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# **Automated Tailoring System using Simulated Environment**

**Bachelor of Science in Computer Science**

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# Certificate

We accept the work contained in the report titled “Automated Tailoring System using Simulated Environment”, written by Mr. Danyal Ahmed Malik AND Mr. Hassam-Bin-Asad as a confirmation to the required standard for the partial fulfillment of the degree of Bachelor of Science in Computer Science.

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# Abstract

The aim of the project is to automate manually maintained tailoring system. The automation of the system will improve the efficiency in overall process which will introduce betterment in the services and will provide a structure that will be good in keeping customer records, and will provide quick retrieval of queried data and also result in a paperless environment. The main concern of this project is to provide simulated environment to see the end stitched cloth and to allow customer making their choice in selecting different components/parts of the clothes while looking at the simulation of the final project in run time accordingly. The project will also cater the management of information of the customer and will also provide a transaction system to generate an invoice of the order of the customer.

The resultant product will introduce an automated mechanism in tailoring industry which will lead the industry participate in modern era of technology.

# Acknowledgments

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# Chapter 1

## Introduction

### 1.1 Overview

With the recent advancements in Computers and Information Technology, intelligent and automated systems have become a significant requirement to meet the challenges faced in different fields. To automate the traditional tailoring system is one of the major requirement in different tailoring environment where traditional mechanism is used for sewing the clothes. Usually, Customers are not satisfied with this mechanism as sometime customer need idea about how the suit will look like after stitching. Sometime customer satisfactory response is not obtained which, therefore, can cause damage to business and to the market position of Tailoring Company. Maintaining related data of a customers and tracking customer order has also got very much importance in current scenario.

To Eliminate the traditional system there exist a wide scope for an automated tailoring system which will help in simulating the real world scenario by showing a prototype of how the clothes will look on the customer after stitching. Use of an automated system will also help in keeping records of customers, taking care of generated order, making customer involvement by mean of reminders and notifications, customer relations will also be increased (i.e. by feedback) which will benefit the company by upsurge in business and strengthen market position in more effective ways.

### 1.2 Objective

The objective of this project is to develop an automated tailoring system that follows a systematic approach by showing the prototype of clothes after stitching in simulated environment to customer. The project will also focus on developing management, tracking system for same domain.

### **1.3 Problem Description**

Currently customers have to walk to the tailors to get their measurements taken for the tailoring of their garments by not knowing how the cloth will look like after stitching. Their details are taken and kept on papers. In traditional system the detail of customers are kept on papers which is not an effective way of maintaining the records. Due to the manual systems in use, the whole process tends to be slow. The proposed tailoring system will eliminate all these manual interventions and increase the speed of the whole process and make it reliable for customer to get satisfy about their orders. The simulated prototype will be completely adaptable according to the measurements given by the customer. The system will work as a desktop application for registered/non registered customer and also work as an online system for registered customer this will help in maintaining the records of the customer, tracking their orders, notify the customers about their order (i.e. giving the reminders to the customer on due date).

### **1.4 Project Scope**

The intended application will mainly focus on developing a system which will facilitate the customer to see prototype of the clothes according to the measurements after stitching. The prototype will be the simulated model. The system will work as a desktop application as well as online system. The simulated models will only cater the design currently in use. The online application will only work for registered customer. It also maintains customer information and will generate various reports needs in the tailoring business. The main users of the project are customer and tailor.

### **1.5 Tools Used**

There are many techniques which are being used in this Automated Tailoring System. Some of them are defined below.

#### **1.5.1 Microsoft Visual Studio**

For desktop module of the intended application Microsoft Visual Studio will be used. The language used is C. Which (C) has been around for a while now and it is continually being enhanced. The new features actually make it a quite unique language. C is readily used for the implementation of various applications. In C many languages can be linked together.[1]

### **1.5.2 MYSQL**

MYSQL is a relational database management system developed by Oracle. MYSQL is to store and retrieve data. It is world's second most widely used RDBMS. It is the popular database used for web applications as well.[2]

### **1.5.3 Marvelous Designer**

Marvelous Designer, 3D design tool for clothes and fabrics, used in animated films and video game development for 3D character design, 3D art, 3D Models. One can design accurate patterns using marvelous designers.[3]

## **Chapter 2**

# **Literature Review**

### **2.1 Simulation**

Simulation is the imitation of the operation of a real-world process or system over time. The act of simulating something first requires that a model be developed, this model represents the key characteristics or behaviors/functions of the selected physical or abstract system or process. The model represents the system itself, whereas the simulation represents the operation of the system over time. Simulation is used in many contexts, such as simulation of technology for performance optimization, safety engineering, testing, training, education, and video games. Often, computer experiments are used to study simulation models. Simulation is also used with scientific or natural systems or human systems to gain insight into their functioning.[4]

### **2.2 Local Tailoring**

Local tailoring is a typical and traditionally old procedure where the tailor is locally available and physically met. The garment is produced locally the physical measurement. Physical professional measurement is taken by the tailor after assessing posture and body shape and unique modification to the garment is made in light of the measurement taken. Local tailors are easily available in the local area and typically have showrooms or shopfront where physical interaction with client is facilitated so that cloth/fabrics selected, exchange or returned for the modification. The oldest and the typical traditional form of the tailoring and used to be only procedure in the past and still it is most widely used tailoring amongst the masses Pakistan due to easy availability and accessibility. London and Hong-Kong are the most famous for quality local tailoring. It takes 2-3 fittings and about 3 to 4 days to hand made one suit.

## 2.3 Distance Tailoring

In distance tailoring the orders of garments are placed through distinct locations that is an out of town order/tailoring, enabling cheaper labor to be used for quick and cheaper production. In practice this can now be done on a global scale via e-commerce websites. Unlike local tailoring in distance tailoring, customers must take their own measurements, fabric selection must be made from a photo and if further alterations are required the garment must be shipped. Today, the most common platform for distance tailoring is via online tailors, where orders, selections of fabrics and sizes are placed online while sitting in homes or offices thus by savings on traveling time and expenses. Online tailors sometimes offer to pay for needed alterations at a local tailor. Another new option is the concept where a free test suit is made to the provided measurements and shipped to the customer first. The test suit can be tried on and worn to see where any adjustments are required. The final suit is then tailored to the new specifications provided by the test suit fitting and sent through courier and payment can be made to the courier man at the time of the delivery or online payment option may be used.

## 2.4 Traveling Tailor

Unlike tailors who do distance tailoring, traveling tailors provide a more personal service to their customers and give the customers an opportunity to see the fabric samples and meet the tailor in person. Then goes the potential clients take required order, measurement and fabrics. After measurement a selection of fabric, come back to his shop and prepare the required products. Subsequently deliver the ready produced to the customers and collect payment.

## 2.5 Proposed System

The proposed tailoring system will eliminate all the manual interventions and will increase the speed of the whole process and make it reliable for customer to get satisfied about their orders. The simulated prototype will be completely adaptable according to the measurements given by the customer. The system will work as a desktop application for registered/non registered customer and also work as an online system for registered customer this will help in maintaining the records of the customer, tracking their orders, notify the customers about their order (i.e. giving the reminders to the customer on due date). All of the three above mentioned tailoring systems (Local tailoring, Distance tailoring and travel tailoring) being mainly manual in nature have their inherent demerits which include human error, time consuming, Costly and unreliable. In order to overcome all these

disadvantages of the traditional systems, a new automated dynamic and efficient tailoring system is being proposed.

## 2.6 3D Modeling

It is the art of representing mathematical three-dimensional models of the objects. The final model is called 3D model. It can be used as 2D model by using the process of rendering. It can be used in simulation of the physical objects and can also be physically created using 3D printing devices. It is created by using 3D connected points. 3D models are now being widely used in the industry. [5] [6]

## 2.7 Existing Systems

Some of the existing systems of online tailoring are:

- Online Tailoring Management System [7]
- iTailors [8]
- Tailor Store [9]

## **Chapter 3**

# **Requirement Specifications**

### **3.1 Application Overview**

The intended application is an automated application using the simulated environment. The application will be designed to introduce new approach in the tailoring industry of Pakistan. The application will eliminate the manual procedures in tailoring environment. The application will present the customer a real 3D model of their cloth that how their cloth will look like after stitching, this application will also allow the customer to login on the web page and use their previous measurements to generate new order.

### **3.2 General Description**

#### **3.2.1 Product Functions**

The tailor will interact with the GUI which will allow the tailor to log into a desktop application. Tailor will enter the measurement of the customer into the system and the application will display the simulated model of the cloth after stitching and customer will able to see the model. The Application basically used three standard sizes of the shirt according to the measurement of the customer i.e(Small,Medium and Large) sizes. User will get an ID pin from the tailor. There will also be a web application (a part of the application) from where the registered customer will be allowed to see their measurement.

#### **3.2.2 User Characteristics**

The application does not require any special characteristics for the users. The users are expected to be familiar with windows based desktop computers. The application will provide a simple and easy to use interface which would not require any specialized knowledge or expertise.

### 3.3 Requirement Specification

#### 3.3.1 Functional Requirement

This section elaborates all the functional requirements that were gathered while keeping all the stakeholders in focus.

##### 3.3.1.1 Functional Requirement 1 (Tailor Login):

**Description** In order to make use of the system, user or administrator must need to log in to a system then the application will start its working.

**Dependency** The tailor must login to a system.

##### 3.3.1.2 Functional Requirement 2 (Record Measurement):

###### **Description**

The tailor will get the measurement of the customer and enter it into the system.

##### 3.3.1.3 Functional Requirement 3 (Cloth Catalog):

The system will have the cloth catalog from where the customer can choose the cloth or user can also refer their own fabric.

##### 3.3.1.4 Functional Requirement 4 (Model Creation):

**Description** The system have the basic models(small,medium and large) 3D model of which will be displayed according to the measurement of the customer.

##### 3.3.1.5 Functional Requirement 5 (Web Login):

Registered user will be able to login to the web application and use their previous measurement.

**Dependency** The web login will be depending on the ID pin customer get from the tailor and the random code that will be generated by the web application.

**Cost** Only development costs are involved, the application does not have any functioning cost.

**Risks** No particular risks can be identified for the given scenario.

#### 3.3.2 Non Functional Requirement

Some of the other particular non-functional attributes required by the system are listed in the following.



### **3.3.2.1 Performance**

The desktop computer should match with the minimum specification requirements that are required by the application. The processor, memory and the type of the windows should be compatible with the application.

### **3.3.2.2 Accuracy**

The application should be accurate enough that it will present the accurate model according to the measurements.

### **3.3.2.3 Maintainability**

The maintenance of the application will be carried out by the developer, if required.

### **3.3.2.4 Portability**

The application is not portable because it is run on the desktop computers so the user cannot carry the computer.

### **3.3.2.5 Extensibility**

The application is not extensible by the user but by the developer. The developer will release latest versions of the application including enhanced functionality when required.

## **3.3.3 Use Case:**

The use cases and the actors of the system are as under.

### **3.3.3.1 Actors:**

- Tailor
- Customer

### **3.3.3.2 Usecases:**

- Record measurement
- Choose fabric
- Select design
- Show real time model
- Register Customer

- Generate ID
- Generate Bill
- Login to web page

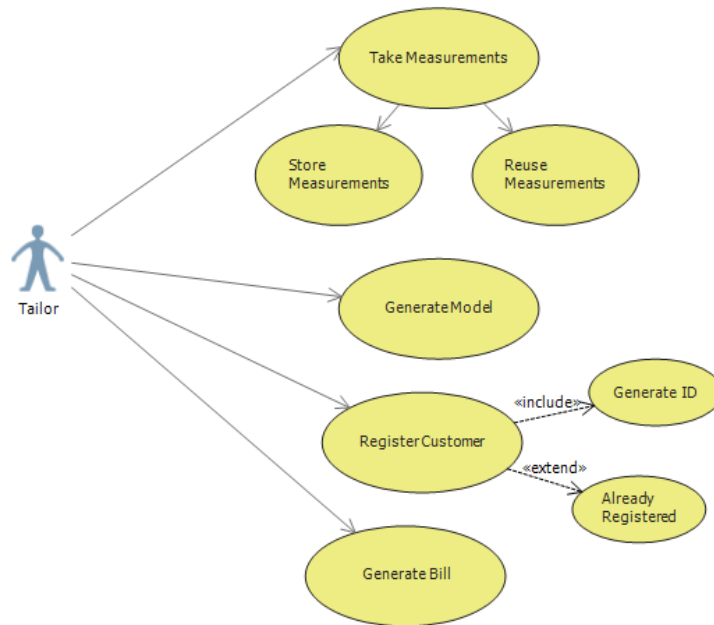


Figure 3.1: Desktop Application Use Case

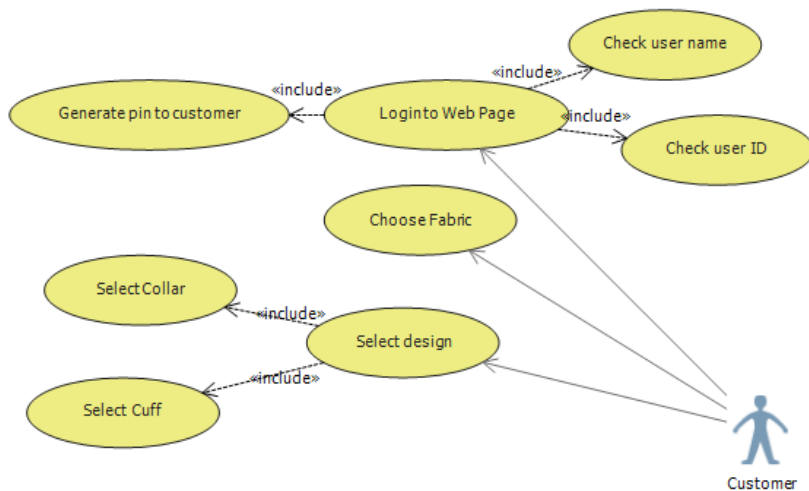


Figure 3.2: Web Application Use Case

<b>Use Case ID</b>	1
<b>Title</b>	Record measurement
<b>Description</b>	Tailor will take measurement of user and enter it into the system or he can reuse the previous measurement as per customer's desire
<b>Primary Actor</b>	Tailor
<b>Actual Result</b>	Tailor has to take measurement
<b>Status</b>	Measurement should be stored in the system

Table 3.1: Record Measurement Use Case

<b>Use Case ID</b>	2
<b>Title</b>	Store measurement
<b>Description</b>	Tailor will store measurement into the system
<b>Primary Actor</b>	Tailor
<b>Actual Result</b>	Tailor has to store measurement
<b>Status</b>	Measurement should be stored in the system

Table 3.2: Store Measurement Use Case

<b>Use Case ID</b>	3
<b>Title</b>	Choose Fabric
<b>Description</b>	Customer will choose fabric from the system catalog
<b>Primary Actor</b>	Customer
<b>Actual Result</b>	Customer has to choose fabrics
<b>Status</b>	Customer should be given the desired fabric

Table 3.3: Choose Fabric Use Case

<b>Use Case ID</b>	4
<b>Title</b>	Select Design
<b>Description</b>	Customer will have to select a design for the cloth, cuff style and collar style
<b>Primary Actor</b>	Customer
<b>Actual Result</b>	Customer should select design for cloth
<b>Status</b>	Customer should be given the desired design

Table 3.4: Select Design Use Case

<b>Use Case ID</b>	5
<b>Title</b>	Generate Model
<b>Description</b>	Tailor will display a real time model of how cloth will look like after stitching
<b>Primary Actor</b>	Tailor
<b>Actual Result</b>	Tailor should show the model
<b>Status</b>	Model should be generated

Table 3.5: Generate Model Use Case

<b>Use Case ID</b>	6
<b>Title</b>	Register Customer
<b>Description</b>	Tailor will register the customer, if he is not already registered
<b>Primary Actor</b>	Tailor
<b>Actual Result</b>	Customer should be registered
<b>Status</b>	Customer registered successfully

Table 3.6: Register Customer Use Case

<b>Use Case ID</b>	7
<b>Title</b>	Generate ID
<b>Description</b>	Tailor will give the customer a system generated ID
<b>Primary Actor</b>	Tailor
<b>Actual Result</b>	System should generate ID
<b>Status</b>	ID should be given to the customer

Table 3.7: Generate ID Use Case

<b>Use Case ID</b>	8
<b>Title</b>	Generate Bill
<b>Description</b>	Tailor should generate the whole bill through system
<b>Primary Actor</b>	Tailor
<b>Actual Result</b>	Bill should be generated
<b>Status</b>	Bill generated

Table 3.8: Generate Bill Use Case

<b>Use Case ID</b>	9
<b>Title</b>	Login to web page
<b>Description</b>	Registered customer and tailor can login to the web page, system will check the username and ID and will generate a pin for customer to login
<b>Primary Actor</b>	Customer-Tailor
<b>Actual Result</b>	Correct username and ID should be entered
<b>Status</b>	Login successfully

Table 3.9: Generate Bill Use Case

<b>Use Case ID</b>	10
<b>Title</b>	Complete System
<b>Description</b>	This is the complete use case of the automated tailoring system using simulated environment.
<b>Steps</b>	Action
<b>Actual Result</b>	Correct username and ID should be entered
<b>Steps</b>	Login successfully
1	Interact with GUI
2	Take measurement
3	Choose fabric
4	Select design
5	Show real time model
6	Register Customer
7	Generate ID
8	Generate Bill
9	Login to web page
<b>Primary Actor</b>	Tailor-Customer
<b>Pre-Condition</b>	User has to run application
<b>Post-Condition</b>	The application give the desired result

Table 3.10: Complete System Use Case

# Chapter 4

## Design

### 4.1 System Design

In this portion of report we will discuss about the detailed architecture of our proposed system with the help of UML diagrams. We will use different UML diagrams to show different aspects of our system like its structure, flow and other things. The UML diagrams that will use are:

- Architecture diagram
- Sequence diagram
- Activity diagram

### 4.1.1 Architecture Diagram

This diagram will show the abstract overview of the intended application. This diagram will show the overall functionality of this application. It will show the relationship between user and the components of the system.

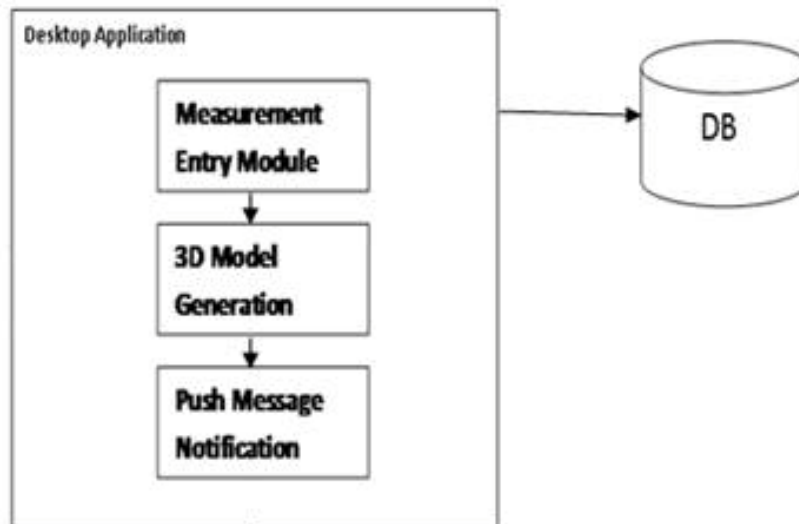


Figure 4.1: Architecture Diagram

### 4.1.2 Sequence Diagram

#### 4.1.2.1 Desktop Application (Registered Customer)

The following is the sequence diagram of the desktop module of the intended application. It tells the sequence of the workflow of the application.

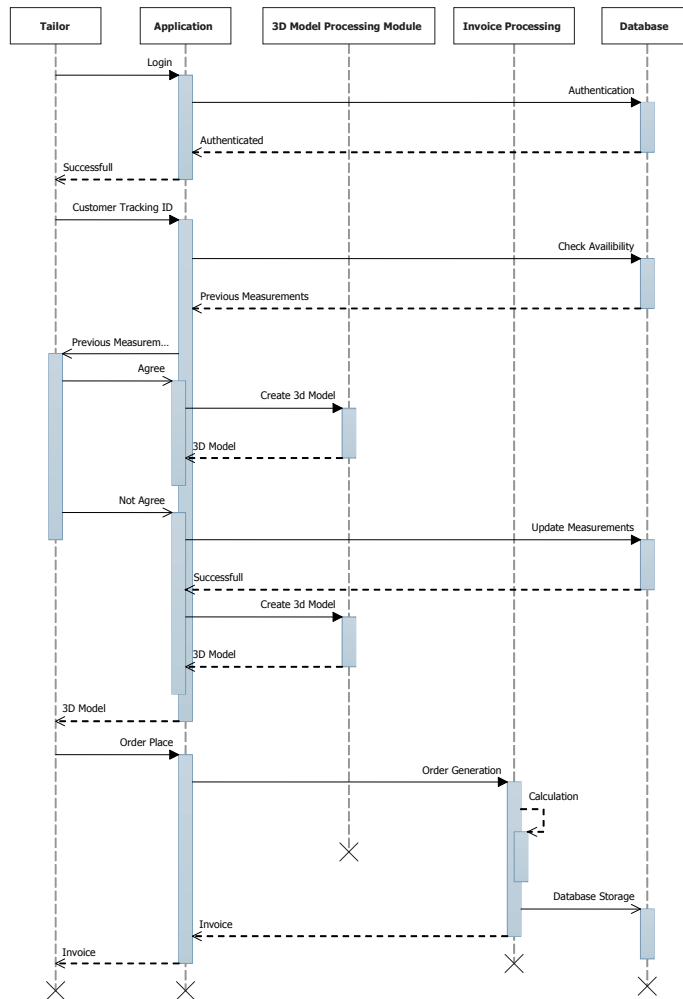


Figure 4.2: Desktop Application (Registered) Sequence Diagram

**4.1.2.2 Desktop Application (Unregistered)**

The following is the sequence diagram of the web module of the intended application. It tell the sequence of the workflow of the application.



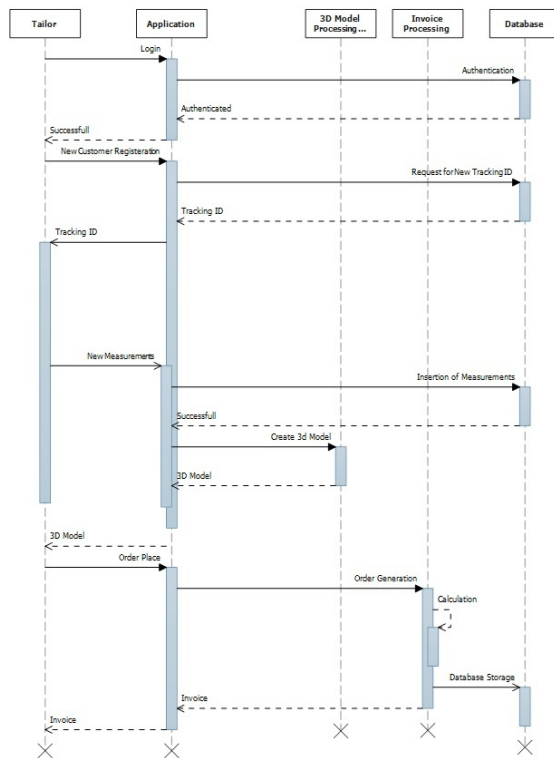


Figure 4.3: sequence diagram for non-registered customers

### 4.1.3 Activity Diagram

#### 4.1.3.1 Desktop Application

This is the activity diagram of the desktop module of the application, it tells that how the activities will be carried out. The whole activity of the application is summarized in the following diagram.

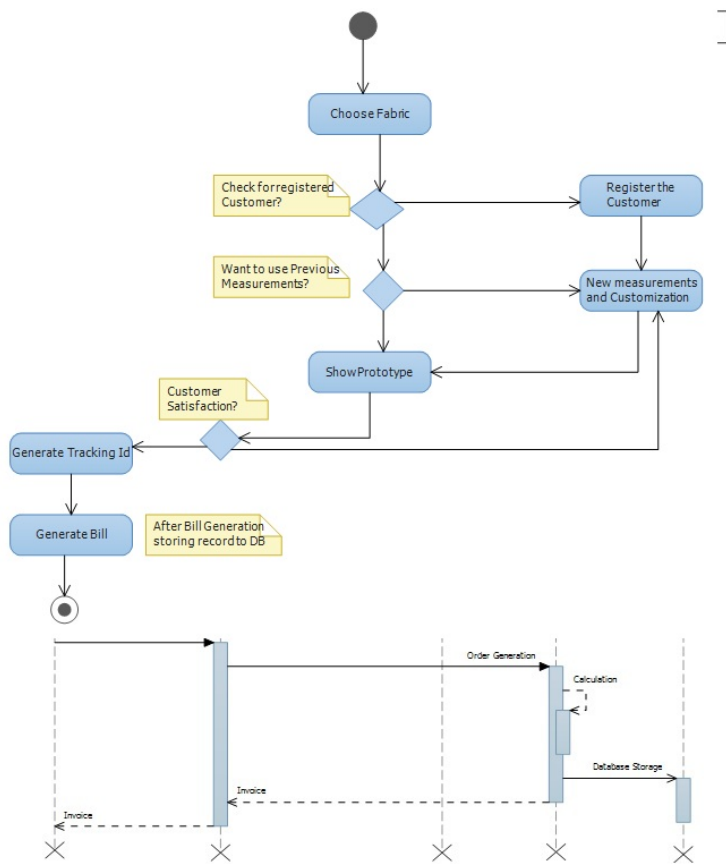


Figure 4.4: Desktop Application Activity Diagram

### 4.1.3.2 Web Application Activity Diagram

This is the activity diagram of the web module of the application, it tells that how the activities will be carried out. The whole activity of the application is summarized in the following diagram.

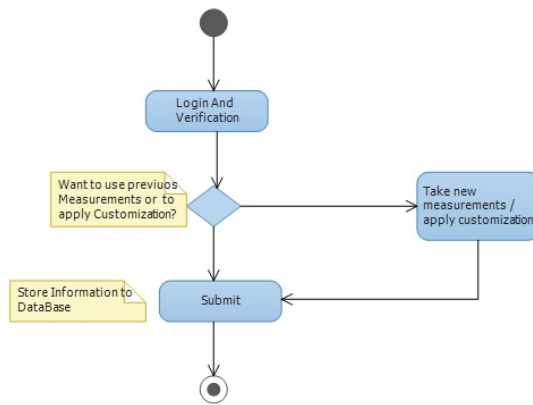


Figure 4.5: Web Application Activity Diagram

## 4.2 Process Model

Iterative Model is used as the process model in development of the intended application. This model has best results under hit and trails method. It produces the incremental results which give more refinement.

## 4.3 GUI

GUI is basically allows the users to interact with software using visual indicators or icons. It allows the user to interact with the device and perform the intended operation. As the intended application is going to be used by the people who do not know much about the computer systems so the main focus is on the usability of the application. The intended application is easy to use and easy to learn as well. The response time of the application is very low as well so that user may not get tired to use of the application. Buttons, textboxes, search fields and menubar are used in the interface of the intended application. Separate window form for the 3D model display is also used. NORMAN's usability principles [10] are used to develop the interface of the application to make its use quite easy.

## **Chapter 5**

# **System Implementation**

### **5.1 System Architecture**

It describes the architecture of the system, which may include the internal and external components of the system. The intended system is divided into two main components, it includes:

#### **5.1.1 Desktop Application**

As it is clear from name that it will be used on desktop computers. Only concerned Tailor will have access of this. Tailor can log into this application using user ID and password. Tailor will be able to add customer details and store the details to maintain customer record and will be able to inform customer when his order will be ready.

#### **5.1.2 Web portal**

web portal will be only for customer. Customer can review his measurement and can also make query for change if any. Customer will be required user ID and password to login to this portal, where user ID will be his contact number which is registered to the tailor system and password will be a unique pin-code which he will receive on his contact number after registration.

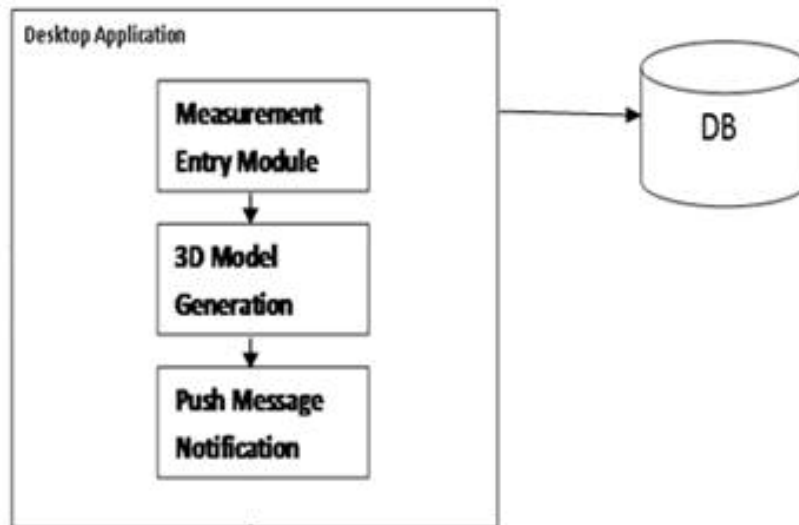


Figure 5.1: Architecture Diagram

## 5.2 System Internal Component

### Sign Up

In this application tailor first have to signup, from where he can login to the application for the further use.

### Sign In

Tailor will have to sign in to the desktop application, user will have his unique login password and username. Registered customer can be login to the web portal to check their measurement and can make change in their measurement if they want, registered customer will have a unique pin to login which will be given to them by the tailor.

### Measurements

The measurements of the customer will be stored in the database by the tailor to register customer order and to maintain the record.

### Query

Registered customer will have option in the web portal that if they want to make any change in their measurement, they can make a query request to their tailor.

## 5.3 Tools and Technology

There are many techniques which are being used in this Automated Tailoring System using Simulated Environment. Some of them are defined below:

### 5.3.1 Microsoft Visual Studio

For desktop module of the intended application Microsoft Visual Studio will be used. The language used is C. Which (C) has been around for a while now and it is continually being enhanced. The new features actually make it a quite unique language. C is readily used for the implementation of various applications. In C many languages can be linked together.[1]

### 5.3.2 MYSQL

MYSQL is a relational database management system developed by Oracle. MYSQL is to store and retrieve data. It is world second most widely used RDBMS. It is the popular database used for web applications as well.[2]

### 5.3.3 Marvelous Designer

Marvelous Designer, 3D design tool for clothes and fabrics, used in animated films and video game development for 3D character design, 3D art, 3D Models. One can design accurate patterns using marvelous designers.[3]

### 5.3.4 Windows Presentation Foundation (WPF)

Windows Presentation Foundation (or WPF) is a graphical subsystem for rendering user interfaces in Windows-based applications by Microsoft. WPF, previously known as "Avalon", was initially released as part of .NET Framework 3.0. Rather than relying on the older GDI subsystem, WPF uses DirectX. [11]

## 5.4 Methodology

This application can be developed by using Incremental model, because requirements will be change according to the user suggestions. Development of this application was done in different phases:

### Phase 1

In phase 1 the main part of this application (i.e. desktop application) will be developed, so the tailor can maintain the record of the customer and change it of required.

**Phase 2**

Web portal will be developed in this phase, web portal will only be used by customer for checking their measurement or to make any query if they want change in measurement.

**Phase 3**

In this phase an interactive and proper interface of the application will be designed. And all the components of the system will be integrated with each other. In this phase system will be ready for testing.

## Chapter 6

# System Testing and Evaluation

### 6.1 Introduction

Software testing process ensures that each module of the product is working and providing results according to the requirements. Each of the individual modules of the application is tested individually and complete application is also tested. The main objective of testing is to check whether the developed software meets the required quality standards or not[12]. Testing is also aimed at determining whether the application is providing the desired result. Some of the commonly used testing are:

- Unit testing
- Incremental integration testing
- Integration testing
- Functional testing
- System testing
- End-to-end testing
- Sanity testing
- Regression testing
- Interface testing
- Exception handling testing

### 6.2 Interface Testing

From the view point of end user, user interface is an important component of the system. The interface has been designed to be simple yet attractive and is easy to use. Subjects



who were asked to interact with the system did not report any issues in the graphical user interface of the system. We also designed test cases to formally test the functionality of the system. These test cases are discussed in the following.

TC_FUNCT_01		
Tests the Login Screen		
Microsoft Visual Studio		
REQ_FUNCT_01		
Visual Studio should be installed on system.		
<b>Step</b>	<b>Task and Expected Result</b>	
1	Open the login screen/menu.	
2	Verify that the login screen is displayed on both monitor.	Pass
3	Enter Username and password.	Pass
4	Verify that the username can be entered.	Pass
5	Verify that the password is masked and can be entered.	Pass
6	Verify that a submit and reset buttons are displayed.	Pass
7	Verify that every field on the login screen working properly.	Pass

Table 6.1: TestCase01 (Testing the Login Screen)

TC_FUNCT_02		
New customer tab		
Microsoft Visual Studio		
REQ_FUNCT_02		
Visual Studio should be installed on system.		
<b>Step</b>	<b>Task and Expected Result</b>	
1	Open new customer tab	
2	Verify that all the required fields are there.	Pass
3	Verify that Add, Delete and Clear buttons are there.	Pass
4	Verify that all the fields take input properly.	Pass

Table 6.2: TestCase02 (Testing the New Customer screen of desktop)

TC_FUNCT_03		
Registered customer tab		
Microsoft Visual Studio		
REQ_FUNCT_03		
Visual Studio should be installed on system.		
Step	Task and Expected Result	
1	Open registered customer tab	
2	Verify that all the required fields are there.	Pass
3	Verify that update button is there.	Pass
4	Verify that all the fields take input properly.	Pass

Table 6.3: TestCase03 (Testing the Registered Customer screen)

TC_FUNCT_04		
Tests the home page of web application		
Microsoft Visual Studio		
REQ_FUNCT_04		
Visual Studio should be installed on system.		
Step	Task and Expected Result	
1	Open the home page.	
2	Verify that the menu and its items are shown properly.	Pass
3	Verify that every menu item is working properly.	Pass
4	Verify that every menu item redirect to the desired web page.	Pass

Table 6.4: TestCase04 (Testing the home page of web application)

TC_FUNCT_05		
Change query web page testing		
Microsoft Visual Studio		
REQ_FUNCT_05		
Visual Studio should be installed on system.		
Step	Task and Expected Result	
1	Open the query page.	
2	Verify that all the field are properly displayed.	Pass
3	Verify that all the fields accept input.	Pass
4	Verify that the submit button works properly.	Pass
5	Verify that action has taken against same Customer ID as given in the query.	Pass

Table 6.5: TestCase05 (Testing change query tab)

TC_FUNCT_06		
Customers details page testing		
Microsoft Visual Studio		
REQ_FUNCT_06		
Visual Studio should be installed on system.		
Step	Task and Expected Result	
1	Open the customers details page.	
2	Verify that it accepts the customer id to get details.	Pass
3	Verify that all the fields are read only.	Pass
4	Verify that details are taken against the customer ID.	Pass

Table 6.6: TestCase06 (Customer details page)

### 6.3 Usability Testing

Usability testing is carried out to ensure that the developed system is usable and does not present any usability issues. In our case, the developed system is fairly simple and does not involve many user interactions. Three different individuals were asked to use the system, load videos, start the surveillance and report any usability issues encountered. The interaction sessions with the system were fairly smooth and the subjects did not report any serious usability issues in the system.

TC_FUNCT_07		
Login screen		
Microsoft Visual Studio		
REQ_FUNCT_0		
Visual Studio should be installed on system.		
Step	Task and Expected Result	
1	Execute application.	Pass
2	Verify that login button work properly.	Pass
3	Verify that user login is properly done.	Pass

Table 6.7: TestCase07 (Testing usability of the login screen)

TC_FUNCT_08		
Customer Info insert/update		
Microsoft Visual Studio		
REQ_FUNCT_08		
Visual Studio should be installed on system.		
Step	Task and Expected Result	
1	Open registered/ new customer page	
2	Verify that all the info of the customer is stored properly.	Pass
3	Verify that customer is showing properly.	Pass
4	Verify that registered and new customers have separate sections.	Pass
5	Verify that registered customers record is saved.	Pass

Table 6.8: TestCase08 (Testing usability of customer's info)

## 6.4 Exception handling testing

Error handling refers to the anticipation, detection, and resolution of programming, application, and communications errors. Specialized programs, called error handlers, are available for some applications.

TC_FUNCT_09		
Login Exception Handling		
Microsoft Visual Studio		
REQ_FUNCT_0		
Visual Studio should be installed on system.		
Step	Task and Expected Result	
1	Open login page.	Pass
2	Verify that all the fields accept input correctly.	Pass
3	Verify that user ID and password does match properly.	Pass
4	Verify that login must not through exception.	Pass

Table 6.9: TestCase09 (Exception handling of login screen)

TC_FUNCT_10		
New customer info exception handling.		
Microsoft Visual Studio		
REQ_FUNCT_10		
Exception handling for storing new customer		
Step	Task and Expected Result	
1	Open new customer page	Pass
2	Verify that all the fields accept input.	Pass
3	Verify that add button stores data properly.	Pass
4	Verify that all the data must stored properly.	Pass

Table 6.10: TestCase10 (Exception handling for storing new customer)

TC_FUNCT_11		
Registered customer info tab exception handling.		
Microsoft Visual Studio		
REQ_FUNCT_11		
Visual Studio should be installed on system.		
Step	Task and Expected Result	
1	Open registered customer page	Pass
2	Verify that all the fields accept input.	Pass
3	Verify that update/delete button works properly.	Pass
4	Verify that the system do not stores duplicate.	Pass

Table 6.11: TestCase11 (Registered customer exception handling)

## 6.5 Software performance testing

Software performance testing is the procedure of deciding the pace or adequacy of a PC, system, programming project or gadget. This procedure can include quantitative tests done in a lab, for example, measuring the reaction time or the quantity of MIPS (a huge number of guidelines every second) at which a framework capacities.

TC_FUNCT_12		
Performance testing		
Microsoft Visual Studio		
REQ_FUNCT_12		
Visual Studio should be installed on system.		
<b>Step</b>	<b>Task and Expected Result</b>	
1	Invoke application from its icon	Quick Response
2	Login to application.	Quick Response
3	Select item from menu bar.	Quick Response
4	Enter new customer details.	Quick Response
5	Update or delete registered customer details.	Quick Response
6	Check status.	Quick Response
7	Logout from application.	Quick Response

Table 6.12: TestCase12 (Software performance testing)

## **6.6 Compatibility Testing**

Compatibility testing is the process to ensure that the application runs without problems on different platforms. The present application is developed on Visual Studio for Microsoft Windows and successfully runs on different versions of Windows[13]

# Chapter 7

## Conclusions

### 7.1 Conclusion

In this work an Automated Tailoring System has been made. With the help of this system it will be cost and time saving for both, the tailor and the customers. Now customer can view that how his shirt will be look like after stitching. Now customer and tailor will not have to follow the old traditional and pathetic procedures. Customers not have to worry now for the delivery date neither he have to visit tailor's shop multiple times for delivery. Customer also got a option to change his measurement from home or any other place he like by using his web portal.

### 7.2 Future Enhancement

Future enhancement includes:

- Full Dress Stitching

This application is only for shirts, it will be further enhanced for full dress(Pent and shirt).

- Display Cloth on Customer's Body

This application is only displaying 3D model of shirts, by using webcam shirt can be displayed on the customer's body as well.



## **Appendix A**

# **User Manual**

## A.1 Introduction

A User manual provides a guide to its users about the system. It gives them a bird's eye view of the whole system, and how system will act on their actions. User guide of the intended application is given below.

## A.2 Start up Window

This is the start up window Automated tailoring system.

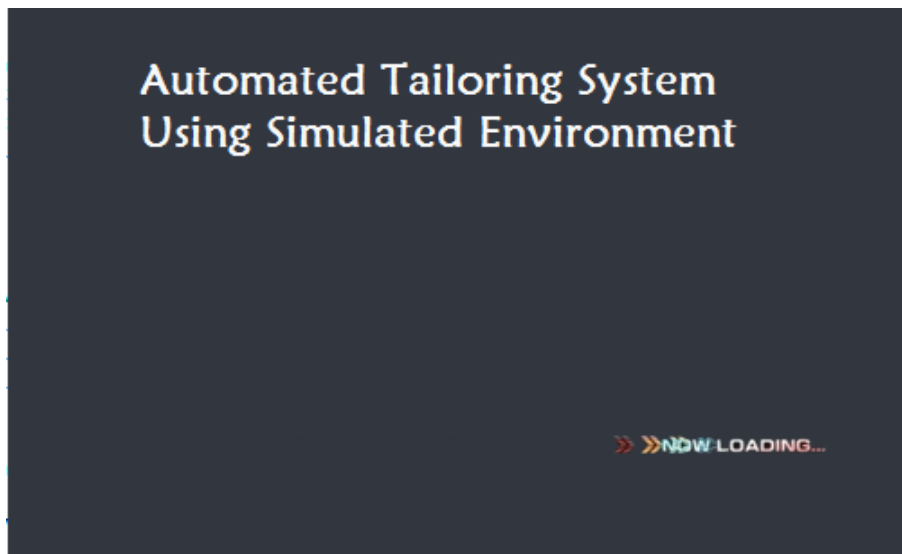


Figure A.1: user Interface

### A.3 Login Screen

This is the login screen of the desktop module of the application, this will be used by the tailor only. Tailor will use his username and password to login to the application. After entering the username and password tailor will click Login button for signing in or Cancel button otherwise.



Figure A.2: Login Screen of Desktop module

### A.4 New Customer Tab

This is the new customer tab of the desktop module of the application, tailor will insert the details of the new customer to the database from here by clicking submit button.

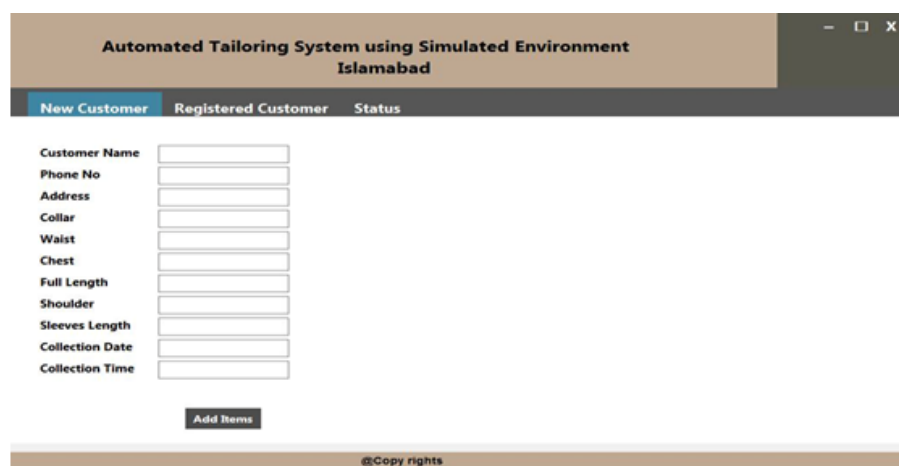
The image shows a window titled 'Automated Tailoring System using Simulated Environment Islamabad'. The window has three tabs: 'New Customer' (which is selected), 'Registered Customer', and 'Status'. Below the tabs, there is a form with the following fields: Customer Name, Phone No, Address, Collar, Waist, Chest, Full Length, Shoulder, Sleeves Length, Collection Date, and Collection Time. Each field has a corresponding text input box. At the bottom of the form, there is an 'Add Items' button. The footer of the window contains the text '@Copy rights'.

Figure A.3: New Customer tab

## A.5 Registered Customer Tab

This is the registered customer tab of the desktop module of the application, tailor can update and delete the record of the registered customer from here and tailor can also search the customer record in database using search option.

Name	Collar	Waist	Chest	Full Length	Shoulder	Sleeves Length	Date
danyal	14.5	30	28	20	1	7.5	4/22/2011
qasim	34	12	34	2	45	23	4/22/2011

Figure A.4: Registered Customer tab

## A.6 3D Model Display

This is the 3D model window which will appear after the measurements of the customer are taken. A 3D model of shirt will be displayed on the form, customer will have option to choose fabrics from the palate or if he wants to use his own fabric. Shirts will have two types of design i.e (with collar and without collar) which user can select from the radio buttons on the form displayed. User will also have the option to choose different fabric for collar. Once the user have selected the design and is satisfied with the model of the shirt displayed, tailor will click the accept button so that the measurement of the customer will be stored in the database and bill will be generated otherwise he will press the cancel button to cancel the order.

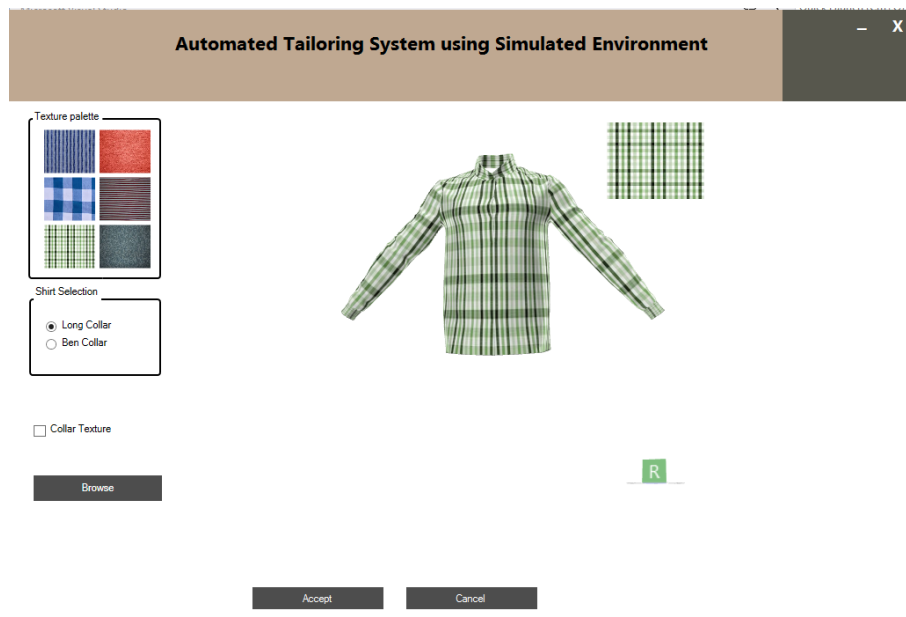


Figure A.5: 3D Model Tab

## A.7 Start up tab of Web portal

This is user interface of the web portal of the application.



Figure A.6: User Interface web portal

## A.8 SignIn Screen

This is the signin screen of the web portal of the application, only registered customer can login to this.



Figure A.7: signin screen for registered customers

## A.9 Home Page

This is the home page of the web portal of the application.



Figure A.8: Home screen of web portal

## A.10 Change Query screen

This is the query screen for the registered customer from where they can send query in their measurement to the tailor.

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## Automated Tailoring

Customer	<input type="text"/>
ID	<input type="text"/>
Collar	<input type="text"/>
Waist	<input type="text"/>
Chest	<input type="text"/>
Length	<input type="text"/>
Shoulder	<input type="text"/>
Sleeves	<input type="text"/>

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Figure A.9: Change query screen for registered customer

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