, among other aspects; this is especially crucial for perishable products (Arce & Cebollada, 2011). Customers often have a series of habits acquired in their offline shopping experiences that are not available in online shopping, such as examining the products (especially food) through a small sample before purchasing them (Müller-Lankenau et al., 2005). What's more, many supermarket products are perishable, and therefore they have problems with expiration dates that do not affect other items, such as books, for example (Raijas & Tuunainen, 2001).

In spite of all of the above, e-commerce is not a niche market, rather a new commercial model that benefits all the mass market agents by giving them added value: for consumers, it is quick, easy and always available; for distributors, it generates loyalty and additional business to the offline channel; and for manufacturers, it captures a high-quality shopper (Roger, 2014).

It should also be said that not everything is difficult when it comes to marketing mass market products over the Internet. Since many customers do not like the conventional shopping framework for this type of products, their purchase through an online channel can be perceived as a very attractive alternative (Müller-Lankenau et al., 2005). 59% of men (as opposed to 36% of women) state that their partner is the one who does "the shopping" (Ideup, 2012), but when they women are asked, the answer is clear: it is not a pleasant experience. 68.4% of the women state they have less than two hours per day for themselves, a very valuable amount of time that 57.6% avoid dedicating to this chore. In fact, if they had more free time, mass market shopping is the task to which they would dedicate the second least amount of time (76.3%), behind only housework (82.5%) (Womenalia & Alice, 2012).

3. Proposed hypotheses

On the Internet, the absence of physical and time-related barriers makes e-commerce websites the main means of communication between the company and its customers, thus making their design just as important as in any physical point of sale. Along this line, focusing the research on a specific part of e-commerce, the following hypothesis is considered:

H. The more complex a product page is, the greater its number of unique purchases is.

A good product page must be able to satisfy all possible buyers, regardless of the amount of information needed to reduce the perceived psychological risk. To eliminate this, it is necessary to design the product pages in such a way that they can provide the information they need to make buying decisions with confidence, according to the different phases through which they

Customer preferences for a product, brand or establishment are largely due to the generation of greater value

pass. It would be ideal for them to be designed in layers, first showing the key points, but also presenting specifications and general details of the products.

- **Notice:** this is the first step in the entire shopping process (and it can be the only one in the case of impulse buying). This is the first contact the user has with the product, so the page must include the product name, some pictures, its price and availability and a button to add it to the shopping cart. It is important for the price to be shown from the outset, since it is one of the first pieces of information that any shopper wants to know, as it provides some clues as to the value of the product, whether it is within their budget and whether they are shopping in the right segment. It is also a key component for comparing products. Not showing prices to users goes against their needs and creates a hostile shopping environment. As far as pictures go, a priority is for them to be clear and to provide added value for the user (providing different views of the same image or adding rotation functions, for example), since customers look at them even when they are buying products that it is not important to see and they have already read the complete description. Furthermore, it is recommended that users be able to zoom in on the photographs in order to see the products close up (Nielsen & Loranger, 2007; Nielsen & Pernice, 2010).
- **Interest:** once the product has captured the attention of the user, it is quite likely that the customers feel that it meets their expectations, but they are still not sure, so they will try to expand on the initial information. In this case, the web page must include a description of the product and its features, as well as secondary images and videos. Precise descriptions with appropriate images help customers make confident buying decisions, but they need to be detailed enough to help differentiate the product. It is recommended to facilitate the purchasing decision as much as possible, enabling customers to narrow down their options. To do this, it is best to provide support in the form of comparative tables, since these are usually the most effective method for communicating differences between similar items (Koyani, Bailer & Nall, 2004; Nielsen & Loranger, 2007). Once inside the e-commerce site, the factor with the most affect on the purchase decision is the website design, to the extent that 92.6% of all users state that the visual aspects are the greatest factors of influence. Product pages with pictures and videos have better results, as users take barely 90 seconds to evaluate them, and on the Internet it is not possible to maintain contact with the product, so the best way to evaluate its quality is through them. Offering several different views of an item and alternative illustrations increases sales by 58%. However, at the same time, it is important for these to match reality, since if they do not, negative after-sales behaviors would occur (Vouchercloud, 2013). With regard to videos, 57% of the customers said they had more confidence in buying a product after watching a video about it, although only 31% decide to buy it after having seen it. 52% state that they are willing to spend more time on e-commerce sites that use product videos and 45% are more likely to return to them (Vouchercloud, 2013). However, it must be kept in mind that users get bored easily with videos of “talking heads,” and they tend to look away, although they often keep listening to the audio if they are interested in the topic (Nielsen & Pernice, 2010).
- **Decision:** this last level is not necessary for all users. It includes evaluations, recommendations of alternative products, comments and videos created by other shoppers and information from the social networks. Likewise, awards and recognitions of product quality are also a good way to increase the credibility of the organization and build bonds of trust (Nielsen & Loranger, 2007).

Therefore, the more complex a product page is, the greater the number of its unique purchases will be.

The weather conditions can actually be more influential than other marketing elements that are not present at the point of sale

4. Empirical study

Since the end of the 20th century, the use of case studies as an applied methodology has been increasingly more accepted as an instrument of scientific research in the area of business administration, since Business Economics, as a social science, and Strategic Management, as a specific scientific discipline within this science, require research methodologies that are capable of reflecting all the complexity of the business phenomena they analyze (Villarreal & Landeta, 2010). Along these lines, it is considered that this technique is useful for research, because it allows the direct measurement of the conduct of the people involved in the phenomenon being studied, without the need for them to verbalize their engagement, which prevents any variations between the reality of their actions and their perception of them, which is especially important in the area of e-commerce.

The methodological design used for this technique is that proposed by Villarreal and Landeta (2010), based on the study of authors like Eisenhardt, Yin, Maxwell, Rialp, Shaw and Fong, among others:

- Research questions and objectives: with the ultimate purpose of helping companies in the food-based mass market sector to make the right strategic decisions that would enable them to increase their e-commerce sales, this research intends to find out whether or not there is any relationship between the degree of complexity of a product web page and the number of unique purchases associated with its.
- Conceptual context, perspectives and theoretical models: the existing literature so far on which this research is supported includes authors such as Koyani et al. (2004), Nielsen and Loranger (2007) and Nielsen and Pernice (2010).
- Selection of the unit of analysis and the cases: using as a reference the research by Cascales (2015), Cristóbal and Marimon (2001) and Marimon and Cristóbal (2012), we opted for a non-probabilistic convenience sample and chose the online greengrocer ComeFruta.es. Within this food-based mass market sector of e-commerce, the core of the study is the product web pages for the 30 top-selling products (as it is understood that these are the ones with the best e-commerce merchandising actions associated with them) during 2016 (by analyzing a full year, we prevent any possible problems related to seasonality and high product rotation) and their number of unique purchases. Since what we want to analyze is the complexity of the web pages, special attention is given to items such as photographs (quantity and quality), text descriptions, videos and the existence of related content.
- Research methods and resources: to grant greater reliability and validity to the research, an action plan is developed that standardizes the evidence collection process through the creation of a data collection protocol that includes the definition and operationalization of the variables analyzed (Table 1).
- Field phase: before proceeding to collect these data, it is necessary to define the sources of evidence that are going to be used, which in this case are:
 - Google Analytics: for a comprehensive study of the website, relating the techniques implemented with the results obtained, a processional discipline belonging to the realm of business intelligence is used: web analytics. In this case, the tool Google Analytics is used to determine which are the 30 best-selling products for 2016 and the number of unique purchases for each. It should be clarified that to ensure the confidentiality of the

Table 1
Definition and operationalization of research variables

Variable	Definition	Type of variable
Number of photographs	Number of photographs (of the product) that there are on the product web page.	Discrete quantitative
Quality of the photographs	In order to capture the attention (and eye) of the user, the photographs must be real and easy to interpret, provide added value (for example, showing different views of the product), have high color contrast (with a light-colored background, if possible) and high quality (that permits zooming in for a close-up view of the product).	Dichotomous nominal qualitative (high/low)
Descriptions	The textual descriptions of the product existing on its web page can be one of two types: • Simple: containing the basic product information (content, weight, ingredients). • Complex: in addition to the basic product information, they contain information about the product and its nutritional properties, the place of origin, the producer, the best time for consumption, culinary and product conservation recommendations, as well as other types of information of value related to the product.	Dichotomous nominal qualitative (simple/complex)
Videos	Existence of videos (related to the product) on the product web page.	Dichotomous nominal qualitative (yes/no)
Extra content related to the product	Existence of links on the product web page to blog articles where content of value is provided in relation to the product, such as information about its nutritional properties and effect on health, culinary recommendations and recipes, for example.	Dichotomous nominal qualitative (yes/no)
Degree of complexity of the product web page	This variable integrates all the elements that make up the product web page. For its operationalization, four levels are considered, although in reality, the first level corresponds to e-commerce without any product web pages. • Null: if the product does not have its own web page with the minimal elements listed in the following paragraph. • Low: this is the minimal level of complexity, and its objective is to get the attention of the user with regard to a certain product. The web pages of this type must include the name of the product, a picture, its price and a button to add it to the shopping cart. • Medium: once the user's attention has been captured, it is appropriate to generate interest, showing that the product in question meets their expectations. To do this, the pages of this type must include everything from the previous level, plus a good description of the product and its characteristics. It is also recommendable for there to be more than one picture of the product and, if possible, a video. • High: this is the maximum level of complexity and its function is to convince the most indecisive customers to buy the product they are seeing. To do this, the web pages of this type must include the same elements as the previous levels, plus evaluations and recommendations for alternative products, comments and videos generated by other buyers and information from the social media. Culinary recommendations and additional information related to the product will also be considered. Since not all the web pages might have all the elements of each level of complexity, it is understood that a level is attained when it has at least two of the three elements that it consists of. Likewise, when a page does not reach the intermediate level, but it does meet the qualifications for the upper level, it is understood that the complexity of the web page is medium.	Ordinal qualitative (null, low, medium, high).
Unique purchases	Number of times that a certain product has formed part of a transaction.	Discrete quantitative

If more free time is available, shopping for mass market products is the activity to which customers would dedicate the second least amount of time

company's data, an index is elaborated in which the largest number of unique purchases is equal to 100 and the rest are calculated accordingly.

- Direct observation: once the best-selling products are determined, the next step is to analyze the complexity of their web pages. To do this, direct observation of them is used, taking into account the key indicators taken from the literature and set out in the data collection protocol.
- Recording and classification of data: after the data collection phase, the data are recorded and classified in a table that organizes, integrates and synthesizes the information obtained.
- Individual analysis of each case to link the data collected to the hypotheses proposed; and a global analysis to test the theoretical hypotheses that led to conducting the study with the evidence available, ultimately accepting, reformulating or rejecting them.
- Drafting of a final report with the general conclusions of the study and their implications.

5. Results

Each element of the product web page was analyzed independently, with the following results:

- Quantity and quality of the photographs: as shown in Table 2, upon analyzing the average number of unique purchases of the best-selling products according to the number of photographs found on their web page, using as a reference the mean number of unique purchases per page for the entire sample (22.87), it can be concluded that providing more than one photograph is positive in terms of sales (25.89 vs. 17.6 purchases/page). However, the added value (represented as the ratio of purchases/page) that two or three pictures generate does not significantly improve as the number of photographs increases.

Table 2

Classification of the product pages analyzed according to the number of photographs

No. photos	No. pages	Unique purchases		Unique purchases/page ($\bar{X}$)
1	11	194	28.28%	17.6
2	9	211	30.76%	23.4
3	4	66	9.62%	47.3
4	3	142	20.70%	16.5
5	1	21	3.06%	21
6	1	37	5.39%	37
7	1	15	2.19%	15
	N=30	N=686	100%	22.87

In terms of the use of high- or low-quality images on the product pages, the result is, as shown in Table 3, that products with high-quality images have more unique purchases (23.26 vs. 21.57), although the difference in size of the two groups should be stressed.

Companies in the food-based mass market sector need help to make the right strategic decisions that would allow them to increase their e-commerce sales

Table 3

Classification of the product pages analyzed according to the quality of the photographs

Quality	No. pages	Unique purchases		Unique purchases/page ($\bar{X}$)
Low	7	151	22%	21.57
High	23	535	78%	23.26
	N=30	N=686	100%	22.87

- Complexity of the descriptions: upon analyzing the number of unique purchases in terms of the type of descriptions found on the web pages (Table 4), it can be seen, as shown in Figure 4, that the full descriptions are slightly higher (53.5%), although in all reality, the mean number of unique purchases per page is lower, which leads us to think that the descriptions do not have a positive influence on the number of purchases.

Table 4

Classification of the product pages analyzed according to their description

Description	No. pages	Unique purchases		Unique purchases/page ($\bar{X}$)
Simple	13	319	46.5%	24.54
Complete	17	367	53.5%	21.59
	N=30	N=686	100%	22.87

- Use of videos: 88% of the unique purchases of the best-selling products are for products that do not include videos on their web pages. However, of the 30 pages analyzed, only 10% have a video of the product (an unboxing), so the sample analyzed is considered to be too small to draw any conclusions (Table 5).

Table 5

Classification of the product pages analyzed according to the use of videos

Videos	No. pages	Unique purchases		Unique purchases/page ($\bar{X}$)
No	27	604	88%	24.54
Yes	3	82	12%	21.59
	N=30	N=686	100%	22.87

- Existence of extra content on the product web page: as seen in Table 6, most of the pages analyzed (73.3%) do include extra content of value and it is precisely these pages that achieve 71.3% of the unique purchases in the sample analyzed.

Table 6

Classification of the product pages analyzed according to the existence of extra content

Extra content	No. pages	Unique purchases		Unique purchases/page ($\bar{X}$)
No	8	197	28.7%	24.63
Yes	22	489	71.3%	22.23
	N=30	N=686	100%	22.87

The main conclusion drawn from the case study is that in the context of online supermarkets, visual information plays a more important role than textual information

- Complexity of the product web page: even though food products typically involve a low degree of engagement (which entails a routine purchasing decision in which habit proves decisive), the web pages analyzed have a medium or high level of complexity. In addition to getting the user's attention with basic product information, they attempt to generate interest and even desire by expanding upon this information with additional content, provided by both the company and by customers. In accordance with the data in Table 7, the pages with a high level of complexity (73.3% of those analyzed) are the ones that achieved most of the unique purchases (83.5%).

Table 7

Classification of the product pages analyzed according to their level of complexity

Complexity	No. pages	Unique purchases		Unique purchases/page ($\bar{X}$)
Mean	8	113	16.5%	14.13
High	22	573	83.5%	26.05
	N=30	N=686	100%	22.87

6. Conclusions

Even though the level of engagement of users with mass market products is usually low (which means that the purchasing decisions are routine), it is necessary to remember that the penetration of online mass market purchases is low as compared to other sectors and countries, which indicates that there are still several entry barriers. Among them, worth mentioning is the intangible nature of the medium, which is a very important barrier, taking into account the specific needs (in terms of temperature and expiration dates, for example) associated with some products. The perceived risk in these cases is high, which pushes users to reduce it by searching for quality information. From a generic perspective, the combination of accurate descriptions and appropriate images helps differentiate the product and as a result, make confident purchasing decisions.

However, in line with the literature, the main conclusion drawn from the case study is that in the context of online supermarkets, visual information plays a more important role than textual information.

Both the number and quality of the photographs included on the product web page has a positive influence on the number of unique purchases. Including more than one photograph is effective for sales, but it is not recommendable to add more than three, since doing so does not significantly increase purchases, so it is likely that the cost for the merchant is greater than the benefit obtained. Likewise, the higher the quality of the images, the greater the number of unique purchases.

Just the opposite, neither the expanded product descriptions nor links on the web page to extra content of value (detailed information about the nutritional properties of the product, the place of origin, the producer, the best time for consumption, culinary recommendations and/or advice on product conservation) have a positive influence on the number of unique purchases.

In essence, it can be stated that the more complex product web pages are associated with a larger number of unique purchases, which allows us to accept the hypothesis proposed in this research study.

7. Declaration of Conflicting Interests

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