Designing an Adaptive Online Advertisement System: A Focus Group Methodology

Dana A. Al Qudah
Department of Computer Science
University of Warwick
CV4 7AL, Coventry, United Kingdom
d.al-qudah@warwick.ac.uk

Alexandra I. Cristea
Department of Computer Science
University of Warwick
CV4 7AL, Coventry, United Kingdom
a.i.cristea@warwick.ac.uk

Lei Shi
Department of Computer Science
University of Warwick
CV4 7AL, Coventry, United Kingdom
Lei.shi@warwick.ac.uk

Ja'far Alqatawna
Department of Business Information Technology
University of Jordan
11942, Amman, Jordan
j.alqatawna@ju.edu.jo

Abstract— **Human Computer Interaction systems have access to the valuable resource of information that can be collected directly from users of these systems and services. This idea has become a part of the design process for systems that touch users' perceptions - here, in the field of online advertising and marketing. This research paper discusses a revisited design for an adaptive online advertisement system called MyAds. The methodological approach used for proposing a new design was the focus group methodology, due to the fact that it produces concrete ideas that are needed at this stage of the research. The main outcomes of the experiment agreed on using Amazon as a motivational blueprint for the new design and generated a list of requirements from users, in order for their acceptance level of personalised online advertisements to increase.**

Index Terms— **Focus groups; adaptive; e-advertising; HCI; requirement list**

I. INTRODUCTION

Online advertisement is one of the main activities conducted online [16]; however, adverts are usually perceived at their best as necessary evil, at their worst, as annoying interferences, and that users don't click enough on them with a decrease click rate on banner online advertisements from 3% to 1% [5]. Also statistics from 2014 suggests that the investments and revenues in online advertisements have increased by 15.1% in the United States alone.

On the other hand, adaptive hypermedia is the science of providing personalised content to the users, based on many personal variables, such as demographics, interests, backgrounds and needs [3]. In e-commerce, the application of adaptive hypermedia has been explored via different research-based systems, such as AdRosa [4]. Unfortunately, due to the fact that famous platforms tend to be commercial and their personalisation techniques remain hidden from research, it is a guessing game of what techniques and methods are being used [5]. One of the popular platforms is Amazon.com that serves as a warehouse shop, advertising platform, as well as a brokerage system, combing the three different aspects of e-commerce in one comprehensive platform [5].

In past research we have built a system called MyAds, an adaptive system that provides a personalised environments for shoppers to enjoy product and content specific shopping experience using adaptive hypermedia [1]. MyAds serves as a brokerage system, advertising products from different suppliers, and the user is suggested products based on the user model constructed, which are presented using adaptive hypermedia techniques. The initial results suggested that the system did provide a personalised experience, but the main drawback was the system design, as users wanted a more user friendly presentation of the products [2]. Thus, we set out to revisit the design of MyAds, however, not concentrating on it alone, but focusing on a *generic set of required features in adaptive e-advertising, which are essential for the advertising to be accepted by the user*s. The enhanced design should provide a more personalised platform that includes adaptive hypermedia properties, which can contribute to exploring the area of designing an adaptive online advertisements. Hence we revisited applying such techniques in a more consistent way in advertising. Moreover, we analysed success stories so far, towards finding a motivational platform to use as a motivation platform to study and analyse and see what features can be extracted as well as what pitfalls can be addresses in the new proposed system. In this research we investigate, on one hand, what successful platforms, like Amazon, do to make their users acceptance of their service so high In 2011, net sales grew 40%, and significant gains thus far in 2013 as well as it ranks among top five in customer service, speed, accuracy [17], but also what can be improved, from the point of view of adaptive hypermedia functionality. Moreover, as users visit commercial platforms, such as Amazon, with an expectation to be offered products, and the line between advertising and product offering is a fine one, we also research other popular platforms that offer advertising as a business model, but whose main role is not a commercial one - such as social networks and their role in delivering targeted ads based on the information harvested about the users. Thus, the research questions resulting and addressed within this paper are:

Q1: Are the features implemented and proposed for MyAds expected to increase the acceptance of users?

Q2: What other features would be useful from adaptive hypermedia and existent famous platforms to increase the acceptance?

In this context, this paper revisits the design of MyAds, by conducting an experiment including actual users, to suggested an enhanced design, and compare it to other popular platforms. This is done via the user focused methodology, where 17 users were included in a two hours experiment, divided in two phases.

More concretely, our initial system design for the first version of MyAds used an exploratory design methodology, where participants were asked to produce a list of system requirements and answer a questionnaire regarding their perceptions about what can a future personalised e-advertising system provide [6]. The data collected from the exploratory study was used in the first system implementation iteration [1]. The main features introduced as a result of the exploratory experiment and were implemented in the first iteration of MyAds included: *user profiling via matching user interest and gender with products, social capability to interact, chat, comments about the advertisement, multiple advertisements based on the stated interests, a proportional recommendation of advertisements with the user interests based on the weights of each interest. The higher the weight of the interest users will get more related items to this interest.* However, some of the main drawbacks from the previous experiment included issues with the design of the system and the need of richer user profiling and recommendations, so the need for an updated design has emerged. The methodology used for the second system design phase was the *focus group approach*. The reason for using this approach is because there was a need for a more concrete interaction with the participants, with a larger amount and range of answers, and more focused responses.

II. Methodology: Focus Groups

The research was in a need for more precise ideas about the new system design. The focus group has been defined as a part of a qualitative research method that has been used for a long time, in order to collect solid observations on products, services, advertisements or ideas, to mention some. Focus groups are conducted via an interactive group setting, where the session leader asks questions and then this is discussed by the group, to collect the various perceptions and attitudes [7]. It is a form of *participatory design*, as customers or potential users become part of the solution [8]. It represents a mixture between a personal experience, where individuals express their personal observations and a collective experience of the group ideas [9]. Moreover, the experiment is conducted in a socially relaxed environment for both the participants and the moderators 10]. Although it is performed in a relaxed and interactive environment, it doesn't omit the fact that the discussion is oriented to answer the questions proposed by the researcher [11]. It is also a rather challenging approach of data collection, as the session moderator (usually the researcher) has to insure that ideas are being discussed thoroughly and the general atmosphere is engaging for the participants and within the context of the research [12].

Other scholars have proposed using the focus group approach as an evaluation strategy for summative and formative evaluation, as they are valuable for system design [13].

The reason the focus group approach has been used within this experiment is due to the fact that it provides a complete cycle of understanding the participants' points of view. It has been conducted with both female and male participants from almost the same age group to have a balanced, discussion-oriented atmosphere. This allows for justifying the reasons for certain participants to have certain opinions, eliminating the abstract forms of information collected from questionnaires and surveys [14]. Another reason is that focus groups are useful in research that is oriented towards understanding customers' behaviours and patterns [15]. However, focus groups put the extra burden upon researchers' shoulders in terms of ethical and personal considerations, and require special inter-personal skills. Researchers have to be very conscious about participants' personal ideas and maintain a very professional attitude [14]

III. Experiment

The experiment has been conducted at the University of Jordan with the help of 17 students studying a senior course called "e-commerce platforms". The students' age ranged from 20 years to 23 years. They are all in their final stages of their degree and the module chosen was an optional module. The students volunteered to participate in the experiment, which was conducted within a 2-hours session. The students were divided into three groups, two groups contained six participants each, and one group contained five participants. The groups were of mixed gender. The moderator was the main researcher of this problem and there was another moderator to help in the session organization, but the second moderator didn't participate in the actual discussions.

Each group was asked to use their computers to browse famous social network platforms such as; Facebook, Twitter, Google+ and LinkedIn. While browsing the websites, the moderator asked questions such as "What are the most used websites for social interaction?", "What do you think of online advertisement found in these social networks?", "How do you find advertisements suggested via Facebook, Google+, Twitter and LinkedIn, are they targeted to your taste, is their location appropriate, would you consider clicking on the ads?". After they finished browsing the websites, an open discussion within each group was conducted, to discuss online advertisements in these platforms. Specifically, they discussed which ones were successful and/or which ones were not in increasing their acceptance of online advertisements. Then all the groups engaged in an interactive discussion to address these drawbacks and benefits. The main moderator asked all the groups to record their findings on paper and on the whiteboard, for further discussions.

The second part of the experiment was focused on the case study of Amazon.com, as one of the most popular e-

commerce platforms, and an appropriate model of e-commerce. The participants were asked to also browse the Amazon.com website and repeat what they have done with the social networks. The moderator asked questions such as "Have you ever used Amazon before?", "What are the features you like on Amazon?", "What are the features missing on Amazon?" Again their notes were recorded on paper and on the whiteboard, after conducting the open discussions, as before.

IV. RESULTS AND DISCUSSIONS

The focus group methodology usually generates qualitative data to be then interpreted by the researcher. For the purpose of this research, the researcher has also quantified some of the questions, to create a comparison between the qualitative results and the quantitative results.

A. Quantitative Results

The users were asked to record their perceptions separately to the questions asked by the moderator throughout the experiment. When the moderator asked about the most used online system the results showed that 42% mostly use Facebook, 35% use Google and 20% use Twitter (Fig 1).
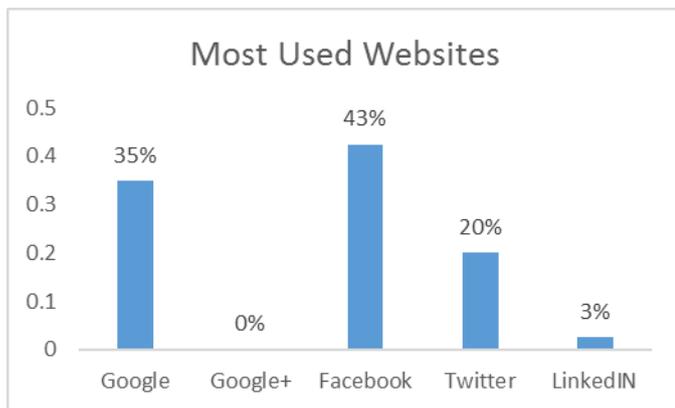

Fig. 1 Most common websites presented by the group

The participants were also asked about their opinion about the advertisements that on one advertisement that have been displayed to them while browsing these websites as were asked to discuss one case so as many as possible advertisements can be discussed. The results showed that 35% suggested that they are annoying, 30% suggested that they are needed and the other 30% suggested that they are needed if put and presented in the right way, instead of being pushed into the page randomly or blocking information, so the ad can be viewed. (Fig 2).
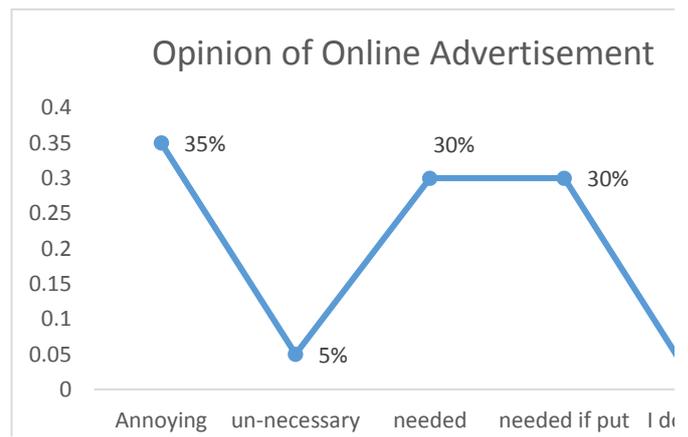

Fig. 2 Group opinion of online advertisement

The users were also asked about their opinion on the advertisements presented in Facebook and Twitter, as the initial results showed that these are the popular social network platform for these groups from both their direct feedback to the moderator and from what they filled in the surveys. The results advocate that Facebook has introduced advertisements that are to the taste of the users (Fig. 3).
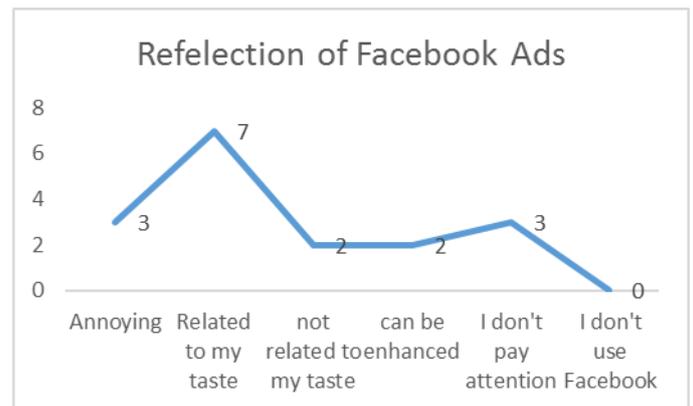

Fig. 3 Group Opinion on Facebook Ads

However, Twitter was not as successful as Facebook, as users' perceptions suggested that Twitter didn't provide advertisements to the taste of the users (see Fig. 4).
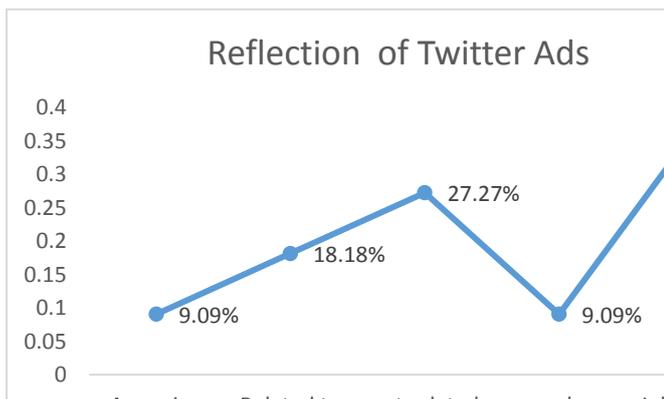
Fig. 4 Group Reflection on Twitter Ads

Fig. 5 Group ideas of Amazon's best features

The previous numbers are representative of the users perceptions of advertisements found on social networks on this sample of users. Participants found that social networks do play a role in their online activities and that advertisements provided by online platforms are generally annoying, unless they are clearly connected within the taste and needs of the users. This provides a clear idea that, in order to increase users' acceptance of advertisements. Moreover, when users examined the advertisements delivered by Facebook, they did agree that this platform does provide them with personalised advertisements, related to their taste, while Twitter failed in this mission. This indicates that the personalisation techniques and user modelling and profiling used by Facebook are indeed successful and worth using for further adaptation implementations of the new iteration of MyAds by including some specific Facebook features. Some of the interesting features found in Facebook that users can actually choose to cancel the advertisement and can then feedback on why this advertisement has been cancelled or blocked. If it was not a sponsored ad, Facebook omits this ad from the user's page.

B. The Case Study of Amazon

The second part of the experiment discussed the case study of Amazon.com, as 53% of the participants had previous experience using it and other 47% didn't. They were given the chance to try Amazon, as it was crucial to address its main features and discuss what the best features were, what features were missing and what can be enhanced so these features as well as the features extracted earlier from social networks can be suggested to be considered in the second implementation iteration in the MyAds system, and further evaluated. The results for the features generated by the users indicated that it provides a variety of products to the users, it is easy to use, provides interactive ads, comprehensive details about products, the recommendations are sufficient and the ability to rate products is highly appreciated. These features were considered the best features for Amazon (Fig. 5).
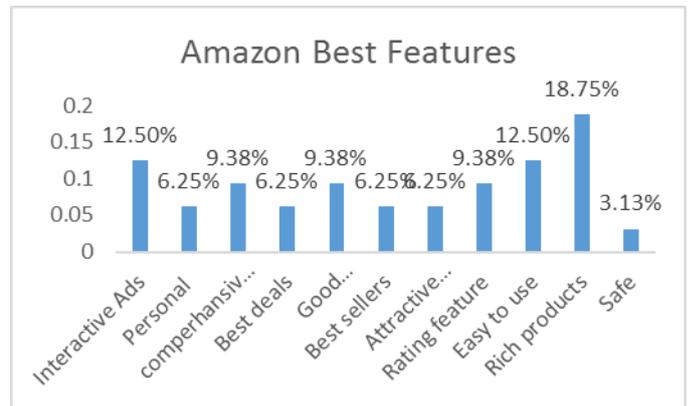
The worst features suggested by the users for Amazon were: that the design is overwhelming and tends to be condensed with information, as well as that it lacks the option of giving them recommendations in other languages (Fig. 6).

Fig. 6 Group Ideas of Amazon's worse features

The results from the case study of Amazon pinpointed that, although Amazon is a very popular platform, there are issues that need to be addressed. This research groups both the approved features to be increasing users' acceptance of online ads, as well as missing features that lead to the rejection of the ads, so they can be further investigated, while updating the second iteration of MyAds.

C. Qualitative Results and Revisited System Design

The qualitative results are listed as a set of new requirements of features to be included within the new system iteration of MyAds. The table below summarises these requirements, as well as categorises them into user modelling requirements and adaptation requirements. During the session, the researcher asked the groups to suggest a number of features for the new system, for both user profiling and adaptation. The users suggested having categorised profiles - and the researcher proposed addressing this via 'sub-profiles' of the initial user profile, to make it more specific for certain needs. This was approved by the users. The researcher also

asked about the adaptation features needed, and the users' suggested to have relevant products - this was addressed via a 'storyline' and recommending not an individual item, but rather a set of products - to this the initial feedback from the users was also positive. These discussions and the previous research resulted in the requirement list below.

TABLE 1 List of System Requirements

Feature	Feature Type
	User Modelling Features
R1	Rich User Profiles that collect precise information about user.
R2	Data harvesting from social networks.
R3	Giving the user the ability to create detailed profiles via sub-profiles.
R4	Linking users' events such as birthdays, special occasions, and graduation with these sub-profiles and recommend items based on that.
R5	Suggest to the user an initial set of personalised recommendations based on their profiles rather than random ones.
	Adaptation Features
R6	Providing the user with an adaptive storyline, as opposed to recommending individual and disparate items.
R7	Give users explanations on the recommendations.
R8	Sort the products based on the user preferences.
R9	Provide users with shortcuts and buttons, to make it easy to navigate the system.
R10	Make the system change the recommendations based on the user behaviour on the system.
R11	Hiding unneeded information.
R12	Give the user the ability to comment, rate and share products.

V. CONCLUSIONS

The work presented in this research paper aimed at revisiting the design of the adaptive online advertisement system MyAds. The researcher used the focus group methodology, as she needed more concrete outcomes from the experiments. Focus groups provide detailed descriptions of users opinions and perceptions about a certain problem. This methodological approach is popular in marketing and advertising, as it tends to make the user express what they actually like. The experiment was conducted with the help of 17 students in their senior level studies. There were three focus groups that interacted based on the questions asked by the moderator. The researcher ensured that all the data collected during the session was recorded for the purpose of quantifying some of these outcomes.

The main outcomes suggested that participants are familiar with popular browsing and social network platforms such as Google, Facebook and Twitter. Participants were very aware of Facebook online advertisements and thought that the suggested advertisements are within their expectations and needs. Other platforms failed to trigger the same acceptance from the participants. Amazon is another success-story for e-commerce websites. Participants believed that it provides a comprehensive, interactive and easy to use environment and they do agree that it is a proper platform to be used as a blueprint for further work to MyAds.

The qualitative outcome of the experiment resulted in a detailed requirements list, to be use in the second iteration of MyAds. The requirement list was divided into *user modelling features* and *adaptation features*.

The user modelling features include richer user profiles, using social networks to harvest personal data, events calendar, and detailed profiles within the system) assigning sub-profiles and the second set of features included the adaptation features. These features included storylines, explanations of recommendations, sorting of products, hiding unneeded information and included some features such as rating, commenting and sharing.

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