

Analysis of the impact of digital marketing tools on consumer behavior in the process of electronic commerce

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Abstract: This paper deals with the research on applying digital marketing tools in electronic commerce. The text does not describe the basic concepts and the current state in the selected area. In any case, as part of its implementation, it was necessary to get thoroughly acquainted with the theoretical background and the current situation. The attention in the presented article is aimed at the quantification of the research goal, the clarification of the used methods and methodology, and the presentation of selected results of the implemented research focusing on possible gender differences in perception. Our ambition is to point out possible causations based on which companies might develop such a set of proposals and recommendations, the implementation of which in practice might ensure more efficient use of resources and gain a competitive advantage as well.

Keywords: Digital marketing. Electronic commerce. Tools. Online. E-business.

I. INTRODUCTION

Digital marketing and electronic commerce (e-commerce) are concepts that we encounter more and more often. In recent years, more and more people began to use this form, and many e-shops were created, providing the sale of various goods and services. However, with the advent of the Covid-19 pandemic and the subsequent adoption of measures to prevent it from spreading, we have seen that almost all sectors of the economy have been forced to shift their activities online in a relatively short period.

Such a sudden change resulted in several problems, but also many opportunities. A significant number of new consumers began to use the online space, which represented (and still represents) an opportunity for business entities to acquire new customers. Companies that were able to respond to this situation adequately and in time thus gained a significant competitive advantage. The ability to use digital marketing tools played an essential role in addressing and acquiring new customers. As most of the users had previously minimal experience with online space, the effect of these tools was multiplicative.

II. RESEARCH GOAL

Setting the research goal was one of the first steps that we implemented in processing the selected topic. As a well-defined research goal is a determinant for the following steps, we have carefully considered the correct wording based on several alternatives. After considering all the options, we have arrived at a final formulation of the research goal (Barnes, Hunt, 2013).

The main goal of the research: to provide an analysis to assess whether and what is the impact of selected digital marketing tools on consumer behavior in the e-commerce process, taking into account possible gender differences. To solve the research goal successfully, we have considered it necessary to explore, in more detail, the following research question:

Research question: Is there, between the gender categories, a significant difference among the consumer purchase behavior indicators in the geographical definition of eastern Slovakia during a coronavirus pandemic?

III. RESEARCH HYPOTHESES

In the next step, we postulated research hypotheses, the verification of which will provide the results necessary to answer the research question and goal. The following research hypotheses were postulated within the research, focusing on quantifying possible gender differences in the respondents' answers:

H 1: We assume that there will be significant differences between men and women in the preferences of selected devices used for online shopping.

H 2: We assume that there will be significant differences between men and women in the time spent on selected online media.

H 3: We assume that there will be significant differences between men and women in their preferences for purchasing selected products.

H 4: We assume that there will be significant differences between men and women in the perception of the impact of selected marketing communication areas (Blake, 2015).

IV. METHODS AND METHODOLOGY

To process the results as well as possible, we have used several surveys and research methods. Numerous methods referred to in this section were useful in trying to obtain as much insight into the theoretical background within the selected area. Others were used in the process of obtaining and subsequent sorting, processing, and evaluating the necessary data. The following methods were used:

- Literature search: the method of the literature search was used as the main procedure for elaborating the current state of the researched issues. In the available domestic and foreign, book and magazine sources, our ambition was to find information of such quality, which might then be used for the most thorough description of the current situation. As the monitored area changes over time, to keep the knowledge presented as up-to-date as possible, suitable internet sources were used if necessary (Lieb, 2017).
- Analysis: the method in question found its application within the conceptual division of the selected issue into smaller parts and their detailed examination to reveal their essence. Based on available data collected by the literature search method, we wanted to select those which were most likely to explain the true nature of the issue in the most appropriate and relevant way (Meier, Stromer, 2009).
- Questionnaire: to obtain the data needed for the research a questionnaire was developed, being distributed among the respondents electronically via social networks. The questionnaire was divided into two parts, the first part consisting of identification variables about the respondents and the second part contained 16 questions aimed at finding out the respondents' opinions on the selected area. The data obtained in the questionnaire research represented the main basis for the processing of the analytical part (Šálová, 2015).
- Mathematical and statistical methods: using selected mathematical and statistical methods, we were able to evaluate the data obtained through questionnaire research into the final outputs in the form of tables and graphs. Regarding higher statistical methods, the Mann-Whitney test and the Kruskal-Wallis test were used in particular (Wenkart, 2014).
- Synthesis: the use of synthesis significantly helped us in our efforts to reveal some tendencies as well as in gaining a better understanding of the various causes of development and prediction of phenomena in the area (Manzor, 2010).
- Induction and deduction: the methods in question were used mainly in the conclusion and summary of the paper. The evaluation and comparison of the obtained data were beneficial for our efforts to create a set of general and partial conclusions, as well as in the process of preparing a general summary (Manzor, 2010).
- Comparison: the use of the comparison method enabled us and facilitated the identification of the presence of differences or similarities in the obtained data, which was one of the main prerequisites in our efforts to subsequently develop a practical set of proposals and recommendations aimed at improving the current situation (Čihovská, 2016).

V. RESEARCH RESULTS

H 1: We assume that there will be significant differences between men and women in the preferences of selected devices used for online shopping.

Tabuľka 1 Výsledky posúdenia štatistickej významnosti

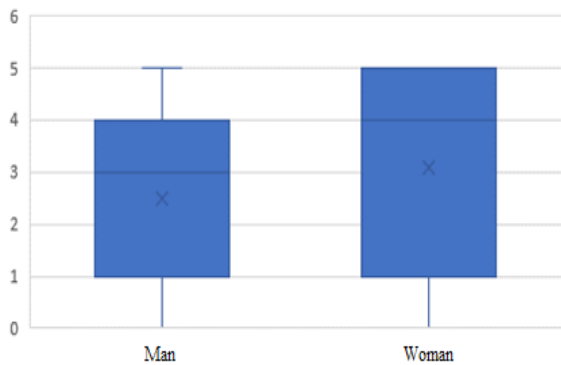
Variable	Mann-Whitney	P hodnota
What device do you use most often when shopping online? [Smartphone]	15566,500	0,001
What device do you use most often when shopping online? [Tablet computer]	17578,500	0,036
What device do you use most often when shopping online? [Desktop PC / Notebook / Laptop]	16774,500	0,018

(Source: own processing)

Table 1 presents the results of assessing the statistical significance of smartphone, tablet computer, and desktop preferences in online shopping between men and women. The P-value shown in the last column of the table indicates the evidence of the named differences, and based on the above, we recommend accepting hypothesis H 1. There are significant differences between men and women in the preferences of selected devices used for online shopping.

The following visualizations describe the differences in question.

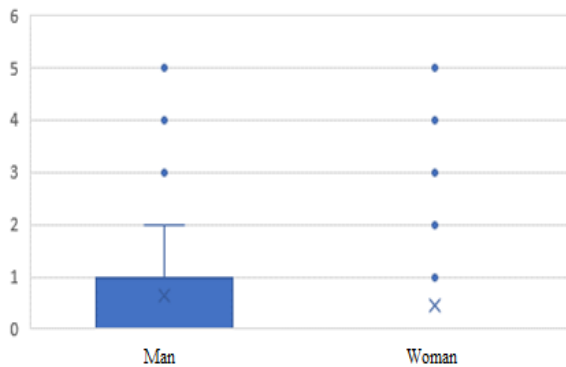
Figure 1 Comparison of men and women when shopping through a smartphone



Concerning smartphone preferences, there is a significantly higher rate measured for women, ie, women were shopping through smartphones significantly more than men during the Covid-19 pandemic. Higher preference is apparent in several characteristics, such as median (horizontal line) or average (cross). The lower quartile is identical in both cases (value 1) and the minimum limit, which is equal to 0, is identical, too. A value of 0 means that the respondent does not make purchases through this device.

(Source: own processing)

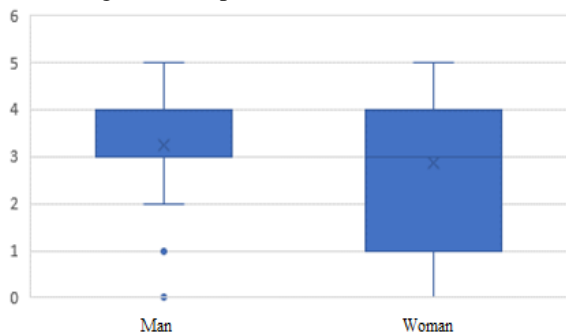
Figure 2 Comparison of men and women when shopping through a tablet computer



When shopping online via a tablet computer, relatively low preferences for the use of this device were generally measured, while concerning the shopping, we can talk about higher values for men.

(Source: own processing)

Figure3 Comparison of men and women when shopping through a desktop PC / notebook / laptop



Desktop computers and laptops represent a classic view of online shopping, and the above chart shows a slightly higher preference in men compared to women. It is important to note the higher variability of values in women.

(Source: own processing)

H 2: We assume that there will be significant differences between men and women in the time spent on selected online media.

Tabuľka 2 Výsledky posúdenia štatistickej významnosti

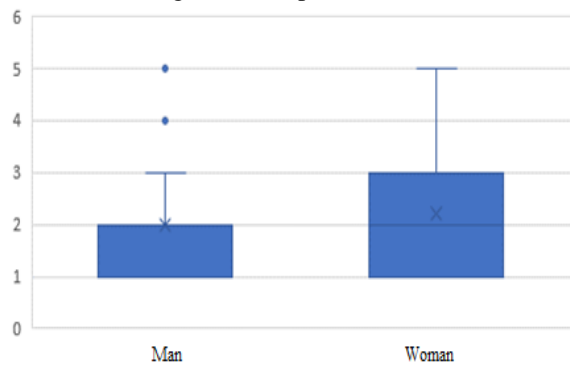
Variable	Mann-Whitney	P hodnota
How much time do you spend on Internet a day?	17609,000	0,088
How much time do you spend on social media a day?	16454,000	0,006

(Source: own processing)

Table 2 presents the results of assessing the statistical significance between men and women in the time spent on the Internet during the day. The P-value displayed in the last column of the table indicates the evidence of differences in the second tested item (How much time do you spend on social media a day?), and based on the above, we recommend accepting hypothesis H 2. Thus, there are significant differences between men and women in the time spent on selected online media.

The following visualization describes the differences in the item in question (social networks).

Figure 4 Comparison of men and women regarding the time spent on social networks



Women spend more time on social networks. The result is supported by the average value (indicated by a cross), the upper quartile, and the maximum value.

(Source: own processing)

H 3: We assume that there will be significant differences between men and women in their preferences for purchasing selected products.

Tabuľka 3 Výsledky posúdenia štatistickej významnosti

Variable	Mann-Whitney	P hodnota
What item do you most often shop online? [Clothing / Jewelry]	11345,000	<0,001
What item do you most often shop online? [Sports equipment]	19276,000	0,910
What item do you most often shop online? [Music (CD / DVD)]	16971,000	0,007
What item do you most often shop online? [PC (hardware / software)]	13920,000	<0,001
What item do you most often shop online? [Insurance]	19170,000	0,808
What item do you most often shop online? [Food]	18937,000	0,657
What item do you most often shop online? [Lottery / Betting]	15594,000	<0,001
What item do you most often shop online? [Apartment / house furnishing]	17517,500	0,088
What item do you most often shop online? [Medications]	18028,500	0,180
What item do you most often shop online? [Electronics]	15065,000	<0,001
What item do you most often shop online? [Cosmetics / Perfumes]	12862,000	<0,001
What item do you most often shop online? [Books]	17727,500	0,132
What item do you most often shop online? [Services]	17656,500	0,116
What item do you most often shop online? [Travel Tickets]	19045,500	0,748

(Source: own processing)

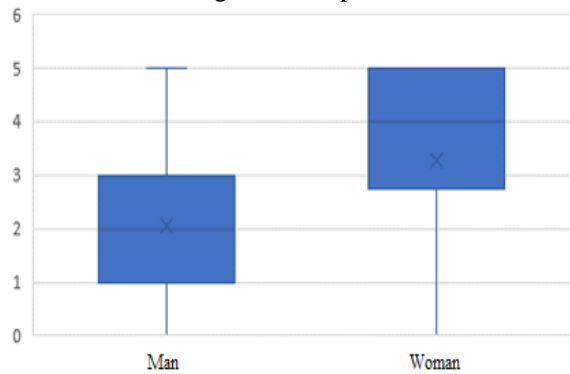
Table 3 presents the results of assessing the statistical significance between men and women in the preference for purchasing selected products. The P-value indicates the evidence of several differences, and based on the above, we recommend accepting hypothesis H 3. There are significant differences between men and women in their preferences for purchasing selected products.

The following visualizations describe the differences in question in those items for which they were identified:

- clothing/jewelry,
- music (CD/DVD),

- PC (hardware/software),
- lottery/betting,
- electronics,
- cosmetics/perfumes.

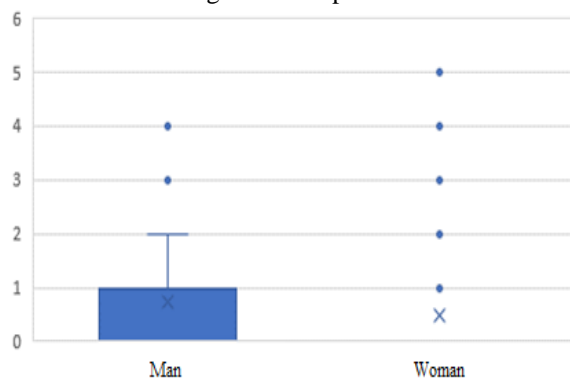
Figure 5 Comparison of men and women when shopping for clothing/jewelry



Regarding buying clothes/jewelry, the difference and the result (women's preference) could be expected. Based on the above, it can be concluded that women often buy clothes and jewelry. In general, this is one of the biggest significant purchasing preferences

(Source: own processing)

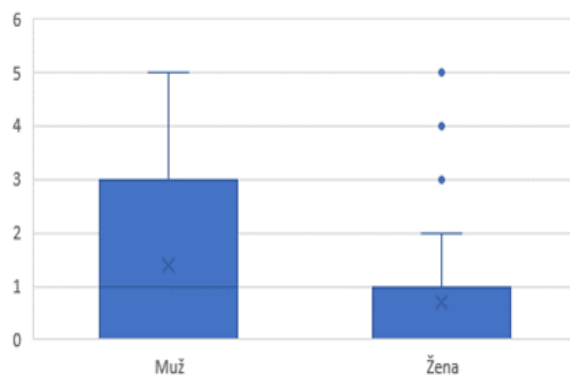
Figure 6 Comparison of men and women when shopping for music (CD/DVD)



There was a low frequency of CD/DVD purchases, while it is minimal in women. This may be due to advanced age and the fact that only a very specific part of the population purchases CDs/DVDs on the Internet. Large part of this population is men, as evidenced by the results in Chart 6.

(Source: own processing)

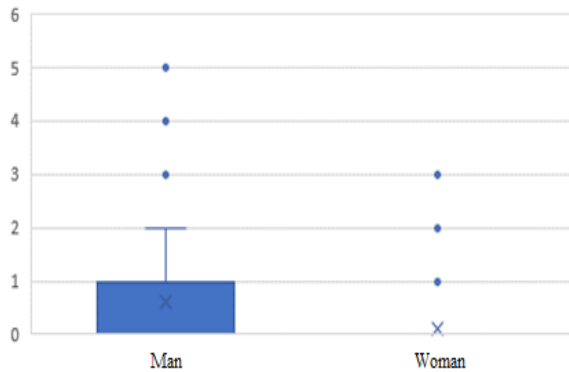
Figure 7 Comparison of men and women when shopping for PC (hardware/software)



The data shown in the chart present a significant preference for software and hardware purchases by men. However, women and their minimal preference for this type of product when shopping online are interesting. Based on the above, it can be seen that the vast majority of women do not buy software and hardware at all.

(Source: own processing)

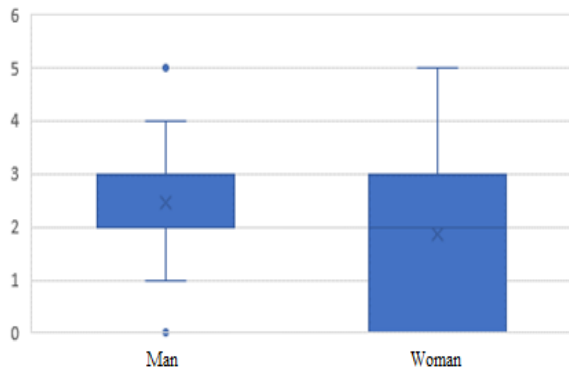
Figure 8 Comparison of men and women when shopping for lottery/betting



Purchasing lotteries and betting online also do not enjoy a high purchase preference compared to other products. The vast majority of women do not buy gambling products and men purchase these products significantly more often, however, it is still a very small range.

(Source: own processing)

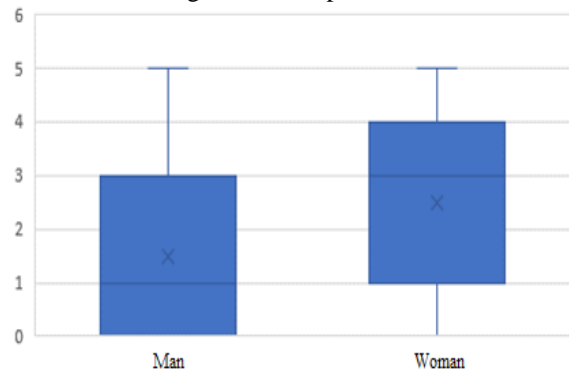
Figure 9 Comparison of men and women when shopping for electronics



Electronics are a stable product when shopping online, as evidenced by the output of chart 9. Men buy electronics a little more than women. However, there is greater variability in values in women, so some women buy a lot and some almost not at all.

(Source: own processing)

Figure 10 Comparison of men and women when shopping for cosmetics/perfumes



With cosmetics and perfumes, the large variability of values is visible in both men and women. The results of the preference tests indicate a higher preference for perfume purchases in women, as evidenced by a higher value of the arithmetic mean (cross), a higher value of the median (horizontal line), and higher values of the lower and upper quartiles.

(Source: own processing)

H 4: We assume that there will be significant differences between men and women in the perception of the impact of selected marketing communication areas.

Tabuľka 4 Výsledky posúdenia štatistickej významnosti

Variable	Mann-Whitney	P hodnota
Please indicate your level of agreement with the following statement: Do you take into account reviews, recommendations of acquaintances, etc. when choosing goods online?	17617,000	0,090
SEO - when shopping online I am influenced by: page title, website structure, page content, link texts, and backlinks.	17023,500	0,028
PPC - when shopping online, I am influenced by: search text ads, banners, YouTube campaigns, shopping product campaigns, and applications.	15614,000	0,001
Content Marketing - when shopping online, I am influenced by valuable, relevant, and consistent content (blog, e-book, etc.).	18498,000	0,408
Email marketing - pri nakupovaní na internete ma ovplyvňuje predmet a obsah newslettera.	15435,500	<0,001

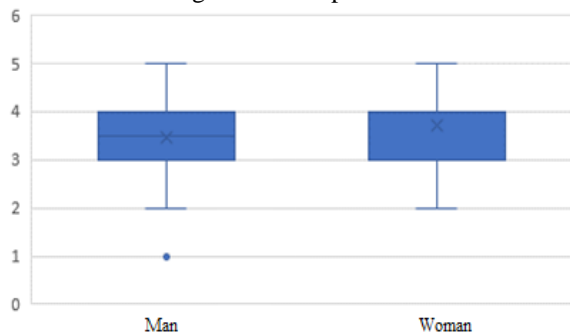
(Source: own processing)

Table 4 presents the results of assessing the statistical significance between men and women in the perception of the impact of selected marketing communication areas. The P-value indicates the evidence of several differences, and based on the above, we recommend accepting hypothesis H 4. There are significant differences between men and women in the perception of the impact of selected marketing communication areas.

The following visualizations describe the differences in question in those items for which they were identified:

- **SEO - when shopping online I am influenced by:** page title, website structure, page content, link texts, and backlinks.
- **PPC - when shopping online, I am influenced by:** search text ads, banners, YouTube campaigns, shopping product campaigns, and applications.
- **Email marketing:** when shopping online, I am influenced by the subject and content of the newsletter.

Figure 11 Comparison of men and women in the perception of the impact of SEO



When analyzing the differences in the impact of SEO attributes such as page title, website structure, page content, link texts, and backlinks, gender characteristics are relatively balanced, with a slightly increased impact on women.

(Source: own processing)

Figure 12 Comparison of men and women in the perception of the impact of PPC

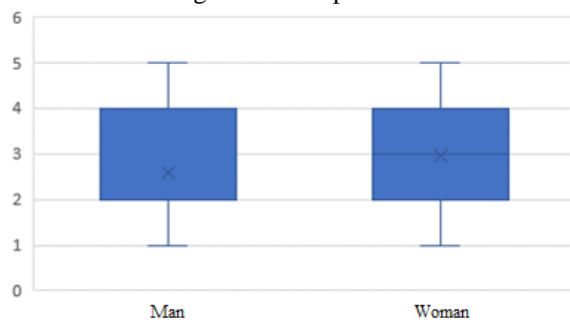
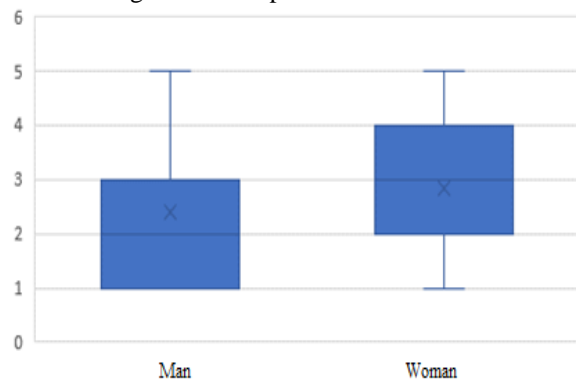


Chart 12 visualizes a comparison of men and women in the area of PPC - search text ads, banners, YouTube campaigns, shopping product campaigns, applications. In this case, too, there are relatively similar outcomes, however, a higher degree of impact was observed among women.

(Source: own processing)

Figure 13 Comparison of men and women in the perception of the impact of email marketing



The data presented in chart 13 point to a very important finding, namely that email marketing affects women more significantly. The higher impact on women is evident from several characteristics, such as the arithmetic mean (cross), the median (horizontal line), or the lower and upper quartiles.

(Source: own processing)

In conclusion, we can state that all four hypotheses that were postulated to research question 1:

Is there, between the gender categories, a significant difference among the consumer purchase behavior indicators in the geographical definition of eastern Slovakia during a coronavirus pandemic?

have been accepted. For that reason, we feel entitled to state that the answer to the question posed is that there is a significant difference, between the gender categories, among the consumer purchase behavior indicators in the geographical definition of eastern Slovakia during a coronavirus pandemic.

CONCLUSION

We are aware that the present times bring various changes that will need to be addressed. Predicting today what will happen in a year, for example, is extremely difficult. We have seen this several times in the last two years. At the same time, however, we are aware that the ability to respond adequately and on time is conditioned primarily by knowledge of the various options and procedures that can be implemented at a particular time. In conclusion, we would therefore like to emphasize that, in particular, the readiness to seize the opportunities that will arise in the future is one of the main preconditions determining success or failure.

E-commerce is an area that is on the rise. The last two years have helped this trend to a large extent and the shift that has taken place in this area will, in our view, be lasting. It is not often that changes, usually gradual, take place in leaps and bounds. However, the current period has created such a change and opened up many opportunities. The correct use of digital marketing tools now offers many business entities the opportunity to seize it and try to establish themselves in this area.

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