Evaluating Personalization and Persuasion in E-Commerce

Ifeoma Adaji, Julita Vassileva

University of Saskatchewan, Saskatoon, Canada
ita811@mail.usask.ca,yiv905@mail.usask.ca

Abstract. The use of personalization and persuasion has been shown to optimize customers' shopping experience in e-commerce. This study aims to identify the personalization methods and persuasive principles that make an e-commerce company successful. Using Amazon as a case study, we evaluated the personalization methods implemented using an existing process framework. We also applied the PSD model to Amazon to evaluate the persuasive principles it uses. Our results show that all the principles of the PSD model were implemented in Amazon. This study can serve as a guide to e-commerce businesses and software developers for building or improving existing e-commerce platforms.

Keywords: Personalization, persuasive technology, e-commerce

1 Introduction

In order to succeed, e-sellers have to give their clients reasons to choose them over their competitors. E-businesses have to offer their clients a shopping experience that is pertinent to who the customers are and guided by their needs [1]. One way to optimize a customer's shopping experience is by providing personalized contents with the use of persuasive techniques [1], [2], [3]. Using Amazon[1] as a case study, this paper aims at identifying the personalization methods and persuasive principles that make an e-business successful. This study can serve as a guide for e-business developers to build successful e-commerce platforms or to improve on existing ones.

2 Related Work and Methods

2.1 Amazon

Amazon is an e-commerce company that started out as an online bookstore, but now sells other items including clothes, electronics, furniture, food, jewelry and toys[1]. Amazon encourages users to review and rate products they purchase. These reviews and ratings (along with other metrics) are used by Amazon to build product recommendations for users[2]. Reviews can be marked as *helpful* by other users and they can also comment on reviews and ask questions about products. Answers to these questions can be *up voted* or *down voted* based on how useful users find them. Amazon uses a ranking system where users are ranked based on how helpful they are to the community. Ranking in Amazon is based on several factors including how helpful

[1] http://www.amazon.ca/
[2] About recommendations http://www.amazon.com/gp/help/customer/display.html?nodeId=16465251

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other users find a review, how often a user writes a review and how many reviews a user has written[3]. Amazon rewards top reviewers with a *Hall of Fame* badge. These badges are rewarded to reviewers who rank 1000 or better[3].

2.2 Process Framework for E-commerce Personalization

To evaluate personalization in Amazon, we used the framework for e-commerce personalization developed by Kaptein and Parvinen [4]. We used this model because it was the only framework we found that evaluated personalization in e-commerce. The model postulates that there are several requirements responsible for personalization to succeed and these are grouped into two main categories; requirements regarding customer behavior and requirements regarding technology. The three requirements regarding customer behavior are; 1) the personalized *content* presented to a user must have an effect on the outcome of the business. 2) The effect should be different for each customer – it should be heterogeneous. 3) The effect should be stable to a large extent.

On the other hand, the requirements regarding technology consists of the technology implemented by an e-business in order to tailor contents so specific users. These requirements are: 1) Ability to measure the effect of personalization, 2) Ability to manipulate content, 3) Ability to scale the algorithm used for personalization.

In this study, we only evaluated the requirements regarding customer behavior as these can be inferred from a system. In the future, we intend to evaluate the requirements regarding technology.

2.3 Persuasive Systems Design Model (PSD)

PSD is a framework for designing and evaluating persuasive systems. It categorizes and maps the elements of persuasion in a system and also describes the software functionality expected in the end product [5]. The PSD model suggests three phases of development and evaluation; understanding the key issues behind persuasive systems, analyzing the persuasion context and designing of system qualities. We however only evaluated the third phase, designing of system qualities, because we are concerned with identifying the persuasive principles adopted in the design of a system. We used this model for evaluating Amazon because the model was developed specifically for designing and evaluating persuasive systems and it also describes the content and software functionality that a typical persuasive system should have.

3 Research Method and Results

3.1 Evaluating Personalization in Amazon

Using the process framework for e-commerce personalization developed by Kaptein and Parvinen [4], we evaluated personalization in Amazon based on the requirements of the customer's behavior. The implementation of these requirements in Amazon are described in this section.

[3] How ranking works http://www.amazon.com/review/guidelines/top-reviewers.html/

Evaluating Amazon based on the customer's behavior as described in section 2.2, it is evident that Amazon personalizes *content* using several means. Amazon changes the *content* displayed to users on the home page based on the last item that user looked up. If for instance a user searches for a digital camera and views the product description of one of the cameras displayed, the next time that customer returns to the home page, Amazon will display several camera suggestions to the user. In addition, Amazon personalizes *content* presented to users by allowing them personalize the adverts they receive from Amazon. Personalized ads displayed to a user are based on information about the user, like previously viewed products and purchases made on Amazon[4].

The effect of the various *content* on each customer can only be evaluated by carrying out a user study which we plan to undertake in the future. This user study will ask individual Amazon users about the implementation of personalization by Amazon and to what degree it is persuasive.

3.2 Evaluating Persuasion in Amazon

In this study, we evaluated the persuasiveness of Amazon as an e-commerce business using the PSD model [5]. In this section, we identified the persuasive principles of the PSD model and how they were implemented in Amazon. We focused on the third phase of the model; design of system qualities. This stage is important as it focuses on the principles of persuasion that should be adopted in making a system more engaging. The principles in this phase are classified into four categories: providing primary task support, dialogue support, system credibility support and social support [5].

This study is still work in progress; in the next phase, we plan to validate all the principles that were identified using a user study, to verify that these principles work as we assume they do.

PRIMARY TASK SUPPORT.
The persuasion principles in this category support users of a system in achieving their primary objective or goal. For each principle, we identified at least one implementation in Amazon. We plan to validate all the identified principles by carrying out a user study on Amazon's users. This study will verify if the implementation of these principles persuade users to use Amazon. The principles in this category and how they were implemented in Amazon include the following:

Reduction: The reduction principle assets that in order to be more persuasive, a system should reduce complex tasks into simpler ones. A typical example in Amazon is the use of 1-Click. From the preview page of a product, users can use the "buy now with 1-Click" button to purchase a product without having to add the item to cart, proceed to check out, preview the payment and shipping address details and then place the order. Here, the task of buying an item has been reduced to a single click event.

[4] Amazon Ad Preferences https://www.amazon.ca/gp/dra/info?ie=UTF8&ref_=ya_advprf

Personalization and Tailoring: The personalization principle of the PSD model states that the more personalized content is available in a system, the more persuasive the system will be. Similarly, the tailoring principle states that a system that provides tailored content is likely to be more persuasive than one that doesn't. The personalization and tailoring principles are similar, hence, both are merged in this review. Users can personalize recommendations on Amazon by rating items previously purchased or by selecting previously purchased items for Amazon to include in future recommendations. In addition, users can change the language for browsing, shopping and communication on Amazon, as well as manage their payment method and options. They can also view and manage their browsing history as well as review their wish list settings. Amazon allows users subscribe to personalized ads based on their activities on other sites where Amazon provides ads or content. All these, according to Amazon, provide a more personalized experience for the user[5].

Self-Monitoring: According to the PSD model, a persuasive system should allow users monitor their performance or status. Once logged in, Amazon users can check their purchase history, previous reviews they have written, helpful votes they have received and their ranking.

Simulation: In order to be persuasive, a system should enable users see the relationship between cause and effect. In Amazon, before purchasing a book, users can view some of its contents using the "Look Inside" link.
Rehearsal: A system could change people's behavior if there exists a means where users can rehearse a target behavior. This is very similar to simulation. An example of rehearsal in Amazon is that users can browse for items, view product description and read reviews without having to sign in or register.

DIALOGUE SUPPORT.
The design principles in this category bring about human-computer communication with the aim of steering users towards their goal. In Amazon, human-computer communication is implemented through reviews, ratings and communication between buyers and sellers. For each principle, we identified at least one implementation in Amazon. We plan to validate all the identified principles by carrying out a user study on Amazon's users. This study will verify if the implementation of these principles are persuasive to users. For example, if a review reminder sent by Amazon actually persuade users to write a review. The principles in this category and how they were implemented in Amazon include the following:

Praise. The principle of praise according to the PSD model states that a system's use of praise can make the system more persuasive. Amazon implements praise in the form of *helpful votes*. For each review a user writes, other reviewers can vote that review as being helpful or not. A user could be persuaded to review more products if their reviews are usually voted as being helpful.

[5] Improve recommendations in Amazon https://www.amazon.ca/gp/yourstore/iyr?ie=UTF8&ref_=ya_improve_recommendations

Rewards. The PSD model postulates that systems that reward their users for performing target behaviors could have more persuasive abilities. Amazon rewards users who have written several helpful reviews with *hall of fame* reviewer badges. These badges are earned by users who earn a ranking of 1000 or better on Amazon. They receive a *hall of fame* badge and are listed on the *hall of fame* page for life. Rankings are earned by writing helpful reviews very often. The usefulness of a review is decided by other users in the community[6].

Reminders. According to the PSD model, systems that remind users to carry out a target behavior is more likely to be persuasive. Amazon relies greatly on reviews and ratings given by users after a purchase to ensure that future recommendations to that user are accurate[7]. Hence, once a user makes a purchase, after the expected delivery date, Amazon sends an email to the user urging him or her to rate and review the item they purchased. Amazon continuously sends a reminder until such review and rating is carried out by the user.

Suggestion. The suggestion principle asserts that users are expected to achieve their target behavior if the system offers suggestions while in use. In Amazon, users are offered suggestions while typing in the name of a product in the search bar. The suggested product is further classified based on the various departments the product occurs in, giving the user several options to choose from. Amazon also offers suggestions to users in the form of the *frequently bought together* feature which shows what items are commonly purchased together by other users based on the current content of the user's shopping cart.

Similarity. This principle according to the PSD model states that users are more persuaded if a system behaves in a way that is similar to their behavior. In other words, a system should mimic its users in specific ways. Amazon implements similarity using the "*customers who bought this items also bought"* feature. With this feature, customers can see what other items similar users have bought.

Liking. Going by the PSD model, a system that is liked by its users is likely to be more persuasive. In order words, a system should look appealing to its users. As this feature is subjective and can only be determined by users, we did not review this persuasive principle. However, the proposed user survey which is a continuation of this study, will include questions to confirm this principle.

Social role. This principle of the PSD model states that systems should adopt a social role to make them more persuasive. Amazon has an active social community where users can ask and answer specific questions about products. Questions and answers can be *upvoted* or *downvoted* based on how helpful they are. Users who participate improve their current ranking and can earn rewards. Amazon also has an active review system where users can review products and earn rewards while doing so. This social role amazon plays could be persuasive to some users.

[6] http://www.amazon.com/review/guidelines/top-reviewers.html/
[7] https://www.amazon.ca/gp/yourstore/iyr?ie=UTF8&ref_=ya_improve_recommendations

SOCIAL SUPPORT.
This category of design principles describes how to design a persuasive system by leveraging on social influence. We identified at least one implementation of each principle. The principles in this category and their implementation on Amazon include the following:

Social learning. According to this principle, a system can be more persuasive if users can learn from other users in the system. In Amazon, product ratings and reviews and their helpfulness are public, hence users can learn from other customers who have bought a product they are interested in. Users can also learn about sellers based on the reviews of sellers done by other users that have had dealings with such sellers in the past. Customers can also learn more about products from other community members by asking specific questions from those that bought similar items in the past. Users can also review previously asked and answered questions to learn more about specific products.

Social comparison. This principle states that a system is more persuasive if it allows users compare their performance with others in the system. Amazon uses a ranking system which gives users a rank based on their participation and helpfulness in the community. This rank is visible on each user's profile (though it can be de-activated to prevent public viewing), hence users can compare their performance to that of other customers in the system. This feature could also help users decide how seriously to consider another customer's review. The list of *hall of fame* reviewers is also public, hence users can compare their performance to those of others.

Normative influence. The normative influence of the PSD model asserts that a system should leverage peer pressure in order to persuade users to carry out their target behavior. Amazon's ranking system could be a source of normative influence among users, whereby customers hoping to rank high in the system buy more products in order to write reviews that other users could consider helpful, thereby improving their ranking among their peers.

Social Facilitation. This principle asserts that a user would be more persuaded to use a system is he/she is able to recognize others also using that system. In Amazon, this could mean that users are more persuaded to rate a product if other users have rated it or that users are more compelled to give a high rating if other users did same. In our proposed user study, we will verify the implementation of this principle by asking users what persuades them to rate a product.

Cooperation. According to the PSD model, a system that brings about cooperation among its users could be more persuasive than one that does not. Cooperation in Amazon is evident in product reviews where a user describes his/her experience with a product and other users concur with that user citing their own experience. This could persuade skeptical customers to take a decision about a product. The *customer questions and answers* product feature could also promote cooperation, where users can comment on existing answers to improve on it.

Competition. This principle stems from humans' natural urge to compete and states that for systems to be persuasive, they should provide means of competition among users. The ranking system of Amazon could lead to competition among users, where by customers who want to improve their ranking buy more products in order to write more reviews with the hope of earning *helpful* votes.

Recognition. This principle according to the PSD model asserts that a persuasive system should offer public recognition to users who perform their target behavior. Amazon recognizes helpful reviews by stating how many people found a review helpful. By clicking on a user's profile, one can see the percentage of helpful reviews that user has written. One can also view the ranking of that user. In addition to recognizing helpful reviews, Amazon recognizes helpful reviewers by awarding the *hall of fame* reviewer badge to the top ranked reviewers. This badge is visible on all reviews written by recipients of the award, hence such awardees are publicly recognized.

4 Conclusion and Future Work

In this study, we identified the personalization and persuasion methods adopted by a successful e-commerce business, Amazon. Using an existing process framework, we identified the methods of personalization implemented by Amazon. With the PSD model, we evaluated the persuasion principles adopted by Amazon. We were able to identify the implementation of all of the principles of the PSD model. This study can guide developers and other stake holders in building successful e-commerce businesses.

This study is work in progress. In the future, we plan to validate the findings in this paper by carrying out a user study to confirm the effectiveness of the principles identified. We also intend on evaluating the *system credibility support* principles of the PSD model, as this category of principles cannot be inferred from the system but through a user study.

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