Program code does not contain any names of layers, fields in attribute tables, so it may be easily adapted to any map, for example to the world map.

Developed application may be used as a training aid for studying geography, history and other subjects, as an interesting game that can improve personal knowledge about districts of Belarus or in pedagogical researches.

REFERENCES

1.   Introduction to Programming ArcObjects with VBA (Final) / J. Lindemann [et al.]. – New York : ESRI, 2004 – 360 p.

UDC 004.45

**THE PROBLEMS OF SERVICE REALIZATION
TO CHECK WEB SITES APPLYING USABILITY INDICATORS**

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The article considers the concept of "site" and site functions, analyzes e-commerce sites and online stores in terms of usability, and provides a scheme for the development of an automated audit Web site usability service.

Website (from the English Website: web – "Wide Web, the network" and the site – "place", literally "place, a segment of the network") is a set of electronic documents (files) of an individual or organization's computer network united under one location (domain name or IP-address). All sites together comprise the World Wide Web [1].

When creating sites, entirely different goals can be pursued, depending on which, sites can be divided into several groups: business card site, online store, corporate information website, corporate image web site, information site, game portal, personal project, content-project, promotional sites, online forum, a blog [2].

The main purpose of any site is to inform visitors about various information. The site should be also convenient and easy to use.

The complexity of usability assessment lies in network users' variety of tastes and preferences: nationality, geography, religion, accepted standards, subjective opinion. All this prevents from creating a universal system of quality assessment.

For simplicity, the study was limited geographically and thematically. Of all the abundance of various sites, the survey considers corporate websites and online stores in the CIS.

A corporate site is perfect for an image presence online. The site provides information about the company, history of the brand, information about the services rendered or goods supplied. A corporate site usually contains the company's newsfeed, publication means of advertising and sales promotion information, press information, and other information. Corporate sites often combine the products catalog and the information about the company. The sites use an exclusive original design, showing the advantages of the company, focus on innovative ideas and solutions in the design, and keep to the percentage of text / graphics = 50/50 [2].

An Internet shop is an interactive web site, which advertises a product or service, receives purchase orders, offers the user the choice of payment options, issuing invoices for payment, thus confirming the order. The store administrator shall organize the delivery of goods and monitor the buyer's payments for it [2].

Forty sites were selected from the above-mentioned categories for the analysis and all the hypotheses were tested on their example.

Here are the examples of ten high-quality sites:
1 Prefab homes turnkey (http://woodbud.by).
2 JSC "Ruchaika» (http://www.ruchaika.by/).
3 SPAS SERVICE Mogilev (http://spas-auto.by/). The site is in Fig. 1.
4 Truck Platforma (http://truck-platforma.ru/).
5 Gletcher - Air pistols (http://gletchergun.ru/).
6 WildBerries - Online store of clothing and footwear (https://www.wildberries.by/).
7 Online Store amd.by (http://www.amd.by/).
8 Stroi-Souz (http://stroi-souz.ru/).
9 Children's toys Internet shop (http://www.happytoys.by/).
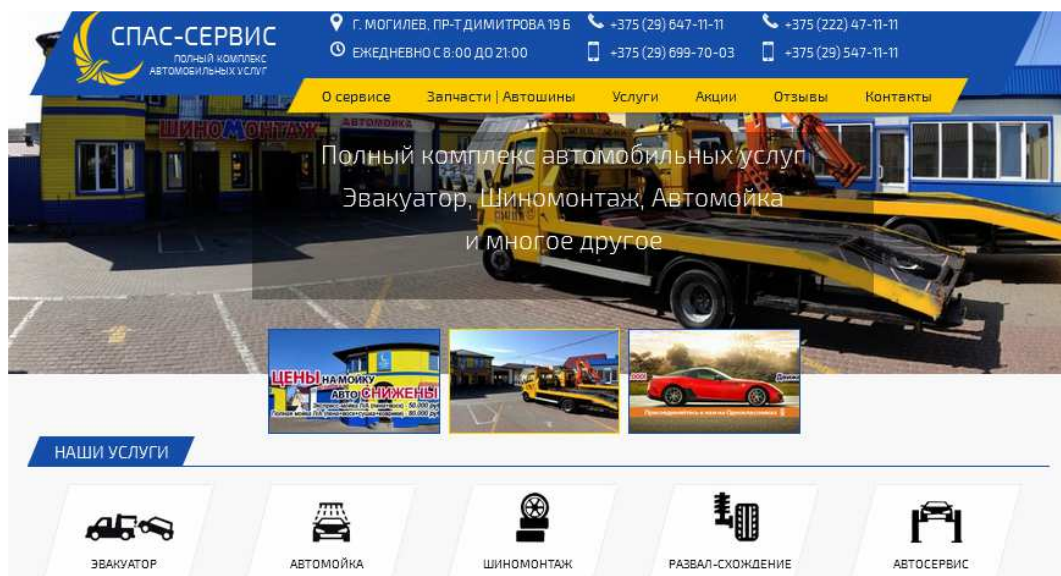10 Yarn shop in Minsk (http://manidoro.by/).

Fig. 1. Site "SPAS-SERVICE"

Here are the ten examples of low-quality sites:
1. Absorbent clarified stabilized (http://homelive24.ru). The site is in Fig. 2.
2. Ltd. "Metall grupp» (http://metallogrup.ru).
3. Balt-test (http://www.balt-test.ru).
4. Stylish jewelry wholesale (http://ma-bel.by/).
5. Avtotreydlizing (http://atlizing.by/).
6. Goods for animals (http://4pets.by/).
7. Network agencies "Vell» (http://welltour.by/).
8. Silver jewelry and other items made of silver (http://www.lk-silver.ru/).
9. Reima Nika Moda (http://www.reima-spb.ru/).
10. Communication World (http://concurent96.ru/).

Viewing the examples, we can observe that the high-quality sites have repeating units. It also becomes clear that the site should perform its main functions efficiently and easily.
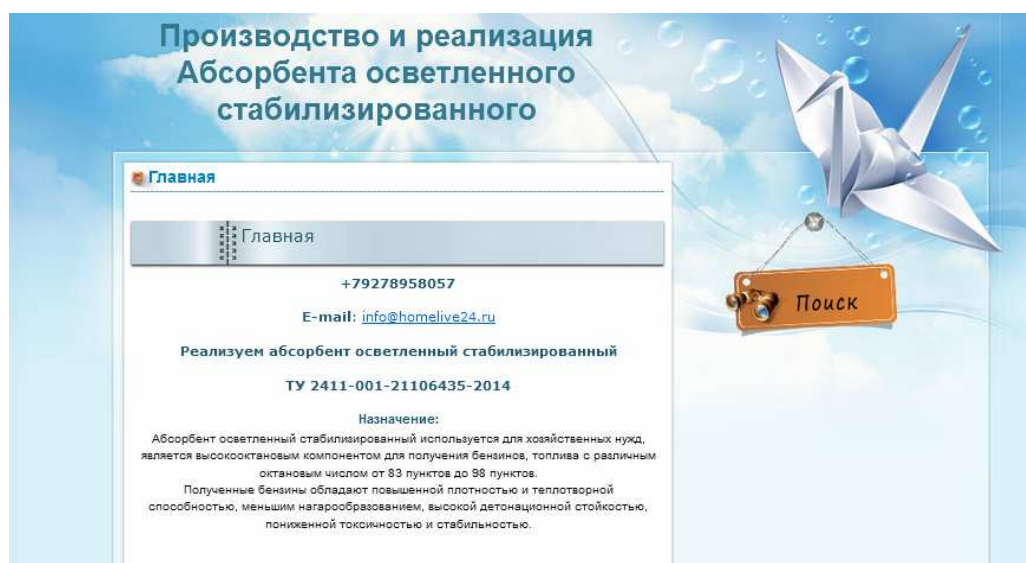

Fig. 2. Site "Absorbent clarified stabilized"

Having highlighted the sites' main objectives, each objective can be further divided into screens and each screen into blocks. The blocks were subjected to testing.

Here are the main features for the corporate sites:
1. Viewing the main information about the company.
2. Browsing the list of the company's services.
3. Getting all possible contacts of the company.
4. Availability of service or product reviews\feedback.

The basic functions for online retailers are as follows:
1. Search for the right product.
2. Viewing the product.
3. Product purchase.
4. Sell screens (promotions, discounts, etc.).

First, we should identify the pages that implement this functionality. For example, the purchase of the product or description of the company page.

Having identified the main page, you must consider the blocks that will be tested. For example, a data entry form when paying or a block with a description of competitive advantages.

We define usability as a measure of the user experience quality, acquired in the course of interaction with the website.

The next step is to consider the elements that will be tested. Since it is extremely difficult to test the overall design, we checked the typography, color compatibility, adaptability to mobile screens, page loading speed, semantic markup (tel, mailto), and high-resolution images (in the product description).

As an automation tool, we chose WebDriver. We developed a set of tests for each block, for which the input data will be the selectors to the test container [3].

The second thing we wanted to test was usability. Subsidiary logical blocks can be incorporated here. For example, similar goods or callback button. It definitely brings more convenience and helps to fulfill the main task of the site but it is poorly amenable to automation.

The logical blocks (optional) that improve the quality are as follows:
− "Similar goods".
− "Postpound on later".
− The presence of "breadcrumbs" in the catalog.
− Callback button.
− "Online consultant".
− Possibility to compare products.
− Possibility to navigate quickly to the information on payment methods and delivery options.
− Possibility to leave feedback at the site.

From the foregoing, there follows a simple scheme of decision but in order to make testing more efficient, it should include additional units. This requires an operator.

The proposed solution is to divide the testing into three stages.

The first is the phase of manual testing of the main pages of the site by the operator. At this stage, the task is to check availability for the main auxiliary blocks, which can be done as a test (putting ticks). As a result, the test demonstrates the quality factor at this stage.

The second stage is automated testing. The operator passes the test containers selectors with the parameter to WebDriver. After this, the quality factor at this stage is shown.

The third stage is automated testing using third-party tools. At this stage, the entire site is tested with the assistance of third-party solutions. After running the test, the quality factor of the third stage is shown.

Thus, the present evaluation system is more flexible. Further, on the basis of the three obtained above factors the final quality assessment can be calculated.

Here is the proposed scheme of work.
1. Receiving the application for testing.
2. Passing the application to the operator.
3. Marking the site on test pages, identification of blocks, preparing selectors.
4. Setting WebDriver tests for testing the selected blocks.
5. The operator performs the manual testing of the main pages.
6. The operator starts the automated testing.
7. The operator starts testing with third-party tools.
8. The operator receives a detailed report with recommendations.
9. The operator sends the report to the user.

It proved difficult to make highly efficient and automated system for evaluating usability. There are many problems at different stages of the design. Thus, we revealed the simplest approaches to fulfill the task and suggested a simplified variant of testing using the operator. When implementing the fully automated software product it can have a limited range of applications.

REFERENCES

1. Сайт – Википедия [Электронный ресурс]. – Режим доступа: http://ru.wikipedia.org/wiki/Сайт.
2. Классификация сайтов [Электронный ресурс]. – Режим доступа: http: //www.internet-technologies.ru/articles/article_1486.html.
3. Что такое Selenium WebDriver [Электронный ресурс]. – Режим доступа: http://habrahabr.ru/post/152971/.

UDC 621.391.6:519.72

EVALUATION OF OPTOELECTRONIC CHANNEL LEAK SPEECH WITH THE USE OF MATHEMATICAL MODELS

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In this article we analyzed optoelectronic channel leakage of voice information. It's a method for processing the measurement signal, including an assessment of the cumulative effect of amplitude and phase modulation. Acoustic vibrations of the solid medium, subject to amplitude and phase modulation, presents a model of a rectangular vibrating membrane. The method of estimating the signal/noise ratio by using the mathematical model developed security assessment. During the research density distribution phase at various energy indicators was built showing the degree of dependence of the phase of the resulting fluctuations of the original signal.

Protecting an acoustic (voice) information is one of the most important tasks in the whole complex of measures to ensure the information security of the object information and carried out passive and active methods.

The speech signal is a complex acoustic signal, which includes noise and harmonic components, so it is important to justify the choice of the measuring signal. Under the influence of the acoustic oscillations of the speech source in enclosing structures and engineering communication facilities there are vibrations.

Depending on the propagation medium of speech signals and methods of interception technical (parametric) leakage channels of information are divided into acoustic, vibro-acoustic, electro-acoustic, optical and electronic.

The criteria for evaluating the security of voice data are [1]:
– Information rate (normalized value speech);
– The energy ratio (the ratio of signal power to noise power).

Estimation of security of optoelectronic channel leakage of voice information is relevant, since there is the possibility of interception of the speech signal remotely (at a considerable distance from the disinformation of the object).

The analysis of existing methods and techniques of information leakage. Protection of information due to the rapid development of technology is more complicated.

We selected electro-optical channel leakage of voice information as the object of research. The subject is the technique of estimation of the signal / noise ratio.

The purpose of research is to develop a mathematical model to assess the security and it is based on the structure of the distribution density of phase with different energy performance.

Optoelectronic (laser) channel leakage of acoustic speech information generated by irradiating a laser beam vibrating under the effect of the acoustic speech signal reflects off-premises surfaces (windows, mirrors, etc.). The reflected laser radiation is modulated in amplitude and phase and is received by the receiver of the optical (laser) radiation, demodulation which distinguishes voice information.

For such channel organization it is preferred to use the specular reflection of the laser beam. At small distances to reflective surfaces (a few tens of meters) a diffuse reflection of the laser radiation may be used.

Sophisticated laser systems are operating in the near infrared wavelength range, while changing to intercept voice data over an optical channel.

To ensure informational signal it's necessary to provide:
– Assessment in terms of background (natural) and artificial noise;
– Implementing a spatial processing;
– Assessment of the mixture signal + noise to determine the signal level;
– Evaluation of the reverberation noise resonance phenomena;
– Consideration of the uneven frequency response (frequency response);
– Evaluation of speech intelligibility in the optical channel of information leakage.

It is proposed to analyze the correlation theory of speech [1, p. 75]. Correlation method takes into account factors affecting methodological (theoretical) uncertainty (accuracy) assess speech intelligibility in a channel of information leakage: