

The Smart Shopping System (SSS): An Adaptive E-shopping Application for Reflecting the User's Personal Model

Hesham M. Kamel
College of IT, UAE University, UAE
Hesham@uaeu.ac.ae

Maryam Al-Aryany
College of IT, UAE University, UAE
200105137@uaeu.ac.ae

Moza Al-Nasseri
College of IT, UAE University, UAE
200105140@uaeu.ac.ae

Hamda Al-Awar
College of IT, UAE University, UAE
200105230@uaeu.ac.ae

Abstract

Clothing shopping systems are widely spread on the World Wide Web (WWW). However, without guaranteeing that these online systems are convenient for the average user, it is difficult for THE "online" businesses to gain the user's trust and it's also intricate for them to build a wide range of clientele. Therefore, we propose a solution, a web-based clothing shopping system call The Smart Shopping System (SSS) that provides an adaptive virtual model for computer users to successfully achieve their online shopping goals.

In this paper we address the problem that users encounter when they are shopping online, then present our solution and the technique behind developing the (SSS) system. We focus on the rationale behind our system interface design and implementation according to HCI standards. In addition, we discuss several important issues and cover features that will be addressed as in future work.

Keywords: E-shopping, Adaptive virtual model, Web-based shopping, SSS, Accessories.

1. Introduction

Due to the increasing use of computers and Internet usage by the public, it is expected that computer-based shopping systems (or on-line shopping) will become more common means of trading Goods and Services in the future. Moreover, there are now many different shopping sites on the Internet; however, most of these sites lack a user-friendly interface design, which is essential for the success of online software as claimed by Tarjé team, an On-Line Shopping Application [6]. Therefore we believe that the interface to online shopping systems must be pleasing to the eye, effortless to learn and easy to use. Otherwise, people in general will likely become less interested in online shopping applications.

In this paper we present our design solution to the problems that are involved in online shopping systems especially in the clothing shopping field. Our ultimate goal is to design a web-based system that provides a 2D virtual model, which can be easily manipulated/customized by the average computer user (e.g., change skin color or hairstyle), in order for the system to reflect the user's personal model. Moreover, the user will have the ability to browse different types of

clothes, try them on the virtual model, then purchase them once he/she is satisfied with the final outlook.

Section 2 covers related online shopping systems. In Section 3, we focus on the rationale behind the design and development process of the Smart Shopping System. Section 4, we discuss the implementation and design approach of the system, then demonstrate the system via examples. In Sections 5 and 6 we cover future work then conclusion.

2. Related Work

We can not deny that there exist many online shopping systems. However, not every shopping system provides a virtual model. Moreover, not all of the provided virtual models can be customized. One of our main goals behind the design of the SSS system, is to gather the most important and desired features of these related systems, then integrate them with the (SSS) in order to create a robust and usable system. For example, EMS online shopping system [1] has a useful feature which shows users the clothes by size (e.g., small, medium, and large). This feature will be applicable if the user knows his/her actual size; however, this question remains unanswered: what if the user is not sure of his/her size? It would be practical if the system can calculate the actual (or the perfect) size of the user.

The Japanese system [2] that is similar to our system has a 3D model and it has been implemented using Flash. However, controlling the 3D model is too difficult using this system, where trying the clothes onto that model seemed like a non-trivial task. This factor became one of our main reasons that we decided to use a controlled 2D model in our current system, rather than uncontrolled 3D model. Thus, overcome the weaknesses in clothing the 3D model.

Maya Unlimited [3], permits the user to create the desired model in order for the user to try clothes on it. Through this method, Maya software improves productivity of clothing simulation. Nevertheless, we believe that showing the user more details about the

measurements of the model, makes the model very difficult for the user to manipulate, where it then becomes uneasy to use. Therefore, this overall method limits the types of target users to only serve experts users, leaving out a large range of people.

ClothReyes [4] is another system which is (in some ways) similar to the (SSS) system. It was the world's first and only cloth simulator when it appeared on the market in 1997. ClothReyes system focuses mainly on clothing the models with the presence of wind. The problem with this system is that it lacks a method of organizing the system tools and the sequence of order. In addition, calculating and showing the wind effects are not of a normal user interest. A powerful system is worth mentioning here, is a system developed by Toshiba [5] in collaboration with a Japanese software company. This system creates a virtual "you" that enables trying on clothes and moves as "you" do. However, it is still at an early stage, but it could be in use by 2007. So, till that time, we will have to wait for this revolutionary technology.

3. When Shopping Online, Issues to Consider

As we mentioned above, the idea of making a shopping system on the Internet available is not new. However, many online customers probably think when they are browsing the Net for clothes: "this looks great, but will it fit me"? To answer this question, we developed the idea of creating an online shopping system that provides a virtual model for customers, which should be modified according to their changes in order to fit their physical requirements. Moreover, if the clothing selections are limited, other customers might face difficulties to match clothes and outfits from one store. Therefore, based on that idea, the (SSS) system will include goods from different stores to provide a variety of possible matching options. Furthermore, in the case of these customers who don't know their exact size, our system will allow the user to enter his/her height and weight, and the system will then suggest a recommended size.

4. The SSS System Implementation and Design Approach

We considered many different options before agreeing on the final design of the system. Whether to have an introductory splash page with limited functionality or not, was discussed extensively. An answer to this question and more are covered in the following sections.

4.1 Designing the Interface

Our target-users are most likely busy people who cannot visit the mall; thus, following the approach of the team of Tarjé, an On-Line Shopping Application [6], we decided to save our customers' time and not make them wait until the flash introduction finishes. We have decided to implement a 3D shape for the basic panel of the system, since it has the main links and it is consistent in all the system windows.

Additionally, the paste shape of it with the purple color gives a hint that shopping is fun and attracts customers who likely tend to be more attracted to unordinary designs. All the features we formerly mentioned above are shown in Figure 1. Moreover, we decided to use a metal frame for the model's window to make the user feels that it is tangible as if s/he can hold it like a mirror and see him\her self with the items (see Figure 2). Furthermore, regarding the order process, the rationale behind putting the order command as a spot of orange color is because symbols have been found to be recognized faster and more accurately than text. Moreover, as Wilbert O. Galitz wrote in his book "The Essential Guide to User Interface Design" [7], graphical representations of objects are thought to be more natural and closer to innate human capabilities.



Figure-1: Main page for Smart Shopping System.

In addition, users usually feel annoyed when the system is slow or when they see many items in a crowded window. Thus, following the approach of Promod Designers Team [8], we present the solution of using pages rather than a scroll in listing items as shown in Figure 6. Using this approach, the load on the system will be less, which means faster navigation and displaying a reasonable number of items in each page.

As for our choice of putting the product information under the model window, rather than under the product itself, our decision was based on a study by Michael Bloch of "Taming the Beast", an ecommerce and web marketing research [9], which stated that, the "me" generation wants everything now, skimming over information. Besides, we have decided to put it under the model window, rather than the other side of the window, because this way it will be closer to the eyesight of the customer. Thus, he/she will be able to read the information of the product and meanwhile be able to look at the product on the model. Also, the user will be able to notice when the product information is changed.

Regarding the membership page, it is mainly a data entry page. Therefore, according to Alan Cooper in his book "About Face: The Essentials of User Interface Design"[13], we can make it a smoothly functioning data entry page using entry boxes (textboxes) and lists, similarly in the members and non-members pages.

4.2 Customizing the Model



Figure-2: Default Model

Customizing the system's model is one of the important features that our system has. The user can change the hair color and style, and the skin color as well. Once the user chooses one of the shopping ways, the default model will be displayed as shown in Figure 2. In order to customize the model, for example, having red long hair and white skin, the user has to click on the "Hair Style" option. A small window will appear where he/she has to select "Red" color and the corresponding hair style, see Figure 3. Next, he/she has to click on the "Skin Color" option and another small window will be displayed, prompting the user: "select White color", see Figure 4. Finally, the new customized model is displayed for the user where he/she can try clothes on it.



Figure-5: Customized Model



Figure-3: Hair color & style

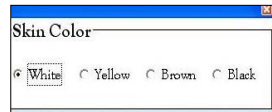


Figure-4: Skin color window

4.3 Dressing up the Model

One of the powerful features of the SSS system is that our users can dress up the model in only two steps. This method saves them time and introduces a memorable way of using the system. For example, if the user wishes to try one of the dresses available in Promod store, she can simply click on the "Dresses" section, then double click on the picture of the dress she wants to try on the model. By applying these two steps, the user can see the dress on the model as well as a description of the dress under the model's frame, see Figure 6.



Figure-6: Promod Dresses section with a dress on the model.

4.4 Recommended Size



Figure-7: The perfect "recommended" size page.

Our system also provides the feature of finding out the perfect size. If the user enters some body measurements, the system will give him/her the recommended size of clothes that fit him/her body measurements. Figure-7 shows this feature's page. As mentioned previously, this feature will be available for the customer through all pages of the system as a link. For example, a customer can use this feature to find

out his\her perfect size in the beginning of his\her navigation in the system, or s\he might use it to find out what size is preferable for him\her when s\he is in the shopping process. The calculations for the recommended size are based on the approach used in Syrian Medical Guide [14], which gives you health conditions and according to them, we can decide the recommended size.

4.5 Login Feature

Regarding the members' login, we insured that the user's browsing experience, using our system is totally pleasing. We wanted the user to feel free to login whenever s\he wishes to, and not limit him\her to login only in the beginning of the system as CWD, Cool Web Design, for web designing suggests [12]. Therefore, we added the 'login' link in all system pages along with the perfect size and comments area features. Thus, to enable the user to use these features whenever s\he feels like it. Besides, the system will remember the member's name and password and will let him\her navigate through the system without having to re-type them whenever s\he move to another page. If the user forgot his\her password, we used the favorite question password security test which is commonly used in many online applications to retrieve the password. If the user answers the question correctly, an email with the password will be sent to him/her.

4.6 Additional Features

We discovered that every shopping system provides some form of advertisements; however, in general people dislike the overuse of banner advertisements with many flash and animation all around the window. Thus, we followed the advice of Fencil Web Design.com team [10], we have decided to use only one banner for the advertisements in which they are going to be organized. Therefore, whenever a customer wants to see the advertisements, he/she can only look on the top of the window to see them. It can be seen on the top of each screen shot (figures) available in the paper.

Furthermore, the system provides a comments area feature for the members to share ideas and opinions about the system or items provided, we built it similar to a forum. The rationale behind this feature is that the forums are widely spread on the internet and our assumption is a high percentage of Internet users have used a forum before. Thus, the forum layout is familiar to most of our potential users, which makes it easier for them to navigate through the comments. Moreover, we noticed that it is extensively used in many online shopping systems (e.g., E-bay). According to WebSynrgi Design [15], Adding features such as the discussion forums, in our case, comments area, increases the practical use and flexibility of a business website. The advantages are discernible to website visitors and the website's owners and may even make it more cost effective.

Also, if a customer feels lost in the system, s\he can use the help link to view the help for that page. Each page in our system has a specific help option. The rationale behind that is to make the system as clear and user friendly as possible for the user.

For customers who are busy and are using our system because they do not have the time to go to the mall, we have decided to provide them with the option of listening to music in order to bring them to the mall surroundings and feel that they are really doing shopping. Besides, this feature is provided in all the system pages. In addition, according to A-1 Technology Team for computer solution [11], we used the easy-to-use shopping cart systems which most of the users prefer. You can see an example of a list of a shopping cart items in Figure 8.



Figure-8: Order confirmation page; the cart items are listed.

5. Future Work

In the future, we intend to build a manageable 3D model rather than the 2D model we are currently using. It will be more accurate and much more convincing to the user's eyes. In addition, the system will ask the user to take and register body measurements, and then applies them to the model, in order to resemble the user's body shape. Furthermore, it will be shown on the model where a measurement should be taken, e.g. show some points on the model's weight, height, waist and shoulders to denote for the user that these are the sizes needed. The system will also offer the user advice on how to get the most accurate measurements. In addition, using this method, the model can compare the garment's size with the model's size, and then show the user where mismatch of measurements will not fit him/her. Additionally, we are planning to provide a male, kids and "male, female" models. These three extra models will have all the new features that are mentioned above for the female model.

6. Conclusion

Besides developing the Smart Shopping web-based system (SSS), we have learned many things. For example, during the development of the system, we learned that almost every part of the interface design has a great meaning to the target user and that it should be designed based on some standards (e.g., perform usability testing at the early stages, base the design on HCD etc.). Although developing the system benefited us in many ways, it made us realize how difficult it is to build such systems without a good business background.

We have also learned from previous work that was done in this area how to explain the necessary factors to build a successful home shopping model. Indeed, a clear and user-friendly web-site design can attract more customers. We have developed a suitable logistics and adaptable system in order for us to successfully transfer the product to the end-user. A 3D model is of no use to the user, if the model can not be easily manipulated. We believe that

providing the online-shopping user with a method to reflect their personal model can be effective; thus increasing the E-shopping population.

Acknowledgement

An experience is always the result of the sweat, tears, and effort of many people. For their effort in guiding us through this wonderful experience, we would like to thank all the people who helped us go through the development phases of this project. Moreover, we would like to thank the teachers who tried their best to transfer their experience to us. Special thanks goes to Mrs Huda Amer, Dr. Halil Erhan, Dr. Hazem El-Khateeb, Dr. Ahmad Jaffar and Mr. Hyder Al-Ameed. Acknowledgments for their contributions to offer this great experience must undoubtedly go to the CIT. We would also like to thank our friends who gave us the support we needed and to Promod (AlAin branch) and its manager Miss Amill Yamadow.

References

- [1] Eastern Mountain Sports (EMS), Women Fleece Jackets. <http://www.ems.com/navigation/>
- [2] RNA Inc. Clothing System, <http://mainc.jp/>
- [3] Alias Partners. Maya Unlimited, Clothing System, http://www.alias.com/eng/partners/conductors_program/plugins/dressingsim.shtml
- [4] Reyes Infografica. The first clothing system, <http://www.reyes-infografica.com/cloth.php>
- [5] BBC NEWS, Virtual Dummy to try on clothes, <http://news.bbc.co.uk/2/hi/technology/3430131.stm>
- [6] Tarjé: An On-Line Shopping Application. Johnny Humphrey, Jodi Shephard & Ashley Taylor, http://www.cc.gatech.edu/classes/cs6751_97_winter/Projects/shopping/a2/#part2
- [7] Welbert O. Galitz. The Essential Guide to User Interface Design: an introduction to GUI Design Principles and Techniques. John Wiley & Sons, 1996, pp. 17-18.

- [8] Promod official website. les Tops Page, Printemps-e'te'-2006.
<http://www.promod.com/odyssee/src/>
- [9] Bloch Michael, Shopping cart abandonment: How to minimize orphaned carts, Taming the Beast.
<http://www.tamingthebeast.net/articles4/cart-abandonment.htm>
- [10] Fencl Web Design.Com, Bad Web Site Design. Fencl Web Design.Com LLC.
<http://www.fenclwebdesign.com/bad-design.htm>
- [11] A-1 Technology, Shopping Cart Systems. A-1 Technology Inc.
<http://www.a1technology.com/shopping-cart-systems.htm>
- [12] Cool Web Design, a global benchmark and a source of design inspiration for web designers.
<http://www.cwd.dk/default.asp>
- [13] Alan Cooper. About Face: the Essentials of User Interface Design. John Wiley & Sons, 1995.
<http://www.amazon.com/gp/product/>
- [14] BMI calculator for body measurements. Syrian Medical Guide
http://www.syriamg.com/old/ur_weight.htm
- [15] Websynergi Design, Develop Custom Web Applications. WebsynergiDesign Ltd.
http://www.websynergi.com/website_applications.asp