Quality factors for agri-touristic websites - comparative study of measurement methods

Karina Cicha[1][0000-0003-4575-6381], Paulina Rutecka[2][0000-0002-1609-9768]

[1] Department of Communication Design and Analysis, University of Economics in Katowice, Katowice, Poland;
[2] Department of Informatics, University of Economics in Katowice, Katowice, Poland;
paulina.rutecka@ue.katowice.pl

Abstract. In this paper, the authors continued research previously conducted on 6 selected websites of Polish agritourism farms. The aim of the conducted analysis was to determine whether the expert analysis, based on literature and distinguished quality websites factors is coherent with the users analysis, based on the WebQual questionnaire. The conducted analysis involved an expert evaluation. The factors, which were taken under consideration during the analysis, were distinguished from literature and grouped accordingly with the WebQual questionnaire sections and focused on the aesthetics, functionality, and usability of each analyzed website. The main objective of the paper is to discover if there are any discrepancies between the two conducted assessments, as well as to answer the question about the quality of the websites of agritourism farms in Poland.

Keywords: websites, agritourism, quality factors, website quality, website analysis, expert analysis, usability

1 Introduction

Websites are currently used by many organizations as a communication and image strategy tool. At the same time, they can fulfill several functions: from informational to sales. In 2000, the number of websites was estimated at around 17 million, in 2005 at 65 million [1], and according to a report prepared by netcraft.com in January 2021, there were already over 1.83 billion active websites on the Internet. According to the CSO report, searching for information about goods and services is a very popular reason for using the Internet. 62.7% of respondents in 2020 in Poland declared that they use the Internet for this purpose [2].

The hotel industry is such a market sector, where the customers who decide on purchase of services in general do not have the opportunity to check for the standard before actual visit in the chosen location. This means that while choosing the hotel, most customers rely on the information they have gathered from ex. the hotel's website or others tourists opinions shared also online [3–6]. The hotels and other touristic facilities' presence on the Internet allows their owners not only to reach a wide group of customers, but to present their facilities and build a trustworthy image of offered

services. According to numerous studies and reports tourists willingly use search engines, such as Yahoo or Google, to find the information needed to decide what tourist facility they should choose [4]. The websites for the entrepreneurs are, in fact, a global communication and marketing tool websites [7, 8], as well as an online transaction facilitators [9].

For agritourism farms, one of the hotel industry 7-branches, having a website which meets customers' expectations is particularly important. It needs not only to provide customers with detailed information of the services offered by the facility, but also needs to meet the quality factors for websites in general. to ensure customers with a positive association with the brand. What is also being pointed out in studies, a quality website can:

- help reduce marketing costs [8, 10]; instead of advertising the tourist facility in external touristic services online like OTA (Online Travel Agency), a well-designed home page containing broad information about the touristic object can be an advertisement itself,
- become a sales channel [5, 11]; as it already has been stated, the tourists, who decide to choose a certain hotel or other type of accommodation, decide based on the information they can possess through the web pages, because they do not have the possibility to verify it. The verification moment is by the check-in, so already after the purchase,
- contribute to high SERP rankings; By the proper content, using the SEO techniques, the web page can be easy-to-find,
- have a positive impact on the facility's image; Perceiving the touristic facility by its customers as professional and up-to-date may evoke a favorable attitude towards its products and services [12].

The online presence of the agritourism farms in Poland is particularly interesting. On the one hand, as a country, Poland is among those EU countries with the largest number of small area farms, where agricultural production is insufficient, which requires from the farmers conducting activities, such as agritourism, to increase the income [8, 13, 14] and diverse its source. By agrotourism one can understand the touristic activity, narrower in definition than the rural tourism [15, 16]. Rural tourism refers to touristic activity taken in the countryside, while agrotourism, as a touristic activity, needs to be conducted on a working farm [17–19]. Those enterprises are often small, run by family and seasonal ones [20], therefore the owners of agritourism farms need to look for savings, including for marketing purposes. One of the result of cutting down on marketing activities is the low quality of the facilities websites, which was confirmed by the research conducted by Król which analyzed the visibility of agritourism websites in Visegrad Group countries, showing that agritourism enterprises in these countries often do not have websites or their quality is insufficient [21]. Since the web pages are relatively cheap promotional solutions [22] allowing a company to offer their products on a large scale [23], it is important for agritourism farms to familiarize the customers with the services they offer and to bring them to the countryside by using websites to feed this purpose. That is why it is crucial to develop effective methods that can help companies evaluate the performance of their websites [8].

In previously conducted research the authors of this paper determined the quality factors for agritourism websites [24] by engaging users in online questionnaires using the WebQual form. At this point the study conducted for this paper focuses on an expert analysis of the same, previously selected websites, to compare the results with the assessment of the websites' users based on the WebQual survey. Lack of discrepancies in both assessments can indicate a simpler to conduct website analysis method.

The following research questions are proposed for this article:

RQ1: Are there any discrepancies between users WebQual and expert's analysis of selected agritourism websites in Poland?

RQ2: Are there any quality factors of analyzed websites which stand out in the expert's analysis in comparison to the users analysis?

RQ3: To what extent the quality factors are implemented in analyzed argo-touristic websites?

The paper is organized as follows. Section 2 contains a review of the relevant literature on website quality factors. Section 3 includes the methodology for data retrieval, while Section 4 presents the data and the results of an expert analysis in comparison to the previously established results. In Section 5, the authors highlight the contribution of the research, as well as discuss its limitations and draw conclusions about the results and propose possible future research avenues.

2 Literature Review

A well-designed and usable web page is an online business card for the company. However, trends in web design are constantly changing. On the one hand, it is related to the changing sense of aesthetics among customers, designers and owners of the web pages. On the other hand, constant development of the technology allows to implement new and newer solutions, which directly affect the functionality of the websites.

Having a functioning and up-to-date website for the touristic industry is crucial as an element of client-company communication strategy and a tool to reach a wider market [7]. As a promotional tool, touristic websites have been analyzed many times by the researchers, who indicated that their structure, content, general design as well as functionality are the key factors on which designers should focus on in user-centered design framework [25–28].

What is also being pointed out by the researchers, a competitiveness among touristic websites is equally important [29]. Since the tourists cannot compare actual touristic objects before deciding on purchasing their services, many times they also take into consideration the appearance of the website as a decision-supporting factor and an element evoking their trust towards the company.

There have been, however, studies conducted, which shows what websites features meet customers' requirements towards them. It can be stated that aesthetic, safe, user-friendly websites with a simple interface, as well as mobile usability (RWD) are the factors attracting more customers [9, 30–32] or at least ensure them a positive experience from using the website.

Although every year current trends in web design are published online in form of guidelines for web designers, the researchers analyzing websites try to point out clear assessment methods that would suit the type of website, as well as all the goals they should fulfill and at the same time they still be attractive to use for visiting users [33]. The quality assessment conducted throughout the website should provide an answer whether the system actually meets the customers' needs [34]. However, at this point, there is still no single measure of website quality. It is also observable that customers' preferences differ for the same functionalities and page factors depending on the type of site [35] and the industry in which the company operates. That arrows the need for distinguishing general quality factors of the websites, present on various pages apart from the market sector represented by the companies.

The most frequently mentioned elements affecting the quality of the website are: visual aspect/aesthetics, information quality/credibility, functionality, accessibility, reliability, and usability. These elements are used to determine whether a website meets the quality standards. They are also important elements in the process of creating a website, to which website designers pay special attention.

The **visual aspect** concerns the perception of the website. Of course, the perception of whether something is nice or ugly is subjective, but research has shown that there is often agreement among observers of objects as to what constitutes an aesthetic object [36]. According to Norman's [37] theory of emotional evaluation of artifacts, on the first level, the brain makes a quick assessment of whether something is good or bad. In the context of website quality assessment, it assesses graphics, cleanliness, and beauty [37, 38]. There are also studies suggesting a relationship between the appearance of the website and the positive attitude of visitors towards it [36, 38, 39]. What is also important, the quality of the web page influences the visitors' perception of the offered product and services, and, as a consequence, the decision of purchase, since they cannot get acquainted with them differently [40].

The **quality of the information** translates into the credibility of the website, which is one of the critical factors determining the intention to use the website [38]. The credibility of the website, apart from the quality of the content, is evidenced by such factors as timeliness of the technologies used, attention to technical details of implementation [41], timeliness of the graphic design concerning market trends, the possibility of identifying the entity responsible for the website, content regarding the protection of personal data, data encryption on the website. These influence customer's trust, defined as a relationship between the company and the consumer built on a trustworthy dialogue and impartial information [42], which concerns such factors as trust in e-sellers, trust in technology, and trust in transaction security [43].

Web functionality is related to various aspects of websites such as user-friendly interface, information presentation, classification, navigation, artistic design, and personalization [44–46]. Together with web content and information security web functionality influences the perceived value of a product or service offered online [44].

Accessibility is the possibility of using a website by as many recipients as possible. It determines the extent to which the website can be perceived, understood, and viewed by users, regardless of their characteristics or disabilities, and regardless of the properties of the software and hardware, they use [47]. Accessibility assessment

and accessibility standards are determined by the WCAG [48], recommended by the W3C consortium responsible for website standards since 1994.

Reliability of IT systems is defined as a measurable property of a system, used to control and manage the system, and indicate potential problems [49]. Reliability includes such elements as system performance [41] and system and information security that meets the three primary goals of computer security: confidentiality, integrity, and certainty [50].

Usability is the extent to which a system, product, or service can be used by specific users to achieve certain goals with effectiveness, efficiency, and satisfaction in a specific context of use [51]. It determines whether the use of the functionalities available on the website is convenient for the user [52] and whether the website itself is convenient, safe, efficient, and intuitive [39]. The assessment of usability is influenced by: page loading speed, ease of navigation, appearance [53], ease of reading [39], and information distribution [39, 52, 53], correlated with the completeness and up-to-date structure of the website [33].

The elements described above were the basis for the expert analysis of the Polish agri-tourism websites in designed and conducted research.

3 Research method

The study was designed to be conducted in two parts. The first part, engaging the users group, had already been conducted in 2021 and the results of this part were presented during the ICMarkTech Conference at the end of that year [24], and then published. Preliminary identification of the research group of agritourism farms was carried out in June 2020. The initial group consisted of 1,925 tourist facilities from Poland. Their addresses were in generally accessible databases of tourist facilities. Apart from open to public databases, the addresses were also obtained from tourist databases provided by Voivodeship Agricultural Advisory Centers and regional tourist organizations. All of the 1,925 facilities were asked via e-mail to participate in the study. From this group 107 objects, which is 18%, agreed. The first step was to verify whether those agritourism farms have an active website. 76 of them had an active website, which was the main criterion for entering the study.

The next step in the research was to verify the basic technical parameters of each website. In order to enter the next part of the research it was obligatory for every website to meet criteria such as:

- usage of a content management system,
- website responsiveness,
- securing the domain with an SSL certificate,
- usage of the Google Analytics system.

Out of a total number of 76 agritourism farms possessing an active website which would meet the technical criteria stated above, only 7 finally agreed to participate in the quality survey. The websites of these farms were then tested by users, which was the first part of the designed research. For the same 7 agritourism farms a quality analysis of their websites was conducted in this part of the study.

The first part of the study, engaging the users, based on the WebQual (eQual) version 4.0 [54] survey method, containing 23 questions [55] divided into

three dimensions of website quality: usability, information quality, and service interaction quality [54, 56]. The choice of WebQual survey for the first part of the study was related to the fact that it is one of the best-formalized models, which is characterized by high versatility, used successfully to evaluate various types of web pages, such as online stores, government websites and the websites of education and higher education institutions [57]. What is also worth mentioning, the results of a survey using the WebQual form are analyzed by the WebQual index, which takes into account not only the user's assessment of the certain assessed criterion but also its importance [58].

In the second part of the study concerning the expert's analysis the WebQual survey was not used. Instead, the expert, using a separate questionnaire, had analyzed the websites within 7 quality factors. Those factors, previously obtained and distinguished based on the extensive literature review, focus on the same aspects as the WebQual form, however the factors in the survey had been presented differently, according to the user experience components. In 2004, Peter Morville distinguished those features of the user experience, which need to be implemented into the structure of any web page in order to make it user-friendly and ensure its great performance [59]. So called Morville's honeycomb includes: usefulness, usability, desirability, findability, credibility, accessibility, and visuality. Taking into consideration the requirements the web page needs to meet to be seen as functional and user-friendly, the expert while conducting the analysis referred to those specific elements or quality factors.

In terms of the **aesthetics of the website** the expert checked whether: a grid-based layout was used; the F-pattern design was used; sans serif and large enough fonts were used; the fonts are legible and reflect the nature of the website; void spaces are skillfully used; the colors create balance and overall harmony; the photos are properly selected, harmonious in color, of high quality; own photos were used, no photo banks were used, photos are not retouched.

In terms of the **information quality,** the expert checked whether: the website provides information on prices in an understandable form; the website contains information about the location, presented in an understandable form; there is a comprehensive visualization of the accommodation on the website; the website provides information on equipment and meals; the website provides information on the distance from important points [hospital, pharmacy, shop, bus stop, etc.]; the website provides information on precautionary measures to ensure the safety of COVID-19.

In terms of **credibility,** the expert checked whether: the website is built using up-to-date technologies; the website has an up-to-date layout in relation to trends; it is possible to identify the party responsible for the website design; the website contains content and consents regarding the protection of personal data; data sent to the website is encrypted; the number of errors and warnings on the website (according to W3C validator).

In terms of **functionality**, the expert checked whether: is there a photo gallery on the website; are there videos on the website; are there any references to the company's social media on the website; is there a virtual tour on the website? is it possible to book a stay online; is there a contact form; is there a price calculator; is there an availability calendar; does the website contain other functionalities.

In terms of **accessibility,** the expert conducted the measurement with the use of WAVE-WCAG 2.0 Validator in terms of WCAG 2.0 requirements. Using the above tool, the expert audited the websites accordingly to WCAG 2.0 guidelines, but only those that could have been automatically checked by analyzing the websites' code, such as the number of critical errors; contrast errors; the number of alerts; the number of alt attributes available; the number of page structure elements (headers); the number of Accessible Rich Internet Applications available.

In terms of **reliability,** the expert checked whether the website is responsive; the system is secured (using Mozilla Observatory); the system is not infected with malware (using Sucuri SiteCheck).

In terms of **usability,** the expert checked whether: the website allows the transaction to be finalized; the site is intuitive; the site is easy to navigate; the site is easy to read; the site has a sitemap; the number of broken links (using Broken-LinksCheck); the site downloads fast enough for both mobile and desktop devices (using Google Page Speed).

For the expert evaluation in the questionnaire, both scale-based questions and yes/no questions were used. The analysis was conducted remotely using Google Forms to submit answers. The form had been divided into 7 sections - each section concerned the website of one of the surveyed agritourism farms. The total number of questions in each section was 46. The chosen expert for the research was an IT engineer, with a master's degree, currently working as a web designer and academic teacher, living in Poland, with 10 years of work experience in fields of marketing, e-commerce, and web design.

4 Data and results

This section presents the data description and summary of the results from the data.

4.1 Data description

The number of agritourism farms selected for expert analysis was 7. Those were the websites which:

- met the basic technical criteria specified in the first study,
- were assessed by users in the previous study using the WQ method.

In the study [24] presented during the ICMarkTech 2021 conference, the WebQual quality assessment method was used, consisting in the assessment of individual website features by users. The WebQual tool [54] includes 23 questions [55], originally grouped into three areas: usability, information quality, and service interaction quality. As 7 areas were identified on the basis of the literature review: aesthetics, information quality, credibility, functionality, accessibility, reliability, usability, the next step was to assign WebQual questions to these areas to compare the scores in both methods.

Table 1. Table captions should be placed above the tables.

Expert's analysis	**WebQual question**
aesthetics	Sense of personalization [SI19]
	Attractive appearance [UQ05]
	Appropriate to the type of site [UQ06]
	Overall view of the Web site [SI23]
information quality	Information at the right level of detail [IQ14]
	Provides believable information [IQ10]
	Provides timely information [IQ11]
	Provides relevant information [IQ12]
credibility	Conveys a sense of competency [UQ07]
	Provides accurate information [UQ09]
	Confident that goods/services will be delivered as promised [SI22]
	Good reputation [SI16]
functionality	Communicate with the organization [SI21]
	Sense of community [SI20]
	Positive experience [UQ08]
accessibility	Interaction with the site is clear and understandable [UQ02]
	Easy to understand information [IQ13]
	Information in the appropriate format [IQ15]
reliability	The information feels secure [SI18]
	Safe to complete transactions [SI17]
usability	The site is easy to navigate [UQ03]
	The site is easy to use [UQ04]
	Easy to learn to operate [UQ01]

Table 2 presents the responses of the respondents (the mean and standard deviation without the estimator bias for each site). The use of this nomenclature for the tested pages is consistent with their designations in the previous study. The questions were arranged according to the assignment to the expert analysis section. The average score for each website within the area was also calculated.

Table 2. Means and standard deviations for WebQual results, assigned to 7 sections for expert analysis

Web.	A1		A2		A3		A4		A5		A6		A7	
Quest.	Mean	St. dev	Mean	St. dev	Mean	St. dev	Mean	St. dev	Mean	St. dev	Mean	St. dev	Mean	St. dev
aesthetics														
UQ05	5,67	1,97	5,83	1,17	3,17	1,33	4,17	1,17	3,67	1,75	5,67	1,37	6	1,1
UQ06	6	1,26	6,17	0,75	3,33	1,75	4,17	0,75	4	2,19	5,67	1,21	6	0,89
SI19	5,5	1,05	5,67	0,52	4,67	1,51	4,5	0,55	4,33	1,86	5,67	1,03	5,83	0,98
SI23	5,33	1,21	5,67	0,52	3,83	0,98	4,17	0,98	4,5	1,87	5,33	0,82	5,83	1,17
information quality														

IQ10	6,17	0,75	6,5	0,55	4,83	1,72	5,17	0,75	5,17	0,75	6	0,89	6,5	0,55
IQ11	4,67	1,51	6,17	0,75	5	1,26	4,83	0,75	5,67	1,03	6	1,26	6	0,63
IQ12	5,5	1,22	6	0,63	4,5	1,76	4,83	0,75	4,67	1,37	5,5	1,22	5,5	1,05
IQ14	5,17	1,33	5,83	0,75	4,5	1,38	5,17	0,41	5	1,79	6	0,63	5,83	1,17
credibility														
UQ07	6	1,26	6	1,55	2,83	2,14	4,33	1,03	4,33	1,51	5,83	1,17	6,17	0,98
UQ09	5,67	1,21	6,33	0,52	4,5	1,38	4,67	0,82	4,17	1,72	6,33	0,82	5,67	0,82
SI22	5,5	1,38	6,67	0,52	4,83	1,17	4,67	1,37	5	1,26	5,67	0,52	6,17	0,75
SI16	5,17	1,17	5,5	0,55	4,33	1,03	4,83	0,75	4,33	0,82	5,67	0,82	6	1,26
functionality														
UQ08	5,33	1,21	5,67	0,82	3,67	1,03	3,67	0,82	4,17	1,83	5,5	1,05	5,67	1,51
SI20	3,5	1,52	4,17	1,72	3,5	1,87	3,83	1,47	3,83	1,72	4,33	1,86	4,17	1,72
SI21	5,67	0,82	6,5	0,55	4,17	1,33	5,33	1,03	5	1,41	5,67	1,03	5,83	0,75
accessibility														
UQ02	6	0,63	6,5	0,84	4,83	1,47	5,17	0,41	4,33	1,21	5,5	1,05	5,83	0,98
IQ13	5,67	1,03	6,17	0,41	5,17	1,72	5,33	0,52	4,33	1,37	5,67	1,03	6,17	0,75
IQ15	5,67	1,03	6,5	0,55	4,33	0,82	5,17	0,75	4,33	2,25	5,33	0,82	6,17	0,98
reliability														
SI17	6,17	1,17	6,17	1,17	5	0,89	5	1,1	5	1,67	5,5	1,05	5,67	1,21
SI18	6,33	0,82	6,17	0,75	4,67	1,03	5	0,63	4,67	1,21	5,67	0,82	6	0,89
usability														
UQ01	6	0,89	6,5	0,55	4,83	1,17	5,17	0,75	4,83	1,33	5,83	0,75	6	0,89
UQ03	5,67	1,21	6,33	1,03	4,67	1,21	4,67	0,82	4,33	1,37	6	0,89	6	1,1
UQ04	6	0,89	6,33	0,82	4,5	0,84	4,33	0,82	4,67	1,51	6,17	0,98	5,67	1,21

Table 3 presents the final results of the expert analysis. The designation of the examined sites [A1-A7] remained unchanged. The websites were analyzed in, previously determined, areas. The shown scores are the sum of the points scored by the website divided by the maximum points the website could score in the surveyed area.

Table 3. Expert's analysis results

	A1	A2	A3	A4	A5	A6	A7
Design aesthetics	0,83	0,93	0,55	0,63	0,78	0,80	1,00
Information quality	0,70	0,87	0,60	0,63	0,67	0,67	0,73
Credibility	0,89	0,72	0,61	0,56	0,67	0,78	0,89
Functionality	0,45	0,55	0,27	0,45	0,64	0,55	0,36
Accessibility	0,83	0,80	0,70	0,47	0,80	0,43	0,80
Reliability	0,60	0,53	0,47	0,33	0,53	0,47	0,53
Usability	0,81	0,75	0,53	0,61	0,50	0,69	0,72
Total mean	**0,73**	**0,73**	**0,53**	**0,53**	**0,65**	**0,63**	**0,72**

Table 4 shows the normalized results of the areas based on users' ratings in the WebQual survey. For normalization, the average area score was divided by the maximum point value that the users could give to the site.

Table 4. Summary of WebQual divided into areas

	A1	A2	A3	A4	A5	A6	A7
Design aesthetics	0,80	0,83	0,54	0,61	0,59	0,80	0,85
Information quality	0,77	0,88	0,67	0,71	0,73	0,84	0,85
Credibility	0,80	0,88	0,59	0,66	0,64	0,84	0,86
Functionality	0,69	0,78	0,54	0,61	0,62	0,74	0,75
Accessibility	0,83	0,91	0,68	0,75	0,62	0,79	0,87
Reliability	0,89	0,88	0,69	0,71	0,69	0,80	0,83
Usability	0,84	0,91	0,67	0,67	0,66	0,86	0,84
Total mean	**0,80**	**0,87**	**0,63**	**0,68**	**0,65**	**0,81**	**0,83**

The users in the WebQual study gave the A2 and A7 pages the best scores, which is in line with the expert assessment, in which the A2 page received the highest score ex aequo with the A1 page. The A7 site came second. Users rated the A1 website a little worse, in their opinion it took only fourth place. In the opinion of the experts, the A3 site was the worst, and this is in line with the opinion of users.

Table 5 presents the differences in user and expert assessments. A negative difference shows that the users' rating was higher than the expert's rating.

Table 5. The differences between the results of WebQual analysis and the expert analysis for assessed pages

	A1	A2	A3	A4	A5	A6	A7
Design aesthetics	0,03	0,1	0,01	0,02	0,19	0	0,15
Information quality	-0,07	-0,01	-0,07	-0,08	-0,06	-0,17	-0,12
Credibility	0,09	-0,16	0,02	-0,1	0,03	-0,06	0,03
Functionality	-0,24	-0,23	-0,27	-0,16	0,02	-0,19	-0,39
Accessibility	0	-0,11	0,02	-0,28	0,18	-0,36	-0,07
Reliability	-0,29	-0,35	-0,22	-0,38	-0,16	-0,33	-0,3
Usability	-0,03	-0,16	-0,14	-0,06	-0,16	-0,17	-0,12
Total mean	**-0,07**	**-0,14**	**-0,1**	**-0,15**	**0**	**-0,18**	**-0,11**

The biggest differences between users' assessments and the expert's assessment concerned the area of Reliability and Functionality. In both cases, users rated these areas better than the expert in the analysis, although this trend is visible throughout the whole analysis, where the users rated the pages better than the expert.

Table 6. The differences between the results of WebQual analysis and expert analysis for areas

	Expert Analysis	**WebQual**	**Differences**
Reliability	3,46	5,49	-2,03

Accessibility	4,83	5,45	-0,62
Usability	4,61	5,45	-0,84
Information quality	4,87	5,45	-0,58
Credibility	5,12	5,27	-0,15
Design aesthetics	5,52	5,02	0,5
Functionality	3,27	4,73	-1,46

Table 6 presents a comparison of the average results for the areas, arranged in order from the highest to the lowest rated by users. The area rated the highest by users is Reliability, which in the expert's opinion is rather low. However, the expert assessed the aesthetics highly, which, in the opinion of users, had the penultimate position (however, the difference in the result was insignificant and amounted to only 0.5). The worst-rated area is Functionality, and the users and the expert agree on this point.

Statistical tests were also performed on two datasets. In order to verify the normality of the distribution, the Shapiro-Wilk test was carried out for the areas on certain websites.

Table 7. Results of the Shapiro-Wilk test

	Expert Analysis			WebQual		
	Statistics	df	Significance	Statistics	df	Significance
Aesthetics	,963	7	,842	,831	7	,081
Information quality	,887	7	,258	,936	7	,602
Credibility	,930	7	,550	,872	7	,192
Functionality	,966	7	,870	,937	7	,613
Accessibility	,768	7	,019	,972	7	,912
Reliability	,880	7	,225	,863	7	,160
Usability	,947	7	,700	,815	7	,058

The Shapiro-Wilk test showed that for both the expert assessment and the results from WebQual, the data distribution was close to normal and the null hypothesis of non-normal distribution was rejected. Since the set meets the assumptions about the equality of groups and the normality of the distribution of variables, the next Student's t-test was carried out for two independent groups, testing the truth of the null hypothesis H0: the average result obtained as part of the expert analysis is the same as the average result obtained in the WebQual study.

		Expert Analysis		WebQual		
	Equality of variance	F	Significance	t	df	Two-sided significance
Aesthetics	was assumed	,002	,967	,922	12	,374
	was not assumed			,922	11,620	,375
Information quality	was assumed	,058	,814	-1,85	12	,089
	was not assumed			-1,85	-1,85	-1,85
Credibility	was assumed	,001	,977	-,322	12	,753
	was not assumed			-,322	11,919	,753

Functionality	was assumed	,601	,453	-3,59	12	,004
	was not assumed			-3,59	10,757	,004
Accessibility	was assumed	2,240	,160	-1,18	12	,260
	was not assumed			-1,18	9,926	,265
Reliability	was assumed	,361	,559	-6,29	12	<,001
	was not assumed			-6,29	11,988	<,001
Usability	was assumed	,000	1,000	-2,01	12	,067
	was not assumed			-2,01	11,935	,067

Since in each case the p-value of Levene's test is higher than the alpha significance level of 0.05, the group variances were considered to be equal. When analyzing the significance of the student's t-test, it was found that the statistical significance of p-value meets the $p < 0.05$ condition only in two cases: for Reliability and Functionality, which indicates that answers within these two groups are different from each other.

4.2 Results

The results of the expert analysis mostly coincide with the results of the respondents' questionnaires. The highest result in the survey with respondents achieved in order websites A2, A7, and A6, and in the expert analysis websites A2, A7, and A1. The websites with the highest scores in both surveys (A2 and A7) were characterized by a transparent grid layout, and the information was distributed in accordance with the F-pattern design principle. The fonts were legible, compliant with design standards, and thanks to the use of empty spaces, the websites seem readable, easy to navigate, and professionally made. These sites also scored high on credibility in an expert study. In the area of reliability, responsible for the security aspect, these websites achieved average results, although they were well rated in this respect by users, which may suggest that the sense of security experienced by users on the website is not significantly correlated with the actual security. The websites that received the highest marks in the expert analysis also had the highest results in the area of information quality. The weights assigned by users in WebQual [55] show that providing accurate, believable, and timely information is equally important for the users as well as for the expert. The results in the areas of Functionality and Reliability are the most discrepant and the users assessed these aspects better than the expert. However, they agree that the Functionality area was overall the weakest feature of the pages. The largest discrepancy, both in terms of the difference in assessment of individual parties and the overall level, concerns the area of Reliability. Users feel safer on the site than an expert thinks they should. This may be due to the fact that neither of these pages was able to finalize the purchase, or they do not know what elements they should pay special attention to in terms of security.

5 Conclusion and Discussion

In this article, the authors presented a comparison of two methods of testing the quality of websites. The popular method of analysis with the participation of users, which

is WebQual, was used for the comparison. The disadvantage of this solution is time-consumption and the need to involve more people. It would also be best if the group selected for the study corresponded to the actual target group of the company's customers. As a result of the literature review, a survey tool for expert analysis was developed and it was verified whether there are differences between the results of these approaches to the analysis of the quality of agritourism websites.

The findings of our study indicate that the quality of websites consists of 7 main areas, which are: Reliability, Accessibility, Usability, Information quality, Credibility, Design aesthetics and Functionality. Thanks to the analysis of the literature, it was possible to identify specific measures and tools to test the quality of websites.

The data analysis shows that the built tool is likely to identify pages that will also be positively assessed by users, as well as to indicate their strengths and weaknesses. On the other hand, the detected discrepancies in the areas of Functionality and Reliability require additional research to determine what they resulted from.

The limitation of our research was the fact that we analyzed only 7 websites and only 6 users took part in the WebQual study. The limitation is also testing this tool for only one type of website.

Future research will be carried out to test whether this tool is suitable for analyzing the websites of other tourism enterprises and using a larger research group to verify assumptions. Further research should also concern factors influencing the sense of security of website users.

This study, apart from the theoretical contribution, which is the identification of potential indicators that could be used to study the quality of websites of tourist enterprises offering accommodation, also has implications for practice. The use of a developed tool can be faster and cheaper to test the quality of a website than user research such as WebQual.

References

1. Hasan L, Abuelrub E (2011) Assessing the quality of web sites. Appl Comput Informatics 9:11–29. https://doi.org/10.1016/j.aci.2009.03.001
2. Główny Urząd Statystyczny (2021) Jak korzystamy z Internetu? 2020
3. Ipsos MediaCT (2014) Google travel study. The 2014 traveler's road to decision.
4. Oplanić M, Težak Damijanić A, Saftić D, Čehić A (2019) The internet as a source of information about local agro-food product. J Cent Eur Agric 20:759–769. https://doi.org/10.5513/JCEA01/20.2.2127
5. Rabadán-Martín I, Aguado-Correa F, Padilla-Garrido N (2019) Facing new challenges in rural tourism: signaling quality via website. Inf Technol Tour 21:559–576. https://doi.org/10.1007/s40558-019-00157-y
6. Park S-Y, Millar M (2016) The US traveler's familiarity with and perceived credibility of lodging ecolabels. J Vacat Mark 22:3–12. https://doi.org/10.1177/1356766715585904
7. Napitupulu D (2017) Analysis of Factors Affecting The Website Quality (Study Case: XYZ University). Int J Adv Sci Eng Inf Technol 7:792. https://doi.org/10.18517/ijaseit.7.3.1748
8. Brščić K, Dropulić Ružić M, Ružic D (2012) Is Agrotourism Popular on the Internet? J Cent Eur Agric 13:221–235. https://doi.org/10.5513/JCEA01/13.2.1038
9. Fam SF, Huang J, Chuan ZL, et al (2020) Fuzzy TOPSIS method as a decision supporting system to rank Malaysia online shopping website quality during COVID-19 MCO 2020. Int J Emerg Trends Eng Res 8:6397–6405. https://doi.org/10.30534/ijeter/2020/239892020
10. Duarte P, Pais AR (2010) Use and Perception of the Internet as a Marketing Tool to Promote Rural Tourism. Work Pap Gestão, Econ e Mark (Management, Econ Mark Work Pap
11. Li X, Wang Y, Yu Y (2015) Present and future hotel website marketing activities: Change propensity analysis. Int J Hosp Manag 47:131–139. https://doi.org/10.1016/j.ijhm.2015.02.007
12. Bai B, Law R, Wen I (2008) The impact of website quality on customer satisfaction and purchase intentions: Evidence from Chinese online visitors. Int J Hosp Manag 27:391–402. https://doi.org/10.1016/j.ijhm.2007.10.008
13. Akpinar N, Talay İ, Ceylan C, Gündüz S (2005) Rural women and agrotourism in the context of sustainable rural development: A case study from Turkey. Environ Dev Sustain 6:473–486. https://doi.org/10.1007/S10668-005-5633-Y
14. Santeramo FG, Barbieri C (2016) On the demand for agritourism: a cursory review of methodologies and practice. https://doi.org/10.1080/21568316.2015.1137968
15. Sznajder M, Przezbórska L (2006) Agroturystyka. Polskie Wydawnictwo Ekonomiczne, Warszawa
16. Sikora J (1999) Organizacja ruchu turystycznego na wsi. Wydawnictwa Szkolne i Pedagogiczne, Warszawa
17. Wojciechowska J (2007) Systematyka i wyróżniki pojęć dotyczących turystyki na obszarach wiejskich. Stud nad Tur Tradycje, stan obecny i Perspekt Badaw 5:297–310
18. Kamieniecka J, Ragus M, Manthey P (2014) Rozpoznanie uwarunkowań tworzenia systemu certyfikacji turystyki zrównoważonej w środowisku wiejskim
19. Roman M, Roman A (2019) Wykorzystanie dziedzictwa kulturowego w działaniach terapeutycznych realizowanych w turystyce wiejskiej. Zagadnienia Doradz Rol 3:72–83
20. Rutecka P (2019) Właściciel agroturystycznego przedsiębiorstwa rodzinnego jako brand-hero marki. In: Nowe trendy w rozwoju firm rodzinnych. Wydawnictwo Politechniki Częstochowskiej, Częstochowa, pp 79–93
21. Król K (2017) Promoting of agrotourism on the internet. A lesson from the Visegrad Group countries. J Agribus Rural Dev 16:805–813. https://doi.org/10.17306/J.JARD.2017.00383
22. Lemonakis C, Zopounidis C, Koliouska C, Andreopoulou Z (2017) Internet and agro-tourism sector for regional development in Crete: a multicriteria ranking. Int J Inf Decis Sci 9:116. https://doi.org/10.1504/IJIDS.2017.10005872
23. Karagiannis S, Stavroulakis D (2011) Development of Agrotourism Through the Application of Internet Technologies: Problems and Perspectives. In: CEUR Workshop Proceedings. CEUR-WS, pp 299–308
24. Cicha K, Rutecka P (2022) Quality Factors for Agro-touristic Websites - An Exploratory Study. Smart Innov Syst Technol 279:471–483. https://doi.org/10.1007/978-981-16-9268-0_40
25. Chan ICC, Law R, Fong LHN, Zhong L (2021) Website design in tourism and hospitality: A multilevel review. Int J Tour Res 23:805–815. https://doi.org/10.1002/JTR.2443

26. Zhou Q, DeSantis R (2005) Usability issues in city tourism website design: A content analysis. IEEE Int Prof Commun Conf 789–796. https://doi.org/10.1109/IPCC.2005.1494253
27. Hiang GC (2008) Developing a Penang Cultural Tourism Website Prototype: A User-Centred Design Approach. WACANA SENI-JOURNAL ART DISCOURSE 91–110
28. Giannopoulos AA, Mavragani EP (2011) Traveling through the web: A first step toward a comparative analysis of European National Tourism Websites. J Hosp Mark Manag 20:718–739. https://doi.org/10.1080/19368623.2011.577706
29. Fominiene VB (2016) The Importance of Tourism Websites to Tourism Services And Assurance Of Their Competitiveness. MONTENEGRIN J Econ 12:41–51
30. Fabisiak L, Wolski W (2010) Metody analizy wielokryterialnej w ocenie użyteczności serwisów internetowych. Stud i Mater Pol Stowarzyszenia Zarządzania Wiedzą 27:116–125
31. Hsu MH, Chang CM, Chu KK, Lee YJ (2014) Determinants of repurchase intention in online group-buying: The perspectives of DeLone & McLean is success model and trust. Comput Human Behav 36:234–245. https://doi.org/10.1016/J.CHB.2014.03.065
32. Groth A, Haslwanter D (2016) Efficiency, effectiveness, and satisfaction of responsive mobile tourism websites: a mobile usability study. Inf Technol Tour 16:201–228. https://doi.org/10.1007/S40558-015-0041-0
33. Chmielarz W, Zborowski M (2020) The selection and comparison of the methods used to evaluate the quality of e-banking websites: The perspective of individual clients. In: Procedia Computer Science. Elsevier B.V., pp 1903–1922
34. Karabasevic D, Stanujkic D, Maksimovic M, et al (2019) An approach to evaluating the quality of websites based on the weighted sum preferred levels of performances method. Acta Polytech Hungarica 16:195–215. https://doi.org/10.12700/APH.16.5.2019.5.11
35. Lee Y, Kozar KA (2006) Investigating the effect of website quality on e-business success: An analytic hierarchy process (AHP) approach. Decis Support Syst 42:1383–1401. https://doi.org/10.1016/j.dss.2005.11.005
36. Tractinsky N (2007) Web-Store Aesthetics in E-Retailing: A Conceptual Framework and Some Theoretical Implications Web-Store Aesthetics in E-Retailing: A Conceptual Framework and Some Theoretical l Implications. Acad Mark Sci Rev 11:1–18
37. Norman DA (2004) Emotional Design: Why We Love (or Hate) Everyday Things Design View project
38. Pengnate S, Sarathy R (2011) Form and function: How website characteristics impact user behavior. In: 17th Americas Conference on Information Systems 2011, AMCIS 2011. pp 1071–1079
39. Loken B (2006) Consumer psychology: Categorization, inferences, affect, and persuasion. Annu Rev Psychol 57:453–485. https://doi.org/10.1146/ANNUREV.PSYCH.57.102904.190136
40. Wells JD, Valacich JS, Hess TJ (2011) What signal are you sending? How website quality influences perceptions of product quality and purchase intentions. MIS Q Manag Inf Syst 35:373–396. https://doi.org/10.2307/23044048
41. Król K, Bedla D (2015) An assessment of the use of responsive web-design technology in projects of agritourism websites. Probl Small Agric Holdings 3:53–65. https://doi.org/10.15576/PDGR/2015.3.53
42. Rutecka P, Cicha K (2018) Customer's trust management in polish e-commerce : case study. Inf Syst Manag Vol. 7, No:258–269. https://doi.org/10.22630/ISIM.2018.7.4.23
43. Lee MKO, Turban E (2001) A Trust Model for Consumer Internet Shopping. Int J Electron Commer 6:75–91
44. Liao Z, Shi X (2017) Web functionality, web content, information security, and online tourism service continuance. J Retail Consum Serv 39:258–263. https://doi.org/10.1016/J.JRETCONSER.2017.06.003
45. Lightner NJ (2004) Evaluating e-commerce functionality with a focus on customer service. Commun ACM 47:88–92. https://doi.org/10.1145/1022594.1022599
46. Sanchez-Franco MJ, Rondan-Cataluña FJ (2010) Virtual travel communities and customer loyalty: Customer purchase involvement and web site design. Electron Commer Res Appl 9:171–182. https://doi.org/10.1016/J.ELERAP.2009.05.004
47. Zdonek D, Spałek S (2013) Metody oceny dostępności stron internetowych i problemy związane z ich wiarygodnością. Zesz Nauk Organ i Zarządzanie / Politech Śląska 64:277–291
48. W3C Consortium Web Content Accessibility Guidelines (WCAG) 2.1. https://www.w3.org/Translations/WCAG21-pl/. Accessed 1 Sep 2022
49. Tworek K (2016) Model niezawodności systemów informacyjnych w organizacji. Zesz Nauk

Organ i Zarządzanie / Politech Śląska 335--342
50. Stallings W, Brown L (2019) Bezpieczeństwo systemów informatycznych. Zasady i praktyka., IV. Helion, Gliwice
51. ISO 9241-11: 2018 (2018) [En] Ergonomics of Human-System Interaction - Part 11: Usability: Definitions and Concepts. https://www.iso.org/obp/ui/#iso:std:iso:9241:-11:ed-2:v1:en. Accessed 25 Jul 2021
52. Brzozowka-Woś M (2014) Zastosowanie pogłębionych wywiadów osobistych w badaniu postrzegania treści internetowych na temat produktów i firm. Mark i Rynek 11:528–536
53. Idzikowski M, Małachowski A, Wasiak M (2006) Weryfikacja istotności kryteriów oceny projektowania witryn internetowych za pomocą algorytmów genetycznych. Ekonometria 17:232–241
54. Barnes S, Vidgen R (2002) An Integrative Approach to the Assessment of E-Commerce Quality. J Electron Commer Res 3:114–127. https://doi.org/10.1.1.83.8310
55. Fernandes Andry J, Christianto K, Wilujeng FR (2019) Using Webqual 4.0 and Importance Performance Analysis to Evaluate E-Commerce Website. J Inf Syst Eng Bus Intell 5:. https://doi.org/10.20473/jisebi.5.1.23-31
56. Utami IS, Winarno, Setiadi H (2021) Analysis The Effect of Website Quality on User Satisfaction with The WebQual 4.0 Method and Importance-Performance Analysis (IPA) (Case Study: SPMB Sebelas Maret University's Website). J Phys Conf Ser 1842:012003. https://doi.org/10.1088/1742-6596/1842/1/012003
57. Ziemba P (2011) Zastosowanie ontologii do łączenia metod oceny serwisów internetowych. Inform Ekon 290–302
58. Jefmański B (2014) Rozmyta metoda Webqual i jej zastosowanie w ocenie internetowych serwisów informacyjnych. Handel Wewnętrzny 2:221–233
59. Morville P (2005) Experience design unplugged. ACM SIGGRAPH 2005 Web Program, SIGGRAPH '05. https://doi.org/10.1145/1187335.1187347