Article

The Utility of Blockchain Technology in the Electronic Commerce of Tourism Services: An Exploratory Study on Romanian Consumers

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Abstract: Blockchain technology is considered one of the most revolutionary innovations that has much to offer the tourism industry, having a positive impact among consumers with the help of interactive applications but also easy to use. Tourist services must constantly evolve in a society where the consumer has everything a click away and his requirements are demanding when it comes to quality leisure. Blockchain technology has the power to change the course of the travel experience, offering the customer more autonomy, but the applications developed by the providers can offer transparency and trust to the customers from the moment T0, when the desire to go on a trip is born, until the end at which it should provide feedback. So far, digital and tourism specialists have not agreed on the development of blockchain-based applications, although the benefits are great for both consumers and tourism service providers, as in this publication we can see a series of advantages that blockchain technology can offer the tourism field. This paper also investigates the satisfaction that the Romanian consumer has after purchasing tourist services through e-commerce applications, a satisfaction that can be an additional motivation for specialists to implement blockchain technology. Following the research in this paper, it can be seen how important it is to develop a series of easy-to-use applications, because if the consumer does not manage to use the applications, this affects the degree of satisfaction and the intention to continue using the online applications for the purchase of tourism services.

Keywords: blockchain; education; electronic commerce; tourism services; tourism online services; tourism applications

1. Introduction

Blockchain, a technology that is still in its infancy, involves new organizational practices [1], according to the technology behind the Internet [2]. Blockchain technology is a revolutionary protocol [3] with huge potential that can influence important industries such as tourism. The accession of the tourism industry to blockchain technology involves the development of digital, transversal, and practical skills of consumers, in other words, consumer education [4]. The tourism industry and blockchain technology have the potential to make a perfect pairing, as technology can bring security and transparency to many critical points of tourism.

Modern technologies have changed over 90% of many aspects of our daily lives [5]. Blockchain technology is already revolutionizing the way people travel. As a developing technology, blockchain is of great interest in the tourism industry [6]. In the tourism industry, the role of the blockchain is to eliminate the need for third parties and to allow consumers and providers to directly connect. The introduction of the blockchain technology model could create benefits for consumers, allowing them to have more control and power over how they consume their travel experience [7], so that it will allow tourists to have control over their own journey.

Consumers are constantly and sometimes abruptly changing their behavior, attitudes, and intentions, so the introduction of blockchain technology in the field of tourism can create a huge advantage for tourism service providers. Blockchain technology could have an extraordinary impact on the entire tourism industry given its unique features [8]. Given that this concept is new in the field of tourism, this whole process can be considered a consumer information literacy, so that blockchain technology will also have an educational role in consumer life.

Therefore, the aim of this study is to determine the satisfaction that the Romanian consumer has after purchasing tourist services through e-commerce applications. Among the specific research objectives considered were: the usefulness and ease of use of e-commerce applications for the purchase of travel services; the individual's ability to use technology; its compatibility with the purchase of travel services through e-commerce applications; the degree of interactivity of e-commerce applications; and the way in which an individual's social groups influence his attitude regarding the purchase of tourist services through e-commerce applications, aiming at the consumer's loyalty to e-commerce applications for the purchase of tourist services, but also his intention to continue purchasing services through e-commerce applications [9] (p. 29).

Blockchain technology is based on a series of models for studying consumer behavior in the online environment, such as: Theory of Reasoned Action, Theory of Planned Behavior, Technology Acceptance Model [10], Unified Theory of Acceptance and Use of Technology [11]. Some of these theories represent the starting point for the conceptual model developed in this paper.

This paper can become a point of reference both from a theoretical point of view and from a practical point of view for the technological and tourist field. From a theoretical point of view, one can discover recent and relevant information on e-commerce, blockchain technology, and its applicability in tourism services. From a practical point of view, the study developed in this paper can be a starting point for specialists for developing new complex, but at the same time easy to use, applications based on blockchain technology. Curiosity, loyalty, adaptability, and utility perceived by the consumer are just a number of factors included in the developed econometric model, which can convince specialists that blockchain technology should be integrated as soon as possible in the field of tourism and there are practical implications that can be stimulated by blockchain technology.

2. Literature Review

2.1. Global E-Commerce: Electronic Commerce in Romania

In recent decades, e-commerce has grown significantly in terms of popularity and has been integrated with traditional commerce, and in some cases has replaced the latter.

Most of the time, companies opt for a mix between traditional and electronic commerce, so they can reach a larger target audience given the possibility of a global presence, but there is also a reduction in costs. The use of e-commerce is constantly increasing considering that most traditional businesses have increased their target audience passionate about the online environment [12]. E-commerce is a major contributor to the global economic system [13], and is the most recommended way to stimulate a company's market, because we live in the age of technology [14]. E-commerce has provided new opportunities for businesses and consumers [15]. When they choose to shop online, customers buy without having any sensory experiences, such as touch, smell, or taste, which means that product reviews are extremely important, both for the brand and for future buyers [16].

For the e-commerce sector, 2020 was one that marked a spectacular evolution considering the context of the pandemic caused the SARS CoV-2 virus, and 2021 saw a favorable continuation for global e-commerce. The financial impact for 2021 on global e-commerce are expected to be over $4.89 billion. Globally, in 2019, only 13.6% of sales were made from online purchases, and by the end of 2021 it is expected that this number will reach 19.5%, which means an increase of 45.8% of e-commerce market share in just two years. Experts in the field predict that by the end of 2024, the growth will reach 21.8%, which implies a rapid

increase of 8.2% in just five years, an acceleration that took place strictly due to the global pandemic situation [17].

The e-commerce market in Romania ranks 50th globally, with a value of $3 billion in 2020, being ahead of Bangladesh and below the online commerce market in Singapore [18]. The SARS CoV-2 virus has had a major impact on e-commerce retail sales, which are estimated to reach $6.5 trillion by 2023 [19]. E-commerce companies introduced a range of new products and services during the pandemic. According to European data, the most popular categories of products and services sold online in 2020 were: fashion, food deliveries from restaurants, fast food, catering services, furniture and accessories for home and garden, cosmetics, beauty and wellness products, books, magazines, and printed newspapers, computers, tablets, mobile phones and IT accessories, and the share of local products was high, 93% [20].

At the end of 2020, there can be an increase of over 30% of e-commerce in Romania compared to the same period of 2019. The increases were higher than the forecasts of specialists, mainly due to the COVID-19 pandemic. According to specialists in the field, the Romanian e-commerce market reached 5.6 billion euros [21]. This value only accounts for the purchases of tangible products and does not consider the purchase of services, plane tickets, vacations, hotel reservations, payment of invoices at utilities, or digital content.

The year 2020 represented for many Romanians the year in which they overcame their fear of ordering online and making online payments. It was also the year that showed Romanians how simple and convenient it is to use the digital environment to purchase your desired products/services. These changes in the buying behavior of Romanians must be taken advantage of by retailers to develop new applications and to access marketplace platforms, maximizing online business. Although some consumers are responsible for the choices made, they face different types of fraud specific to e-commerce [22], hence the reluctance of the Romanian consumer to use online stores.

In addition to purchases in Romania, a third of Romanians prefer to shop online from stores in China (27%), EU member states (23%), and the United States (4%) [21], allowing rapid adaptability to blockchain technology, both for consumers and suppliers.

2.2. Blockchain Technology: An Innovative Concept with a Focus on Tourism Services

The year 2016, representative for the popularity of cryptocurrencies, was also the beginning of the interest in blockchain technology [23]. Blockchain technology is a new method of structuring, orchestrating, manipulating, and recording data in blocks that are verifiable, reliable, and permanent, which form a chain, thus leading to the name blockchain. By its nature, blockchain offers a number of advantages, which can be seen in the tourism industry, such as: data security, immutability, transparency, programmability, distributed trust [24], anonymity, consensus, and decentralization (being considered the main feature of blockchain technology). Blockchain technology helps to improve communication performance, reduce transaction costs, but also improve privacy [3].

Although, until now, blockchain technology has been predominantly noted in the field of cryptocurrencies, it can find its applicability in various sectors of activity, such as economic-financial, energy, health, education, transport, construction, automation of contract signing, investigations, and business intelligence.

Blockchain technology is also gaining more and more ground in the gaming industry, given that "gamers" have more technological knowledge than other Internet users, so they are more open to new ideas and concepts, such as blockchain [25].

The global video game industry is currently worth $180 billion, which is constantly growing because modern technology is developing exponentially. The interest for the development of this industry is great, considering the fact that gamification elements predict consumer purchase behaviors [26].

This reference technology is not only mandatory in the cryptocurrency sector, but also represents a challenge for the tourism industry. Tourism is a new, complex economic and social phenomenon that began to develop in 1960 and is now the most powerful

industry in the world. The continuous growth trends of tourism identify it as a vital branch of the economy, both nationally and internationally, being considered a key factor of economic growth.

Researchers and practitioners believe that blockchain technology will increase the confidence of tourists in this industry, given the transparency that could improve the entire tourism system [27]. Blockchain technology will eliminate intermediaries in the tourism industry, so there will be a transfer of power from suppliers to consumers. Tourism companies need to see the benefits that blockchain technology can bring, such as customer loyalty and an advantage over other competitors. You can already see in the market a number of online travel platforms based on blockchain technology, and these are just the beginning of the transformation [28]. Today, blockchain technology is still at a very technical level, which means that it is not so accessible to tourism professionals [29]. Blockchain technology has the potential to overcome the barriers in the tourism industry by effectively solving common challenges and dedicated processes [30].

The novelty of this innovation will also depend on how people learn to use it, so a number of applications should be developed on how blockchain technology works in tourism services.

Given the exponential development of modern technology, blockchain technology is becoming a certainty for many industries, and implementation is expected.

2.3. Possible Blackchain Applications for Tourism Services

The rapid evolution of technology in recent years has led to rapid changes in the tourism industry, so that the Internet has given customers the opportunity to search, book vacations, or even travel online [28]. To meet the growing technological needs of customers, tourism specialists had to combine money, technology, and knowledge to build new and innovative platforms [31].

All forms of tourism involve the significant use of all that technology means, whether we are talking about the traveler or the travel service provider: the traveler has the opportunity to capitalize on technology to identify, customize, and buy tourism products, whereas travel service providers benefit from technology to develop, manage, and distribute their offerings worldwide [32].

The tourism industry is extremely complex, so the concept of blockchain can be implemented at several key points of this vast industry. The implementation of the blockchain in tourism companies will enable them to manage sales, operations, finance, and administration-related transactions [8]; in other words, it can reshape the centralized tourism ecosystem [33]. Given that blockchain technology is at the beginning of the road in the tourism industry, it can play an educational role in terms of a number of applications that can be developed in this field. Blockchain technology can be implemented in applications for:

1. Content—Updating a company's website is a necessity when it comes to constantly informing customers [11]. Any changes of the brand, service updates, or new facilities must be reflected in the shortest time on the site, so that the client has the correct and complete information about the brand and the services it offers. In such cases, a blockchain can be set up as a central location where data can be stored and updated in real time.
2. Reservations and ticketing—Solutions based on blockchain technology can be extremely useful when it comes to reservations and ticketing. The booking and purchase process can be simplified, but also possible problems (for example, the loss of plane tickets) can be solved more easily if the concept of blockchain is used [11].
3. Payments—The implementation of cryptocurrencies could have a positive impact on the tourism industry and could create a competitive advantage in the market. Given that blockchain technology involves the elimination of intermediaries, it will be automatic and prices will be lower. Another advantage when it comes to pay-

ments is that cryptocurrency payments will be much more secure, tracked, and have chain registration.

4.   Baggage tracking—Certainly many tourists have faced lost luggage, which can lead to a failed vacation. The transparency of blockchain systems makes it easy to track the location and status of luggage, with the information being subsequently transmitted to passengers through the digital environment [11].

5.   Inventory management—Inventory in the tourism and hospitality industry is a big challenge. The inventory can be broken down when it comes to the number of rooms available in a hotel or the number of seats on a plane, but also when it comes to the food part of the hospitality industry. There are currently a number of programs that help suppliers, but blockchain technology could help them with stock availability. In addition, in this case we can talk about a reduction of costs considering the main feature of blockchains: decentralization(through which intermediaries are eliminated).

6.   Identity and privacy—Blockchain technology can be the basis of applications that help determine a person's identity, a great advantage for those who travel very often and are required to present identity documents [11]. An essential thing in the tourism industry is the customer reviews, but it is important that they are real, so that through the blockchain technology a private key can be generated that can lead to the signing of these reviews. In recent years, confidentiality and data protection have been hotly debated topics for which attempts have been made to find quick and long-term solutions. Blockchain technology offers a wide range of potential applications [11] to manage data in an integrated way, without endangering a person's identity. The applicability of blockchain technology in tourism services and marketing consists of providing more protection to users.

It is important for the tourism industry to fully adapt to online and develop applications that can trigger a consumer's desire to travel; help plan their trip; book their hotel, travel arrangements, and the tourist attractions they want to experience; and help provide feedback and reviews and possibly share their own experiences. In sum, blockchain for travel applications could enable firms to strengthen the ties between travellers and destinations.

Certainly, technology can help specialists in the field to create new applications that are as easy to use, interactive, and as user-friendly as possible. The question is, are consumers prepared and confident in using them and subsequently show a great satisfaction buying travel services through e-commerce applications?

3. Methodology

The aim of this quantitative marketing research is to study the satisfaction that the consumer has after purchasing tourist services through e-commerce applications [9] (p. 211).

Quantitative marketing research on satisfaction of buying behavior in the purchase of tourism services by electronic commerce applications seeks to identify factors that determine the usefulness and ease of use of e-commerce applications for the acquisition of tourism services, the ability of the individual to use technology, and its compatibility with the acquisition of tourism services through e-commerce applications. In addition, the goal is to collect information on the degree of interactivity of e-commerce applications and on how social groups influence an individual's attitude towards the acquisition of tourism services through e-commerce applications. Thus, the paper is targeting the consumer's loyalty to e-commerce applications for the acquisition of tourism services, but also its intention to continue the acquisition of tourism services through e-commerce applications [9].

3.1. Hypotheses

For this quantitative marketing research, the following hypotheses are proposed [9] (pp. 215–219):

Hypothesis 1 (H1). *There is a direct and positive relationship between the consumer's perceived usefulness of e-commerce applications in the purchase of tourism services and the degree of satisfaction he feels after using online commerce applications.*

Hypothesis 2 (H2). *There is a direct and positive relationship between the consumer's perceived usefulness of e-commerce applications in the purchase of tourism services and his attitude towards the acquisition of tourism services through e-commerce applications.*

Hypothesis 3 (H3). *There is a direct and positive relationship between the ease perceived by the consumer in using e-commerce applications for the purchase of tourism services and the degree of satisfaction he feels after using online commerce applications.*

Hypothesis 4 (H4). *There is a direct and positive relationship between the ease perceived by the consumer in the use of e-commerce applications for the purchase of tourism services and the perceived usefulness of the consumer in purchasing tourism services through e-commerce applications.*

Hypothesis 5 (H5). *There is a direct and positive relationship between the consumer's ability to use technology to make the purchase of travel services through e-commerce applications and the degree of satisfaction he feels after using online commerce applications.*

Hypothesis 6 (H6). *There is a direct and positive relationship between the consumer's ability to use technology to make the purchase of travel services through e-commerce applications and his intention to continue using online commerce applications.*

Hypothesis 7 (H7). *There is a direct and positive relationship between the degree of interactivity of e-commerce applications for travel services and the degree of consumer satisfaction felt after using online commerce applications.*

Hypothesis 8 (H8). *There is a direct and positive relationship between the degree of interactivity of e-commerce applications for tourism services and the consumer's attitude towards the purchase of tourism services through e-commerce applications.*

Hypothesis 9 (H9). *There is a direct and positive relationship between consumer satisfaction with the purchase of tourism services through e-commerce applications and the consumer's attitude towards the purchase of tourism services through e-commerce applications.*

Hypothesis 10 (H10). *There is a direct and positive relationship between consumer satisfaction with the purchase of tourism services through e-commerce applications and their loyalty to e-commerce applications for the purchase of tourism services.*

Hypothesis 11 (H11). *There is a direct and positive relationship between the social influence of the social groups to which the consumer belongs and his attitude towards the purchase of tourist services through e-commerce applications.*

Hypothesis 12 (H12). *There is a direct and positive relationship between the consumer's attitude towards the use of e-commerce applications for the purchase of tourism services and his intention to continue using online commerce applications.*

Hypothesis 13 (H13). *There is a direct and positive relationship between consumer loyalty to e-commerce applications for the purchase of tourism services and its intention to continue using online commerce applications.*

Hypothesis 14 (H14). *There is a direct and positive relationship between consumer compatibility in relation to e-commerce applications for the purchase of travel services and his intention to continue using online commerce applications.*

The research hypotheses presented above are represented in graphical form in the conceptual model on the satisfaction of purchasing behavior in terms of purchasing tourist services through e-commerce applications (see Figure 1). Following the data analysis, the model will be validated or not.
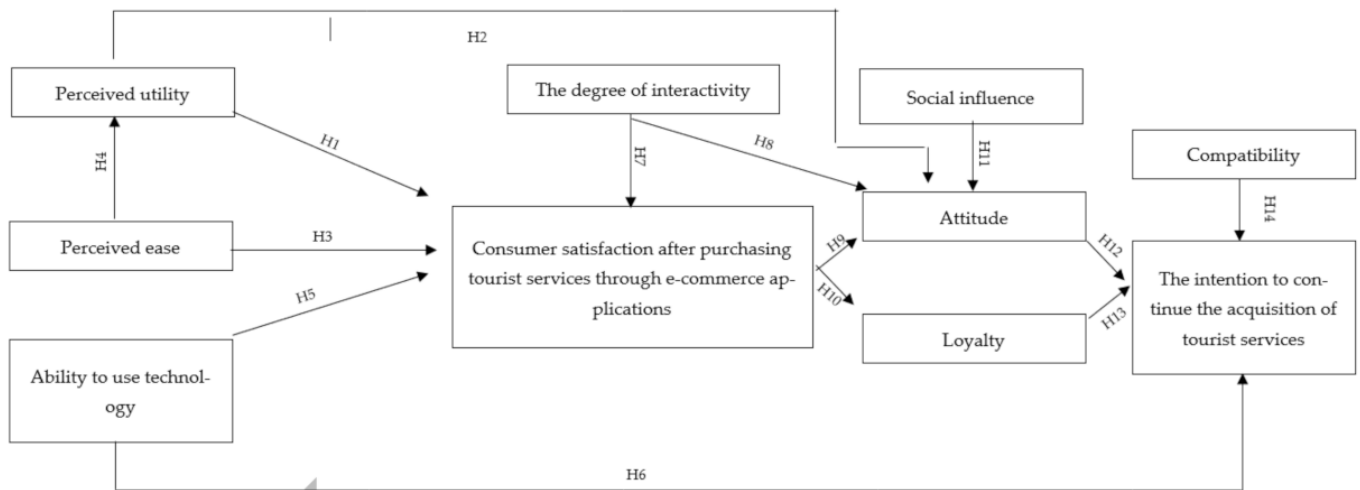

Figure 1. The conceptual model regarding the satisfaction of purchasing behavior in what is pursued by the application of e-commerce tourism services [9] (p. 220).

The development of the aforementioned hypotheses and the econometric model are based on a series of models of consumer behavior in the online environment, such as the Theory of Reasoned Actions, the Theory of Planned Behavior, the Technology Acceptance Model, the Unified Theory of Acceptance and Use of Technology, and the Theory of Diffusion of Innovations.

The Theory of Reasoned Actions (TRA) was developed in 1975 by Icek Ajzen and Martin Fishbein. This theory is part of the attitude models based on social psychology and can be applied in various fields, such as marketing, management, psychology, medicine, technology, and education. Specialists apply TRA in the study of online buying behavior by introducing cognitive assessments that are associated with the benefits and risks associated with online shopping [9] (p. 133). This theory underlies the following variables used in the econometric model developed in this research: attitude, intention, and social influence.

The Technology Acceptance Model was developed in 1986 by Fred Davis and is based on the Theory of Reasoned Actions. The purpose of the Technology Acceptance Model is to explain the acceptance or rejection of the new technology by the individual and to analyze the end user of the information system [9] (p. 136). Over the years, several specialists have left their mark on the development and completion of this model. The Technology Acceptance Model is the basis of the following variables used in the econometric model developed in this research: ease of use and perceived usefulness, establishing a direct link between the two variables, the individual using a certain technology more intensely if he puts in less effort [9] (p. 138).

The Theory of Diffusion of Innovations was developed by Everett Rogers in 1962 and involves communicating about a particular innovation through multiple channels of communication between members of a social system over a period of time [9] (p. 144). This theory underlies the degree of compatibility variable used in the econometric model developed in this research. It should be noted that if the compatibility is high, the individual's attitude towards the use of a technological novelty is higher.

3.2. Sample and Data

In this marketing research, the method of data collection was an online survey, and the data collection tool used was a questionnaire, which is essentially a formalized set of ques-

tions. In designing the questionnaire, the purpose of the research was considered so that the questions were ordered logically, without putting the respondent in difficulty. The funnel principle was used to construct the questionnaire, so that the respondent follows a flow of questions from general to individual. In addition, the questionnaire contained filter questions that had the role of selecting the appropriate category of respondents for this research. The five-step Likert ordinal scale was used for most questions. The questionnaire for this research was distributed and administered online and was built using the eSurveysPro platform [9] (pp. 233–235).

The quantitative survey was conducted with a sample of 384 respondents, and all questionnaires were valid.

In the present research, opt for traditional sampling (sample will be determined before data collection), non-return (a single sample item is included only once), nonprobabilistic (procedure that assumes that the probability of selection of any observation unit is not known before the selection to be carried out), and "by the method of quotas" (which involves the establishment by the researcher of quotas according to a series of characteristics of the sampling base. In the case of this research, the characteristics being the sex and age of the respondents) [9] (p. 230).

Given the sampling methods noted above, the structure of the sample is shown in Table 1.

Table 1. The sample structure.

Characteristics		Frequency	Percentage
Gender	**Age**		
Male	20–29	30	7.81%
Male	30–39	39	10.16%
Male	40 and above	116	30.21%
Female	20–29	29	7.55%
Female	30–39	37	9.64%
Female	40 and above	133	34.64%

Note: n = 384.

4. Results and Discussion

The most important contribution of this paper is the definition and validation of the proposed conceptual model on the satisfaction of purchasing behavior in terms of purchasing tourist services through e-commerce applications.

The proposed conceptual model (see Figure 2) consists of 10 latent variables, formative or reflective, built on the Likert measurement scale with three, four, or five items (see Table 2) [9] (p. 280). The variables are based on theoretical models of consumer behavior in the online environment developed and completed by specialists in the field.

Table 2. Latent variables of the proposed econometric model.

Variable	Variable Abbreviation	The Type of the Variable	Number of Items
Attitude	AT	Reflective	3
Ease of use	US	Formative	4
Ability to use	AB	Reflective	5
Usefulness of use	UU	Formative	5
Interactivity	INTER	Reflective	4
Satisfaction	SAT	Reflective	4
Compatibility	COMP	Formative	4
Intention to continue	INT	Reflective	4
Loyalty	LOIAL	Formative	3
Social influence	INFS	Reflective	3

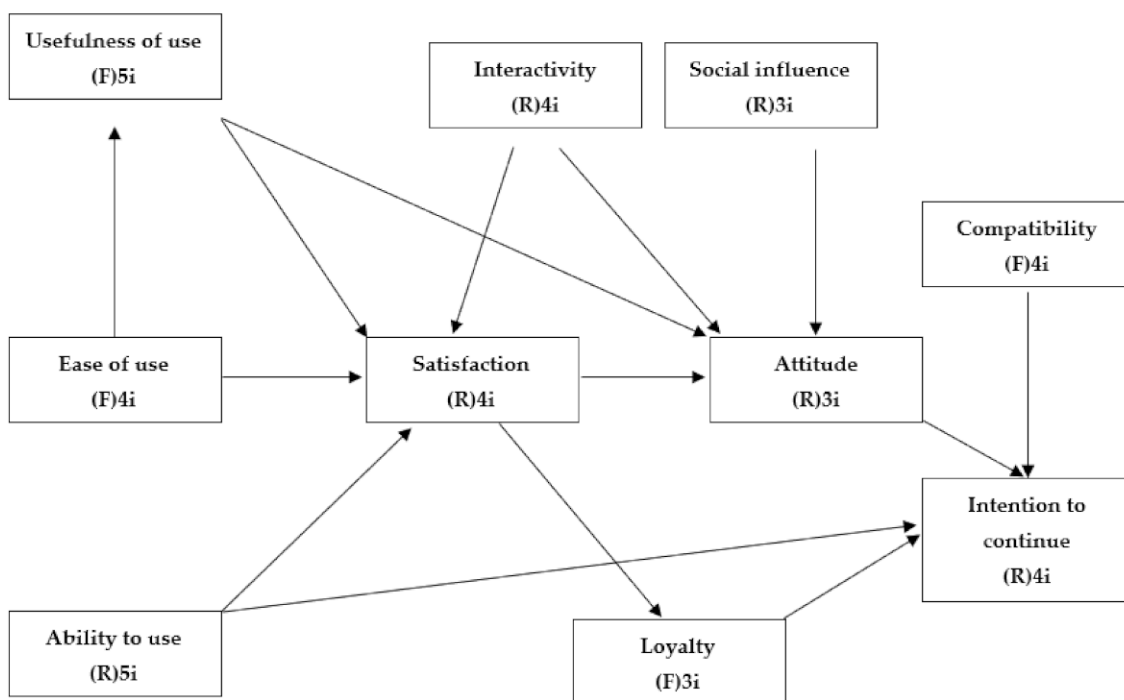The proposed econometric model was generated using WarpPLS 3.0.

Figure 2. Proposed conceptual model for the satisfaction of purchasing behavior in terms of purchasing tourist services through e-commerce applications [9] (p. 280).

4.1. Determination of Statistical Indicators, Examination of Normalcy, and Validity of Measurements

The analysis of statistical indicators was performed for each variable using IBM SPSS Statistics 23 (see Table 3).

Table 3. Statistical indicators [9] (p. 238).

Variable	N	Average	Median	Mode	Standard Deviation	MIN	MAX
Attitude	384	0	0.6211244	0.62112	1	−5.22099	0.62112
Ease of use	384	0	0.6079974	0.81300	1	−4.84507	0.81300
Ability to use	384	0	0.6576894	0.65769	1	−4.76360	0.65769
Usefulness of use	384	0	0.6016438	0.60164	1	−6.03398	0.60164
Interactivity	384	0	0.5814060	0.58141	1	−4.73955	0.58141
Satisfaction	384	0	0.7268684	0.72687	1	−4.74773	0.72687
Compatibility	384	0	0.4921007	0.76211	1	−4.48605	0.76211
Intention to continue	384	0	0.5491437	0.54914	1	−5.22424	0.54914
Loyalty	384	0	0.3740424	0.83605	1	−3.97403	0.83605
Social influence	384	0	0.4263615	0.86539	1	−4.00696	0.86539

Also, in this paper, the Skewness coefficient and the Kurtosis flattening coefficient were calculated for the variables of the proposed econometric model (see Table 4).

Table 4. Statistics on asymmetry and flattening coefficients for latent variables [9] (p. 248).

Variable	The Skewness Coefficient	The Kurtosis Coefficient
Attitude	−2.351	7.417
Ease of use	−1.846	4.678
Ability to use	−2.218	5.984
Usefulness of use	−2.769	10.652
Interactivity	−2.385	6.545
Satisfaction	−1.694	3.783
Compatibility	−1.584	3.203
Intention to continue	−2.498	7.774
Loyalty	−1.411	1.980
Social influence	−1.028	0.621

The role of the Skewness coefficient is to measure the asymmetry of a distribution. The positive value of the Skewness coefficient implies a below-average data distribution and an elongation of the data distribution to the right, whereas the above-average data distribution indicates that the value of the Skewness coefficient is negative, which implies an elongation of the distribution to the left. Zero value is interpreted as a perfectly symmetrical distribution. The Kurtosis flattening coefficient aims to show how close the values of a distribution are to its average. The positive value of the coefficient indicates that the values are very close to the average and the distribution curve of the series of values is higher. A negative value indicates that the values are further away from the average and the curve is flatter. For a normal distribution, the value of the coefficient is zero [9] (p. 247).

The result of the skewness coefficient for all variables is a negative one, which implies that there is a slight asymmetry to the right of the data. The positive value of the kurtosis flattening coefficient for all latent variables assumes that the variables are characterized by a more vaulted distribution of data [9] (p. 248).

The validity of the measurements was achieved by the "Criterion-Related Validity" method which has the role of measuring the degree to which the data collection tool used in this marketing research (the questionnaire) can predict a certain variable. To test the validity of the criterion, the Q-square coefficients for the dependent variables in the proposed econometric model are calculated in the WarpPLS 3.0 program [9] (p. 273).

The values of the Q-square coefficients of the dependent variables in the econometric model presented in Table 5 are all positive and exceed the value 0.2, which indicates that the validity of the criterion is met [9] (p. 273).

Table 5. Q-square coefficients of the dependent variables in the econometric model [9] (p. 273).

Usefulness of Use (UU)	Satisfaction (SAT)	Attitude (AT)	Loyalty (LOIAL)	Intention to Continue (INT)
0.564	0.620	0.546	0.456	0.673

4.2. Validation of Hypotheses Based on Direct Effects

The validation of the main hypotheses of the research, which is based on the direct effects that are established between the independent variables and the dependent variables, takes place by calculating the β coefficients (see Table 6). The condition for a hypothesis to be considered valid is that the value of the coefficient β is greater than 0.1, with a probability P less than 0.05 [9] (p. 281).

Table 6. Validation of hypotheses based on direct effects [9] (p. 281).

	Hypotheses	β	*p*	Validation
Hypothesis H1	Perceived utility → Degree of satisfaction	0.391	<0.001	Yes
Hypothesis H2	Perceived utility → Consumer attitude	0.204	<0.001	Yes
Hypothesis H3	Perceived ease → Degree of satisfaction	0.221	<0.001	Yes
Hypothesis H4	Perceived ease → Perceived utility	0.752	<0.001	Yes
Hypothesis H5	**Ability to use technology → Degree of satisfaction**	**0.038**	**0.229**	**No**
Hypothesis H6	**Ability to use technology → Consumer intention**	**0.048**	**0.174**	**No**
Hypothesis H7	Degree of interactivity → Degree of satisfaction	0.234	<0.001	Yes
Hypothesis H8	Degree of interactivity → Consumer attitude	0.13	<0.001	Yes
Hypothesis H9	Satisfaction → Consumer attitude	0.445	<0.001	Yes
Hypothesis H10	Satisfaction → Consumer loyalty	0.677	<0.001	Yes
Hypothesis H11	**Social influence → Consumer attitude**	**−0.032**	**0.264**	**No**
Hypothesis H12	Consumer attitude → Consumer intention	0.216	<0.001	Yes
Hypothesis H13	Consumer loyalty → Consumer intention	0.360	<0.001	Yes
Hypothesis H14	Consumer compatibility → Consumer intent	0.305	<0.001	Yes

Data processing was performed using IBM SPSS Statistics 23 and WarpPLS 3.0 for 384 responses, so all were validated. Modeling using structural equations was used to analyze and validate the model. To see if the econometric model is valid, the WarpPLS 3.0 program was used.

It can be seen that H5 has a coefficient β = 0.038, with a probability *p* = 0.229, which means that the hypothesis is rejected [9] (p. 281).

Also, the value of the coefficient β = 0.048 and the probability *p* = 0.174, makes the H6 to be rejected [9] (p. 281).

H11 has a coefficient β = −0.032, with a probability *p* = 0.264, the hypothesis being considered rejected [9] (p. 282).

The validation of the main hypotheses of the research, which is based on the direct effects that are established between independent variables and dependent variables, took place by calculating the coefficients β. After calculating the β coefficients for each hypothesis, 11 of them met the condition that its value be greater than 0.1, so that of the 14 main hypotheses formulated, 11 were validated, which shows that among the variables of the proposed model there are significant relationships [9] (p. 297).

In order to be able to explain the power of independent variables, the determination coefficients R^2 are used, which are generally calculated only for endogenous (dependent) latent variables and reflect the degree to which independent variables explain the variation of dependent latent variables. In general, it is preferred that the value of the coefficient R^2 be greater than 0.7 [9] (p. 282).

Table 7 shows the values of the determination coefficients R^2, all of which have values higher than 0.4, which indicates that the predictors have substantial explanatory power [9] (p. 282).

Table 7. Coefficients of determination R^2 [9] (p. 282).

Usefulness of Use (UU)	Satisfaction (SAT)	Attitude (AT)	Loyalty (LOIAL)	Intention to Continue (INT)
0.565	0.616	0.511	0.456	0.668

4.3. Validation of the Research Model Based on Compliance Indicators

To see if the econometric model is valid, WarpPLS 3.0 calculates a series of compliance indicators. They are considered valid when the condition is met.

The data in Table 8 show that the compliance indicators have very good values and all the conditions are met, so the proposed research model is valid.

Table 8. Model compliance indicators [9] (p. 285).

Indicator	Indicator Value	Probability	Condition	Validation
Average path coefficient (APC)	0.289	<0.001	$p > 0.05$	Yes
Average R-squared (ARS)	0.566	<0.001	$p > 0.05$	Yes
Average adjusted R-squared (AARS)	0.563	<0.001	$p > 0.05$	Yes
Average block VIF (AVIF)	2.571		acceptable if ≤ 5 ideal ≤ 3.3	Yes
Average full collinearity VIF (AFVIF)	2.820		acceptable if ≤ 5 ideal ≤ 3.3	Yes
Tenenhaus GoF (GoF)	0.652		small ≥ 0.1 middle ≥ 0.25 high ≥ 0.36	Yes
Sympson's paradox ratio (SPR)	0.929		acceptable if ≥ 0.7 ideal = 1	Yes
R-squared contribution ratio (RSCR)	0.995		acceptable if ≥ 0.9 ideal = 1	Yes
Statistical suppression ratio (SSR)	1.000		acceptable if ≥ 0.7	Yes
Nonlinear bivariate causality direction ratio (NLBCDR)	1.000		acceptable if ≥ 0.7	Yes

5. Conclusions

In Romania, at present an evolution in the field of technology and digital applications can be observed. In addition, the last two years have persuaded the most reluctant to use the internet and online applications of many companies, but certainly Romania is still at the beginning of development.

It can also be seen from the research conducted that if people do not have the ability to use technology, everything affects the degree of satisfaction and the consumer's intention to continue using e-commerce applications. This can cause companies to give up or limit themselves only to the current target audience or it can make them ambitious to develop gradual applications in terms of difficulty that will ensure them a gain anyway, and a degree of satisfaction in as far as the consumer is concerned.

In general, marketing also has the role of educating the consumer regarding his buying and consuming behavior. This is also the case with modern technologies, because marketing is constantly adapting to all that innovation means, and the consumer, in turn, is obliged to adapt to new technologies. The implementation of blockchain technology in tourism services will also be a point of consumer education that will have to adapt and get used to new applications, which would not be difficult or impossible for the Romanian consumer, because he is eager for technology and everything that is new, and education through and for blockchain technology will be extremely challenging for him.

Annually, Romania has the highest percentage of evolution in terms of online commerce, compared to western countries, but this is because the beginning was a bit slow for our country. Although blockchain technology is in an incipient form of development, a major potential can be seen in tourism services [34]. The rapid implementation of blockchain technology in the tourism industry can be considered a necessity, even if this means changing buying and consuming behavior. Consumers can easily become familiar with the concept of blockchain and it will not be difficult for them to adapt to new technological changes, given that in recent years technology and the online environment have become indispensable in everyday life, but specialists in the field must also consider the experiences of consumers with reality-enhancing technologies [35], these being an advantage for the technology market. Adapting the concept of blockchain to the needs and challenges of

users would enable people to enjoy a safer way to travel. The most important feature of blockchain technology is disintermediation. In the tourism industry, this disintermediation means that consumers could be more autonomous in travel planning and could achieve operational efficiency, cost savings, and anonymous transactions.

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