UI DESIGN OPTIMIZATION AND ANALYSIS ON COUPON PLATFORMS FOR IMPROVING SERVICE QUALITY

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Abstract: As popularity of social couponing websites increases constantly, so does the competition. The good and usable design of the websites interface makes a huge difference between success and failure in the group buying market. In this paper usability evaluation is conducted on a relevant case study. The usability of an group buying platform was tested using two different methods: heuristic evaluation by experts and scenario testing by users. Results show that each method uncovers different types of problems that contribute to the improvement of the overall performance on the website.
Key words: usability evaluation, group buying, user interface, user satisfaction

1. INTRODUCTION

In the last couple of years, coupon sites have gained popularity, on global as well as local level. In Macedonia, coupon platforms are the primary steps that citizens take towards regular e-commerce practice. Knowing the economic situation and the high price sensitivity of the Macedonian customers, the huge interest in online coupon deals is not surprising. Even the traditional fear of lack of security on the online platforms was overcome by the users looking for the best online deals.

According to Stulec and Petljak [1], group buying can be defined as buying in a group in order to achieve quantity discounts. The concept of online group buying comes as an intermediary between sellers (producers, local retailers and service providers) on one side and buyers (customers) on the other side.

When user makes a decision whether to buy a coupon, he/she is taking in consideration several factor. First and most important factor for the users is

trustworthiness of the site, than price, product specifications, and online product presentation (the design of the user interface). Some of the biggest challenges for e-commerce that need to be overcome are optimization and presentation of every product category, although the user interface is often limited due to growth of popularity on small screen devices like mobile phones.

Shiau and Yeh [2] conducted a case study on Groupon usage in Taiwan in order to determine the **effects of website characteristics** (information richness and navigation) **on shopping value** (perceived utilitarian and hedonic value) and on **online group buying intention**. Research results show that:

- the navigation functions assist consumers to find the product discount they need in time, and
- graphics in the navigation bar enhance interaction between the consumer and website as well as consumer intention towards online group buying.

The main question is how many products to offer on the web site?

Huge number of products offered by the e-stores is usually a problem for the sites navigation. The amount of data that has to be presented to the user is regularly in conflict with the user interface design principles. The basic goal of this paper is to present a detailed research of the identified problem first, so that good redesign directions can be given later.

2. PROBLEM DEFINITION

A brief background to group buying practice in Republic of Macedonia and the challenges that the biggest market player faces nowadays is presented at the beginning. Then, we elaborate the usability factors and the evaluation methods that are most suitable for coupon websites.

Since we live in a developing country, the price factor is the main determinant in the purchase decision of Macedonian buyers. Platforms for group buying are ideal marketplace that delivers those low prices and cumulative savings for customers. The constantly increasing demand for cheap offers leads to increasing supply on the other side. Many businesses see the opportunity to attract new customers and increase the level of sales. So the main challenge for the group buying sites is how to present so much information on the users' computer/mobile screen and still to be simple and easy for using.

1.1. Usability

Interface design is becoming even more critical in the e-commerce world. Poor interface design may lead users to shift from one site to another and that makes the crucial difference between profit and loss. Website quality has a tremendous effect on customer satisfaction and purchase intentions [3].

Here comes the question, how to measure the quality of the website? The quality is determined from the usability features it offers.

Usability as a concept has lots of definitions given by individuals who are interested in the subject. One of the most famous definitions is the one by Jacob Nielsen [4] who claims that usability is a **quality attribute** that assesses how easy user interfaces are to use. Usability is defined by **5 quality components**:

- **Learnability**: How easy is it for users to accomplish basic tasks the first time they encounter the design?
- **Efficiency**: Once users have learned the design, how quickly can they perform tasks?
- **Memorability**: When users return to the design after a period of time not using it, how easily can they reestablish proficiency?
- **Errors**: How many errors do users make, how severe are these errors, and how easily can they recover from the errors?
- **Satisfaction**: How pleasant is it to use the design?

Nielsen looks at usability as the only acceptable software solution for the user. The acceptability can be looked from a practical view (is the software technically qualified to fulfill the goals and need of the user) or a social view (we are looking into the psychology of one system, acceptability from the society, the branding etc.)

Usability as a term is derived from the term 'user friendly'. According to ISO 9241-11 [5] usability is referred to as the extent to which product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use.

The objective of design and evaluation for usability is to enable users to achieve goals and meet needs in a particular context of use. ISO 9241-11 explains how usability can be specified and evaluated in terms of user performance and satisfaction. User performance is measured by the **effectiveness** (extent to which the intended goals of use are achieved) and the **efficiency** (resources such as time, money or mental effort that have to be expended to achieve the intended goals). On the end **satisfaction** is measured by the extent to which the user finds the use of the product acceptable [6].

1.1.1. Usability principles

The usability principles are one approach for quantifying the usability of one system. They combine the best user interface design practices and help the researchers focus on the crucial parts of the design to avoid and solve the biggest challenges.

The first usability principles were developed by Jacob Nielsen together with Rolf Molich [10] in the early 90's. The final set was released by Nielsen in 1994 [7]. His principles are general, and that is the main reason why they are popular even

today. Notwithstanding their popularity, they don't cover every aspect of e-commerce websites.

Given that fallback of the Nielsen principles, we also integrated the principles of Liang and Lai. Their principles include several components that specifically target e-commerce sites and its elements like shopping carts, registration process, product categories, buying process etc. Their main case study for development of these principles was an online book store, and the principles were built on the ground of Engel, Kollat & Blackwell model [11] for purchase decision. According to their principles, the buying process is separated in five phases: problem recognition, search, alternative evaluation, choice and purchase. For each of these phases, Liang and Lai defined key principles that every e-commerce website should follow.

The U.S. Department of Health and Human Services has created a manual with 209 design principles for optimizing the usability of the websites. They gave direction for every participant including in the process of creating and using the websites. Their directions are based on the latest scientific findings in the specific field. Those findings are cross section of the ones of several authors and their researches. Every direction in the manual is ranked by the relative importance of the website success, as well as the scientific strength of the assertions.

Using these principles we evaluated the general acceptability of our case study.

2.   RESEARCH METHODOLOGY

Grouper.mk is the biggest group buying platform in Macedonia emerged in 2011[12]. Although many other early followers appeared latter Grouper.mk continues to be the dominant market player in this segment in Macedonia. Grouper offers three main category products: travel deals, products and services. Online group deals have gained their popularity among Macedonian users, and they have great influence over the development of e-business in Macedonia.

Each of these evaluation methods it's not perfect on its own, and none of these methods can give complete results independently. In pursuance of getting more accurate results we separated our research in two parts: heuristic evaluation given from experts in the field and test-scenarios given to end-user which we later analyzed with special software. Splitting the research spawned more quantitative and qualitative results from both sides. On one side we have the experts, UI/UX designers that dedicate their time to creating creative design solutions following the design principles. On the other side are the users, which are the main target of our research and have to be satisfied with the final usability of the website.

2.1. Heuristic evaluation

The principles we chose were based on two different studies that were presented earlier. The selected studies are "Liang and Lai" and "Research-Based Web Design and Usability Guidelines" of U.S. Department of Health and Human Services. In some of the chosen principles, Nielsen universal principles are incorporated.

The principles are presented in question form. The original statements were explanatory, but in our case study we reformulated them in order to give direction and simplify the experts answer with a simple yes or no. Every question was followed with a short explanation to avoid confusion.

Heuristic evaluation was conducted by three UX professionals. They were asked to analyze the website Grouper.mk and give their opinion about the current state in relation to the given principles. Every principle was rated by the evaluator based on his opinion about the relative importance of the principle to the usability of the overall website. The rating of the principles was done after the completion of the whole evaluation process so that the evaluators could get the bigger pictures about the websites functioning.

2.2. Scenario-testing

Scenario testing was done using a software tool Loop 11 (www. loop11.com). Loop 11 is a usability testing software that requires no physical presence of the researcher. While user work on their assignments, their cursor movement is visually recorded from the screen. The results are aggregated for every user individually and as a sum. The software presents average values and task completion rates.
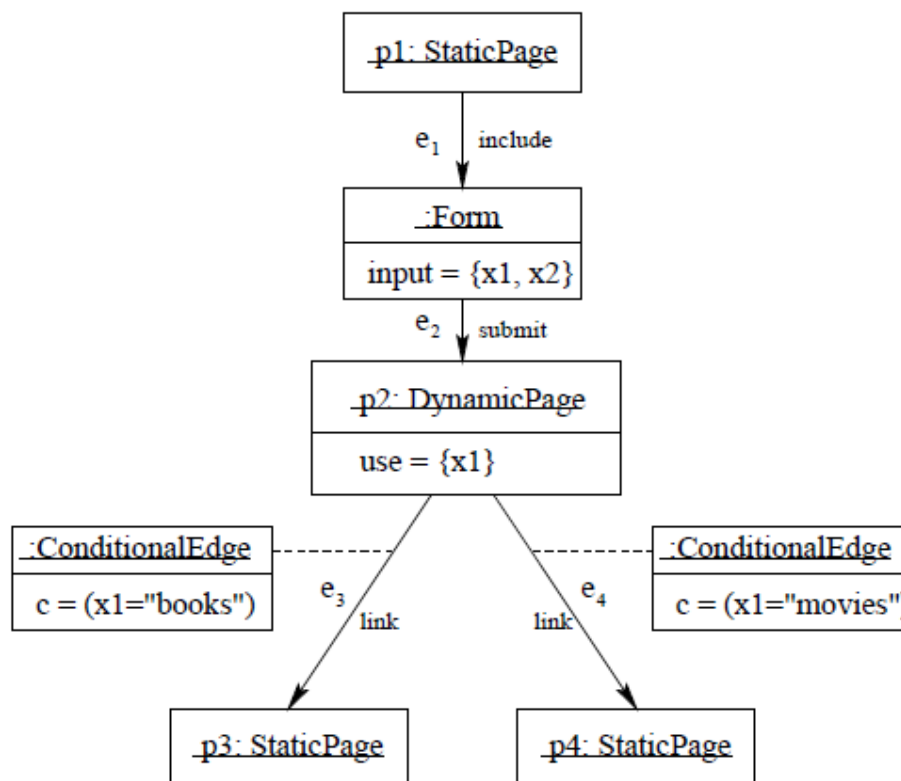

Fig. 1. Example of web page model

Selected users were given a hyperlink. By clicking on the link, users were redirected to Groupers website. They were given set of three demographic questions

at first (birth year, gender and frequency of visit of Grouper.mk). Then two tasks followed. Web application, page p1 provides a search facility - buying specific coupon on the website, and p2 displays the result of the search. The first task required the user is to find travel coupons with the 'All Inclusive' or 'Bansko' sign. Then the site provides information through links respectively to p3 or p4. The second task required the users to find a precise coupon on the website. After every task, a Likert scale question followed about the 'easy' of a task completion.

At the end, users were asked to answer the questions from the System Usability Scale. The System Usability Scale (SUS) is a simple, ten-item scale giving a global view of subjective assessments of usability. SUS is a Likert scale. It is often assumed that a Likert scale is simply based on forced choice questions, where a statement is made and the respondent then indicates the degree of agreement or disagreement with the statement on a 5 (or 7) point scale [13]

3.   EXPERIMENTAL RESULTS AND DISCUSSIONS

Heuristic evaluation - The evaluators reviewed the website based on the 25 given usability principles. We only present the principles that according to the experts were not met by the website.

Severity rating mean value for the question 'Does the website use a clear user-logical hierarchy of categories to classify products and to find them?' is equal to 5 (on a scale from 1-5).

The horizontal menu has a category named 'All deals' which according to the evaluators is redundant and leads into a page full of chaotic product presentation.

The vertical menu has completely different categorization. In assumption, the people that manage the website like to simplify the buying process of the most sold product categories. The comment was that category 'Bansko' can damage the successfulness of the other travel deals and cannibalize their sales. A more generic category names would be more appropriate for usage.

Severity rating mean value for the question about the payment process is smaller - 3.6, because the system doesn't show a progress bar that would indicate the remaining steps to complete the payment. The progress bar would give user a visual time frame for task completion and reduce user impatience.

When we asked the users about product-related ratings and review options we evaluate Severity rating mean value= 4.3 and we concluded that every deal offer should be rated on a scale from 1 to 5. The opportunity for rating should be given only to actual buyers so that the rating would reflect the actual user experience from the product or service. These mechanisms would force the businesses that offer their products on the website to keep a satisfactory quality level of their products.

For the question 'Does the website provide a comparison tool between two different products or services?' Severity rating mean value is 4.

A comparison tool in Grouper case doesn't exist and would be quite inappropriate to use. This tool can be only effective in the Travel part. The option for comparing two different coupons for travel would speed up the customer decision making process.

Scenario testing results - Task completion time, task completion success rate and number of clicks were recorded for each task and participant. After the results summary, the conclusions and future considerations for interface improvement were made with the three UX designers that participated in the heuristic evaluation of the website.

Table 1: Task completion success rate

	% for both	% for the first task	% for the second task
Succesfull	81 %	65%	96 %
Failure	19%	35 %	4%
Abandon task	0%	0%	0%

According to the results, the success rate of the first task fulfillment was significantly lower. Comparing to Jeff Sauro [14] findings who states that the average task-completion rate is 78%, our example shows significant deviation. From 17 successful destination pages of task number one, even 14 used the links in the menu panels. Only 3 users used the search bar in the central upper part of the homepage.

An inconsistency in the generated results was found depending on the trajectory of user movement through the website. When going through the menu categories the final page shows three results, and using the search bar gives two results for the same task.

In task number two, from 25 successful task accomplishments only 2 were done using the search option. The search engine had a very limited use. The conclusion is that the search bar is not quite noticeable because of the dominant size of the top front banner that goes right under it.

Recommendations for improvement:
- Reducing the size of the upper front banner
- Refining the filter tools and tags on every deal on the website in order to improve the results relevancy
- Making changes in the category names in the left menu bar (more generic and clear titles)

Fig 2: Average Task completion time and number of clicks

Both tasks	Average number of clicks	Average task completion time (sec)
First task	3. 2	50. 1 sec.
Second task	2. 6	44. 1. sec.

The average number of clicks for both tasks matches the rule of three clicks, a principle according to which the user needs to find the needed information on the website in no more than three clicks [15].

Table 3 shows the results from the 'ease of use' questions that followed after every task accomplishment. Each task was rated on a Likert scale from 1 to 5, where 1 is very difficult, and 5 very easy to accomplish.

Table 3: Mean value and standard deviation of 'ease of use' questions

	Task 1	Task 2
Mean value	4. 076	4. 192
Standard deviation	0. 688	0. 693

The System Usability Scale gave 75.3 percentile results. The average value on the scale is 68 % which shows that the general satisfaction from using the system is above average.

4.   CONCLUSION

This paper addressed different types of usability problems during the coupon buying process. The findings identified the challenges that user faces during the ordering process. The findings from heuristic evaluation and scenario testing identified areas for usability improvement through redesigning website elements.

However, both user and expert results showed that the problems are not critical and wouldn't prevent the buyer from finishing the order. A more precise definition would be that we found deficiencies in the website design, instead of problems. These design deficiencies aren't a decision making turnover, but every business should calculate if it's ready for taking the risks. Small design flaws can make the crucial difference in user buying decision.

5.   LIMITATIONS OF THE STUDY

The findings from the heuristic evaluation were based on the experts' subjective opinion about the company and the website. This suggests that certain aspects of websites usability weren't objectively analyzed.

Choosing the user sample for scenario testing was another challenge. The most appropriate way would be to recruit users by asking actual visitors from the website to participate in the research. Also, there is a possibility that the task completion time and the errors users made were influenced by the specific conditions in which the users were at that time. Users behave differently when they are subject of a research process, rather than casually browsing and using the website. They act more precautious than in real life situation.

The last dilemma was whether the research findings have a broader usage. The research was done on a case study. Every website has specific, recognizable user interface. The question is whether these findings can be applied on other platforms for group buying in a situation where their user interface is completely different.

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