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Predicting User Behaviour Based on the Level of Interactivity Implemented in Blockchain Technologies in Websites and Used Devices

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Abstract: Today's business development processes force companies to find ways to increase the level of interactivity of their products with consumers. One of the ways that companies communicate interactively with users is communication via websites; another way is using a channel that makes the customer more loyal to the company. The aim of this paper is to point out the differences between the effects that interactive and non-interactive blockchain technologies have on users and their behavior, as well as to determine whether the same degree of interactivity is achieved with users who use the same site via computers or mobile phones. For this purpose, three models by Song, Liu, and Wu were compared, which gives this paper a superior precision and depth of research regarding the above-mentioned problem. Furthermore, the contributions of the paper are reflected in a comprehensive and detailed review of previous research on the topic of interactivity and the importance of using a website, showing the specific effects expected from users after the introduction of interactive website features, as well as indicating a difference in customer perception and behavior after using a different site search device.

Keywords: mobile marketing; interactivity; website interactivity; customer satisfaction; customer behavior; blockchain technologies

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1. Introduction

Whether or not it is possible for an enterprise to succeed in today's market depends on the enterprise itself, and on its ability to accommodate the market's needs. Business methods today imply the use of digital marketing tools and daily communication with consumers. The most common tool for encouraging two-way communication is a company website. The website is the mirror of the company, and has a significant impact on the creation of images in the minds of consumers regarding the company [1–3]. What makes the distinction between companies is fair usage of digital marketing, i.e., websites, and their adjustment to users in order to achieve greater customer satisfaction. Thus, many papers have been written on the topic of researching the interactivity that is achieved with site users. It is because of this vast research that we know that the introduction of interactive features on a website increases interactivity with the user [4–18]. The emphasis in this paper is on the use of mobile phones for searching websites, and the differences in the

effects that are achieved by users depending on whether they receive information via a mobile phone or a computer. For this reason, the works of authors who have researched the importance of mobile marketing were analyzed [19–26].

The primary goal of this paper was to compare three models for research on interactivity, written by authors Ji Hee Song, Y. P. Liu, and G. Wu [8,11], and Song, Zinkhan [12], and analyze the mentioned models in order to obtain the effects on consumers after the applied interactive features of the website on mobile phones and computers. As a result of this research, we expect to determine the difference in the effects achieved by consumers of interactive and non-interactive sites, as well as the difference in the outcomes achieved by users of mobile devices and computers.

The use of blockchain technology is a structure consisting of a list of blocked blocks in a decentralized, distributed, and public form, that is used to record distributed transactions on the network. The records are timeless in the sense that they cannot be changed over time without the alteration of subsequent blocks.

2. Website

Digital marketing tools are used to manage and reflect a company's identity, communicate with customers, and increase online presence. The design of the website using blockchain technologies ensures a distributed, decentralized structure consisting of a list of chained blocks. The efficiency of the integration of blockchain technologies in the design of the sites contributes to the increase in their security, and to the transactions carried out through the payment pages. The blockchain is used to record transactions whose records are timeless (without retroactive changes affecting subsequent blocks). It is critical to understand the intended outcomes on the web in order to select the appropriate tools. Each digital marketing tool offers benefits and drawbacks based on the business type [27] (pp. 28–32). Many authors have studied digital marketing and its technologies [1] (pp. 17–26) [2] (pp. 32–33) [3] (p. 35). Ryan places a website at the core of any digital marketing plan [2] (p. 35). It is regarded as a grave omission not to consider the user while constructing a website [28] (pp. 3–4). This leads to focusing on technology rather than users, which undermines the website's success [29] (pp. 573–581). There are various vital parts of digital marketing, as seen in the preceding categories, but one thing is certain: any online marketing strategy relies on web presence [29] (pp. 392–393): "You are your website," says Charlesworth [29] (pp. 496–504). In their paper, Wolk and Theysohn find that only quality, interactivity, accessibility, and relevance determine the number of website visits. According to their second model, credibility, engagement, customization, and navigation enhance website views per visitor. Thus, only the quality of the product, interactivity, accessibility, and relevancy have a substantial beneficial impact on visitor numbers. Similarly, website reputation, interaction, personalization, and navigation influence page views per visitor. They show the impact of the website attributes for potential clients when deciding how long to stay on a website [30]. Interactivity is the foundation for a customer–vendor conversation that is sensitive to consumer requirements, although using interactivity to strengthen online information offerings as a foundation for consumer relationships has received little attention.

Innovation in the integration of blockchain technologies in website design is represented according to the literature by four factors: internal framework, strategies, operations, and structure [31]. We must remember that website interaction allows consumers to research purchases [32].

3. Interactivity

Numerous studies have investigated interaction. Authors focus on the method, features, perception, or a combination of these [6]. J. Steuer defines interactivity as the extent to which users can adjust the form and content of the mediated environment in real-time [33]. This definition emphasizes characteristics. However, according to the author, we can influence presence by influencing the mediated environment. Johnson et al. [10] describe

interactivity as the degree to which a participant perceives communication as mutual, responsive, and fast; this is typified by the use of nonverbal information. For this study, we agreed with Wu, and provided a paradigm for perceived interactivity as an intermediary on the impact of actual interaction on website attitudes [34]. The authors Chung and Zhao [35] found that perceived interaction influences customers' attitudes towards websites and the recall of their contents. Their findings show that perceived involvement has a beneficial effect on customer attitudes and memory. On the other hand, Song and Zinkhan [12] claim that recent studies have focused on the sense of interaction. Actual and perceived interactivity should be distinguished [5,6,10,12,34,36]. Authors [5] refer to actual and perceived interactivity as structural and empirical, and even use the phrases objective and subjective interactivity. Participants' sense of interactivity in a communication process differs from the real interactivity of a system. This work focuses on perceived interactivity or the influence of interactive elements on consumers. Many authors have studied website interactivity and reported their findings [6–13,16–18,37]. Others have conceptualized attitudes towards websites [6,12,36,38–41]. Interactivity also brings satisfaction. Satisfaction is linked to active control over the content, which is a desired psychological state [5]. The authors' Song and Zinkhan used the findings of Fornell et al. to quantify satisfaction [12]. Song and Zinkhan [12] employed devices to measure overall website quality and loyalty. Some authors, such as Wu [36], focus on the relationship between perceived engagement and customer views toward websites. However, some authors, such as Song and Zinkhan [12], look at the attitude towards websites, as well as contentment, overall website quality, loyalty intention, and repeat purchase intention. Several authors have identified, but not empirically proved the above impacts [8]. Interactivity, vividness, and participation are important characteristics influencing virtual experience and behaviour [42]. The website's interactivity improves brand experience and choice. Two-way communication helps consumers to observe how the brand meets their demands, leading to an outstanding site usage experience [16]. Many authors associate good site design and usability with happy experiences [14,43]. The impact of site style, simplicity of use, customization, interaction, engagement, and enjoyment on online customer experience [43] is determined to be considerable. The authors found that information quality and website credibility affect the customer experience when searching for information on B2B websites. In addition, a good information search is linked to happiness with the experience. CREDIBILITY and INFORMATION QUALITY signal positive impact. Thus, the absence of online customer service is linked to unhappiness. [15] Based on previous research on user behaviour and future behaviour, writers Yoon and Youn evaluated the importance of the function of mediators on the impact of perceived website interactivity on purchase intent (e.g., perceived utilitarian value and online trust). Active control and two-way communication appeared to be essential features of interactivity in boosting the strong brand experience and connection quality with the brand [37]. However, a high degree of interaction is required if the user requires a great degree of control when utilizing the site. Interactivity positively improves participants' perceptions, demonstrating that high degrees of information control may not overwhelm customers [18]. The website's interactivity boosts users' sense of the site's usefulness and simplicity of use. Interactive user experiences on retail sites boost user perception, and thus buy intent. Sellers that want customers to explore their site must rebuild it with interactive features [17,44–46]. In conclusion, increasing perceived task difficulty lowers ease of use, but increases enjoyment [47].

4. Mobile Ads

Despite the vast quantity of articles on mobile marketing, no universal definition has been established [19] (pp. 144–151) [20]. Researchers [21] (pp. 153–175) define mobile marketing as using wireless media to promote products, services, and ideas. It is possible to personalize web marketing using mobiles [25] (p. 7). We know when the consumer calls, whom they write to, and how they spend their time, because their phonebook and calendar are accessible. This technology allows you to track the consumer's web

activity and app downloads. Mobile phones are the most targeted kind of web marketing, because companies know the owners' preferences. The way people use their phones reveals a lot about their demographic and psychographic features. This gives people a new method to communicate, stand out from their peers, and stay informed. Notably, this necessity predates the emergence of mobile phones [22]. Mobile marketing's key features include ubiquity, customization, two-way communication, and localization [23] With digital marketing comes a new set of marketing methods and expertise [48] (pp. 219–221). Mobile marketing is the best option for marketers to reach consumers quickly. For example, according to Michael and Salter [22] (p. 25), mobile marketing has a higher response rate than traditional media, is the cheapest means of connecting with consumers, and needs the least amount of effort to get started. It is also easier to locate the user who is best suited for specific marketing [24] (p. 104). Because mobile phone numbers are issued to individuals rather than locations, they are rarely shared. While mobile marketing is effective, it is not suitable for all businesses: mobile marketing, like any other marketing effort, requires rigorous planning and development. [25] Unfortunately, mobile marketing is typically performed haphazardly, with little or no connection to a company's marketing communication plan [26].

5. Materials and Methods

Based on the literature review, the tool used in our research is a website. For the needs of the research, an interactive and a non-interactive website were created for job/practice/training course searches. Websites contained the same job/practice/training course advertisements. The difference between interactive and non-interactive websites is reflected in the introduction of interactive features in an interactive website, as stated in the works of author Wu [34]. The elements integrated into an interactive website are the following: a possibility to recommend the website to friends; a possibility to apply for a job/practice/training course online; a website map; e-mail hotlink; online chat room; drop-down search menu; a website search; tags; and a possibility to comment on advertisements. An interactive website offers the possibility of sharing website content via other social media such as Facebook, Twitter, LinkedIn, Google+, Pinterest, Reddit, and is integrated with other digital marketing tools, such as mobile marketing and e-mail marketing. An interactive website is also integrated with other digital marketing tools, i.e., it makes it possible for users to view the website contents on the Facebook social network and to sign up to a mailing list in order to be informed about any news on the website. Upon signing up to a mailing list, the users receive an automatic e-mail confirming that they have successfully signed up to the mailing list, and a link via which they should activate their registration. Upon activating the registration, users are automatically transferred to the website page on which they can view recommended advertisements, leave a comment, or contact the website support.

Based on the literature review, we noticed that there is greater activity in mobile device users, compared to users who receive the same information via computers, which led us to the following hypotheses:

Hypotheses 1 (H1.) *The use of a mobile device for site searching increases the degree of user's interactivity.*

5.1. Pre-Test

Prior to testing, we performed a pre-test which included 350 students of a chosen higher educational institution (Appendix A). The objective of the pre-testing was to single out 240 students with identical or similar interests. All the respondents were in the first year of studies and were listening to lectures in Digital Multimedia I. Respondents completed a survey consisting of 8 questions. Based on the given answers, we singled out 240 students who were interested in looking for a job/practice/training course on the website.

5.2. Main Survey

The total number of 240 respondents was randomly divided into four groups: 60 respondents who used a non-interactive website via a computer; 60 respondents who used a non-interactive website via a mobile phone; 60 respondents who used an interactive website via a computer; and 60 respondents who used an interactive website via a mobile phone.

In the primary survey, the students singled out in the pre-testing stage were divided into 12 groups of 20 students each. All respondents were given the exact instructions, and we randomly chose the respondents who would visit an interactive website and those who would visit a non-interactive website, who would use the mobile phone and who would use a computer, ensuring the same number of all different categories in the group (5 of all categories in each group). The respondents were given 30 min to search the website.

A week before the survey began, 350 students took part in the study, which was conducted based on similar research by authors in interactivity [6–8]. The research aimed to determine whether all respondents had experience on the Internet, whether they had a smartphone, and whether they have experience using the Internet through mobile devices. It also aimed to identify the areas of students' interest to create content relevant to them. The website was created with the content most respondents showed interest to, as in the research by Liu [8].

Students in their first year of the study participated in the research, studying the programs of New Computer Technology, Computer Techniques and Electronic Business. The main goal of this questionnaire was to single out students with the same interests who would participate in the main study. It was also essential to single out students predisposed to participate in the primary research in terms of computer knowledge, long-term computer use, possession of smartphones, long-term use of mobile phones, and frequent use of the Internet on mobile phones. Out of the 350 respondents who met these conditions, 240 students with the same interests were selected, i.e., those who looked at job offers, practices or courses on the Internet, and met all other criteria. Other categories of students' interest in the Internet were significantly lower; thus, the students interested in work, practice or courses were invited for the primary survey.

The selected 240 students represented participants in the primary survey. All participants had smartphones by which could visit both sites prepared for this research. In addition, based on the interest in pre-testing, two websites were created, interactive and non-interactive, both on the topic of employment, practice and courses for which students could apply.

In the survey, we had four different groups of respondents, one group used an interactive site through a computer, another used an interactive website via mobile device, the third group used a non-interactive website through a computer, and the fourth group used a non-interactive site via mobile device. Due to the limited space in the laboratory, respondents were divided into 12 groups of 20 participants. Therefore, in every group of 20 participants, we had 5 participants per group as defined above (5 participants who used an interactive site via a mobile device, 5 participants who used an interactive site via desktop, 5 participants who used a non-interactive site via a mobile device, and 5 participants who used a non-interactive site via desktop). This accounted for a total number of 60 respondents in the four defined categories.

In each research group, clear instructions were given to respondents on how to conduct the research. These instructions were also written on both types of created websites. Respondents received papers with a marked website they should visit and a device to see the designated site. All four groups of respondents had 30 min available to search the designated site. After a 30-min search, respondents received a survey questionnaire and unlimited time to fill out a survey questionnaire, which they then left to the person on duty and left the lab.

The laboratory was equipped with 20 of the same computers of the following configuration:

- Type and version of Windows 8.1. Enterprise, Microsoft Corporation 2013;

- Computer configuration:
  - Processor: Intel(R) Core (TM) i3-4160 CPU @ 36 GHz;
  - Memory (RAM) 4GB;
  - System type: 64-bit operating system.
- Computers were connected on an Internet link of 100Mbps to an academic network.

Students were also provided with a wireless local computer network by IEEE 802.11 G standard, which allowed respondents who viewed the site via mobile phone to search the site seamlessly.

In each group of examinations, clear instructions were given to respondents on how to conduct the research. These instructions are also written on both types of created websites. Respondents were given papers with a marked website to look at, as well as a designated device through which to view the obtained site. All four groups of respondents had 30 min available to search the obtained site. After a 30-min search, respondents received a survey questionnaire and unlimited time to fill out a survey questionnaire, which they then left to the person on duty and left the lab.

5.3. Research Instruments

A survey questionnaire created for the purpose of measuring the effects on consumers after using a website was prepared from the research of Wu [36] Song and Zinkhan [12], and Liu [8]. Upon a detailed analysis of works of the aforementioned authors, it was established that Wu [36] used 15 items to measure the attitude of consumers towards websites, that was subsequently reduced to nine. Song and Zinkhan argue and prove that it is sufficient to use three questions to measure the attitude of consumers towards a website, and these questions have been used in this research [12]. For measuring the attitude towards a website, Song referred to Coyle and Thorson, [40]; for measuring the satisfaction of users, he referred to Fornell, 1996; for measuring the overall website quality, he referred to Wolfinbarger and Gilly, 2003; and for measuring the loyalty intention he referred to Zeithaml, Berry and Parasuraman, 1996 [12]. The particularity of this research is the insight of three models for measuring perceived interactivity, by authors Liu [8], Wu [11] and Song and Zinkhan [12].

The survey consisted of 35 questions (Appendix B). The first eight questions referred to the examination of the demographic characteristics of the respondents. Control towards the website was examined by 12 questions, while the next nine questions referred to communication. Responsiveness was examined under the six questions). The differences between the respondents who used an interactive website and those who used a non-interactive website on a different channel (mobile phones and computer) were determined by using the two-way ANOVA between-groups analysis of variance. The statistical processing and analysis were performed in the SPSS (Statistical Package for the Social Sciences) program, ver. 20.

While processing the data in the SPSS program, it was observed that there were incorrectly completed survey questionnaires, which were eliminated from further processing, and the number of respondents thus decreased from 240 to 197. This resulted in a change in the number of respondents in related categories, and a uniformity analysis according to the number of respondents was, therefore, performed.

The number of respondents who used a mobile phone was 98, and the number of respondents who used a computer was 99. Although the number of respondents was not absolutely identical in both groups, there was no statistically significant difference between them ($\chi^2 = 0.005$, $p = 0.943$). The number of respondents who used an interactive website was 100, and the number of respondents who used a non-interactive website was 97. Although the number of respondents was not absolutely identical in both groups, there was no statistically significant difference between them ($\chi^2 = 0.046$, $p = 0.831$). The obtained result showed that the groups were uniform when it came to the number of respondents; thus, the further processing of results could be continued.

5.4. Analysis of Results

The Results of a Two-factor Analysis of the Variation of Different Groups

In the continuation of the paper, the reciprocal influence of the site type and the device type according to the presented models was determined.

SONG and ZINKHAN Model

According to chosen SONG and ZINKHAN model average size and device type values are calculated and presented in Table 1.

Table 1. Average size and device type values for the SONG and ZINKHAN model.

Devices (Channel)	Website Type	M	SD
Desktop	High interactivity	5.1866	0.61003
	Low interactivity	4.4848	0.62866
	Total	4.8463	0.70968
Mobile	High interactivity	5.4051	0.55328
	Low interactivity	4.8794	0.76159
	Total	5.1422	0.71295
Total	High interactivity	5.2936	0.59027
	Low interactivity	4.6842	0.72306
	Total	4.9935	0.72483

M, arithmetic mean (average value of the variable in the sample); SD, standard deviation (average deviation of individual values of the variable from the average in the sample).

Influence of site and device type based on chosen model value are presented in Table 2.

Table 2. Influence of site and device type on SONG and ZINKHAN model value.

	df	F	*p*	Partial Eta Squared
Devices (Channel)	1	11.198	0.001	0.055
Website type	1	44.886	0.000	0.189
Devices * Website type	1	0.924	0.338	0.005

R squared = 0.226 (adjusted R squared = 0.214).

Two-factor analysis of variance of different groups—Song and Zinkhan model is presented with Figure 1.

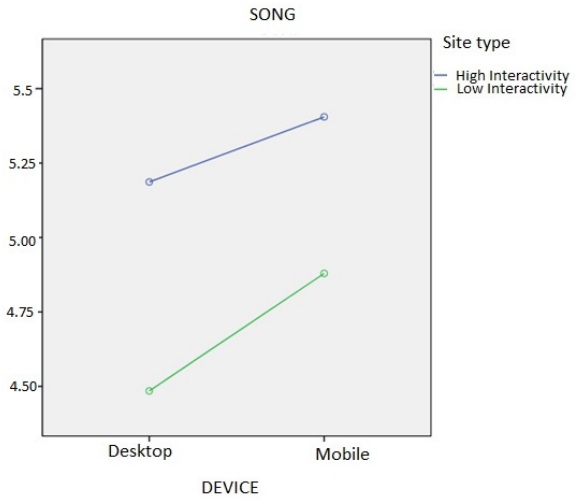

Figure 1. Two-factor analysis of variance of different groups—Song and Zinkhan model.

The influence of site and device type on the Song and Zinkhan model was investigated by the two-factor analyses of variance of different groups. The influence of the interaction was not statistically significant (F = 0.92, p = 0.338). The value of the Eta square was very low (ηp2 = 0.005) and showed that the impact of the interaction was very small or non-existent. Based on the guidelines proposed by Cohen (Cohen, 1988), the value of the eta square was estimated as follows: 0.01—small impact; 0.06—moderate impact; 0.14—large impact.

A statistically significant separate influence of the device type was determined (F = 11.19, p = 0.001), as well as a separate statistically significant influence of the site type (F = 44.885, p = 0.000). The value of the Eta square for the site type showed a large impact (ηp2 = 0.189), while the value of the Eta square for the device type showed a moderate impact (ηp2 = 0.055). The total percentage of explained variance of the dependent variable was 21% (adjusted R squared = 0.214).

LIU Model

According to chosen LIU model, average cite and device type values are calculated and presented in Table 3.

Table 3. Average site and device type values for the LIU model.

Devices (Channel)	Website Type	M	SD
Desktop	High interactivity	5.0967	0.53621
	Low interactivity	4.2639	0.49182
	Total	4.6929	0.66160
Mobile	High interactivity	5.1633	0.63887
	Low interactivity	4.5823	0.66608
	Total	4.8728	0.71188
Total	High interactivity	5.1293	0.58671
	Low interactivity	4.4247	0.60487
	Total	4.7824	0.69122

M, arithmetic mean (average value of the variable in the sample); SD, standard deviation (average deviation of individual values of the variable from the average in the sample).

Influence of site and device type on LIU model value is calculated and presented in Table 4.

Table 4. Influence of site and device type on LIU model value.

	df	F	p	Partial Eta Squared
Devices (Channel)	1	5.282	0.023	0.027
Website type	1	71.250	0.000	0.270
Devices * Website type	1	2.262	0.134	0.012

R squared = 0.288 (adjusted R squared = 0.277).

Figure 2 presents two-factor analyses of variance of different groups based on LIU model.

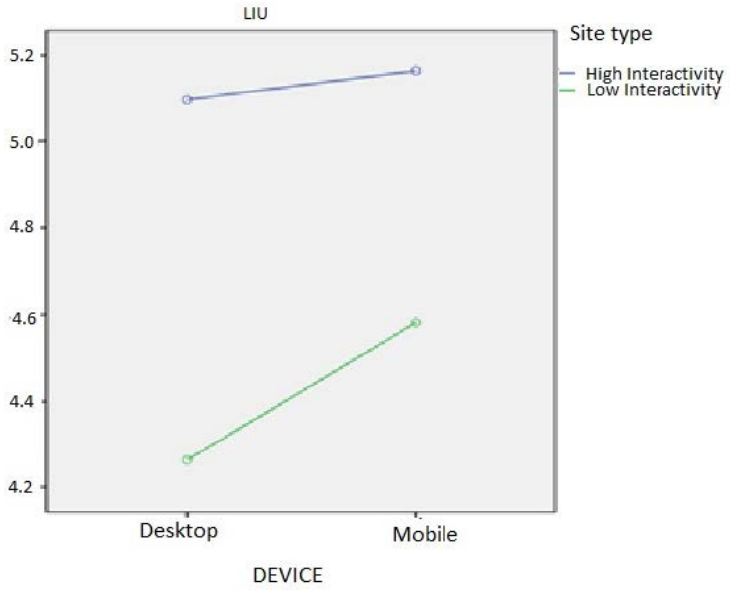

Figure 2. Two-factor analysis of variance of different groups—LIU Model.

The influence of site and device type on the LIU model was investigated by a two-factor analyses of variance of different groups, while the influence of the interaction was not statistically significant (F = 2.26, p = 0.134). The value of the Eta square was deficient (ηp2 = 0.012) and showed that the impact of the interaction was very small or non-existent. Based on the guidelines proposed by Cohen (Cohen, 1988), the value of the eta square was estimated as follows: 0.01—small impact; 0.06—moderate impact; 0.14—large impact.

A statistically significant separate influence of the device type was noted (F = 5.28, p = 0.023), as well as a separate statistically significant influence of the site type (F = 71.25, p = 0.000). The value of the Eta square for the site type showed a large impact (ηp2 = 0.270), while the value of the Eta square for the device type showed a small impact (ηp2 = 0.027). The dependent variable's total percentage of explained variance was 28% (adjusted R squared = 0.277).

Wu Model

Table 5 presents average site and device type values for the Wu model.

Table 5. Average site and device type values for the Wu model.

Devices (Channel)	Website Type	M	SD
Desktop	High interactivity	4.9564	0.64677
	Low interactivity	3.9699	0.74685
	Total	4.4781	0.85235
Mobile	High interactivity	5.0181	0.54213
	Low interactivity	4.4921	0.93128
	Total	4.7551	0.80281
Total	High interactivity	4.9867	0.59559
	Low interactivity	4.2337	0.88067
	Total	4.6159	0.83755

M, arithmetic mean (average value of the variable in the sample); SD, standard deviation (average deviation of individual values of the variable from the average in the sample).

Influence of site and device type on WU model value is calculated and presented in Table 6. Further in Figure 3. it is presents two-factor analyses of variance of different groups based on same model.

Table 6. Influence of site and device type on Wu model value.

Source	df	F	*p*	Partial Eta Squared
Devices (Channel)	1	7.871	0.006	0.039
Website type	1	52.827	0.000	0.215
Devices * Website type	1	4.895	0.028	0.025

R squared = 0.252 (adjusted R squared = 0.240).

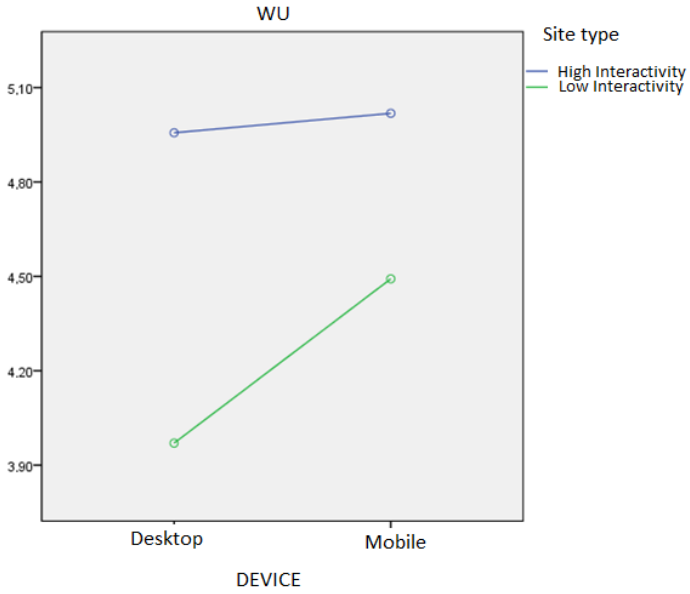

Figure 3. Two-factor analysis of variance of different groups—Wu Model.

The influence of site and device type on the Wu model was investigated by a two-factor analysis of variance of different groups. The results showed that the influence of the interaction was statistically significant (F = 4.89, p = 0.028). The value of the Eta square was very high (ηp2 = 0.025) and showed that the impact of the interaction was very large. Based on the guidelines proposed by Cohen (Cohen, 1988), the value of the eta square was estimated as follows: 0.01—small impact; 0.06—moderate impact; 0.14—large impact.

A statistically significant separate influence of the device type was determined (F = 7.87, p = 0.006), as well as a separate statistically significant influence of the site type (F = 52.82, p = 0.000). The value of the Eta square for the site type showed a large impact (ηp2 = 0.215), while the value of the Eta square for the device type showed a small impact (ηp2 = 0.039). The total percentage of explained variance of the dependent variable was 24% (adjusted R squared = 0.240).

6. Discussion

The following research shows the analysis of the respondents of the interactive site between the two used channels—computers and mobile devices. The influence of the site and device type on the presented models in the paper were investigated by a two-factor analysis of variance of different groups. The influence of the interaction between site type and device type in the Song and Zinkhan model was not statistically significant, and showed that the impact of the interaction was very small or non-existent. A statistically significant separate influence of the device type (moderate influence), as well as a separate statistically significant influence of the site type (large influence), were determined.

The LIU model showed that the influence of the interaction between site type and devise type was not statistically significant, and showed that the impact of the interaction was very small or non-existent. A statistically significant separate influence of the device type (small influence), as well as a separate statistically significant influence of the site type (big influence), were determined. On the other hand, the Wu model showed that the influence of the interaction between site type and devise type was statistically significant and that the impact of interaction was tremendous. A statistically significant separate influence of the device type (small influence), as well as a separate statistically significant influence of the site type (big influence), were determined. Furthermore, on all three models shown, a statistically significant separate influence of the device type (minor or moderate) was observed, which proves H1.

The interactions between the site type and the user device on the Song and Zinkhan model and the LIU model were not statistically significant, while with the Wu model, a statistically significant difference was determined. It was noticed that on all three presented models, there was a statistically significant separate influence of the device type (moderate or small influence) as well as a different statistically significant influence of the site type (considerable influence). Perhaps the reason for the moderate or small influence of the type of device can be attributed to the subjective perception of the user that everything observed via a mobile phone is considered interactive, although there is no objective evidence for that.

7. Conclusions

A large number of authors explored interactivity and the impact that interactivity leaves on the users when choosing products/services [6–13,16–18,36–41]. A significant impact was proven on the end actions of users if the level of interactivity increased, by introducing interactive features on the website used in this research [44].

The importance of using mobile phones for making a bigger influence on consumers is also very important [22–24,48].

The survey was conducted among students of chosen higher education institutions. It is effective to know their habits and draw conclusions regarding the learning process, so that positive impacts can be made for learning outcomes. The results of this research study can be therefore used for obtaining the sustainability of processes in higher education. In the higher education sector, mobile devices and other user devices have significant roles in the learning process, accompanied by other technologies (artificial intelligence, blockchain, machine learning, augmented reality) [49–52], especially in times of crisis, such as during the COVID-19 pandemic.

The contribution of this work is reflected in that, in addition to interactivity as one of the important characteristics of today's businesses, we should also address the importance of used device (mobile/computer) when searching for requested products/services. One group of authors explored the importance of interactive features of the site on the consumer, another group of authors processed the importance of using mobile phones on the consumer. In this study, a two-factor analysis of the variation of different groups was completed, in order to the determine influence of the site type and the device type on the consumer.

For this reason, three models were used to prove the impact of interactive and non-interactive consumer characteristics, as well as the type of tool used on the user.

Results obtained by the survey showed, on all three presented models, a statistically significant separate influence of the device type, as well as site type.

In the first two models (Song and Zinkhan, and LIU model) the influence of the interaction between site type and device type was not statistically significant, showing that the impact of the interaction was very small or non-existent, while in third model (Wu) the influence of the interaction between site type and device type was statistically significant, and the impact of interaction was tremendous.

A statistically significant separate influence of the device type (moderate influence—Song and Zinkhan; small influence—LIU; small influence—Wu) as well as a separate

statistically significant influence of the site type (large influence—Song and Zinkhan; big influence—LIU; big influence—Wu) was determined.

The scale used in the works of the authors LIU, Song and Zinkhan and Wu [8,12,36] as already demonstrated in their work, has been confirmed in this research, and can find application in both marketing practice and scientific research. Its application can be expanded by research into the degree to which a student understands prepared materials.

The study, however, contained several limitations. Due to the validity of the results, the research was conducted in laboratory conditions. The respondents were not in their natural environment, in which it would be more pleasant for them to visit the website. Respondents also had limited time for both—to visit the website and to complete the survey questionnaire, which could affect the speed and reasoning of the respondents. Furthermore, the participants in the research were first-year students, which included only one age group of respondents.

This paper established that users utilized their ability to search via mobile phone in order to achieve the necessary information or perform a desired action, while viewing interactive features of the used tool, regardless of whether the tool had built-in interactive features or not. A proposal for further research is suggested in order to investigate the reasons that lead to a wrong subjective assessment by users.

The two groups of students who were the subject of the research, Serbs and Romanians, aim to validate the quality of the information obtained through specialized sites. In the conditions of increasing the incidence of using online tools in the educational process, the present research highlights the advance of information in the learning process and its customization in order to increase specific skills.

Currently, researchers, including research teams in Serbia and Romania, are examining how the use of marketing tools that measure the impact of gadgets on the supply of information is correctly sized to the demand for specific skills and competencies absorbed by the labor market. Therefore, future recommendations for the sector of education, as well as for sectors of the economy, shall be given. For now, based on the results of the current study, authors can recommend following: in order to remain competitive, businesses must figure out how to make their products more interactive with their customers. Companies can communicate with customers in two ways: through websites or through a channel that strengthens the customer's bond with the business. When it comes to blockchain technology, interactive and non-interactive methods have different effects on users' behavior, which has to be acknowledged.

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Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Survey questionnaire for Pre-test

1. Name and surname of the student _____

2. How old are you? (circle the number in front of the offered answer)

(1) <20
(2) 21–25
(3) 26–30
(4) 31–40
(5) >40

3. What gender are you? (circle the number in front of the offered answer)

(1) Male
(2) Female

4. How many years have you been using the Internet (circle the number in front of the offered answer)

(1) <2 years
(2) 2–4 years
(3) 5–6 years
(4) >6 years

5. How much time do you spend online per week? (circle the number in front of the offered answer)

(1) <5 hours
(2) 5–20 hours
(3) 21–40 hours
(4) >40 hours

6. Do you own a mobile phone with an operating system?

(1) Yes
(2) No

7. How many years have you been using your mobile phone? (circle the number in front of the offered answer)

(1) Less than a year
(2) 1 or 2 years
(3) 3 or 4 years
(4) More tan 5 years

8. How much time do you use the internet on your mobile per week? (circle the number in front of the offered answer)

(1) <1 hour
(2) from 1 to 3 hours
(3) from 4 to 5 hours
(4) >5 hours

Appendix B

Survey questionnaire for Main test

Dear students,

This anonymous survey questionnaire was designed to investigate the degree of interactivity in digital marketing strategies. The answers given will be used for scientific purposes and will not be misused in any way.

Please answer each question with one answer.

I was informed regarding the objectives of this study and

(1) I agree to participate in this study.
(2) I do not agree to participate in this study.

1. How old are you? (circle the number in front of the offered answer)

(1) <20
(2) 21–25
(3) 26–30
(4) 31–40
(5) >40

2. What gender are you? (circle the number in front of the offered answer)

(1) Male
(2) Female

3. How many years have you been using the Internet? (circle the number in front of the offered answer)

(1) <2 years
(2) 2–4 years
(3) 5–6 years
(4) >6 years

4. How much time do you spend online per week? (circle the number in front of the offered answer)

(1) <5 hours
(2) 5–20 hours
(3) 21–40 hours
(4) >40 hours

5. How many years have you been using your mobile phone? (circle the number in front of the offered answer)

(1) Less than a year
(2) 1 or 2 years
(3) 3 or 4 years
(4) More tan 5 years

6. How much time do you use the internet on your mobile per week? (circle the number in front of the offered answer)

(1) <1 hour
(2) from 1 to 3 hours
(3) from 4 to 5 hours
(4) >5 hours

7. Do you have a social media profile?

(1) No
(2) Yes (you can use more than one answer)
    (a) Facebook
    (b) Tweeter
    (c) Google +
    (d) Pinterest
    (e) LinkedIn
    (f) Neki drugi _____

8. How much of the total time you spend online on social media? (circle the number in front of the offered answer)

(1) <10%
(2) from 11 till 30%
(3) from 31 till 50%
(4) More than 50%

Answer the following questions by marking one square with the letter "X" below the desired offered answer.

9. I felt that I had a lot of control over my visiting experiences at this website.

Strongly disagree	Disagree	Somewhat disagree	Neither disagree or agree	Somewhat agree	Agree	Strongly disagree
☐	☐	☐	☐	☐	☐	☐

10. While I was on the site, I was always aware where I was

Strongly disagree	Disagree	Somewhat disagree	Neither disagree or agree	Somewhat agree	Agree	Strongly disagree
☐	☐	☐	☐	☐	☐	☐

11. While I was on the site, I always knew where I was going

Strongly disagree	Disagree	Somewhat disagree	Neither disagree or agree	Somewhat agree	Agree	Strongly disagree
☐	☐	☐	☐	☐	☐	☐

12. I was in control of my navigation through this website

Strongly disagree	Disagree	Somewhat disagree	Neither disagree or agree	Somewhat agree	Agree	Strongly disagree
☐	☐	☐	☐	☐	☐	☐

13. I had some control over the content of this Web site that I wanted to see

Strongly disagree	Disagree	Somewhat disagree	Neither disagree or agree	Somewhat agree	Agree	Strongly disagree
☐	☐	☐	☐	☐	☐	☐

14. While I was on the site, I could choose freely what I wanted to see

Strongly disagree	Disagree	Somewhat disagree	Neither disagree or agree	Somewhat agree	Agree	Strongly disagree
☐	☐	☐	☐	☐	☐	☐

15. While surfing the site, my actions decided the kind of experiences I got

Strongly disagree	Disagree	Somewhat disagree	Neither disagree or agree	Somewhat agree	Agree	Strongly disagree
☐	☐	☐	☐	☐	☐	☐

16. While I was on the site, I was always able to go where I thought I was going

Strongly disagree	Disagree	Somewhat disagree	Neither disagree or agree	Somewhat agree	Agree	Strongly disagree
☐	☐	☐	☐	☐	☐	☐

17. I was delighted to be able to choose which link and when to click

Strongly disagree	Disagree	Somewhat disagree	Neither disagree or agree	Somewhat agree	Agree	Strongly disagree
☐	☐	☐	☐	☐	☐	☐

18. I was in total control over the pace of my visit to this Web site

Strongly disagree	Disagree	Somewhat disagree	Neither disagree or agree	Somewhat agree	Agree	Strongly disagree
☐	☐	☐	☐	☐	☐	☐

19. While surfi ng the site, I had absolutely no control over what I could do on the site

Strongly disagree	Disagree	Somewhat disagree	Neither disagree or agree	Somewhat agree	Agree	Strongly disagree
☐	☐	☐	☐	☐	☐	☐

20. The Web site is not manageable

Strongly disagree	Disagree	Somewhat disagree	Neither disagree or agree	Somewhat agree	Agree	Strongly disagree
☐	☐	☐	☐	☐	☐	☐

21. This Web site facilitates two-way

Strongly disagree	Disagree	Somewhat disagree	Neither disagree or agree	Somewhat agree	Agree	Strongly disagree
☐	☐	☐	☐	☐	☐	☐

22. The Web site gives me the opportunity to talk back.

Strongly disagree	Disagree	Somewhat disagree	Neither disagree or agree	Somewhat agree	Agree	Strongly disagree
☐	☐	☐	☐	☐	☐	☐

23. The Web site facilitates concurrent communication.

Strongly disagree	Disagree	Somewhat disagree	Neither disagree or agree	Somewhat agree	Agree	Strongly disagree
☐	☐	☐	☐	☐	☐	☐

24. The Web site enables conversation

Strongly disagree	Disagree	Somewhat disagree	Neither disagree or agree	Somewhat agree	Agree	Strongly disagree
☐	☐	☐	☐	☐	☐	☐

25. Site created the feeling that it wants to listen to its users

Strongly disagree	Disagree	Somewhat disagree	Neither disagree or agree	Somewhat agree	Agree	Strongly disagree
☐	☐	☐	☐	☐	☐	☐

26. The website gives visitors the opportunity to talk back

Strongly disagree	Disagree	Somewhat disagree	Neither disagree or agree	Somewhat agree	Agree	Strongly disagree
☐	☐	☐	☐	☐	☐	☐

27. It is difficult to offer feedback to the website

Strongly disagree	Disagree	Somewhat disagree	Neither disagree or agree	Somewhat agree	Agree	Strongly disagree
☐	☐	☐	☐	☐	☐	☐

28. The website does not at all encourage visitors to talk back

Strongly disagree	Disagree	Somewhat disagree	Neither disagree or agree	Somewhat agree	Agree	Strongly disagree
☐	☐	☐	☐	☐	☐	☐

29. The Web site processed my input very quickly

Strongly disagree	Disagree	Somewhat disagree	Neither disagree or agree	Somewhat agree	Agree	Strongly disagree
☐	☐	☐	☐	☐	☐	☐

30. Getting information from the Web site is very fast

Strongly disagree	Disagree	Somewhat disagree	Neither disagree or agree	Somewhat agree	Agree	Strongly disagree
☐	☐	☐	☐	☐	☐	☐

31. I was able to obtain the information I want without any delay

Strongly disagree	Disagree	Somewhat disagree	Neither disagree or agree	Somewhat agree	Agree	Strongly disagree
☐	☐	☐	☐	☐	☐	☐

32. When I clicked on the links, I felt I was getting instantaneous information

Strongly disagree	Disagree	Somewhat disagree	Neither disagree or agree	Somewhat agree	Agree	Strongly disagree
☐	☐	☐	☐	☐	☐	☐

33. The Web site was very slow in responding to my request

Strongly disagree	Disagree	Somewhat disagree	Neither disagree or agree	Somewhat agree	Agree	Strongly disagree
☐	☐	☐	☐	☐	☐	☐

34. The Web site answers my question immediately

Strongly disagree	Disagree	Somewhat disagree	Neither disagree or agree	Somewhat agree	Agree	Strongly disagree
☐	☐	☐	☐	☐	☐	☐

35. The site had the ability to respond to my specifi cquestions quickly and efficiently

Strongly disagree	Disagree	Somewhat disagree	Neither disagree or agree	Somewhat agree	Agree	Strongly disagree
☐	☐	☐	☐	☐	☐	☐

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