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Exploration of Tucking Techniques on Cotton Fabric for Modern Casual Wear: Digital Design Approach and Promotional Opportunities with Scratch

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Abstract: This study aims to explore the application of tucking techniques on cotton fabric as an innovation in modern casual fashion design, as well as to evaluate the potential use of the Scratch platform as a medium for visualization and promotion of designs. The tucking technique, which manipulates the fabric surface by creating permanent folds, is considered to have high aesthetic and structural potential but is still rarely integrated into everyday casual wear, particularly in the context of cotton-based design. This study employs a qualitative approach using the ADDIE development model and is supplemented by in-depth interviews with five professional respondents in the fashion and textile industry. The results indicate that tucking techniques are relevant for casual wear as they enhance aesthetic value, create dynamic visual silhouettes, and strengthen consumers' perception of product quality. Cotton fabrics such as twill and poplin are identified as the most suitable materials for this technique. Additionally, the Scratch platform is effective in conveying design concepts in an interactive and educational manner, though it has limitations in representing realistic textures. Scratch has the potential to support digital fashion product promotion, especially for novice designers and small-scale businesses. These findings demonstrate that the integration of textile technique exploration and digital approaches can open new avenues in contemporary clothing design and promotion strategies. This research is expected to contribute to the development of innovative, sustainable, and adaptive clothing designs that align with technological advancements and modern market preferences.

Keywords: Tucking Technique, Cotton Fabric, Casual Wear, Digital Design, Scratch, Interactive Promotion

1. Introduction

The contemporary fashion industry is experiencing rapid growth in response to changes in lifestyle, technological advances, and increasing consumer awareness of aesthetic value and sustainability in clothing (Handayani & Ruhidawati, 2020). One notable phenomenon in the past decade has been the rising popularity of modern casual wear, which not only prioritizes comfort and functionality but also serves as a medium for personal expression and visual identity (Burns, 2022). This category is increasingly relevant, especially among the younger generation, who tend to prioritize adaptive fashion styles that still have a unique look (Indarti & Putri, 2021).

The contemporary fashion industry is experiencing rapid growth in response to changes in lifestyle, technological advances, and increasing consumer awareness of aesthetic value and sustainability in clothing. One notable phenomenon in the last decade has been the rise in popularity of modern casual wear, which not only emphasizes comfort and functionality but also serves as a medium for personal expression and visual identity. This category is becoming increasingly relevant, particularly among younger generations, who tend to prioritize adaptive yet distinctive

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fashion styles. In this context, there is a growing need for design innovations that not only address visual aspects but also enhance structural value and product differentiation. One approach with significant potential but still relatively unexplored is tucking technique. This technique involves manipulating fabric by creating permanent folds on the textile surface, which can produce dimensional effects, volume, and distinctive visual accents (Savitri & Hidayati, 2019). Although tucking techniques have been known in classical fashion traditions, particularly in formal wear or evening gowns, their application in casual fashion design remains very limited, especially in cotton fabrics, which actually have suitable characteristics (Haq & Afizah, 2022).

Cotton fabric is known as one of the most commonly used materials in casual wear, primarily due to its lightweight, sweat-absorbent, easy-to-maintain, and comfortable properties in tropical climates like Indonesia (Bouagga et al., 2021). Additionally, the surface structure of cotton fabric allows for various forms of textile technique exploration, including tucking techniques, which can enhance visual appeal without requiring the addition of new materials (Burns, 2022). Thus, this technique also holds high relevance in supporting sustainable design approaches, which are increasingly gaining attention in contemporary fashion practices (Drinkwater, 2022). However, there is a gap between the potential of tucking techniques as a textile design strategy and their implementation in the context of modern casual wear. Current design practices are still dominated by other manipulation techniques such as pleats, gathers, or smocking, which are more frequently referenced in the development of garment textures (Cahyanti, 2015; Savitri & Hidayati, 2019). Additionally, the lack of studies specifically exploring variations of tucking techniques on cotton fabric, along with the limitations of visual media capable of interactively explaining the design process and outcomes, pose unique challenges in widely introducing this technique (Li et al., 2020). In response to these conditions, this study not only focuses on exploring tucking techniques in the development of modern casual cotton clothing designs but also integrates a digital visual approach through the use of the Scratch platform. This platform was chosen because it can present interactive visualizations that depict variations of the tucking technique in an animated and communicative manner. Through Scratch, the designs produced can not only be displayed as static visuals but also as an interactive digital catalog that enhances user understanding while opening up more adaptive promotional potential in line with digital technology developments.

This research aims to develop the process of applying tucking techniques to cotton fabric in the context of modern casual fashion design, identify the types of cotton fabric suitable for tucking technique applications, and analyze the aesthetic value and visual uniqueness produced by this technique. Additionally, this research also examines the potential of the Scratch platform as an educational and interactive visualization and promotion medium for design.

2. Methodology

This study uses a qualitative-descriptive approach with the ADDIE (Analysis, Design, Development, Implementation, Evaluation) model framework, which has been modified for the purposes of digital visualization design. The ADDIE model was chosen because it provides a systematic structure for developing and delivering technology-based design content, in this case the tucking technique on casual cotton clothing visualized through the Scratch platform. The main focus of the research is to develop interactive visual media to present digital designs of casual clothing using tucking techniques, complete with price information and a display of how the clothing is worn on a digital model.

2.1 Analysis Phase

This research uses a qualitative-descriptive approach with the ADDIE model framework (Analysis, Design, Development, Implementation, Evaluation), which has been modified for the needs of digital visualization design. The ADDIE model was chosen because it provides a systematic structure for developing and presenting technology-based design content, in this case, tucking techniques on casual cotton clothing visualized through the Scratch platform. The main focus of the research is to develop interactive visual media to present digital designs of casual clothing using tucking techniques, complete with price information and wearable displays on digital models.

2.2 Design Phase

At this stage, researchers digitally designed casual clothing based on tucking techniques using principles of visual aesthetics and body ergonomics. The clothing designs included variations in tucking position and direction, as well as functional details such as sleeve length, button type, and neckline style. The designs also included simulations of the clothing being worn on human body illustrations to demonstrate visual compatibility and context of use. Researchers also create an interactive storyboard structure for visualization in Scratch, which includes design displays, fabric color options, price details, and simple animations showing the design when worn by a digital model. The following Fig. 1 shows the main code blocks used in Scratch.

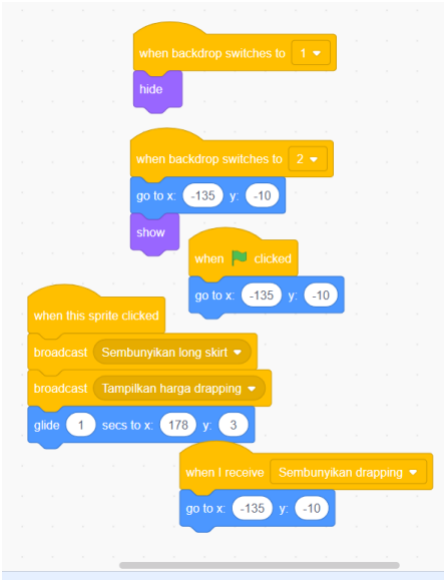
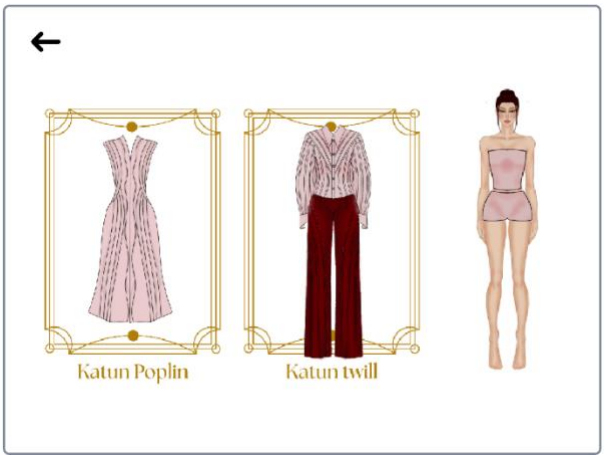


Fig 1: Prototype Design Code

The result of this process is an interactive simulation of casual cotton clothing designs featuring various tucking techniques. Through this visualization, users can select specific design elements and observe the changes that occur in an animated manner, including the position, direction, and type of folds. The final display of Scratch serves as a digitally accessible visual catalog and provides a more concrete understanding of the implementation of tucking techniques in clothing design as illustrated in Fig. 2.



(a)

(b)

Fig 2: Prototype Design Output (a) apparel selection; (b) main menu

This interactive visualization is designed to support more inclusive and educational design communication, as well as open up opportunities for product promotion through participatory digital media that is easily accessible to a wide audience.

2.3 Development Phase

During the development stage, in addition to designing casual cotton clothing using tucking techniques, the researcher also built an interactive visualization system using the Scratch platform. Programming was carried out using a visual block-based approach, which was systematically arranged to simulate the tucking technique on a digital clothing model. Code blocks were arranged to control the placement on the model, as well as the change of clothing models and prices displayed. The following is the display of the main code block structure used in the Scratch visualization system as illustrated in Fig. 3.

Fig 3: Coding Block (a) coding for price one; (b) coding for main menu; (c) coding for price two; (d) coding for apparel collection one; (e) coding for back; (f) coding for apparel collection two

This implementation produces an interactive design catalog, where users can interact directly with tucking designs through buttons, clicks, or hovers to explore the visual variations that have been designed. This visualization not only shows the changes in tucking designs through animation, but also reinforces the understanding of the position and aesthetic function of each fold in the design. The final Scratch display serves as an educational and communicative digital promotional medium as shown in Fig. 4.

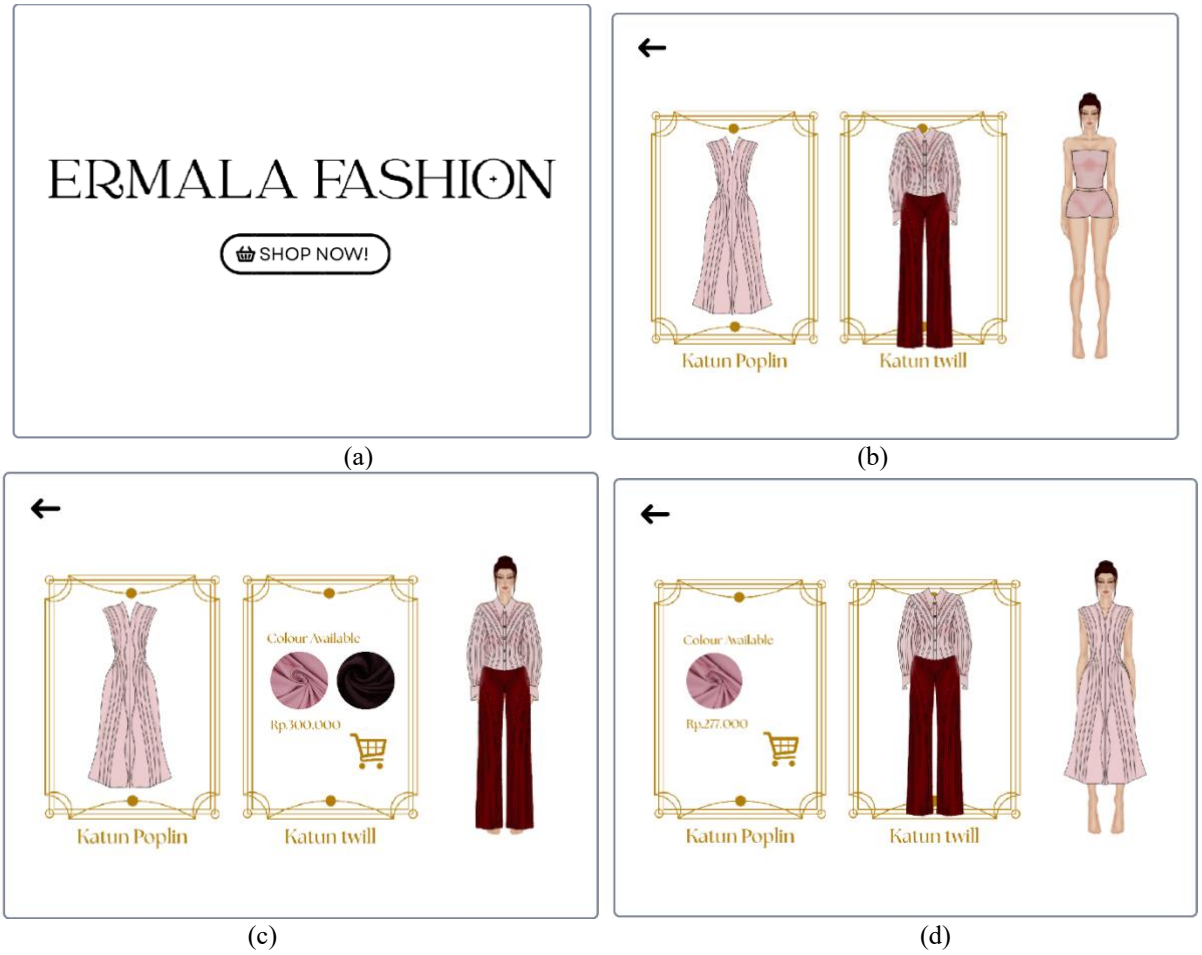


Fig 4: Catalogue Scratch (a) main menu; (b) apparel selection; (c) apparel one fitted on model; (d) apparel two fitted on model

The results of this visualization development enable tucking designs to be displayed in a more interactive way, easily understood by non-designers, and accessible as a tool for presentations, education, and marketing of fashion products based on textile manipulation techniques.

3. Finding & Result

This study obtained primary data through semi-structured interviews with five professional respondents working in the fields of fashion design and production, fashion illustration, and textile entrepreneurship. The purpose of these interviews was to explore views on the application of tucking techniques in casual cotton clothing, as well as the effectiveness of the Scratch platform as an interactive visualization medium. The data was analyzed using a thematic approach to identify patterns of perception related to design, aesthetics, and digital communication. The results of this thematic analysis are summarized in Table 1.

Table 1: Application of tucking techniques on cotton fabric & the potential of the Scratch platform

Respondent Code	Position & Experience	Interview Question	Key Response Summary	Theme
R1	Independent Fashion Designer – 8 years of experience in textile-based ready-to-wear design	How do you perceive the relevance of tucking techniques in modern casual fashion trends?	Tucking is highly relevant, especially to create unique and artistic casual looks.	Relevance of Tucking Technique
		Which types of cotton are suitable for tucking?	Twill and poplin are stable for folds; voile is too thin and unsuitable.	Material Suitability
		What are the technical	Maintaining fold structure after washing	Technical Production

		challenges in tucking application?	is the main challenge.	Challenges
		What is the aesthetic uniqueness of tucking?	Adds dimension and strong visual accents, but must be balanced to avoid overstatement.	Aesthetic Value
		What is your view on the promotional potential of Scratch?	Scratch is excellent for interactive promotion and education, especially for young designers and students.	Visualization & Promotion
R2	Fashion Design Lecturer – 12 years teaching textile manipulation at vocational education	Which cotton types are most challenging for tucking?	Stretch cotton is harder to tuck as it returns to original shape and lacks fold stability.	Material Suitability
		What aesthetic factors matter when assessing garments with tucking?	Neatness, symmetry, and proportion of tucks to the overall design.	Design Aesthetics
		What is the potential of Scratch for fashion catalog design?	Very useful for step-by-step visualization, though limited in realistic texture rendering.	Digital Visualization
R3	Garment Production Technician – 9 years in medium-scale manufacturing	What are the technical production challenges with tucking?	Requires precise machine settings and trained labor.	Production Challenges
		Is tucking feasible for mass casual production?	Feasible if patterns are simplified and not too complex.	Small to Medium Scale Production
		How do you view Scratch as a product promotion tool?	Attractive, especially when combined with color and size simulation.	Digital-Based Promotion
R4	Fashion Illustrator – 5 years freelance in fashion catalog illustration	What is your impression of tucking visualization using Scratch?	Easy to understand, highly interactive for explaining design to non-designer clients.	Design Communication
		Does Scratch improve consumer understanding of textile design?	Yes, as users can explore the design directly and it's easy to present online.	Design Interaction & Education
R5	Local Fashion Entrepreneur – Owner of casual clothing SME (6 years)	Do your consumers value tucking details in garments?	Yes, considered a "premium" detail despite its simplicity. It elevates perceived product quality.	Consumer Perception of Value
		Does Scratch help you promote your products online?	Absolutely, it showcases product features without needing a professional photo studio.	Digital Promotion Efficiency

The interview results show that the tucking technique is seen as having great potential to strengthen the visual identity of casual wear. Four out of five respondents stated that tucking adds visual value without compromising the simplicity of the design. This technique is considered suitable for casual wear, which emphasizes comfort while still providing a distinctive aesthetic touch. The variety of tucking shapes and directions is considered to influence the perception of product quality. Respondents agreed that neat, proportional, and strategically placed tucking folds give an impression of exclusivity. One respondent noted that "tucking is like a designer's signature—it makes the product appear more valuable even when made from simple materials like cotton." Despite its high aesthetic value, the application of tucking is not without technical challenges. Some respondents highlighted the importance of selecting cotton types with stable structures, such as twill or poplin cotton, to ensure the folds maintain their shape after washing. Fabrics that are too thin or elastic are considered less optimal as they can disrupt the precision of the folds. In addition to interview data, this study also produced interactive digital visualizations using the Scratch platform. This visualization displays casual clothing designs based on tucking, complete with garment model details, tucking types, and pricing information. Users can select design views and interactively observe visual changes on the digital model. Initial testing of this visualization indicates that Scratch effectively bridges conceptual understanding of design, particularly for non-designers.

Respondents rated Scratch as an intuitive and educational platform, despite its limitations in displaying realistic textures. Based on findings from both interviews and digital visualizations, it can be concluded that tucking techniques hold high relevance in modern casual clothing design, and visual media like Scratch play a crucial role in conveying design concepts inclusively. These findings will be discussed further in the subsequent chapter.

4. Discussion

The results of the study indicate that tucking techniques have strong relevance in the development of modern casual fashion designs. All respondents stated that tucking not only enhances aesthetic value but also provides a visual character that distinguishes the product from conventional designs. This supports findings from the analysis phase that contemporary casual wear consumers increasingly value unique design details, even if they are technically simple (Nartker et al., 2022; Ko et al., 2025). Although this technique has long been known in classical fashion, these findings show that tucking remains adaptive in the context of contemporary fashion, especially when applied selectively to suitable materials. Cotton, as a commonly found material in casual wear, has proven capable of accommodating tucking folds if the chosen fabric type has a sufficiently stable structure, such as cotton twill or poplin (Fernandopulle, 2022). Thus, material selection becomes a crucial determinant in design planning based on fabric manipulation.

From an aesthetic perspective, respondents agreed that the presence of tucking details enhances the visual identity of the garment. These small folds not only add dimension and rhythm to the fabric's surface but also create an impression of meticulous and professional craftsmanship (das Neves et al., 2020). Even in simple garment designs, the application of tucking can serve as a focal point that elevates the overall value of the product. This is consistent with previous findings showing that variations in tucking size and spacing strongly affect the aesthetic and structural quality of garments, especially in smocked tucks (Citra Tiarasiwi, 2015). Additionally, consumers' perception of tucking as a "high-value" element highlights the potential of this technique as a differentiation strategy in marketing casual clothing products, particularly in the SME sector and independent labels (Ko et al., 2025). Furthermore, the use of the Scratch platform as a medium for digital design visualization has proven to have promising potential. Although Scratch is technically a simple visual programming platform, its ability to display design transformations in an animated and interactive manner has proven adequate for explaining design concepts to non-professional audiences. This aligns with findings that interactive visual tools can significantly enhance understanding of complex concepts (Sampath Kumar, 2016). This is particularly important in the context of fashion product promotion, where visual communication plays a crucial role in building market interest and understanding.

Respondents noted that Scratch excels at simplifying complex design concepts into easily understandable visuals. This presents an opportunity for young designers and small business owners to creatively present their products without requiring expensive graphic design software or advanced technical training. However, it should be noted that Scratch has limitations in terms of rendering realistic textures and three-dimensional details, which may be important for certain types of designs (Chen et al., 2024). Nevertheless, as an initial promotional tool and visual education platform, it has effectively fulfilled its functions. Overall, this discussion reinforces that the integration of traditional textile techniques such as tucking with a digital approach based on interactive visualization provides significant added value in modern fashion design practices. In addition to creating a unique and functional appearance, this approach also supports the principles of inclusivity and accessibility in design promotion, especially in today's digital age (Li et al., 2020).

5. Conclusion

This study confirms that the tucking technique on cotton fabric is a design approach with high potential to enrich the visual appearance, structure of clothing, and create strong aesthetic value in modern casual wear. This exploration proves that tucking is not only relevant in the context of formal design, but can also be flexibly adapted for everyday needs while maintaining the principles of comfort and simplicity. From interviews with five respondents with professional backgrounds in fashion and textiles, it was found that the success of applying this technique is highly dependent on selecting the appropriate type of cotton fabric and mastering precise production techniques. Tucking adds value in terms of visual appeal and perceived product quality, making it a strategic design element in building market differentiation, particularly for local

and independent fashion products. Additionally, the integration of digital technology through the Scratch platform has proven to open new possibilities in design visualization and promotion. Scratch facilitates more inclusive, interactive, and cost-effective design communication while expanding promotional access for emerging designers and small-scale businesses. Overall, this research contributes practical and conceptual insights for the development of textile manipulation techniques within the context of contemporary fashion design. Tucking techniques should not only be repositioned as aesthetic and structural solutions but also as part of an adaptive design strategy responsive to modern consumer needs and advancements in visual technology. Further research is recommended to test the ergonomic aspects and durability of tucking in actual production and to evaluate the effectiveness of Scratch in the context of large-scale digital promotion.

6. Acknowledgement

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7. Conflict Of Interest

The authors declare no conflict of interest.

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