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Development of Tailor Shop Management System for Order Tracking and Customer Measurement Recording

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***Abstract* - This study addresses the challenges caused by the manual processes used in tailoring shops, such as inaccurate measurements, misplaced records, inconsistent entries, and delays in order fulfillment. The main objective of this study is to digitize customer order processing, measurement recording, order tracking, and order-related documents to improve efficiency, reduce human error, and enhance customer satisfaction. This is a web-based system built on HTML, CSS, JavaScript, MySQL, and PhilSMS API, designed to be a cross-platform solution accessible on both desktop and mobile. Agile methodology was used to facilitate continuous development and increased user feedback throughout the phases of planning, data gathering and analysis, design, development, testing, evaluation, and deployment. It is intended for tailoring shop staff responsible for order processing, garment production, and customer management offering features such as digital customer records, automated cost calculation, standard and custom measurements handling, tailor assignment, order status updates, invoice creation, payment record, and automated SMS notifications. Functionality tests confirmed all modules were working correctly, while usability testing using the System Usability Scale (SUS) rated it as acceptable and user-friendly. It improves record accuracy and organization, making the order management process more reliable with additional features planned for the future.**

Keywords* - *Agile Model; digitize; measurement recording; order tracking; SMS notification; tailor management system; web-based system

I. INTRODUCTION

The field of Information Technology has become necessary in solving real-world problems and significantly driving progress across various industries around the world, especially in tailoring sectors. In industries such as tailoring that still rely on manual processes, the integration of information technology has changed the way businesses manage their operations. In [1], the authors stated that automation in small and medium-sized enterprises (SMEs) can really boost efficiency and productivity, including a reduction in manual errors and better data accuracy. In fact, authors discovered that automation can increase productivity by up to 30% and reduce manual errors by 25%.

In the tailoring industry, most businesses still rely on manual operations, which create a major challenges for tailors and clients. The challenges are lost or misplaced records, inaccurate measurements, incorrect data, inconsistent entry, and delays in order fulfillment. The use of manual process increases human errors, which have a direct effect on quality and efficiency of services delivered. In [2], authors stated that the manual recording of customer details and order data presents many challenges, particularly with higher order volumes. It is also difficult to accurately track customer orders and customer information due to this inconsistency.

The project is relevant to tailoring businesses that still struggle with manual process for managing customer orders, measurements, and records. By digitalizing these processes, tailors, customers, and business owners will benefit from a more efficient process that will reduce human error, save time, and offer an improved customer experience, which will lead to the increase in business efficiency and customer satisfaction. Digital system will help manage orders, tracking inventory, analyze client preferences and behaviour, reduce human errors, improve communication and trust [3].

II. OBJECTIVES OF THE STUDY

The general objectives of the study is to design and develop a Tailor Shop Management System for Order Tracking and Customer Measurement Recording to digitize customer order processing, facilitate accurate garment production, and order tracking.

Specifically, the study seeks:

- To create cross-platform for accessibility through web and mobile devices for Freyah's employees.
- To create a digital system that collects and stores customer details, including measurements, clothing categories, and transaction methods.
- To implement an order management module that automates cost calculation, order processing, SMS status updates, and report and invoice generation.
- To test the developed interface for accurate data entry and system navigation.
- To evaluate the systems performance based on usability, and efficiency in tailoring management.

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III. REVIEW OF RELATED WORKS

Several studies have been developed using both sequential and iterative approach. In [4] authors developed an Online Selling and Sewing Clothes Management System for Tailor using the Waterfall model, with technologies and tools such as HTML, CSS, JavaScript, PHP, and SQL Server. A customer can login, place an order, check the current status of their outfit, and even provide feedback. The system was at an implementation rate of 95% with a good user interface and solid functional implementation. Similarly, In [5] authors applied the Waterfall model using PHP to automate the manual tailoring system service that has been seen to be tedious, discomforting and tiring. It allow consumers to login, place an order, monitor the status of their outfit, and even provide feedback.

In contrast, [6] authors uses System Development Life Cycle (SDLC), specifically the Spiral SDLC in developing web-based E-Tailor information system. This website application enables online clothing orders, supports smooth transactions, ensures timely completion of goods, and allows users to request sewing services without visiting the tailor shop. Black box testing confirmed that the E-Tailor web system functioned correctly, meeting all specified requirements such as functionality testing, usability testing, interface testing, compatibility testing, performance testing, and security testing methods. Although the Spiral model improved risk handling and testing coverage, the study did not emphasize cross-platform accessibility or integrated payment and tracking features.

Iterative methods were used in later studies. In [7], an Online Fashion Store Management System was developed using the Agile Scrum model. This approach focused on flexibility, user feedback, and ongoing improvement. It led to a better customer experience and efficient inventory and order management. With real-time inventory tracking, secure payment processing, and customized suggestions, it resolves the major gaps of digital fashion retailing. In [8] authors developed an Ordering System using the Agile Model. The system is developed using HTML, Tailwind CSS, JavaScript for front-end, APIs built with the Laravel PHP framework and MySQL database for storing designs, orders, and customer information. The struggle of keeping track of customer orders, now only took 20 seconds to confirm, which shows it is efficient in managing orders and it is stated that the system made the order management process easier, helped customers interact more smoothly.

In [9] authors design a website with Ordering and Inventory Systems using agile software development methodology, as the authors mention that the Agile methodology permits the efficient construction of all system development components by placing client requirements first. The system was developed using PhpMyAdmin SQL for Database, and Sublime Text for coding. The ordering system achieved a 'Very Satisfactory' rating (4.06/5) in functionality and usability, enabling seamless product browsing, cart management, checkout and excelled in terms of being accessible across different platforms, providing a user-friendly experience, and maintaining a high level of dependability.

The studies highlighted evidenced that the sequential approach like Waterfall and Spiral SDLCs were reliable systems for producing tailoring management systems with good user interfaces and stable functionality. In contrast, iterative and incremental approaches like Agile, Scrum, and Prototyping produced systems with developed significantly faster, allowed for real time updates and customer interaction, but were prone to somewhat inaccurate measurements and the need for continuous feedback.

Despite improvements in management systems available, there is not one complete system that includes customer ordering, measurement recording, payment, and real-time tracking within a single cross-platform. Many solutions included part of the tailoring process but left important gaps. Existing system did not include a combination of both desktop and mobile platforms, which does limit accessibility and flexibility for users. The proposed Tailor Shop Management System for Order Tracking and Customer Measurement Recording will addressed these weaknesses by using an Agile methodology and will provide a set of features, including order management, measurements, payments, tracking, and customization. Customers feedback will aid clarification and improvement for all features. The proposed system will also have cross-platform compatibility to allow the tailoring shop to run using a desktop computer and mobile device.

IV. RESEARCH METHODOLOGY

The Agile Model was used for the development of Tailor Shop Management System for Order Tracking and Customer Measurement Recording. The Agile Model was selected for its simplicity, flexibility, and iterative nature, which support continuous development, testing and feedback from users, while progressing from planning, design, development, testing to deployment seamlessly. In particular, Agile made it easier to adapt to changes, enhanced system quality, and user satisfaction as demonstrated in the similar study in [8].

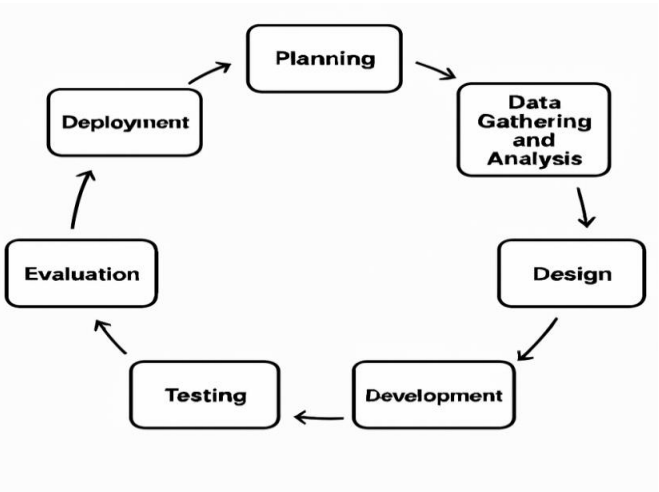

Fig. 1.0 Agile Model adopted from the study of Valdez et al. (2024)

During the planning phase, the researchers established a relationship with the client to understand the primary goals and scope of the Tailor Shop Management System for Order Tracking and Customer Measurement Recording. Data gathering and analysis was conducted through interviews

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consisting of twenty open-ended questions to identify current issues, understand workflows, and certain needs in the tailoring business. All needed information was collected using audio recordings and note taking throughout the interview. During the follow-up interview, additional data was collected such as receipts, records of orders, and other varying supplemental documents to understand the daily operations, as well as frequent issues of the tailoring business.

In the design phase, the analyzed requirements were translated into system models including a Use Case Diagram, Entity Relationship Diagram (ERD), Data Flow Diagram (DFD), and low-fidelity prototypes using Figma. The system follows a Three-Tier Architecture Design consisting of three logical tiers, which are: the presentation tier, application (logic) tier, and the data tier. The presentation layer will be developed with HTML, CSS, and JavaScript. HTML provides the structural components to the contents on the web pages. CSS gives style and format across multiple pages for a consistent look and operational responsiveness. JavaScript adds interactivity and dynamic behavior. The front-end interface is developed with these technologies to make the interaction with the user responsive and visually pleasing. The application layer processes business logic such as order management, payment handling, and SMS notifications, will be implemented using PHP and PhilSMS. MySQL will serve as the data layer for storing and managing customer, order, and transaction records, ensuring secure and organized data access.

During testing and evaluation phase, functionality testing was carried out using detailed test cases to confirm that all system features met their requirements and worked correctly. A usability assessment used the System Usability Scale (SUS) to measure effectiveness, efficiency, and user satisfaction. Although only five participants were involved in the interviews and usability evaluation, they represented key personnel in the tailoring shop. This limited sample size is recognized as a limitation. So, generalizing the results is uncertain.

Finally, the deployment phase, the system was deployed on a live server using Hostinger. The deployment involved setting up the database, configuring the system, creating user documentation, and providing basic training to ensure smooth adoption. The final product is a fully operational Tailor Shop Management System that supports efficient order tracking, recording customer measurements, and managing business transactions.

V. RESULTS & DISCUSSIONS

The results showed that the Development of a Tailor Shop Management System for Order Tracking and Customer Measurement Recording performed well in supporting the shop's processes. Users were able to complete tasks such as creating orders, assigning tailors, and tracking orders more efficiently compared to the manual process. The test results and user feedback indicate that the system performs appropriately in its designated tasks and is generally comprehensible to participants. The use of a digital platform reduces manual errors, ensures transparency, and provides accurate records, resulting in smoother operations and improved customer satisfaction.

The system showed clear improvements compared to the old manual process. The manual method required more time, effort, and paper records, which often led to delays and mistakes. In contrast, the new system allowed for faster order processing, easier tracking method, and timely updates for customers. A major improvement is the addition of automated SMS notifications. These provide customers timely updates on their order status. This feature cut down the need for frequent visits or follow-up questions. It also improved communication between the shop and customers while helping manage expectations regarding order completion/ Compared with related systems discussed in the study, the tailor shop management system also included added features such as SMS notifications for customer, order tracking, web and mobile access, which were not present in some earlier systems.

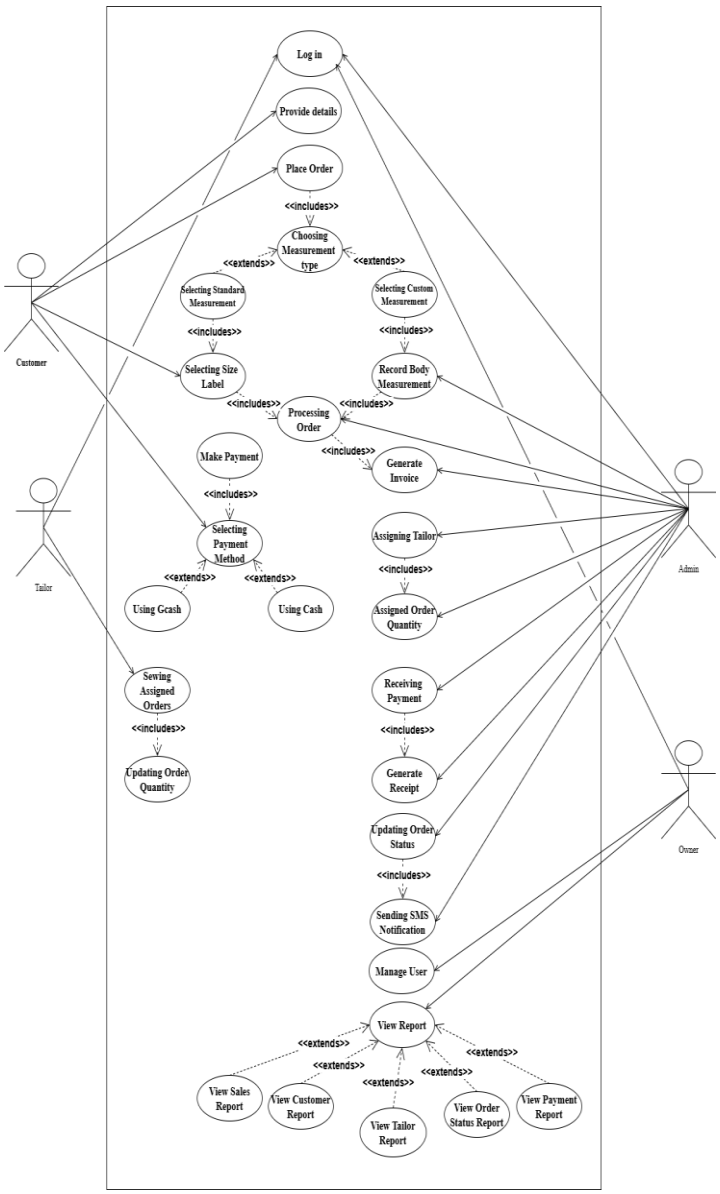

Fig. 2.0 Use Case Diagram

Figure 2.0 presents the Use Case Diagram of the system, illustrat how owners, tailors, and customers interact with the

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system and what functions they are allowed to perform. It shows how the admin process customer orders, generate invoices, assign tailor, received payments, update and track orders. The customer supplies information to complete an order.The tailor is responsible for sewing assigned orders and update the quantity of each orders. The owner is responsible for managing users, viewing reports, and maintaining proper access control. The defined roles show that each actor can only access the features that are relevant to their role. This interaction provides efficiency, offering significant improvements compared to traditional manual processes.

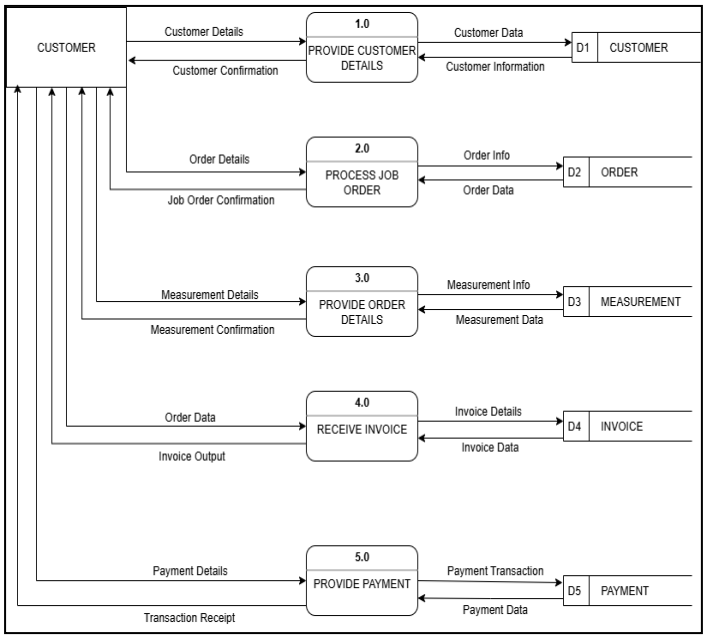

Fig. 3.0 Level Data Flow Diagram for Customer

The Context Diagram Level 1 DFD in Figure 3.0 shows the Customer's Data Flow Diagram in the Tailor Shop Management System for Order Tracking and Customer Measurement Recording. It is composed of five main processes that explain how the system manages customer data. The first process begins with provide customer details where a customer gives their details such as full name, contact number, and address, where it will be stored in the Customer data store for the next process of their order. The second process is the process job order, where the order details from the customer are recorded and organized. The third process is provide body measurement, where the admin captures the sizing information required for the order whether the customer chooses a standard size or custom measurements. The fourth process is receive invoice, where the system uses the order data provided by the customer including cloth type, quantity, measurement details, and scheduled pickup date to create an official record of the transaction. The fifth process is provide payment, where the system captures the customer's chosen payment details whether full payment or partial down payment and stores the transaction in the Payment Data Store.

The Customer Data Flow Diagram shows how the tailoring system records and manages customer details, orders, measurements, invoices, and payments in a digital way. It reduces manual errors, ensures transparency, and provides accurate records, resulting in smoother operations and improved customer satisfaction.

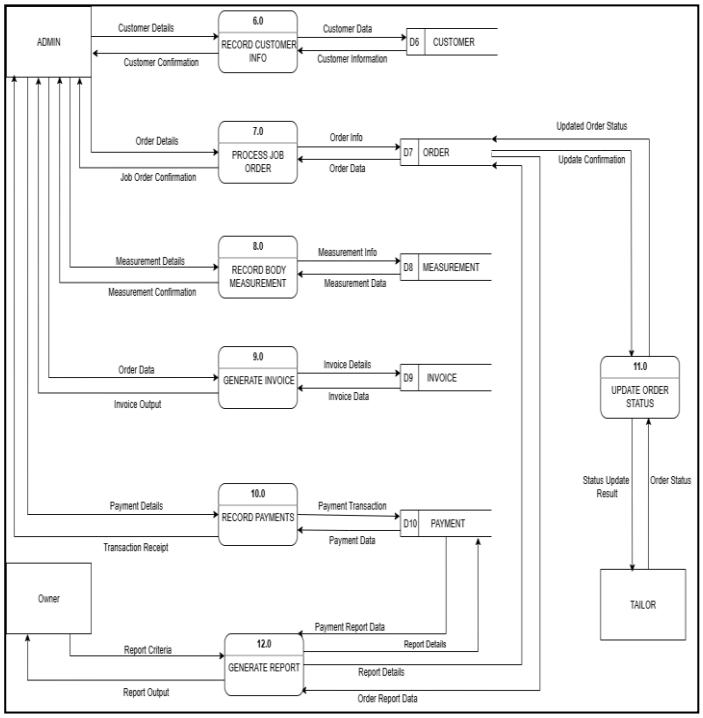

Fig. 4.0 Level Data Flow Diagram for Owner, Admin, And Tailor

The Context Diagram Level 1 DFD in Figure 4.0 shows the owner, admin, and tailor data flow diagram in the System. The sixth process is the record customer info, the admin records the customer's details such as full name, contact number, and address. The seventh process is the process job order, here, the admin manages and processes the order details given by the customer. The order specification includes clothing type, quantity, scheduled pickup date and assigning of tailors. The eight process, record body measurement involves the admin recording the customer's body measurements. This may involve either Standard Sizing, selecting predefined size labels or Custom Measurements.

Once the order and measurement details are properly recorded, the admin can generate invoice. The invoice also becomes the basis for the payment process. The tenth process, record payments. The admin records the payment transaction provided by the customer. Payments can be either, Full Payment or Partial Payment/Down Payment, the initial amount with a balance to be settled later. The eleventh process is update order status. In this process, the Tailor is responsible for updating the progress of the customer's order. It also allows the admin to track all active job orders, making monitoring more efficient and organized. The twelfth process is generate report, where the system gathers and organizes information. This process allows the owner to view various types of reports, including the Sales Report, Customer Report, Order Status Report, and Payment Report. Once generated, the system produces a report output, often in the form of an Excel file or PDF/

The admin, tailor, and owner data flow diagram shows how the system manages and organizes customer records, job orders, body measurements, invoices, payments, order status, and business reports. Improving accuracy and efficiency by digitizing records, and providing clear tracking of orders and payments.

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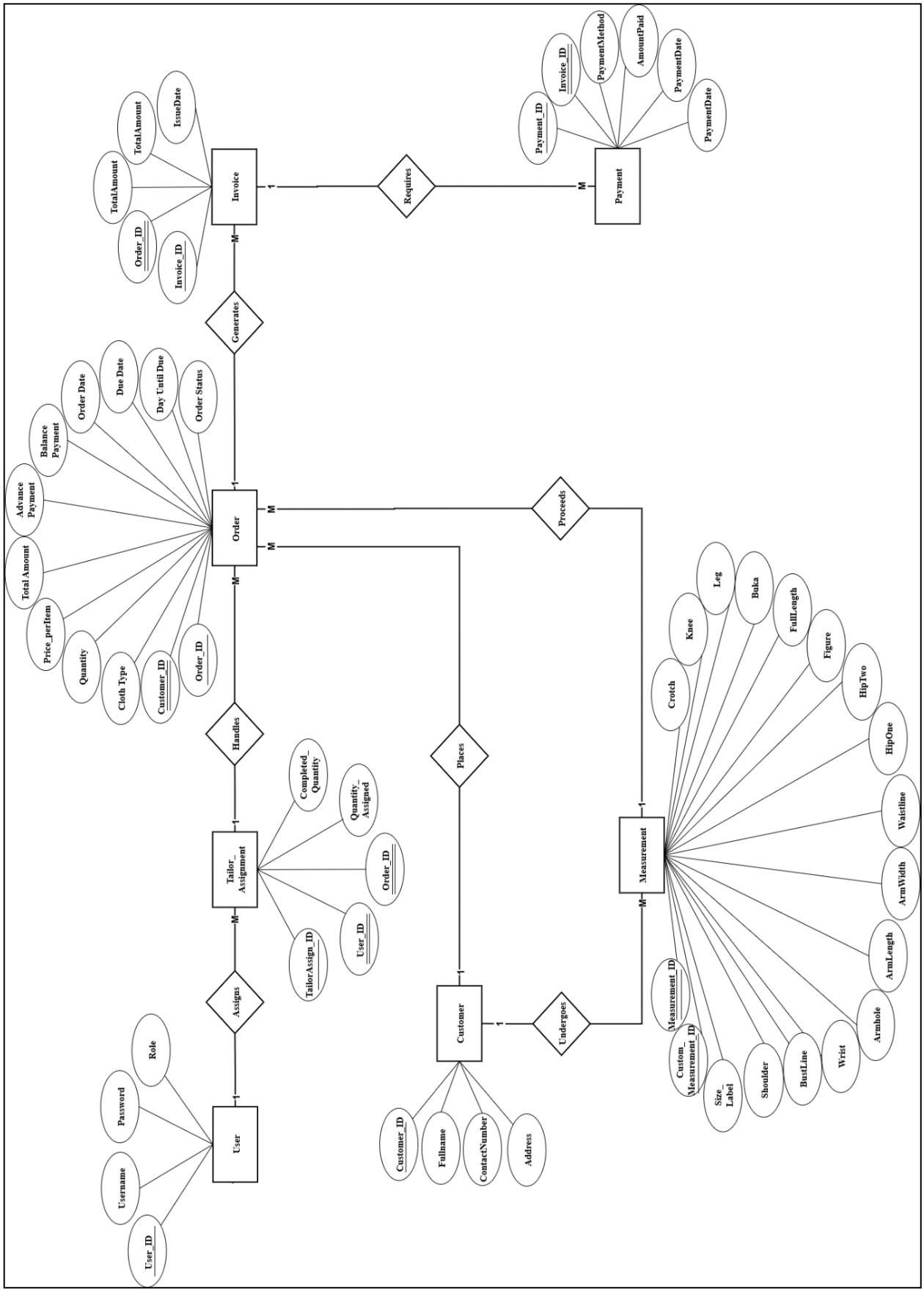

Fig. 5.0 Logical Entity Relationship Diagram

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Logical Entity Relationship Diagram (ERD) was developed to illustrate the structure of the database. An Entity Relationship Diagram (ERD) is a diagram that used for database design. It represents the entities in the system and the way the entities relate to one another. The ERD outlines the data structure and can illustrate the entities, attributes, primary and foreign keys as well as relationships.

The ERD, shown in Figure 5.0 above, identifies the core entities User, Customer, Order, Measurement, Tailor Assignment, Invoice, Payment and defines how they are related. The ERD details the data flow and relationships in the system. By laying out the interactions between users, customers, orders, and payments, it creates a good structure for the database. This builds the right order process that supports multiple payments, while also tracking tailor assignments and ensuring each order refers to the correct pair of customer and measurements.

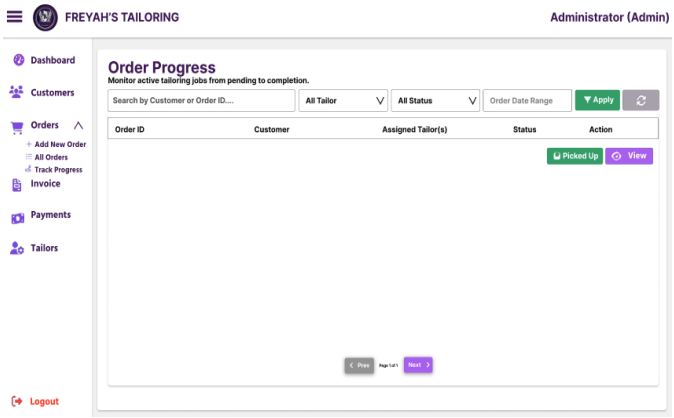

Fig. 6.0 Track Progrerss Page

Figure 6.0 shows the page for tracking Order Progress at Freyah's Tailoring. It's designed to help admin keep an eye on all the active tailoring jobs from when they start until they're finished. Admin can easily search for a specific order by customer or order ID, and also filter by which tailor it's assigned to or its current status. The page shows a list of orders with their ID, the customer's name, the assigned tailor(s), and the current status, plus an action button for likely viewing more details. This feature provides an effective way to monitor job progress and ensure that operations proceed as expected.

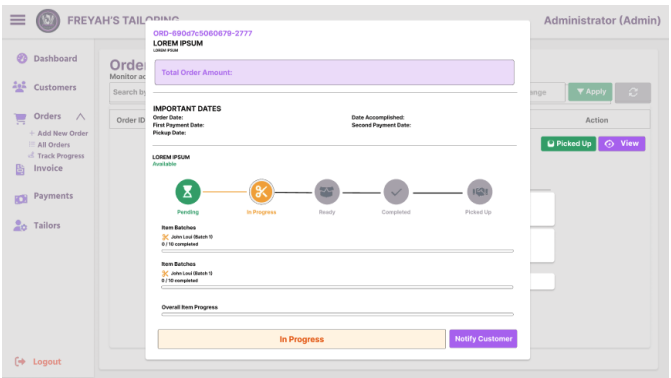

Fig. 7.0 Order Progress Pop-up View

Figure 7.0 shows a detailed view of an individual order's progress at Freyah's Tailoring. After selecting an order, this page pops up to show you exactly where it stands in the tailoring process, from "Pending" all the way to "Picked Up," with the current status highlighted. You can see specific items, like which tailor is working on them and how many items they've completed. It even provides an overall progress update and a handy button to notify the customer about their order's status. It's really useful for giving accurate updates and managing customer expectations.

QUESTIONS	PARTICIPANTS				
	P1	P2	P3	P4	P5
1. I think that I would like to use this system frequently	3	4	4	4	3
2. I found this system unnecessarily complex.	3	3	0	4	3
3. I thought the system was easy to use.	3	4	3	4	4
4. I think that I would need support of a technical person to be able to use this system.	1	2	0	3	0
5. I found the various functions in this system were well integrated and organized.	3	4	4	4	0
6. I thought there was too much inconsistency in the system.	1	3	0	4	3
7. I would imagine that most people would learn to use this system very quickly.	3	4	4	4	4
8. I found the system very cumbersome to use.	4	4	4	3	3
9. I felt confident using the system.	3	4	4	4	4
10. I needed to learn a lot of things before I could get going with this system.	3	1	2	4	4
TOTAL SCORES:	**67.5**	**82.5**	**62.5**	**95**	**70**
OVERALL SCORE:	**377.5**				
SUS SCORE:	**75.5**				

Table 1. Final SUS Score Computation

Table 1.0 shows the calculated System Usability Scale (SUS) scores of five participants after their ratings have been processed. Their ages ranges from 23 to 47. Two participants

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were college graduates, two were college level students, and one was a high school graduate. During the usability testing, the participants were observed navigating through the system with minimal assistance. In terms on user feedback and test results, the system appeared to help with the common problems previously faced by the shop, such as misplaced records, inaccurate measurements, incorrect data, and inconsistent entry. All five participants received a final SUS scores of 67.5, 82.5, 62.5, 95, 70, resulting in a total SUS score of 75.5, which falls within the "acceptable" to "good" range for usability. It has a letter grade of B and considered acceptable, indicating that users find it generally easy to learn and navigate. It suggests good usability though there may still be some room for improvements.

Most participants agreed they felt confident in using the system and that new users would be able to learn the system quickly. Most participants generally found the system's features to be mostly well integrated and organized. However, some minor concerns were noted regarding some complexity, inconsistency, and the need for technical support. These lower scores may reflect first-time exposure to the system. These issues may mean that some parts of the interface still need improvement, such as clearer labeling, streamlined workflows, or more user-friendly designs. Overall, the system demonstrates reasonably good usability, while still indicating opportunities to small enhancements in the system.

VI. CONCLUSION & FUTURE WORK

The study concludes that the Tailor Shop Management System for Order Tracking and Customer Measurement Recording successfully achieved its main objective, which is to digitize customer order processing, facilitate accurate garment production, and order tracking, generating automated sales reports, and automated cost calculation. The system reduces human error and reliance on paper-based or handwritten records, and also allows smooth interaction where admin can assign orders and tailors can update their progress in real time, providing a modern experience for the different users for this business.

Furthermore, the test results and user feedback indicate that the system performs appropriately in its designated tasks and is generally comprehensible to participants. The SUS score suggests a positive perception of the system's usability, but there are still needs of improvements and updates to the interface that may assist the usability of the system. While the system shows potential to support tailor shop operations, further updates and refinement are needed, particularly regarding layout and enhanced features, so that it could be more effectively implemented in other tailored scenarios and ultimately meet the needs of other shops.

Recommendations:

Based on the findings and conclusions, the researchers present the following recommendations to support proper deployment, ongoing use, and future development. These recommendations aim to help improve the use of the system and ensure that it remains effective.

1. The shop is encouraged to officially implement the system so that the order process can be handled in an organized way, and enhance the reports to allow clearer summaries of the order details and order timelines.
2. Improve the user interface in future versions to make it easier to navigate and provide brief staff training for effective use.
3. Implement offline functionality to improve accessibility during slow internet connections, add inventory management functionality, and assign a technical person to maintain the system in order to ensure that it continues to function properly over time.

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