A Case Study on Usability Metrics Applied in Romanian E-Commerce Environment

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Abstract: - This paper extends the previous research regarding the Romanian electronic market as context for the launching a business opportunity in this domain. Here we will present a study on the indigenous e-commerce websites in general and their usability in particular. Nowadays, an impressive number of virtual businesses were open despite the crisis, since others closed their doors due to the same reason. Thus, before starting a new business, it is strongly recommended to make a deeper analysis of the environment and potential competitors, especially in the Web 2.0 context. Web 2.0 provides a winning edge over e-markets that lack social connectivity and high usability features. Usability cannot be quantified easily. Despite this fact, this paper will propose a usability evaluation methodology that will be tested in the local virtual space. For a visitor, usability is more related to a feeling than a figure, and the designer must power the website with it. We have also tackled a main branch of the electronic marketing, entitled SEO (Search Engineering Optimization). In order to promote our business and to put/keep it in the top of the search result list, a continuous optimization of the dynamic web site is required. We asses that usability and SEO must be both considered for the success of an electronic business. For our purposes, a statistical study was applied, using a battery of tests including the Kolmogorov-Smirnov, Spearman, and Kruskal-Wallis ones. Also, some data mining tools will be used to confirm or infirm the statistical assertions.

Key-Words: - Usability, SEO, search engines, data mining, Kolmogorov–Smirnov, Spearman, Kruskal-Wallis

1 Introduction

The present paper continues the recent research [11] regarding usability and SEO in the context of our country's efforts to find digital channels for integration with Europe and whole world.

In 1995, the Internet came into the business world in Romania. The companies started to make static web sites, with the purpose of supplying information such as the address of the company and the object of activity. The economic activity was developing in the real world. Soon, these types of web sites lagged behind a new, more dynamic generation. Still, frequent updating behind messages such as "under construction" become a disadvantage for the image of the company.

The dynamic web sites were posted on the Internet as a result of the appearance of new technologies that transformed the web into a virtual business environment, dominated by two general notions [20]:

1. content management system – adjustment in real time of the content and structure of the web site
2. shopping cart or e-shop.

The dynamic web sites represented the starting point in the development of virtual business, electronic education and not lastly, they modified the life of the whole planet. In this context, a theory oriented to the optimal use of these types of web sites has appeared and developed.

At the end of 2008, according to Europe's Digital Competitiveness Report, Romanian information society is still in an early stage of development although the first steps date back to the late '90s. There is a visible progress in the fields of eProcurement, eBusiness and eGovernment [15].

Data provided by Europe's Digital Competitiveness Report shows that two thirds of Romanian people have never used the Internet while only one third of the Europeans have never used the Internet. This fact explains why Romania ranks the

last 3 positions of the EU-27 ranking. Few relevant indicators sustaining this remark are listed in Table 1.

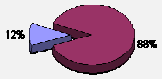
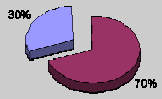
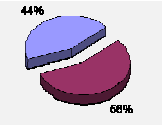
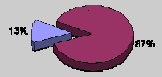
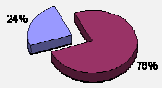
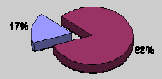
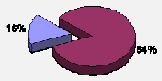
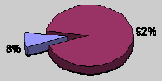
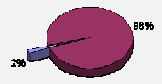
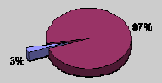
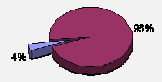
Indicator	Ampleness (%)	Overview
Broadband	11.7	
Household Internet connectivity	30	
Legal entities' connectivity	44	
Number of households connected to Internet	13	
Asynchronous communication services	24	
Electronic search services	17	
Online entertainment services	16	
Accessing basic public services	8	
Electronic commerce in the total turnover of companies	2	
Electronic transactions	3	
Online purchases	4	

Table 1 – A set of indicators that characterizes Romanian digital covering in 2008

The earlier data taken over from the same report shows that Romanian ITC industry is underdeveloped in comparison with European countries, generally occupying the last 3 positions of the ranking. However, the Romanian ITC industry made some progresses since 2007. For example, only 33.3% of broadband Internet connections provided a higher speed of 2 megabytes per second (Mbps), compared to 79.1% in 2008 [17]. Moreover, it is the only major part of the study in which Romania ranks higher than the EU average of 63.3% [17]. ICT is a priority focus of current government's policy, which has allocated to it 3.6% of GDP. 1.5% of the workforce is concentrated in the ICT industry. ICT provides 5.3% of total exports [17].

The worldwide economic crisis affected the Romanian electronic commerce by the fact that during early 2009, there was an eight percent decrease of electronic transactions, from 84 EUR in 2008 to 77 EUR in the first months of this year [22]. In early 2009, experts forecasted a 50% increase of the amounts traded on the Internet as compared to 2008 [22]. This year, the Romanian citizens preferred payment on delivery method for electronic commerce, which explains the increasing number of electronic transactions during the crisis.

2 Methodology

The design of the study involved the preliminary steps recommended for usability studies:

The subjects were selected from our university students (average age 22 years) with respect to several factors, each defining few segments represented in the sample:

- Self-reported level of expertise in website testing (novice, expert)
- Frequency of Internet use (rarely, occasionally, frequent)
- Amount of experience in website testing/evaluation (intuitive, professionals – based on their work experience and their grades on relevant courses)
- Gender (males, females)
- Frequency of domain-specific Internet use (with respect to the types of evaluated websites: advertisement, auctions, commerce, and intermediation).

The sampling strategy was based on convenience (students willing to participate) and a selection process in order to reflect all the segments. The sample was sized according to recent usability studies stating that Jakob Nielsen's 5-users rule is ineffective [1]. 13 subjects were used, for evaluation of 32 Romanian e-commerce related websites, splat in 4 equal-sized categories according to their implication degree or stage of the commerce act:

- **advertisement**
- **auctions**
- **commerce**
- **intermediation.**

The metrics were collected by one-to-one sessions between a user and a moderator. The evaluated criteria were:

1. **Loading speed**
2. **Communication/feedback**
3. **Transparency**
4. **General aspect**
5. **Publicity**
6. **Deductive interface**
7. **Arrangement of information**
8. **Navigability**
9. **The quality of the internal search engine**
10. **The quality of information.**

We consider that our criteria fits better for the investigation domain than using the nine ones specially designed for WSPAs (Web Sites of Public Administration) [3] by Hub and Zatloukal. In a case study that followed the methology developed earlier, the same authors took for tests 10 most known WPAs from Czech Republic and distribute sets of 5 items randomly for evaluation to 10 operators [4]. They obtained 45 (5 x 9) marks from a user, since we get 320 (32 x 10).

Each criterion involved subjective evaluation and self-reported metrics. Some of them also involved usability metrics with respect to several usage scenarios (inspired by [14]):

- Completing a transaction: this scenario is one of the most frequent in usability studies and involves all 10 criteria targeted by our study. A transaction is a sequence of interactions with the web site with a certain aim depending on the site domain of activity (consuming a service, acquiring information, ordering a product etc.). The main metric here, task success, was broken in weighted components, with weights assigned by evaluators to each criterion influencing the task success, failure or delay. Another metric, issue severity was evaluated by those with delayed or failed transactions, mapped on our set of criteria. Other self-reported metrics were the user expectation and the likelihood to return with respect to the alternative websites available in the Romanian e-environment
- Comparing websites: this scenario involved self-reported metrics of satisfaction according to each criteria, weighted to objective metrics such as duration of task completion, number of links activated during the task and task scalability
- Frequent use of the same website: this scenario aims at establishing how easy a certain use case may be repeated and if there were some optimization features for repeatable actions (such as 1-click Buy). Task time was here the main metric, broken into the determining factors of each criterion. Also, learnability shows the effort required to increase efficiency (by automating certain decisions). Some evaluators did not favor automated decisions and step-skipping, needing more control and visual confirmation over each step of a transaction. This relates to awareness and trust regarding certain parts of the website and how they work
- Navigation: this is influenced by most of our criteria and involved task success, task time, learnability and efficiency metrics for specific tasks of information acquisition. An important objective metric is lostness – the number of steps one takes to acquire a certain information, relative to the minimum number of steps. The intuitiveness of the information architecture was established through category sorting – having evaluators create their own preferred taxonomy of objects (products, services) and comparing it to the one provided by the web site
- Increasing awareness regarding underutilized functionality, by monitoring the number of interactions with each feature. It's important here to distinguish between not noticing a certain feature and not needing it, a difference drawn by self-reporting. A metric widely recommended comes from the memory test – showing subjects a list of features and checking how many of them are recognized. Other metrics, not employed by our current research due to logistic limitations, would be eye tracking and awareness relative to alternative designs
- Black box testing: this is closer to software testing and some of the evaluators have a background in the field, professional or educational. An important gap was drawn between experienced testers and inexperienced ones. The inexperienced one accused misunderstood anomalies, due to low awareness or overcomplicated navigability. During problem discovery, users engage in their own tasks, some of them not even possible to accomplish, thus showing a need for certain features. Discovered issues (and non-issues) were categorized by type and severity and each category was correlated with one or more of our target criteria
- Critical feature usability tests regarded those features which must be reliable in order to protect the user and the security of its data. Again, this involved the testing skills of some participants (mainly for form validation) and each one evaluated according to found issues
- Comparing alternative design. This was hardly possible since the tested websites are on-line and not accessible at design level, but several tests involved alternative formatting (by predefined

themes and styles) provided by some of the websites [1]. Criteria such as general aspect and arrangement of information were influenced by these comparisons. In the few cases where customization was possible based on user's profile, the impact and awareness of subtle changes was also observed

• Subjective overall user experience only involved self-reported evaluation, by pointing to the more (or less) satisfactory criteria influencing what participants perceived as being their experience satisfaction relative to expectance.

We considered self-reported data to be of essence in describing the user perception and to establish if the users relate to a common set of quality attributes. This was sometimes contrary to objective metrics of efficiency and effectiveness, users preferring to have control over certain aspects rather than minimizing effort. In collecting self-reported data, Likert scales were used. Each scenario was followed by a questionnaire in order to establish how the 10 target criteria influenced the self-reported metrics.

3 Problem formulation

The online commerce (e-commerce) represents the selling of products and / or services on the Internet [2], especially dynamic web sites. The online businesses are not limited only to the selling of various products and / or services on the Internet. An electronic business means much more. It involves the maintenance of the contracts with the suppliers, with the possible business partners, and also with the clients, the promotion of products and / or services offered, etc., all using the electronic resources, dynamic web sites, chats, blogs and e-mails.

The electronic marketing techniques are inspired by the real world and adapted to the virtual environment, in order to generate the highest number of visitors and to make them loyal visitors. Measures have been taken for this and a series of new ideas specific to the virtual environment have appeared, of which the most used is the search engine. The search engine is used as a base element in the promotion of dynamic web sites. The most well known search engines are ***Yahoo, Google, Ask, Mahalo.*** As each company wishes to be listed in the top 10 web sites within these search engines, a new research direction has developed, namely SEO.

The optimization of web engines and directories is defined according to all the key elements regarded by the search engines and web directories upon the indexing of the web sites in the database. These key elements, corroborated according to the algorithms of the search engines, offer a certain relevance and importance to the web site according to the information field. According to the relevance and importance factors, the web site will be displayed on a certain position in the list resulting a users' search. [7].

According to SEO theory, the design and implementation phases of a dynamic web site are based on the principle – *the site should allow the user to fulfill his task the best and easiest way possible* [21][13]. The usability is the quality of a system, generally speaking, of a site, in particular, which makes it easy to learn, use, remember, tolerant to errors and agreeable from a subjective point of view [20]. We may conclude that the usability of a dynamic site refers to the relationship between the site and the user.

The attributes of a dynamic site for electronic businesses, irrespective of the areas where it is used are [9]:

1. compatibility with all web browsers;
2. obtaining a maximum profit with minimal costs;
3. to be useful;
4. to be easy to learn;
5. to be easy to use;
6. not to include errors;
7. to be able to load any page of the web site any time;
8. to offer safety to the user;
9. to approach interesting subjects;
10. to offer the most recent information, related to the theme of the web site;
11. to include all means of communication adequate to the area of activity.

According to the SEO theory, a basic phase in the preparation of a web site, especially in measuring its usability is the testing phase. In this phase, after the uploading on the web server, it will be verified if [19]:

- the connections within the web site do not lead to non-existent pages and to be placed naturally
- the site may be accessed from all types of browsers (IE, Firefox) without generating incompatibility errors between the soft versions used to display the information on the computer screen
- the screen resolution does not modify / distort the structure (design) of the site
- the loading speed of the site in the browser is the same irrespective of the Internet connection device that the user has (modem, dialup, network)
- entering a web site should not generate errors in javascript or warnings in the status bar of the Internet Explorer browser

- the content of the web site is analyzed as follows: the purpose of the site, the elements that draw the attention of the users at their first visit, elements that dislike, etc.
- deeper testing will involve traditional software testing techniques:

a. black box form testing using partitions of input data according to the validation rules

b. automated testing using macro recording add-ons for the various browsers (iMacro, Selenium)

c. gray box testing for the HTML formatting

d. white box testing if the website was developed with technologies that permit variable watching, code coverage and debugging.

If after this phase the results are satisfactory, the site may be registered in the search engines. Before the registration in the search engines of such site, we think that the preparation of a statistic study of the competition is important. We will make a statistical analysis of the competition web sites within the electronic commerce domain, where we want to launch our business. The study sample is made of 32 web sites that we have chosen from the Romanian traffic-monitoring site www.trafic.ro, for the electronic commerce domain. In this paper, we do not doubt the site-monitoring algorithm's correctness and we limit our investigation only to the sites listed here. According to these prerequisites, we have made an assessment of these websites based on 10 usability criteria.

4 Problem solution

The purpose of the study we have made is the calculation and evaluation made by 13 different evaluators, who have relatively homogeneous background, 8 in each category (**advertisement, auctions, commerce, and intermediation domains**), giving marks for each criterion of the following ten: Loading speed, Communication/ Feedback instruments, Transparency, General aspect, Publicity, Deductive interface, Arrangement of information, Navigability, Search engines for products, and Information quality for products.

The content of the website list is that one from Table 2, but evaluators have idea about the ranking of the items neither at global level, nor within each category. In order to achieve this goal, users got an alphabetic site list, but grouped by category to be able to compare easily items from homogenous categories.

Position	Site	Category	Position By Category
1	www.okazii.ro	INT	1
2	www.shopmania.ro	INT	2
3	www.price.ro	INT	3
4	www.librarie.net	COM	1
5	www.domo.ro	COM	2
6	www.compari.ro	INT	4
7	www.marketonline.ro	COM	3
8	www.e-tc.ro	COM	4
9	www.magazine-online.ro	INT	5
10	www.pcgarage.ro	COM	5
11	www.cauti.ro	INT	6
12	www.pretbomba.ro	AUC	1
13	www.1001case.ro	INT	7
14	www.smartbuy.ro	ADV	1
15	www.dc-shop.ro	INT	8
16	www.evomag.ro	COM	6
17	www.tarafashion.ro	COM	7
18	www.pcfun.ro	COM	8
19	www.indecis.ro	ADV	2
20	www.totcedoresti.ro	ADV	3
21	www.totulredus.ro	ADV	4
22	www.orditv.ro	ADV	5
23	www.etarg.ro	ADV	6
24	www.infopromotii.ro	ADV	7
25	www.nailshop.ro	ADV	8
26	www.minim.ro	AUC	2
27	www.licitezonline.ro	AUC	3
28	www.uaucepreturi.ro	AUC	4
29	www.shop-bay.com	AUC	5
30	www.licitatii-virtuale.ro	AUC	6
31	www.licitatieporumbei.ro	AUC	7
32	www.micropret.ro	AUC	8

Table 2 – e-Commerce related websites list

For each variable that encodes the marks given for one criterion (discreet, ordinal variable), we have tested the normality condition using the Kolmogorov–Smirnov test [12]. Taking into consideration that, this idea has been rejected (**$p<0.001$**), non – parameter tests have been applied, and the median, not the mean has been used,

considering that this has the capacity to characterize "more cleanly" the variable.

Variable	LSpeed	Comm	Transp	GenAsp	Pub	DedIntf	Arrange	Nav	SearchEn	InfQP
Median	2	8	8	8	8	9	8	9	8	9
95% CI for the median	2 – 2	7 - 8	8 - 8	8 - 8	8 - 9	8 - 9	8 - 9	9 - 9	8 – 9	9 - 9
Kolmogorov-Smirnov test for Normal distribution – **Rejected Normality (p<0.001)**	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Sample size	Lowest value	Highest value
416	1	10

Fig. 1 – Kolmogorov-Smirnov test – Normality rejection confirmed

A normal distribution would allow the use of the mean, which would lead to assessments that are more accurate. E.g. In our case, 2 or more sites having a median of 8 cannot be differentiated by a certain criterion or overall, but if one would have a mean of 7.8 and another 8.4, the ranking would be more feasible.

Now we check the distribution of median scores in relationship with the median confidence interval (95%) for each site separately. For this, we have calculated the median scores of all the marks – Mn – (all criteria included) given by each evaluator for each site and we looked at the differences between the median Mn according to the position of the site. Even if they have been identified, as shown in the figure below, there was no clear evolution direction of the marks, the differences can be explained (at least in the first part of the classification) by the presence of "discrepant" sites (high position – lower marks, for example those on positions 2, 8, 9, 14, 16). If we exclude these five sites, we do not detect significant differences between the medians of the marks given for the first 20 sites (p>0.05).

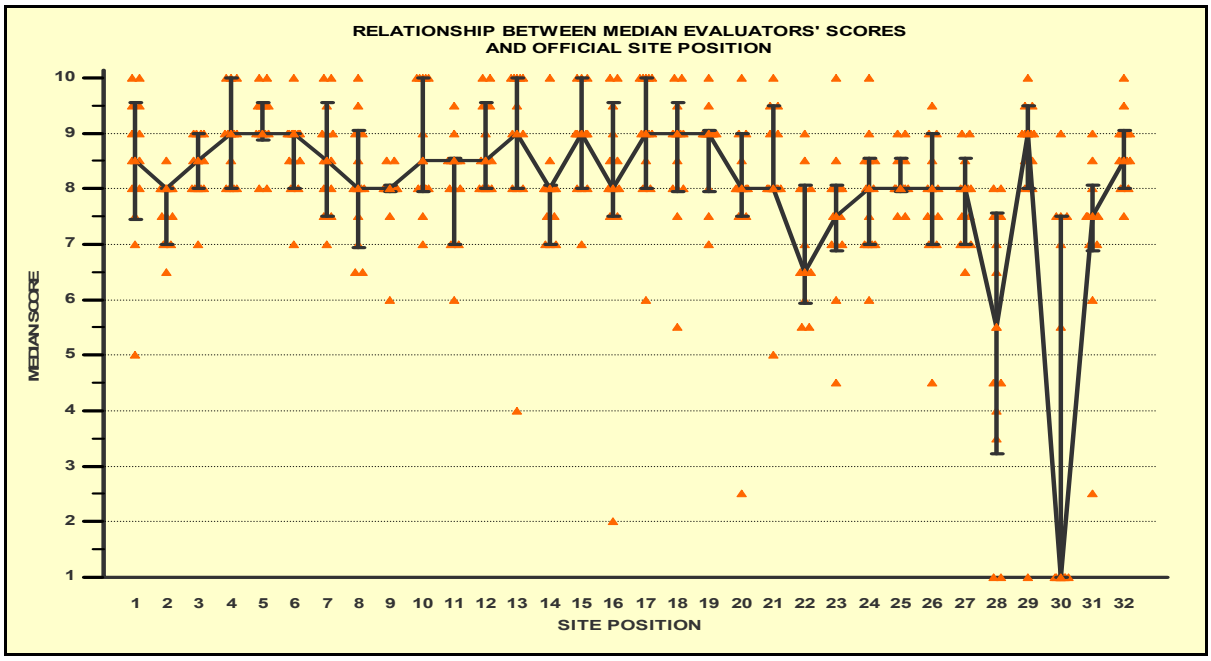


Fig. 2 – Median evaluators' site scores spread and their relationship with site's position

As we can notice from **Fig. 2**, the broken line that connects each site's median score does not follow a clear downward slope since the first position site until toward the last one. In these circumstances we suspect that there are some criteria "guilty" for this miscorrelation and/or the evaluators are not reliable, being driven by a significant objectivism dose.

We have tested if there were differences between the medians of the marks given for a feature, according to the position of the site. These have been presented (between at least two sites), the only exception being represented by LSpeed. However, we cannot say that there has been a clear correlation between the marks and the position of the web site.

Then, by calculating the Spearman's ρ (rho) correlation coefficients [10], we have followed if the official position of the site (given by the number of visits during a determined period) is correlated with the score given by each evaluator, according to the

marks provided. We could not find a positive correlation, significant from a statistical point of view, between any variable and the position of the site in the classification.

Variable Y		Position									
Variable X		**LSpeed**	**Comm**	**Transp**	**GenAsp**	**Pub**	**DedIntf**	**Arrange**	**Nav**	**Search En**	**InfQP**
Spearman's coefficient of rank correlation (rho)		0.0676	-0.158	-0.187	-0.262	-0.146	-0.150	-0.248	-0.044	-0.340	-0.239
Significance level		p=0.1685	p=0.0013	p=0.0001	p<0.0001	p=0.0030	p=0.0022	p<0.0001	p=0.3661	p<0.0001	p<0.0001
95% Confidence Interval for rho	Lower boundary	-0.0287	-0.250	-0.278	-0.350	-0.238	-0.243	-0.336	-0.140	-0.422	-0.328
	Upper boundary	0.163	-0.0629	-0.0923	-0.1	-0.0501	-0.0551	-0.156	0.052	-0.252	-0.147

Fig. 3 - Spearman's rho correlation coefficients – No correlations between position and variables

Due to the conclusion, our investigation must go further, checking if the second assumption stands or not. To do this, we have tested if there were differences between the medians of the marks given by each evaluator for a certain criterion (Kruskal–Wallis) [10]. We have found out that although the evaluators had relatively homogenous degree of education (enrolment to the same university) and age, but being heterogeneous in gender and terms of experience in site testing and dealing with e-commerce domain in its various forms, there were various – sometimes severe – levels of severity in the evaluation process.

Factor codes	Evaluator									
Data	**LSpeed**	**Comm**	**Transp**	**GenAsp**	**Pub**	**DedIntf**	**Arrange**	**Nav**	**Search En**	**InfQP**
Test statistic	166.897	102.689	22.538	34.494	53.9204	94.048	68.722	67.225	34.861	90.287
Corrected for ties Ht	177.554	105.409	23.266	36.241	56.824	99.625	72.341	73.292	36.170	95.962
Degrees of Freedom (DF)	12	12	12	12	12	12	12	12	12	12
	p < 0.0001	p < 0.0001	p = 0.0256	p = 0.0003	p < 0.0001	p < 0.0001	p < 0.0001	p < 0.0001	p = 0.0003	p < 0.0001

Fig. 4 – Kruskal-Wallis – No concordance between evaluators' opinions

If neither global, nor specific correlation between evaluation and site ranking have been revealed for the most visited Romanian e-commerce websites in a determined period, and the evaluators behavior being proved as "subjective", we intend to narrow our investigation by a sub-domain (category) of the analyzed sites. We consider that even all previous hypothesis have been infirmed it is still possible that for one or two categories to exist correlation between site evaluation and traffic.

In Fig. 5 we have the median's confidence interval and median score for each site, the lines and markers for each category follows the same color (or gray shade) convention and inner category position numbering as in Table 2 – e-Commerce related websites list. Intuitively, we may notice there are no very strong relationships either within categories. However, two categories – **advertisement and commerce** – have 5 form 8 sites that follows the downward slope, which is good. E.g. For commerce, if we exclude sites located at positions 5, 7, and 8 (www.magazine-online.ro, www.tarafashion.ro, and www.pcfun.ro) we get a correlation between evaluation (usability) and ranking (visitors). But, an interesting, but annoying fact is that the first two sites achieved the same score as the last two.

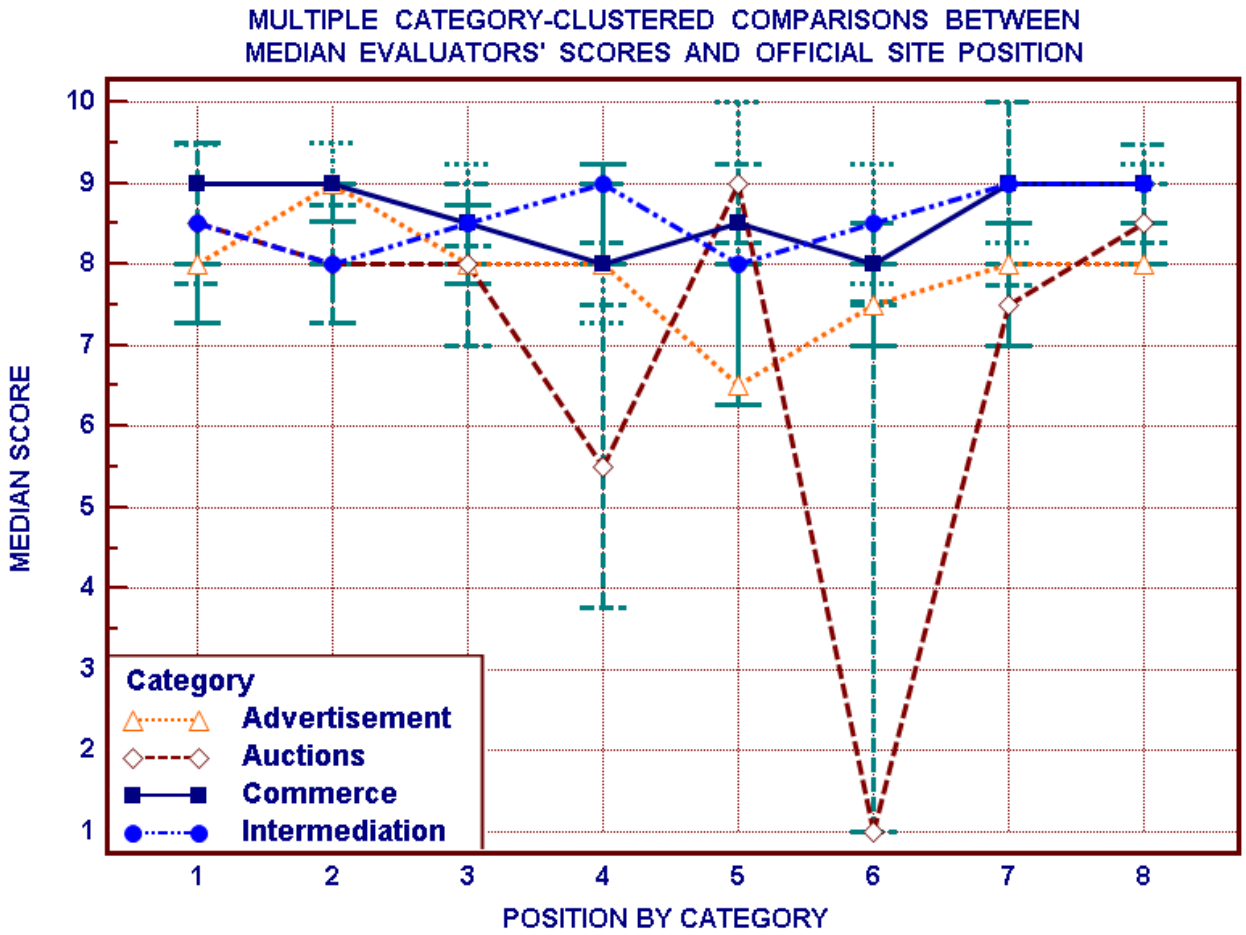


Fig. 5 – Median evaluators' site scores spread and their relationship with site's position by category

	Class Attribute: Position			**Class Attribute: PosByCat**		
Attribute Ranking	Result	Gain Ratio	Attribute	Result	Gain Ratio	Attribute
	Correctly Classified Instances 101: 24.2788 % Incorrectly Classified Instances 315: 75.7212 %	0.0976	SearchEn	**Correctly Classified Instances 91: 21.875 % Incorrectly Classified Instances 325: 78.125 %**	0.171	SearchEn
		0.0914	GenAsp		0.15	GenAsp
		0.0837	Transp		0.15	Transp
		0.0749	InfQP		0.138	InfQP
		0.0738	DedIntf		0.13	Arrange
		0.0725	Arrange		0.123	DedIntf
		0.0643	Comm		0.12	Pub
		0.0557	Pub		0.12	Comm
		0.0501	Nav		0.119	Lspeed
		0.0486	Lspeed		0.1	Nav

Fig. 6 – Attributes evaluation and (mis)classification by global and category-based position

Mainly, data mining (DM) is more comfortable to be used than statistics because it does not require model or hypothesis validation. However, in our circumstances we put DM to validate the results obtained statistically. The fact that there is no significant accordance between the marks given to the sites and their official position has also been tested by means of data mining tools, supplied by the application of algorithm C4.5 (J48) in Weka. Even if this algorithm may fit successfully [16] to such a situation, the results were disappointing again, although we have taken into consideration a tolerance of four positions in the case of classification according to the global position and of two positions, in the case of intra-category classifications. In both cases, we can find out that

the first four attributes occupy the same position, according to the relevance (based on the informational gain). The decision trees resulted, even in pruned variant, present too many ramifications and levels.

Thus, even if the DM analysis was more permissive, both methods confirmed the accuracy of the performed tests. Usability evaluation is a difficult task, susceptible to subjectivity. The results of the statistical study show that launching a new business in the Romanian Web environment should rely neither only on usability, nor strictly on SEO efforts. Efforts should be synchronized with off-line marketing, which has significantly more impact than on-line solutions in a country with low digital literacy. In Romania, due to the small (or wrong) steps taken in the field of usability, there is a significant divergence between SEO efforts and usability. Consequently, the conversion rates are very low even with SEO campaigns that successfully attract visits. A consistent usability culture should bring a new perspective upon visitor loyalty, this being an essential condition for on-line success, independent from the off-line economic space [13]. According to our study, attractiveness of the products/services, information quality and marketing policies overcome usability as a determining factor for success, with the respect of our evaluators' opinions.

We will improve our methodology after validating the confidence of our testers with a second evaluation on the same sites sample. Further research will consist in evaluation of just a single category of websites – e.g. commerce – handling similar types of products or services (e.g. electronics). Evaluators will have a more effective and less time-consuming job by randomly distributing just slices from the chosen website sample. The analysis playground will be enlarged from the indigenous one to the wide world, since the whole Internet philosophy pleads for geographical delocalization. Also, our criteria may suffer minor mutations by combining parts of criteria which are susceptible to be misunderstood, reducing their number if necessary, and decreasing the dose of interpretability by detailing rigorously all tasks implied. The support of the evaluation – now just consisting in questionnaires – will be extended, too.

5 Conclusion

The virtual businesses in the Romanian virtual space appear in a stunning rhythm, but not many succeed in keeping up with the virtual market. Taking into consideration this reality, we have thought it is necessary to present a methodology for the research of the electronic market that we consider important both for the start-ups in the electronic economy domain and for the electronic businesses reaching maturity. Any e-business launched on the market needs continuous work for the optimization of the web site, so that it appears and remains in top 10 of as many search engines as possible.

According to the study we have made, we reached the conclusion that the launching of an electronic commerce web site is still a good business in Romania, as the local web sites in this domain have not reached maturity and do not focus on SEO techniques or the wishes of their visitors, and they cannot make the visitors their clients.

In the end, for a successful business, were recommend a good strategy of electronic marketing and a continuous effort for the optimization of the electronic commerce site. The fact that usability does not provide a winning edge in the Romanian virtual economic environment is due to the lack of maturity of Romanian e-business. The most attractive websites are not necessarily the most usable ones, but those that are extensions of real-world businesses with a significant tradition and reputation. Word of mouth is more important than using search engines in order to locate products and services. In explaining the subjective evaluations, the evaluators stated that lack of usability is acceptable as long as there are only a few websites providing certain services and products. Also, e-payment is hardly trusted, most users preferring slower methods due to a widely spread feeling of insecurity regarding on-line payments. In other words, usability feels like a luxury which is irrelevant as long as more basic mechanisms are not implemented and accepted widely enough. The low digital literacy and slow emergence of high speed Internet connections makes people more tolerant to issues regarding loading speeds and navigability. Thus, Romanian web sites are not necessarily user-centered; more often the user has to make an effort to get closer to its providers of services, products and information. This shows some similarities between the Romanian virtual environment and the US environment in the late '90s, with the main difference that Romania currently has a matured legislative framework (inherited and adapted from the European Union). In the context of a deep digital division (and slow digital inclusion) the Internet is exploited as a communication tools rather than as a support for economic activities. However, the e-market openness created by the inclusion of Romania in the European Union stimulates a certain segment of the population (young, English speakers,

early adopters) to enter the international e-markets (Amazon, eBay, etc.) which will expectedly put some pressure on the Romanian websites and raising awareness of a culture of web quality. An important factor for the Romanian digital division is age, correlated with the ability to understand English, which was poorly promoted during communism and later became a barrier for IT and Internet emergence for population segments older than a certain threshold (approximately 45 in 2009).

We believe that there will be a spectacular growth in the ICT industry, although in the current European Commission Report Romania ranks the last positions of the lists. Romanian society has become aware of the importance of the Internet and European funded projects are developing for increasing e-inclusion and synchronizing Romania to the i2010 strategy. Based on current developments in this area, we believe that in the following 2 years Romania will rank among the first 15 countries in the European Union.

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