AN E-COMMERCE BASED WEB PORTAL TO SUPPORT CUSTOMIZE CLOTHES FOR OBESE PEOPLE

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Abstract. Obesity is growing day by day all over the world. It is a global problem affecting both male and female worldwide. In mall and market, most of the clothes available are of standard size (small, medium, large). People, who are obese or overweight, have a problem to find properly fitting clothes. They have only one option, which is to manually stitch the clothes through tailors. In this context, we are going to propose a web portal architecture to customize clothing making system for obese people. Through our web portal interface tailors can enhance their income and on the other hand, obese people can customize clothes online by simple easy steps. The web portal will allow the obese people to choose a fabric, apply style and provide measurement. PHP, MySQL, JavaScript, and Ajax was used to develop the web-based portal for buying customized clothes by overweight individuals.

Keywords: Customize cloths; Obesity; e-commerce; web portal; PHP; MySQL; Ajax.

1. Introduction. Through Electronic Commerce (EC), the company can increase their economic growth, reduce transaction cost and improve efficiency, effectiveness [1]. In fact, many consumers have found benefit namely convenience, more choices for products and services, vast amounts of information and time savings in using the internet for buying products online. Rising obesity rate is a global phenomenon that affects individuals irrespective of income, age, and sex across the globe [2]. Presently, billions of people – nearly 30% of the total population of the globe – are either obese or overweight. Moreover, the obesity rate for both male and female have increased drastically during recent years [3]. In most of the developing countries, women’s show a higher rate of obesity as compared to advanced countries, where the men show upper rates of obesity, as compared to women. Moreover, in many advanced countries, the obesity rates has severely affected individuals of the younger generation. These days the normal values of Body Mass Index (BMI) are more than the previous estimations, this clearly indicates an alarming increase in obesity across the population of the world [4]. Since clothing is normally constructed for people with standard body dimensions and posture therefore getting proper fitting clothes for overweight/obese individuals become troublesome. In this regard, we developed an interactive and dynamic electronic portal for obese/overweight people. Through this electronic portal, we can confidently enhance the income of the tailors by generating more business as well as provide a simple way for online purchase of customized clothes for obese/overweight people. This study was intended to develop an application using the prototype methods for exploring various clothes for obese people using PHP and MySQL platform [5].
**Comparative study with related E-Commerce clothing system and problem statement.** Currently all the e-commerce based web portal namely ebay, amazon, flipkart, forever 21, mod deals, styles for less, 10 dollar mall, necessary clothing sell clothes mostly of standard sizes namely small, medium, large and extra-large. However, few web portal namely My Tailors and Tom Tailor have a system to address the clothing issues of obese people but their system require an appointment with a tailor near your city. However, researcher in the past [6-7] have tried to address and solve the problem associated with the current online system namely non-availability of customize clothes for obese people as well as non-availability of tailors provided by some online portal near customers vicinity. In this context, recently Niculescu et al., 2016 have built a web portal for selling customized clothing based on some specific anthropometric data of obese and overweight individuals from Poland and Romania. However, the current system was based on anthropometric data of obese people of their localized population namely Poland and Romania. However, the anthropometric data of individuals might vary for population from countries across the globe. Therefore, the anthropometric data obtained by Niculescu et al., 2016 cannot be standardized for every obese people of the world. Therefore, in this regard our proposed E-commerce clothing system for Obese (ECCSO) will provide a dynamic platform to order/stich customized clothes for both obese and normal individuals based on their measurement. The customers can provide their measurement based on certain attribute such as height, weight, trouser waist size, shirt size provided in the user interface. Subsequently the customer can choose his/her preferred fit (extra full fit, classic fit and tapered fit), neck and shoulder style (Slopping Shoulder Long Neck, Normal Shoulder & Neck, Square Shoulder Short Neck), upper body type (Regular, Hefty, Fit, Athletic, Slim), and midsection (Large Stomach, Hefty, Slight Stomach, Flat Stomach). Our web portal also provides the customer additional advantages of choosing fabrics by clicking different type of fabric image. Additionally, the customer can apply style like collar style, collar & cuff stitch, short sleeves style, long sleeves cuffs, pocket style, body & back style, and monogram to the purchased clothes.

**2. Materials and method.**

**System architecture.** We have developed an e-commerce system for obese people, named E-commerce clothing system for Obese (ECCSO). This was a small application so we used waterfall method for the development of e-commerce clothing system for obese people [8]. In the early stages of the waterfall model Unified Modeling Language (UML) ver. 2.0 was used as a modeling language. The waterfall method has five phases [9] namely: 1) Requirement, 2) system design, 3) implementation and testing, 4) integration and 5) operation and maintenance as shown in Figure 1.

For easiness, model-view-controller (MVC) architecture was used in the implementation phase to develop the web portal for ECCSO. Model, view, and controller is part of MVC. MySQL database is a model that is an open source Relational Database Management system (RDBMS) which was used for managing the input from obese people namely 1) style, 2) fabric and 3) measurement. Hypertext Markup Language (HTML) was used to develop a responsive dynamic user-friendly web portal of ECCSO. The controller receives input and transforms it to command for either model or view using the server-side scripting language the Hypertext Preprocessor (PHP). The functionality of each module of the ECCSO was tested using white-box and black-box, respectively.
2. Results and discussion.

System architecture. In the proposed clothing system architecture of ECCSO, the customer first choose the fabric after that he will apply a different clothing outfit style. The clothing outfit style namely comprises of collar style, collar & cuff stitch, short sleeves style, long sleeves cuffs, pocket style, body & back style, and monogram. Later on, the customer will provide his measurement. The feature measurements consist of height, weight, trouser waist size, shirt size. Subsequently the customer can choose his/her preferred fit (extra full fit, classic fit and tapered fit), can select the neck and shoulder style (Slopping Shoulder Long Neck, Normal Shoulder & Neck, Square Shoulder Short Neck), can select upper body type (Regular, Hefty, Fit, Athletic, Slim), can select midsection (Large Stomach, Hefty, Slight Stomach, Flat Stomach). Finally, the customer will pay the money online. Tailor on the basis of fabric, style, and measurements provided by a customer he will stitch clothes. At the end either customer collects clothes from tailor shop or tailor will deliver clothes to the customer [9].

![Diagram](image)

**Figure-2:** Proposed e-commerce customized clothing system architecture

System requirement, design, and implementation. The functional requirement of ECCSO System is centered on the interaction of the admin, customer, fabric supplier and tailor. In this context, the interaction between the admin, customer, fabric supplier and tailor was modeled using the use case diagram as shown in Figure (3-6), respectively[6].
Figure-3: Use case diagram for admin of ECCSO
**Figure-4:** Use case diagram for customer in ECCSO

**Figure-5(a):** Use case diagram for fabric supplier in ESSCO
The use case diagram of ECCSO shows that it includes four actors namely the admin, customer, tailor, fabric supplier and 18 use cases. The actor admin of ECCSO after successful login can add and manage (edit/update/delete) fabric, tailor, fabric supplier and customers order details. On the other hand, the actor customer after successful login can make an order, update profile and view order history.

Table 1. Use Case Actor Description

<table>
<thead>
<tr>
<th>Use Case</th>
<th>Actor</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Login</td>
<td>Admin - Fabric Supplier - Tailor</td>
<td>Enable admin, fabric supplier and tailor to login after verification from username and password.</td>
</tr>
<tr>
<td>Manage Fabric Details</td>
<td>Admin - Fabric Supplier</td>
<td>Enable admin and fabric supplier to manage fabric details.</td>
</tr>
<tr>
<td>Manage Tailor</td>
<td>Admin</td>
<td>Enable admin to manage tailor details.</td>
</tr>
<tr>
<td>Manage Customer</td>
<td>Admin</td>
<td>Enable admin to manage customer details.</td>
</tr>
<tr>
<td>Manage Fabric Supplier</td>
<td>Admin</td>
<td>Enable admin to manage fabric supplier details</td>
</tr>
<tr>
<td>Manage Order</td>
<td>Admin</td>
<td>Enable admin to manage order details.</td>
</tr>
<tr>
<td>Manage Payment</td>
<td>Admin</td>
<td>Enable admin to manage payment details.</td>
</tr>
<tr>
<td>Register</td>
<td>Customer</td>
<td>Enable customer to register in the system.</td>
</tr>
<tr>
<td>Make Order</td>
<td>Customer</td>
<td>Enable customer to make an order.</td>
</tr>
<tr>
<td>View Assigned order</td>
<td>Tailor</td>
<td>Enable retailer to check his sales status.</td>
</tr>
<tr>
<td>View Order Details</td>
<td>Fabric Supplier</td>
<td>Enable fabric supplier to view order details.</td>
</tr>
</tbody>
</table>
Activity Diagram. After use case we created activity diagram for admin, customer, fabric supplier and tailor. The activity diagram explain the activity associated with each actors in ESSCO. Figure 6(a) represents the activity diagram for admin where admin will login with a unique username and password after that he can manage (edit/update/delete) fabric category, fabrics, fabric supplier details, customer details, order details, and payment details. Finally admin can logout. Figure 6(b) shows the activity diagram for customer where customer can register with their personal details, after registration the customers will get a unique username and password so customer will able to login. After successful login customer can make an order. To make an order customer have to choose fabric to cart, apply different style, input measurement respectively. Finally the customer can do payment. The customer can also update profile, view order related history. Figure 7(a) illustrates the activity diagram for fabric supplier where the fabric supplier can login with a unique username and password after that he can manage (add/update/delete) fabrics, order details. Finally fabric supplier can logout. Similarly, Figure 7(b) shows the activity diagram for tailor where tailor after successful login with a unique username and password can view assign order details of the individual customers. Finally tailor can logout.

Entity Relationship Diagram. Subsequently, an Entity Relationship Diagram (ER) using phpmyadmin version 2.11.7 was made to design the interactive web portal as shown in Figure 8. The ER diagram have 11 entity namely 1) fabrics, 2) fabric supplier, 3) category, 4) tailor, 5) style, 6) measurement, 7) customer, 8) payment, 9) order, 10) cart, and 11) admin. Each entity have attributes.
Figure-7(a) : Activity Diagram fabric supplier

Figure-7(b) : Activity Diagram tailor

Figure-8: ER diagram of ESSCO
Implementation.
Interface and visualization. An interactive user friendly web interface of ECCSO was designed to facilitate the customer to choose different category and measurement of cloths for the obese customer. The web page of ESSCO is divided into three sections namely 1) header, 2) body and 3) Footer. The header section of ESSCO consist of a navigation bar for customers. The navigation bar consist of following link namely category of cloths, accessories, how to measure, why tailoring, gift certificate and new offers. The body of the interface consist of banner, advertisement and information regarding the usage of the web portal. Similarly the footer consist of link such as information about the portal, customer service, frequently asked question, return policy, contact us etc as shown in Figure 9. The customer can visit the fabric page by click the respective category of cloth namely shirt, pant etc. Figure 10 represents the fabric page for customer where customer can choose fabric to cart for next step. Figure 11 represents the style page for customer where customer can apply style to fabric like collar style, collar & cuff stitch, short sleeves style, long sleeves cuffs, pocket style, body & back style, and monogram. Figure 12 represents the measurement page for customer where customer can input measurement like of height, weight, trouser waist size, shirt size. Subsequently the customer can choose his/her preferred fit (extra full fit, classic fit and tapered fit), can select the neck and shoulder style (Slopping Shoulder Long Neck, Normal Shoulder & Neck, Square Shoulder Short Neck), can select upper body type (Regular, Hefty, Fit, Athletic, Slim), can select midsection (Large Stomach, Hefty, Slight Stomach, Flat Stomach).

Figure-9 : Home page of ECCSO  
Figure -10: Fabric Page of ECCSO

Conclusion. In this paper, we developed an electronic portal for making customize clothes for obese people. The customize cloths system will be a more efficient and streamlined processing system for the purchase of customize clothes for obese people. The web portal allows a smooth interaction between the customer (obese people) and the tailor which help the customer to purchase and stich customize clothes based on his requirements. The web portal thus solve the problem associated with the available models. Moreover, our present system will provide better coordination between customers and the tailors leading to desired results in terms of quality, service, profits, market, and competitiveness.

Contribution of authors. All the authors have contributed equally in designing of the system as well as in the preparation of the article.
REFERENCES


