Tailorease – Smart Tailoring Management System

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Abstract—**Tailorease is an flutter based android application, sometimes the tailors are in the remote location and it becomes difficult for an customer to find the tailor and give their clothes for stitching and give their body measurements which is just a waste of time for the customers. So to overcome this problem the tailorease is made which is an android application with Google ML Kit Pose Detection using which it extracts the body measurement of the customer through the mobile itself where the customer need not to leave their house, they can easily take the measurement through the phone itself. Using this application the customer can select the tailor they want, preferred material, designs and order status. This application is also useful for the tailor using this application the can get the orders and there will be no need for the tailor to take the measurement manually.**

Index Terms—**Smart tailoring, contactless body measurement, Pose detection through phone, Body measurement extraction.**

I. INTRODUCTION

The garment industry is very large and it is expanding day by day. The problem is that there are tailors in the market but it is difficult to reach and contact those tailors when they are required by the customers. To overcome this there is a need of a smart application that can be for both the customers as well as the tailors. The aim of this application is to provide the service to the customer easily where they can find the tailors very quickly and easily, by using the mobile itself they can take the measurement, choose the cloth they want, select a design and book a tailor.

To find solution to all these problems this application was introduced, with the help of this application the customers can take the measurement through the mobile itself there will be no need for them to visit a tailor to take the measurement. This work has also helped the tailors to find the customers. This work is developed using Flutter and Dart for cross-platform support, with the backend using Node.js and Express, for the storage of data MySQL database is used.

This work is developed using some of the technologies like the Flutter and Dart for cross-platform support along with it for backend Node.js and Express is used, and for data storage MySQL database is used. The system uses Google ML Kit Pose Detection to generate body measurement estimate. The Google ML Kit Pose Detection to process front photos for producing body dimension data. The system operates through backend API which manages data storage performing authentication tasks.

II. LITERATURE SURVEY

Kamrul Hasan Foysal proposed a smartphone-based body size measurement system in [1]. The method allows body measurements to be obtained without using any additional measuring objects while capturing images through a smartphone. The approach combines body proportion analysis, machine learning techniques, and 3D body reconstruction using measurements extracted from two silhouette images. Mohammad Montazerian and Frederic Fol Leymarie developed Contactless, AI System to Measure Human Body using a Single Camera for the Clothing and Fashion Industry in [2], this work estimates upper human body measurements using set of computer vision and machine learning techniques. The main steps involve using a portable camera (such as from a smartphone), improving the image quality, isolating the human body from the surrounding environment, performing a calibration step, extracting features of the body from the image, indicating markers on the image, producing refined final results. Geraldine CURIPACO developed Design and development of an application for the generation of garment patterns

based on body measurements using CNN in [3], in this word they propose an application to produce dress garment patterns tailored to a person from photos, using image processing and convolutional neural networks (CNN). Their proposal starts by obtaining a frontal and a lateral photo of the person, and calculating height, and then processing the images to obtain the body measurements by means of a CNN. M. Avadanei developed an integrated solution for the online marketing in [4], this work proposes an integrated solution for online marketing of customized clothing products, using a virtual test room that simulates the product on the virtual mannequin in different positions. Katja Wolff developed Designing Personalized Garments with Body Movement in [5], this work proposes an design tool for creating custom-fit garments based on 3D body scans of the intended wearer. Their method explicitly incorporates transitions between various body poses to ensure a better fit and freedom of movement. D. L Mudalige developed a mobile-based management solution in [6], in this work a tailor-specific mobile application, an automatic measurement manipulation system, and an advanced recommendation system, all integrated into an intuitive user experience, are key components. The success of the system is based on its capacity to improve the user experience, streamline tailoring procedures, and build stronger customer tailor connections. Phoebe R. Apeagyei introduced the application of 3D body scanning technology for human body measurement in the clothing fit industry in [7]. The study explained how automated 3D body scanners can quickly capture the shape and dimensions of the human body within seconds and generate an accurate three-dimensional body model for precise clothing measurements. P. Karthikeyan developed Design and Implementation of Automatic Cloth Measuring System in [8], this work proposes automatic cloth measuring system for textile industries based on IOT Technology to optimize the cloth measuring process and increase efficiency in textile production. Yong Ji developed Garment customization big data–processing and analysis in optimization design in [9], this word proposes a method of tailoring clothing throughout the early stages of personal design and product development. This approach improves the understanding of garment fitting by analyzing individual preferences, and also helps designers capture user needs very fast and deal with them more accurately. Sadia Idrees developed Mobile 3D body scanning applications are emerging as effective contact-free solutions for AI-based body measurement in the apparel industry [10], this work presents a detailed analysis of human body measurements using mobile scanning technology. By utilizing a personal smartphone, users can accurately obtain measurements such as distances, girths, heights, widths, surface area, body fat percentage, and body circumferences. Song Yan developed Anthropometric clothing measurements from 3D body scans in [11], this work proposes a full processing pipeline to acquire anthropometric measurements from 3D measurements. The first stage of their pipeline is a commercial point cloud scanner. In the second stage, a pre-defined body model is fitted to the captured point cloud. They have generated one male and one female model from the SMPL library. Zhylenko, T.I. developed Mobile Application to Calculate the Parameters of Top Wear Basic Design in [12], in this work mobile applications for the garment industry have been analyzed. These applications contain galleries of clothing models, but only for specific styles of fashion and unrecognizable sizes. Therefore, it will be used as a guide for creating clothes of similar fashion styles but without the necessary level of accuracy. Daria Casciani developed digital body measurement technologies in [13], this work investigates the feasibility, accuracy, and effectiveness of various measurement techniques, including traditional manual methods, 3D body scanning, and smartphone applications, to capture anthropometric data. Xin Pei developed Image-based Measuring Technique for the Prediction of Human Body Size in [14], this work takes people's height, weight and gender as params to initialize a common body size set, and corrects each part of the set by analyzing the body proportion via the front and side images. The predict accurate testing with the 50 digital models and 10 real people. Dr Fanke Peng developed Designing 3d body scanning apps for fashion in [15], this work was designed to investigate the 3D body scanning service of the current fashion market and to build a framework comprising predicting those factors influencing consumer adoption of 3D body scanner applications for a particular personalization system. Ying Yuan developed Clothing Size Recommendation System in [16], this work shows the most similar size dataset among the body size GB/T dataset to the customer

once he/she inputs his/her height and weight. Each GB/T data was entered after categorizing it according to the proportion between height and weight. For the latter function, size recommendation, size coding was performed first for all the clothes by the shop owner by entering individual size data. Bowen Zhan developed Evaluation of customer engagement and interaction in online garment customization in [17], this study aims to understand customer expectations and concerns in the context of garment customization within a virtual environment, utilizing a qualitative approach. The research is conducted through two main activities: engaging participants in a simulated garment customization process using an online configurator tool, and conducting in-depth, semi-structured interviews. Eric R. HARVEY developed 3D Digital Technologies For Virtual Fitting Of Garments In Tailor-Made Application in [18], this work explores the use of 3D technologies for performing virtual measurements and try-on. A friendly user 3D manipulation software tool has developed; it performs virtual measurement using scanned data of the actual body. This involves the creation of a virtual mannequin based on customer mensuration. Alessandra Vecchi developed online fashion retail in [19], this work describes the e-Size project as well as presenting the preliminary results of its first pilot test - an exploratory survey administered to a convenience sample of customers in the attempt to establish whether the integration of a size recommendation application into a menswear fashion retail website had been successfully achieved. Li Duan developed Automatic three-dimensional-scanned garment fitting based on virtual tailoring and geometric sewing in [20], this work indicated the proposed method was an efficient way for redressing various garments onto various human models while maintaining the original geometrical features of garments.

III. PROPOSED METHODOLOGY

The application is developed using the Flutter framework for building the mobile application interface, providing a smooth and user-friendly experience across devices. For backend development, Node.js and Express.js are used to manage server-side operations, process user data, and store information in the database efficiently. The system also integrates Google ML Kit for pose detection and body measurement analysis. This technology helps identify the human body posture and calculate body measurements accurately.

For collecting body measurements, the system captures two images of the user: a front-view image and a side-view image. Using these images, the application identifies important body points such as the shoulders, waist, and hips, and then computes the required measurements needed for tailoring and stitching clothes. In addition to body measurements, the application also stores essential user information, including address details, which are later used for the delivery of the stitched garments.

For data collection the system takes two images of the user that is a front image and an side image. Then with the help of those images the it identifies the shoulder, waist, heap and then computes the body measurements which is required by the tailor for stitching the cloth. In this application the user data is also collected these data will be the user address which is used for the delivering of the cloth after stitching.

The reason behind development of this work is to overcome the current problems faced by the tailoring system. This application is designed in such a way that it becomes easier for the user to use it. It is a user-friendly application with the minimum knowledge about the application the user can use it. This application uses the flutter for the user interface using this the user will be able to use the application and as of backend services it uses Node.js and Express. Along with these the application also uses Google ML Kit it is used for detect whether there is a person or not on detecting the person the application will take the body size and it will compute and will give us the full body measurement to the user. At last there is an order management system this is implement on the order details used for saving the measurement and the user details. This application has been tested with different user inputs to make sure that the application provides accurate and efficient results to the users.

The Figure 1 shows the complete flowchart of the TailorEase application. First the customer opens the app, then selects a tailor and a fabric, then he captures the front and side photo, after that the measurement will be detected by the AI, the body measurement will be generated, then the customer verifies and submits the order request. The tailor receives the submitted order, he reviews that order and then if he approves,

he will select a delivery date and time and notifies the customer, otherwise he will reject the order with a reason. Then the order status will be updated, the customer can track the order and order will be prepared and delivered.

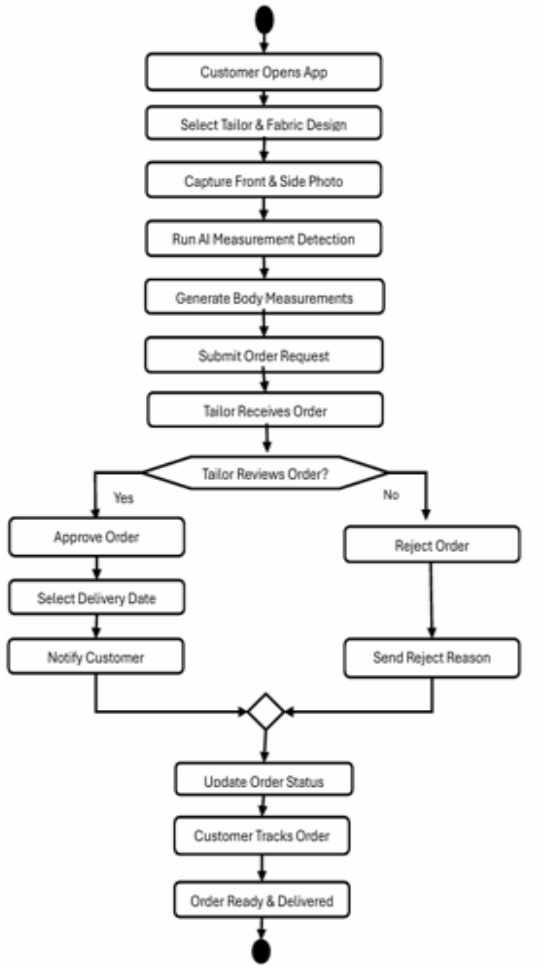

Figure 1: Flowchart

IV. RESULTS AND DISCUSSION

Figure 2 illustrates the Welcome Page of the application. This page allows new users to create an account by signing up, while existing users can log in using their credentials. It also provides a short introduction to the application, helping users understand its purpose and features. In addition, the page includes a "Contact Us" section where users can access different contact details to communicate or get support when needed.

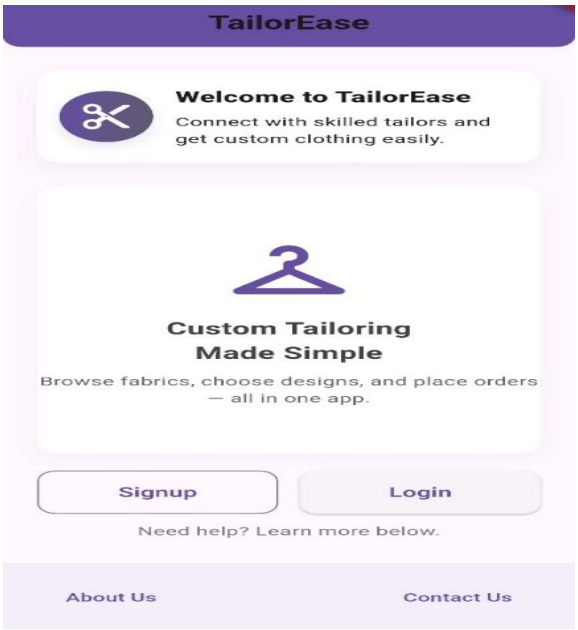

Figure 2: Welcome Page

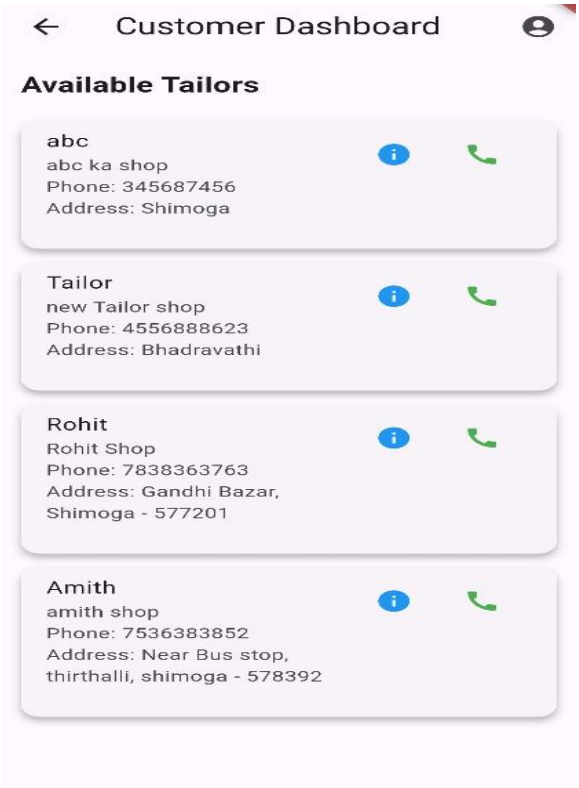

Figure 3: Customer Dashboard

The Figure 3 customer dashboard shows that customer will be able to see the list of the tailors and select one tailor among them.

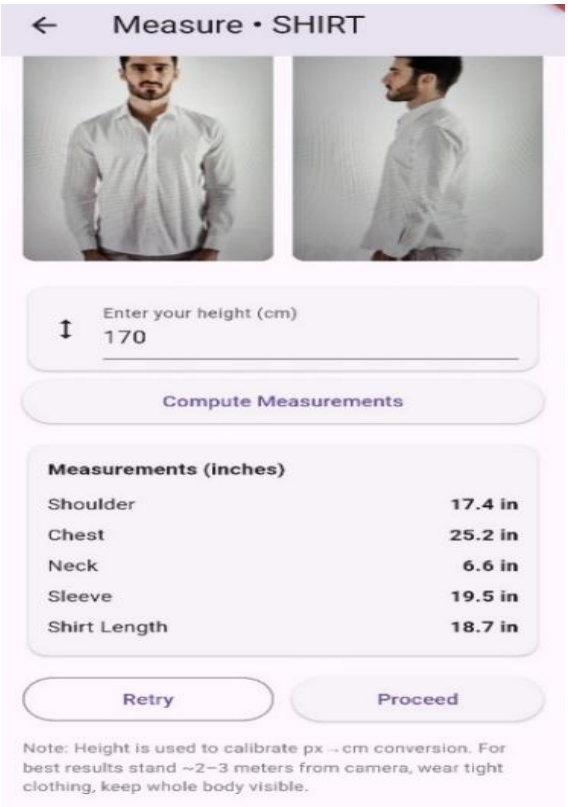

Figure 4: AI-Based Measurement

The Figure 4 AI-Based Measurement shows that the user has to take front and side picture and calculates and gives the chest, waist, hip measurement.

Figure 5: Design selection

Figure 5 Design selection shows the user can select the design the design there will be various types of design among those design the user can select one. And the designs will be shown based on the gender and the type of cloth if female is selected female design will be shown else if male is selected then we have to select the either shirt or pant based on that the design will be shown.

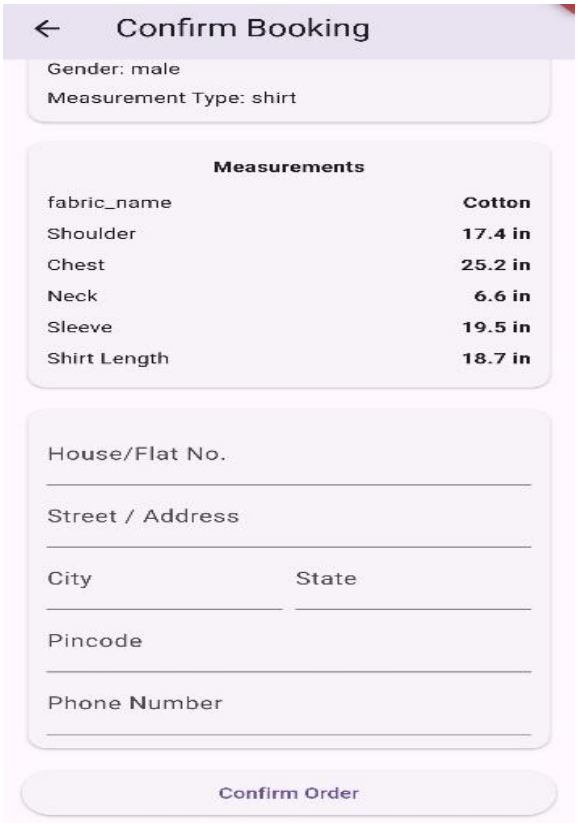

Figure 6: Order Placement and confirmation

Figure 6 Order placement and confirmation shows that user can verify whether all the entered details are correct or not if the details are not correct the user can go back and edit those details otherwise, they can fill the address with the house number, their complete address including the city and state, with phone number and they can confirm the order.

Figure 7 Tailor dashboard shows that the placed order will be visible in the tailor dashboard where the tailor can approve the order by providing the date and time of delivery or they can reject the order by giving some reason.

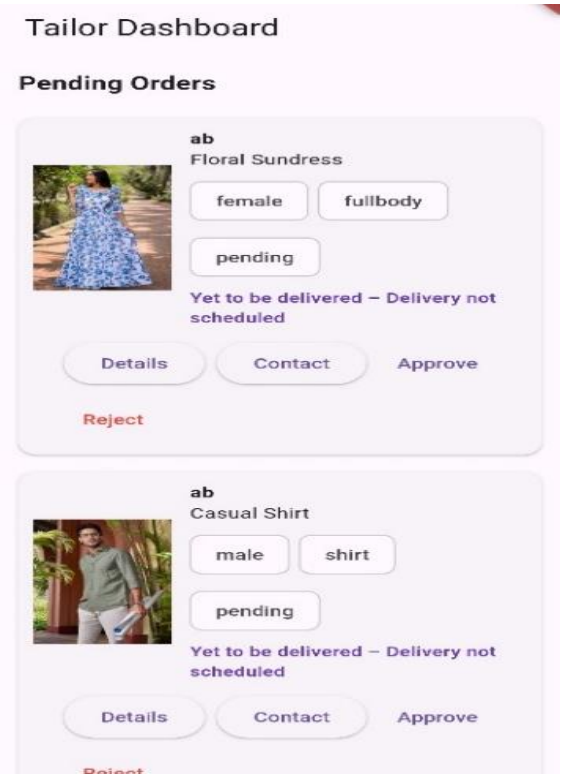

Figure 7: Tailor Dashboard

V. CONCLUSION

This android application solves the traditional tailoring business of manual measurement and customer communication issues. This application makes everything online from selecting the tailor, selecting the fabric to taking the measurement. Using this application the user will be able to take the measurement through the mobile phone itself. This application uses the flutter-based interface with the support of Node.js as an backend.

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