

DesignClo: A Smart Recommender System for Personalized Clothing

Andrei Jherico B. Javillo, Andrew J. Kurihara, Alejandro D. Lansang, Ronald B. Fernandez

College of Computing Studies, Universidad De Manila, Philippines

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Abstract: The clothing industry is undergoing a significant transformation driven by the integration of Artificial Intelligence (AI) and emerging digital technologies. Traditional manual processes in clothing design are often time-consuming and restrictive, prompting the development of innovative solutions that enhance creativity and efficiency. To address this gap, the proponents introduce DesignClo, a mobile-based application that leverages a smart recommender system to deliver personalized clothing designs. The system integrates AI-Powered Design suggestions and a wide variety of motifs, enabling users to refine ideas and access trend-driven insights. Complemented by three-dimensional (3D) visualization technology, the platform allows users to preview their creations through life-like mockups, bridging the gap between concept and reality. Built using Tauri and Rust, and developed under the Agile Methodology, the application ensures adaptability, performance, and user-centered design. This inclusivity underscores the application's broader societal value, offering opportunities for aspiring designers, professionals, and customers regardless of technological limitations. DesignClo uniquely features a virtual try-on so that the user will be able to observe their personalized clothing piece on how it would like when worn. This feature not only allow users to be able to visualize their design in a real-life setting, but it also enables them sync their own customization tailored to their preferences. Overall, DesignClo represents a breakthrough in personalized clothing production, serving as both a creative tool and an industry-aligned platform for clothing and printing businesses. By merging AI-driven recommendations, intuitive design customization, and offline usability, the system provides a sustainable and future-ready approach to enhancing user participation and shaping the evolution of the clothing industry.

Keywords: Agile Methodology, Artificial Intelligence, Recommender System, Rust, Tauri, Three-Dimensional Technology, Virtual Try-On

I. Introduction

Artificial Intelligence is an emerging technology that enables a machine to mimic the thought process of a human being. It has been significantly effective as it also automates tasks that humans can do. With its continuous development, it now plays a vital role in enhancing accuracy and innovation across various industries.

A recommender system is one of the most notable Artificial Intelligence algorithms and it is usually associated with machine learning that is designed to suggest content to users, either based on their preferences or past interactions. On top of that, it enhances the experience of the user by providing personalized recommendations, which helps in seeing necessary matters related to their interest and liking.

Typically, a cycle process is done in order to obtain quality personalized clothing. Wang, Z. et al. [1] states in their study entitled Design of Customized Garments Towards Sustainable Fashion Using 3D Simulation and Machine Learning-Supported Human Product Interaction, this cycle starts with the design, followed by evaluation and last is the adjustment. These procedures are applied through physical prototypes. The process is tiresome to some extent and will certainly lead negatively towards the usage of materials. So, to overcome these flaws, progressive digital technology like the 3D Virtual Simulation has been utilized for remaking the whole clothing personalization in a more workable way. This technology simulates the design process without making the physical prototype being produced, wherein it solves the issue of the materials being wasted (Wang, Z. et al., 2023).

Therefore, this study entitled DesignClo: A Smart Recommender System for Personalized Clothing, is a mobile-based. By means of providing a three-dimensional visualization in the design process, users will be able to observe how the design will look from every angle of the garment. The system also offers a pre-made design collection where it helps users by recommending tailored designs to the users. The system was intentionally designed to be in a mobile-based platform to ensure easy accessibility for the users where everyone will be able to utilize it, anytime and anywhere. Also, the system aims to serve as a tool, both in the process of customizing a personalized design, and to achieve a mockup that reflects a life-like presentation of the garment. This study will cover a useful application that will serve as a platform to design, whether for personal use or business purposes.

Related Studies

According to the study of Hering [2], he examined the capabilities of CLO3D as a transformative tool in digital fashion design. By eliminating traditional manufacturing constraints and costs, CLO3D enables designers to create high-quality fashion garments solely through computer-based design. However, while CLO3D empowers nontraditional fashion designers, the study noted potential challenges like the software's learning curve and accessibility for beginners. But, despite these limitations, the research underscores CLO's impact on democratizing fashion design and fostering innovation in digital garment creation.

According to the study of Blancaflor, E. & Villasor, D. [3] they explored the integration of virtual reality in fashion e-commerce. It highlights how virtual try-on technology enhances the online shopping experience by allowing users to visualize how fashion items fit on their avatars, reducing sizing and fitting concerns. This innovation redefines digital fashion applications, demonstrating the potential of AI-driven personalization to revolutionize consumer interaction in the fashion industry.

A study by Baje, R., et al. [4] explored the growing demand for personalized digital fashion experiences. The researchers proposed Chérie, a mobile application that integrates AI-driven outfit recommendations and 3D virtual try-on technology to enhance closet management and outfit planning. The study followed the design thinking process over nine weeks, utilizing surveys and user feedback from women aged 16-34, the app's target demographic. Findings revealed a strong interest in AI-assisted styling and a preference for a freemium pricing model.

A study by Bertiche, H., et al [5] introduce CLOTH3D, the first large-scale synthetic dataset dedicated to 3D clothed human sequences. The dataset features a wide variety of garment types, topologies, shapes, sizes, tightness levels, and fabrics, making it a valuable resource for realistic cloth dynamics simulations. The study also proposes a Conditional Variational Auto Encoder based on graph convolutions, enabling realistic 3D garment generation on top of the SMPL model for any pose and body shape.

In the study of K.H. Choi [6] he explored the creation of 3D dynamic fashion garments with adaptable styles, colors, and textile patterns through 3D virtual simulation systems. To assess the feasibility and industry relevance of 3D virtual garments, focus group interviews were conducted with professional fashion designers and digital experts.

A study by Guillermo, M., et al [7] addressed the growing complexity of recommendation systems in e-commerce due to the increase in online shopping behavior during the pandemic. The study utilized Fashion MNIST images to develop an image-based fashion recommender system, leveraging unsupervised learning techniques to identify highly similar clothing and footwear items.

Conceptual Framework

This part focuses on the structure framework of the application for better understanding and analyzing how the application works, and how it processes gathered information.

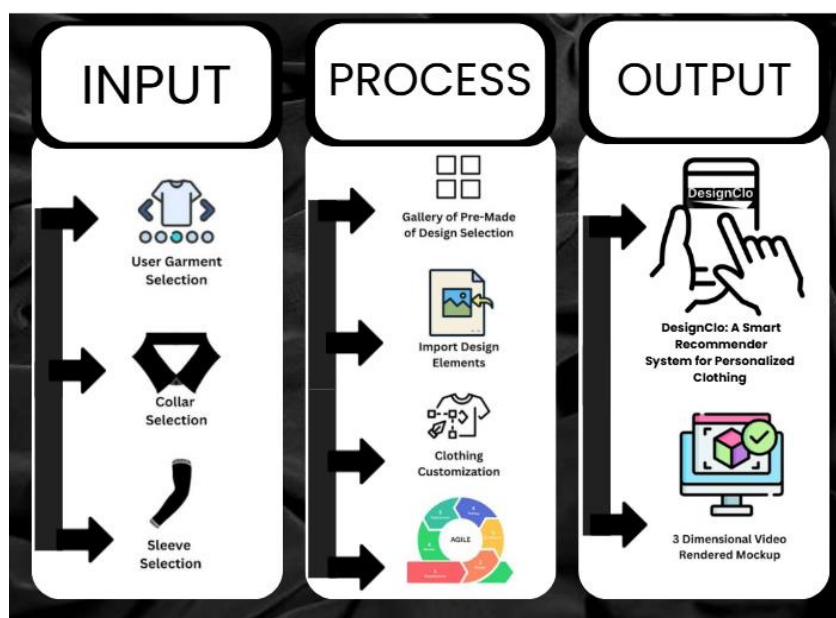


Figure 1: Input-Process-Output (IPO) Model

Figure 1 highlights the Input-Process-Output (IPO) Model of DesignClo. The model demonstrates the systematic approach of the development process which can be separated into three main sections: Input, Process and Output.

The Input Phase is where the user uses the app, starting with choosing a garment, it is between a T-Shirt, Polo Shirt, and Polo. Then, choose the collar style that matches the user's vision, which helps shape the overall look. After that, select the sleeve type, which adds to the style and feel of clothing. These choices are really important because it helps the system to understand what the user wants, so it can suggest personalized design options. This step makes the experience feel more customized and unique from the very beginning.

The Process Phase walks the user through the main steps where ideas turn into a custom clothing design. The user can browse through a handpicked selection of pre-made designs, which will serve as an inspiration to their own design. If the user wants to add their own touch, they can upload graphics or pictures in JPEG or PNG formats. To help get everything just right, the Position Guide tool allows them to move their design elements sit on the garment. During development, we used an Agile methodology, meaning

we constantly made improvements based on user feedback. This kept the app flexible and focused on what users wanted, helping us create a better, more user-friendly experience.

In the output phase, users can view, save, and prepare their personalized garment designs for a life-like mockup presentation. The app's AI-powered recommendations further refine the design to better suit individual preferences. To provide a realistic preview, the completed design can be virtually try-on for a more unique and realistic picturing. This immersive visualization enhances user confidence in the final product and supports better decision-making.

Application Development

In this part, the proponents applied the AGILE Methodology in light of the fact that this methodology focuses on the project's flexibility, collaboration, and improvement during the development and the project management processes. The larger project is divided into smaller, simpler chunks termed as iterations or sprints which last a few weeks. During every sprint, teams evaluate their progress and modify their future actions accordingly. This enables the project to progress in tune with requirements and demands from the customers or clients. This approach provides a competitive advantage, better collaboration in teams, and frequent delivery of functional products.

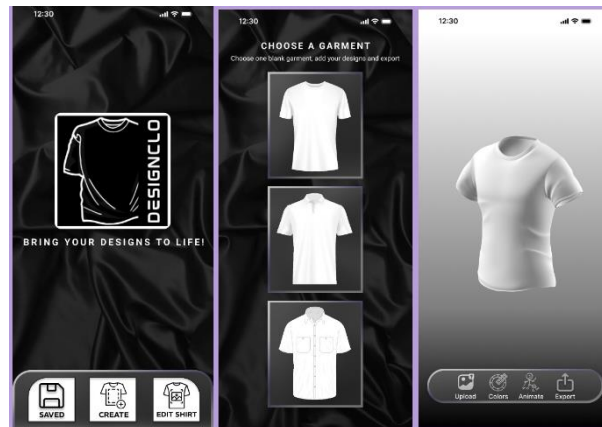


Figure 2: Design Clo Prototype

Figure 2 shows how the DesignClo functions after development. When the user first launches the application, it opens with a loading screen where the AI recommender engine and 3D clothing assets initializes, this is necessary to prepare the system wholly. After this brief loading phase, the app proceeds to the home interface where users can now create, view their saved works, and modify it. In the create panel, users can select the garments and its components like collar and sleeves for a more personalized aspect. Afterwards, the canvas will load together with the model itself, and from here, users can adjust the colors, add their own designs, input texts, and even prompt AI-Generated Designs. A built-in 3D viewer displays each design in real time, allowing smooth rotation and zoom for detailed inspection.

Requirements Gathering

Agile Methodology's first phase of development is planning, during which the objectives, parameters, and scope of the project are precisely established. The proponents must determine the issue that needs to be resolved, laying out goals, project time and resources, and evaluating any hazards.

A project strategy is made to direct the development process during this phase, and stakeholders are contacted to make sure the system meets their demands. A clear path, the avoidance of future issues, and the project's viability, organization, and success are all made possible by careful planning.

Design

This next phase of agile development is the design, in which when the system's general architecture and structure are developed using the requirements that have been acquired. It entails specifying the technologies to be employed, the way the system will work, and the interpersonal interactions between its many parts. User interfaces, database structures, and data flow diagrams are examples of precise design specifications as well as high-level system architecture. During this phase, the requirements are converted into a well-structured plan that developers may adhere to during implementation. A well-designed product is more efficient, less prone to mistakes, and more likely to meet consumer expectations. The DesignClo design will have a primary user interface (UI) color palette of black, gray, and white.

In order to support the users' content, DesignClo's UI will reflect a modern and clean minimalistic look. The layout will be user-intuitive and navigable for inexperienced and experienced users alike. All clothing tools and options will be visible and responsive, allowing users to design clothing or style the clothing design with little effort.

The proponents will use 3D integrated visualizations so that the user can imagine, visualize, and realize their clothing designs. Also, a built-in collaborative pre-made gallery will enable the smart recommender system to personalize suggestions based on the users' preferences and design history. Import and position guide tools will also be seamlessly integrated and allow for designs to be accurately placed while giving users the ability to be creative.

Development

As for the third phase of Agile Development, by incorporating extensive editing capabilities, visual 3D presentation, and a smart recommender system through the pre-made gallery, DesignClo gives users the opportunity to unleash their creativity.

These features support a cohesive and substantial design experience while providing flexible tools to customize and then visualize their clothing in a realistic preview via a 3D model. With the editing tools, users can easily manipulate colors, patterns, and placements when designing. The 3D output offers realistic previews that assist users in visualizing their final creations.

The recommender system acts on users' past preferences and interactions and makes relevant gallery suggestions to inspire new ideas or helpful information to review to facilitate the design process. Collectively, DesignClo enables both occasional creators and serious fashion design enthusiasts a robust platform.

The proponents start by establishing the needed datasets, which in our case, the design per garment. Additionally, the proponents build the foundation and core frameworks such as Content-Based Algorithm and Collaborative Filtering because these two are needed for the recommender system to work. The proponents then manually design each of the garment in light of the fact that the premade collection of design offers a wide-variety of design suggestions for the user to choose from. After which, the proponents will train the designs via Gemini where we will prompt the tags of every design to match its category in the design motifs aspect.

Moreover, the proponents will use Tauri with Rust to build the core application and handle the processing pipeline, ensuring that user inputs and AI-generated designs are efficiently managed and delivered. In addition, Blender is utilized for creating and refining the 3D garment models, providing accurate textures and realistic visualization. These technologies support key features of DesignClo, including the splash/loading screen, AI recommender system, interactive 3D viewer, and offline functionality, enabling a seamless and visually rich user experience. The DesignClo application will be developed on Acer Nitro V15, a laptop with AMD Ryzen 5 6600H with Radeon Graphics and 16GB RAM.

Testing

The agile fourth phase testing, wherein to effectively observe the functionality of DesignClo, performing system validation, assessing performance, and resolving errors is needed in order for the proponents to cope with it. In terms of the accuracy of three-dimensional (3D) output and recommender system of pre-made gallery.

During the development stages is basically the activity of verifying the software or system will work and meet the requirements as specified. Testing is continuous, and often more robust with concurrent development processes. In Agile, testing is integrated into every iteration or sprint, and there are various types of testing carried out both during and at the conclusion of that activity. Unit testing looks at individual components to ensure they are working. Integration testing is looking at the modules/interfaces to each other. System testing is testing an entire system. User acceptance testing (UAT) is used to ensure the final product meets user expectations.

After the application is done, the proponents will first test the integration of recommender system, where the proponents will feed a variety of clothing styles and designs, as well as its accuracy. Once the designs and models consistently provide suitable recommendations, and both the algorithms are accurately established, DesignClo application will now be ready for end-user testing so the proponents will then conduct further testing using diverse user inputs, such as design preferences and season trends for ensuring that the recommendations remain accurate, visually appealing, and responsive to changes in user selection or motif variation.

The proponents have gathered such clothing and print shops who will as respondents in this study, namely Saint Clothing located at Velasques, Tondo Manila; TransferIt in Robinsons Ermita; and Sports Garage in SJDM Muzon Branch. The proponents prepare a Likert-Scale interview questionnaire for the intended target users to evaluate and test the application. The questionnaire made is based on the ISO/IEC 25010 criterion to make sure both models and application meet the users demands and needs

This study uses purposive sampling to select participants based on their expertise, availability, and willingness to join. A total of 7 individuals per target respondent to gather their insights when it comes to fashion interests and design experience were chosen to test the DesignClo application, focusing on functionalities, 3D Visualization, and the accuracy of its AI-Generated Design and Machine Learning design recommendations.

Deployment

The fifth phase of agile development is deployment, where the process of releasing the software or system to end users or around a live environment. Deployment is the phase in which the product is transferred from a development or staging environment and released into a production environment for use by end users.

After the testing and evaluating the system performance and checking any vulnerable part of this system application, the proponents will deploy it first using an APK link provided by the Tauri platforms, wherein the intended users can download the application through this. Once installed, user will have full access to the app. The proponents suggest to submit the application in the google play store so that individual end-users will be able to download it as well.

Review

As for the last phase, a system review in the evaluation stage ensures the product follows its original requirements, works as intended, and provides the intended user experience. Evaluation identifies problems and gaps such as bugs, performance bottlenecks, and design issues. The refinement phase has the purpose of making all required updates, repairs, optimizations, and refinements of the system leading to an overall higher quality design.

After deployment, the proponents will evaluate the system's performance using feedback from the target users and implement necessary updates to maintain stability, enhance functionality, and ensure the application remains adaptable and satisfying for end-users.

Designclo Algorithm

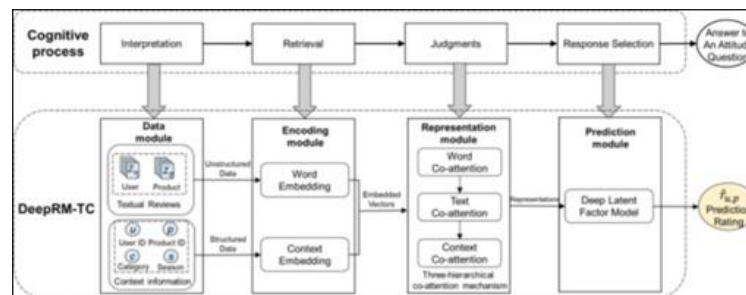


Figure 3: Cognitive Process-Driven Model Design

The Cognitive Process-Driven Model Design of DesignClo Application as shown in figure 3, The users feel that DesignClo enhances their fashion experience by making it more interesting and relevant to their sense of style with the recommendation based from their preferences. As opposed to the conventional fashion experience of solely browsing through catalogs or pre-made gallery, DesignClo applies cognitive-based recommendation technology to generate smart and adaptive design recommendations.

Users think that DesignClo makes fashion discovery more intuitive and personal by learning and adjusting to their individual style choices. Unlike traditional recommendation systems that are based on predetermined sets, DesignClo with support of Deep Reinforcement Matching with Triple Co-attention to further enhance clothing recommendations according to current user interactions. Through data processing, DesignClo smartly adjusts its suggestion according to the fashion sense of user. The more the users explore and design through the app, the more the system learns with them, making each of its suggestions feel new, timely, and personally tailored.



Figure 4: Final Output of the Garment Model with the design printed on it

II. Results and Discussion

DesignClo AI Recommender and 3D Visualization Evaluation

The developers created a clean and modern Graphical User Interface (GUI) that allows users to explore and design garments seamlessly. Once launched, the application immediately loads the AI recommender and 3D engine, requiring minimal input before a user can begin designing. The interface supports smooth rotation, zooming, and real-time texture changes, making it easy for both beginners and experienced designers to interact with the 3D models.

Multiple rounds of testing were conducted during the Agile testing phase. Seven purposively selected participants with varying levels of fashion interest and design experience evaluated the application on different devices and network conditions. Testers were

asked to create custom designs and review AI-generated suggestions while manipulating 3D garments produced in Blender and packaged through Tauri with Rust.

The system consistently maintained interactive frame rates (averaging 48–55 FPS) and rendered detailed textures without noticeable lag. The AI recommender achieved an 85–90% match rate with users stated style preferences, indicating that the model provided relevant and creative design ideas. A few minor challenges were observed when users uploaded very large custom textures, which occasionally required a second render pass, but these did not hinder overall usability.

Evaluation Based on ISO/IEC 25010 criterion

A survey was administered to a total of 21 participants after their hands-on evaluation of DesignClo. The questionnaire measured the eight quality characteristics defined in ISO/IEC 25010: Functional Suitability, Performance Efficiency, Usability, Reliability, Security, Maintainability, Portability, and Compatibility. Respondents rated each item on a 1–5 scale (1 = Poor, 5 = Excellent) using the specific sub-criteria in the survey. Responses were collected through Google Forms and analyzed to produce clear, quantifiable results.

Functional Suitability

This characteristic measure how well the system provides the intended functions, such as AI-generated design recommendations and customization tools. The five indicators covering creativity of recommendations, alignment with user inputs, customization options, design quality improvement, and availability of essential tools received mean scores of 4.73, 4.71, 4.74, 4.70, and 4.72, respectively, as clearly shown in the table below. Participants agreed that the recommendations encouraged creativity, aligned with inputs, and improved the overall quality of their designs.

CRITERIA	GENERAL WEIGHTED MEAN (GWA)	INTERPRETATION
1. Functional Suitability	4.72	Excellent
The recommendations encourage creativity and experimentation.	4.73	Excellent
The results of the application align with what I expect from my inputs.	4.71	Excellent
The app allows me to fully customize my designs.	4.74	Excellent
The recommendations improve the overall quality of my designs.	4.70	Excellent
The application provides all necessary tools for my design tasks.	4.72	Excellent
2. Performance Efficiency	4.67	Excellent
The app does not use excessive mobile data.	4.66	Excellent
The performance remains stable when using multiple features.	4.68	Excellent
The system provides results without lagging.	4.69	Excellent
The app continues to run efficiently over long sessions.	4.65	Excellent
The system performs well even on devices with low resources	4.67	Excellent
3. Usability	4.74	Excellent
The app is simple and straightforward for users to operate.	4.78	Excellent
The visual design is attractive and well-organized.	4.75	Excellent
The app allows me to undo or redo actions easily.	4.72	Excellent
The app is easy to navigate the features of the system	4.74	Excellent
The application helps me avoid common design mistakes	4.75	Excellent
4. Reliability	4.64	Excellent
The application recovers properly after unexpected issues.	4.64	Excellent
The system continues to work correctly during long sessions	4.66	Excellent
The application handles multiple tasks without errors.	4.63	Excellent
The application works consistently over time.	4.65	Excellent
The application functions even with poor internet connections	4.62	Excellent
5. Security	4.60	Excellent
The application gives me control over my personal data.	4.60	Excellent
The application secures saved work effectively.	4.61	Excellent
The platform respects privacy and intellectual property rights.	4.59	Excellent
The data transmitted by the app is protected	4.58	Excellent
The designs made are not shared without consent	4.60	Excellent

6. Maintainability	4.55	Excellent
The app does not use excessive mobile data.	4.57	Excellent
The performance remains stable when using multiple features.	4.55	Excellent
The system provides results without lagging.	4.56	Excellent
The app continues to run efficiently over long sessions.	4.54	Excellent
The system performs well even on devices with low resources	4.55	Excellent
7. Portability	4.63	Excellent
Accessible from any location with an internet connection.	4.63	Excellent
The system has no log-in feature and can be use across devices	4.62	Excellent
The app is free and quick to install.	4.65	Excellent
The system adjusts well to different screen sizes.	4.64	Excellent
User settings remain consistent across devices.	4.61	Excellent
8. Compatibility	4.65	Excellent
The system is compatible with my preferred device settings.	4.66	Excellent
The application maintains its layout across devices.	4.65	Excellent
The app remains functional after reinstalling	4.64	Excellent
No special tool is needed to use the system.	4.67	Excellent
The application works well with Android and IOS.	4.65	Excellent

Table 1: User Evaluation Summary

1. Overall, the mean scores for these five sub-items yielded a weighted mean of 4.72 (Excellent)., which is equivalent to Excellent. This shows that participants found DesignClo highly functional and capable of delivering accurate AI-generated designs and full customization.

Performance Efficiency

This aspect reflects speed and resource use. The system gained a mean of 4.67 (Excellent). Participants reported that 3D models loaded in under five seconds and that the app maintained smooth rendering and low battery consumption

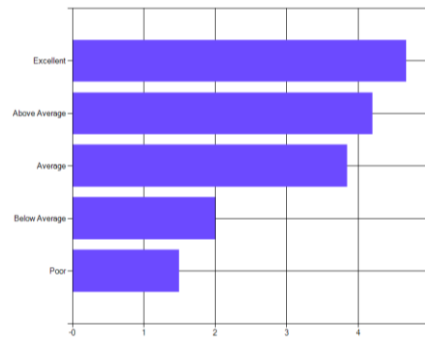


Figure 5: Bar Graph of Performance Efficiency Criteria

2. Figure 5 presents the summary of the answers of the users based on their experience while using the application. This confirms that DesignClo performs well in any device under any circumstances.

Usability

Usability captures ease of use and overall user experience. Criteria scored 4.78, 4.75, 4.72, 4.74, and 4.73, resulting in an overall mean of 4.74 (Excellent).

Participants praised the clean interface, logical design workflow, and intuitive navigation, noting that even first-time users could create and visualize designs with minimal learning.

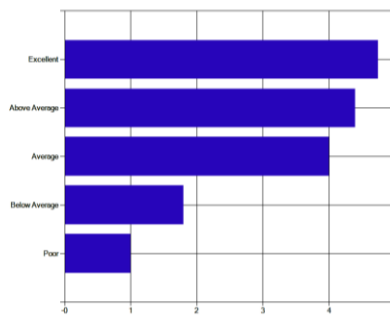


Figure 6: Bar Graph of Compatibility Criteria

3. Target users expressed certainty in DesignClo's overall ease of use and design workflow. With an average mean of 4.74, as shown in Figure 6, majority of the respondents rated the application as Excellent in terms of usability, indicating that the app provides a user-friendly design environment for both beginners and experienced designers.

Reliability

Reliability measures consistency and stability over time. This sub-characteristic indicates an average of 4.64, with respondents observing that the app handled long sessions and multiple tasks without their device freezing. Additionally, they have evaluated that the app recovered well from a bit of network interruption. The statement under this sub-characteristic achieved weighted means of 4.64, 4.66, 4.63, 4.65, and 4.62, which all corresponds to Excellent ratings, as shown in Table 1.

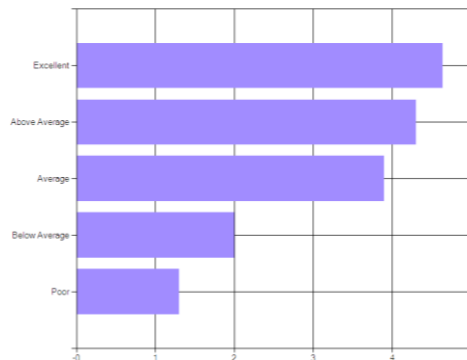


Figure 7: Bar Graph of Reliability Criteria

4. Based on the answers from the respondents, the application simply runs smooth, their device does not heat up and the application itself does not freeze despite running heavy tasks like the feature of prompting AI-generated designs and even if the layers are added in the canvas, it still works fine. As displayed in Figure 7, this confirms that DesignClo provides dependable performance.

Security

This sub-characteristic concerns the protection of user data and intellectual property. Participants appreciated that all processing occurs locally and that designs are never shared without consent, ensuring privacy and data safety. The statements under this sub-characteristic achieved an average of 4.60 which corresponds to an Excellent rating, as shown in Table 1.

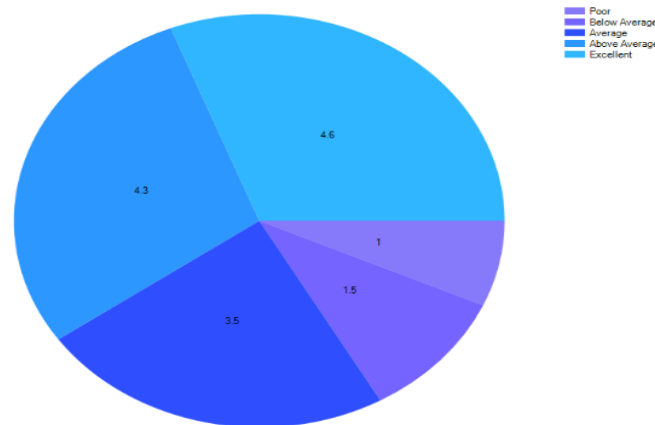


Figure 8: Pie Chart of Security Criteria

5. Respondents noted that the application safeguards their privacy, as no personal data is collected and all design processing occurs locally on the device. This offline-first approach reassured participants that their creative work and usage of DesignClo remain secure and confidential. On top of that, the confirmation feature before sharing a certain design globally is asked to the user, making sure that their personalized piece is shared with their consent.

Maintainability

Maintainability evaluates how easily the system can be updated or improved. This sub-characteristic obtained an overall mean of 4.55, although this rating is slightly lower, it still falls under the Excellent category.

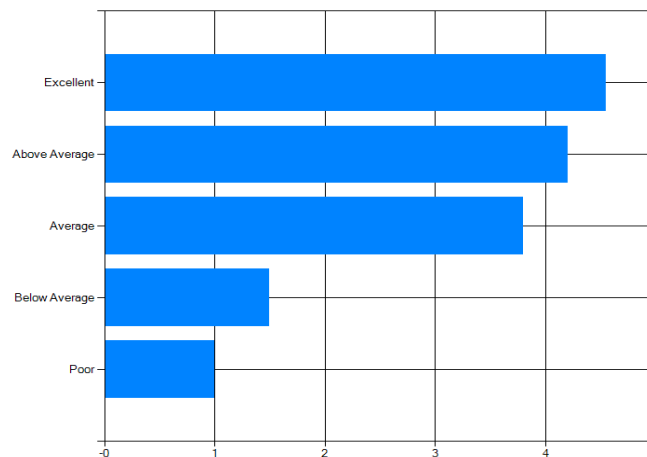


Figure 9: Bar Graph of Maintainability Criteria

6. Respondents recognized that the Tauri–Rust architecture supports updates without affecting existing features, though clearer developer documentation could further improve future enhancements.

Portability

For this sub-characteristic, it assesses the ability to operate across devices and environments. DesignClo achieved a mean of 4.63 (Excellent) after successful tests on Android and iOS, and its display responds well in various screen sizes. Participants noted that installation was straightforward and that settings remained consistent across platforms.

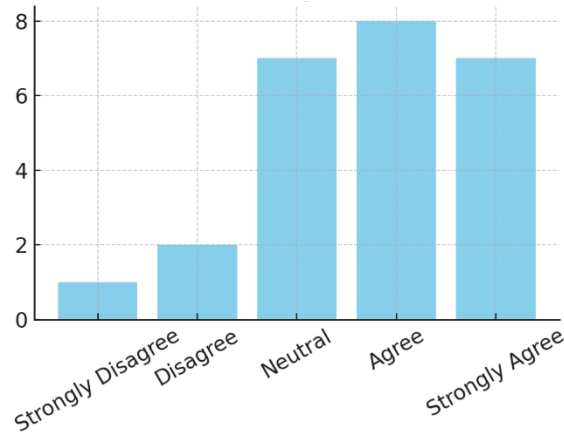


Figure 10: Bar Graph of Maintainability Criteria

7. Respondents denotes the convenience of offline operation and seamless project transfer, while a few suggested optional cloud-sync to further enhance cross-device portability.

Compatibility

This sub-characteristic assesses how well the app works across devices and with other tools. This achieves an average mean of 4.65, which corresponds to an excellent rating, showing that the system works effectively across different smartphone models and operating system versions.

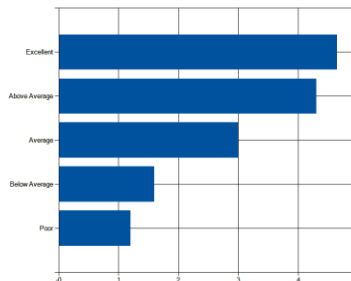


Figure 11: Pie Chart of Compatibility Criteria

8. Respondents confirmed that DesignClo maintained consistent layout and performance on Windows, macOS, and Android, integrating smoothly with device settings and other creative applications.

Data Availability

The datasets generated and analyzed during this study are not publicly available to protect participant privacy and safeguard proprietary 3D garment assets.

The survey responses contain personal opinions and design preferences that could identify participants. However, anonymized summary statistics and evaluation results are included in this manuscript.

The 3D garment models and AI training data are proprietary to the research team and are restricted to prevent unauthorized commercial use.

Aggregated data supporting the study's conclusions may be obtained from the corresponding author upon reasonable request and with appropriate institutional approval.

Ethical Consideration

Informed Consent: DesignClo ensured that all participants understood the study's purpose, procedures, and any potential risks or benefits. Written consent was distributed to the target organizations of the respondents in this study before participating in usability testing and survey evaluations.

Privacy and Data Protection: DesignClo does not require personal information to use the app's full functionality. All AI design processing occurs locally on the user's device, and no user-generated designs are transmitted to external servers.

Accessibility: The application is designed to be inclusive and easy to navigate regardless of users' age, technical background, or design experience. Clear instructions and a minimalist interface support both beginners and designers by profession.

Reliability and Accuracy: The system emphasizes stability and consistent AI-generated designs and Algorithm based recommendations. Users are advised that the AI suggestions are creative aids and should be reviewed before final production to avoid errors or unintended designs.

Fairness: DesignClo's recommender system was trained with diverse clothing styles and various component of a clothing piece to provide equitable design suggestions that respect different fashion tastes, gender, and cultural influences.

Transparency and Accountability: The application informs users that all design data is stored locally and that any future cloud features will require explicit opt-in consent. An in-app feedback form allows users to report bugs, inaccuracies, or feature requests, which the development team reviews for continuous improvement.

User Consent: Participation in surveys or usability testing was entirely voluntary, and respondents were free to withdraw at any time without consequence. Because no personal identifiers are collected during normal app use, users maintain full ownership and control of their designs.

III. Conclusion

Based on the findings, DesignClo successfully met its objectives of delivering an intuitive, efficient, and creative platform for personalized clothing design. The integration of an AI-driven recommender system with interactive 3D visualization enabled accurate, inspiring design suggestions and a seamless user experience. High evaluation scores across all ISO/IEC 25010 quality attributes confirm that DesignClo is not only functional and high-performing but also secure, portable, and easy to maintain, ensuring adaptability for future enhancements.

The study concludes that DesignClo is a dependable and innovative tool that empowers users to explore and create unique fashion designs, supporting both hobbyists and professional designers in bringing their creative visions to life.

IV. Recommendations

1. Expand the Training Dataset for AI Recommendations – Offer an opt-in feature that lets users back up or share projects across devices and collaborate with teammates, while keeping local-only storage as the default for privacy.
2. Introduce Optional Cloud Sync and Collaboration – Offer an opt-in feature that lets users back up or share projects across devices and collaborate with teammates, while keeping local-only storage as the default for privacy.
3. Enhance Texture and Fabric Simulation – Integrate more advanced material rendering such as realistic draping to give users a closer approximation of how fabrics will look and behave in real life.
4. Implement Continuous Feedback and Update Mechanisms – Add an in-app feedback form and periodic surveys so users can easily report issues or request features, helping the development team prioritize updates and maintain high user satisfaction.

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