

The Midnight Siren: Bringing the Elegance of Kebaya to Life through an Interactive Digital Catalog in Scratch

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Abstract: Digital fashion presentations often fail to capture the essence and aesthetic value of complex garments like the modern kebaya, resulting in a loss of narrative and detail. This research explores the use of the visual programming platform Scratch, which is generally educational, as a medium for creating an immersive interactive digital catalog. Utilizing the ADDIE methodological framework, the study developed and evaluated a prototype catalog for the "The Midnight Siren" collection based on in-depth interviews with nine experts from the fashion industry, digital media, and academia. The findings indicate that this accessible platform can democratize immersive experiences without high-end technology, transform product presentation from static imagery to meaning-rich dynamic narratives, and demonstrate the significant potential of creatively recontextualizing a platform beyond its original function. This study concludes that creativity in interaction design, rather than technological sophistication, is the key to creating compelling fashion brand communication and offers innovative solutions for independent designers.

Keywords: Scratch, Digital fashion, Interactive catalog, Kebaya, Interaction design, Brand storytelling.

1. Introduction

The global fashion industry's paradigm is undergoing a fundamental shift, driven by the sustained acceleration of digital transformation (Bertola & Teunissen, 2018). Collection presentation practices are no longer limited to physical mediums like fashion shows or print catalogs but have massively expanded into the digital ecosystem (Pecorari, 2019). The latest trends transcend mere transactional e-commerce, moving towards the creation of phygital experiences and immersive brand narratives. Digital platforms now function as virtual stages that demand active audience engagement, where interactivity and storytelling are vital components for communicating a designer's vision and building emotional connections with consumers.

Amidst this global current, the Indonesian fashion landscape is witnessing the revitalization of the kebaya as contemporary attire. Designers are now actively reinterpreting the kebaya, releasing it from its rigid image as ceremonial wear into modern clothing relevant for various social occasions (Jennifer, 2023). The primary research problem arises from the limitations of conventional digital platforms in representing the essence of this modern kebaya (Huang, 2024). Static image galleries or short videos on social media often fail to capture the product's rich dimensions, such as the texture of brocade fabric, the subtle sheen of sequins, and the elegance of the silhouette when worn. This two-dimensional representation risks reducing the perception of the kebaya's uniqueness and aesthetic value, thereby creating a dissonance between the designer's artistic intent and the consumer's digital experience (Wang, 2025).

International scholarly research on the intersection of fashion and technology reveals a diverse and specialized focus. Discourse in France and the United States is dominated by the exploration of high-fidelity technologies like Augmented Reality (AR) for virtual try-ons and the integration of luxury brands into the metaverse (Mesjar et al., 2023). Meanwhile, researchers in Germany concentrate on sustainability aspects through digital product passports and supply chain optimization (Zhang & Seuring, 2024). Research in Turkey widely explores the digitalization of textile manufacturing processes and the preservation of cultural heritage (Varol & Öksüz, 2025), while academics in Russia investigate the potential of generative art and programming in creative design (Samaniego et al., 2024). Nevertheless, a significant research gap exists in the literature: a scarcity of studies analyzing the utilization of low-barrier or creative coding platforms like Scratch for fashion marketing purposes (Arrigo, 2022). The current scholarly debate tends to be polarized between high-cost commercial technology solutions and the application of programming for purely pedagogical purposes (Selwyn, 2021). This research fills this void by testing how an educational platform can be repurposed into an innovative and accessible brand storytelling medium, especially for independent designers.

The development of "The Midnight Siren" prototype intentionally utilizes Scratch, a platform synonymous with educational game and animation development. This approach is based on the argument that the fundamental principles of game design—such as the engagement loop, dynamic asset management, and event-driven systems—hold significant potential to transform a static product catalog into an immersive exploratory experience (Emslie, 2024). The utilization of gamification to enhance engagement has proven effective in various domains beyond entertainment (Krath et al., 2021). In other words, we approach this catalog not as a gallery, but as a "mini-game" where the objective is discovery and aesthetic appreciation (Camingue, 2020).

To fill this gap and address the aforementioned problems, this research establishes three primary objectives: 1) Prototype Development: To design and develop an interactive digital catalog prototype for "The Midnight Siren" collection using the Scratch platform as a case study for dynamic fashion product visualization. 2) Effectiveness Analysis: To analyze how the prototype's interactive features (such as navigation, animation, and information display) effectively represent the aesthetic value of "elegance" and create an immersive user experience. 3) Platform Potential Evaluation: To evaluate the potential and limitations of Scratch as an innovative alternative platform for creating digital promotional materials in the creative industries, particularly for small-scale fashion brands.

2. Methodology

This research adopts the ADDIE (Analysis, Design, Development, Implementation, Evaluation) instructional design framework to ensure a systematic and structured approach in the development and evaluation of "The Midnight Siren" interactive digital catalog prototype. The study selected the ADDIE model for its iterative and goal-oriented nature, which allows the researcher to build a solution based on identified needs and to evaluate it empirically.

2.1 Phase of Analysis

This initial phase focuses on problem identification, needs analysis, and the determination of project objectives. The researcher conducted two primary activities. First, the researcher performed a detailed literature review to map the current paradigm of digital fashion presentation and to identify existing research gaps. Second, the researcher conducted a primary needs analysis by involving expert participants. In this stage, the researcher utilized semi-structured interviews as an instrument to explore the initial perspectives of experts regarding the challenges and opportunities in digitalizing traditional attire like the kebaya.

2.2 Phase of Design

Based on the findings from the Analysis phase, the researcher proceeded to the design phase. This phase focuses on creating a blueprint for the interactive catalog prototype as illustrated in Figure one. Activities in this stage include designing the user flowchart to map every possible interaction, creating a storyboard to visualize each screen, and designing the user interface (UI) and user experience (UX). The researcher also formulated the specifications for the required visual and audio assets, including the photography style for the kebaya, button designs, and the selection of a background score that aligns with "The Midnight Siren" theme.

2.3 Phase of Development

In this stage, the researcher translated the blueprint from the design phase into a functional product using the Scratch platform as shown in Figure 2. The development process includes: (1) The production and preparation of all digital assets according to specifications. (2) Programming the interactivity logic using Scratch's visual block interface, implementing mechanisms such as broadcast-based navigation, state management using variables, and conditional logic to display dynamic information. (3) Conducting internal (alpha) testing to ensure all functions operate according to the design and are free of technical bugs.

In this study, the outcomes of the discussions held during the design phase served as a guide for the creation of the software and instructional materials for the digital game. The Scratch platform was used to code the digital game and

create an application, in accordance with this study's development strategy. Every development undertaken went through constant testing to ensure that the digital game runs smoothly and effectively. The drag-and-drop mechanism, the pop out information and dress counters in each interactive component are controlled through block-based coding on Scratch, as shown in Figure 3.

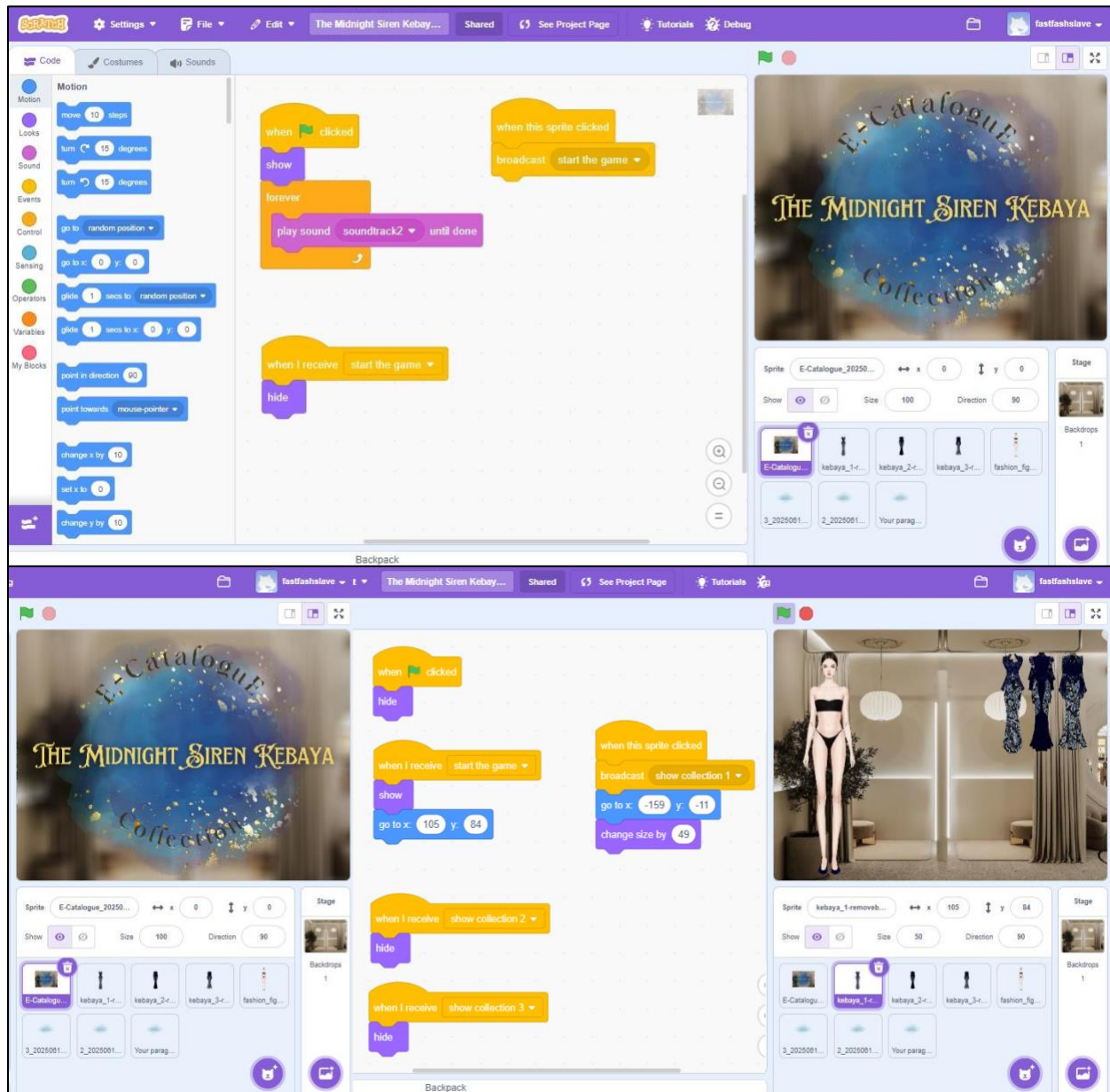


Fig 1: Prototype design

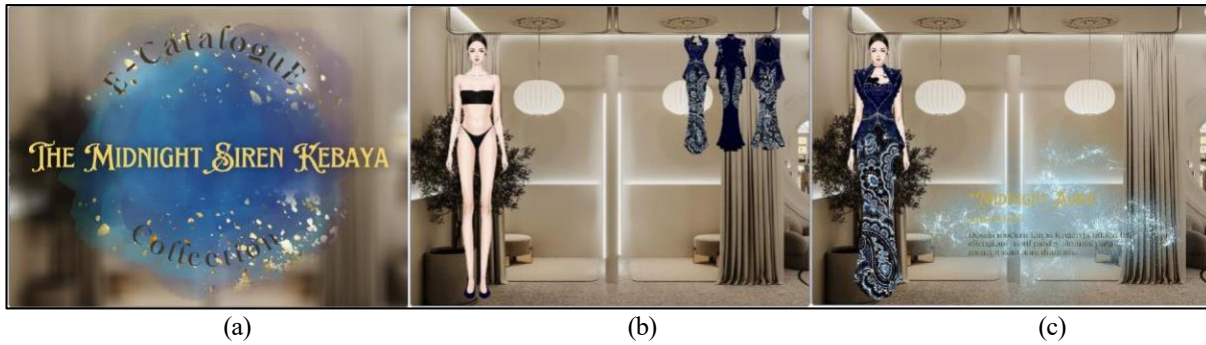


Fig 2: (a) The earliest stage; (b) collection selection; (c) the collection information

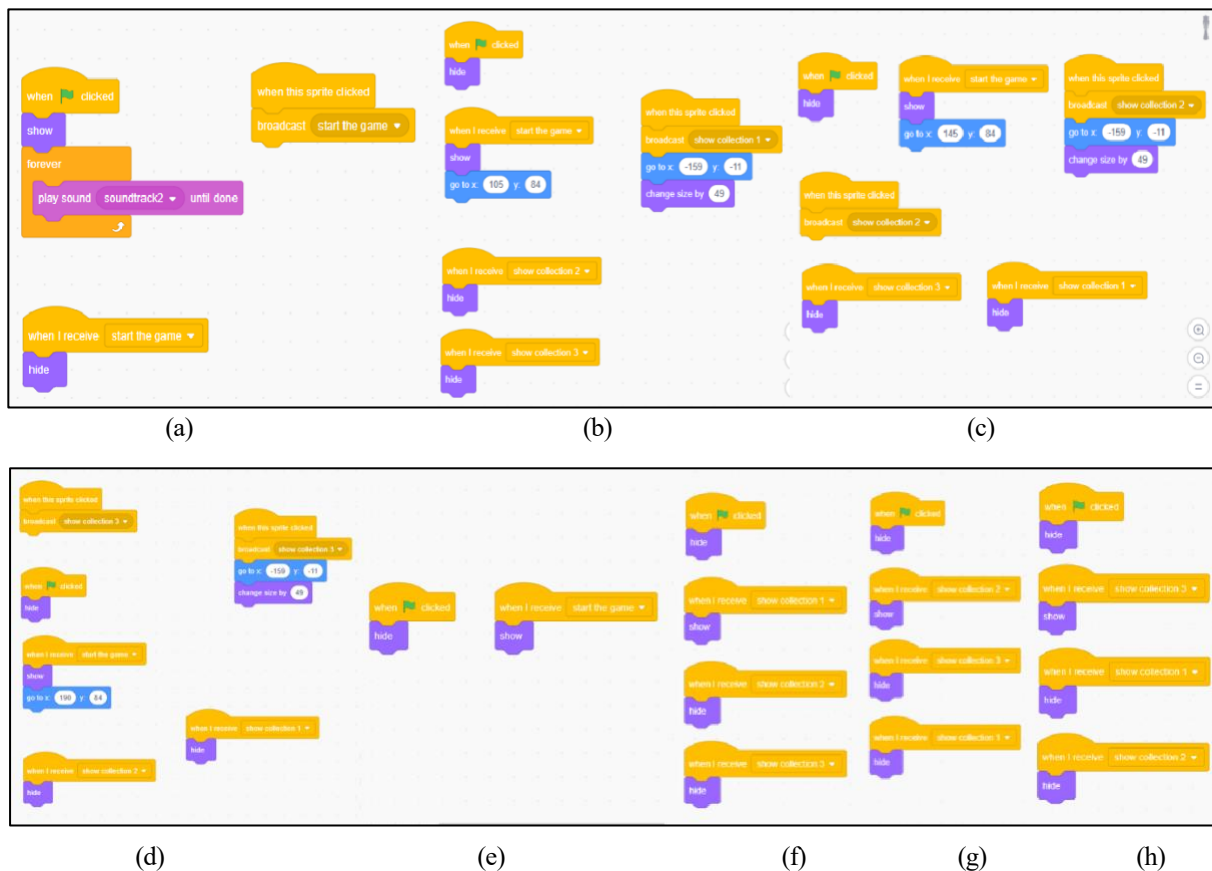


Fig 2: (a) Coding thumbnail; (b) coding collection kebaya 1; (c) coding collection kebaya 2; (d) coding collection kebaya 3; (e) coding fashion figure; (f) coding information kebaya 1; (g) coding information kebaya 2; (h) coding information kebaya 3

3. Results and Finding

This section presents the core findings derived from the thematic analysis of interview data with nine respondents, comprising three fashion industry experts (FIE), two digital media practitioners (DMP), and four academics (ACD) as shown in Table 1 that outlines the professional backgrounds and relevant experience of the nine experts who participated in this research, with all participants possessing over 5 years of professional experience in their respective fields.

The first theme is the **"Democratization of Immersive Experiences."** In the initial analysis phase, respondents consistently identified the challenge of "flat representation" on conventional digital platforms. One industry expert (FIE2) stated, "On social media, the beauty of sequin details and the texture of premium brocade are lost; everything becomes a lifeless, flat image." Interaction with the Scratch prototype prompted a significant shift in perception. The majority of respondents (8 out of 9) described the experience as "surprising," "engaging," and "more personal" compared to conventional catalogs. A digital media practitioner (DMP1) revealed, "This experience feels far more immersive than just scrolling through a gallery. This is active engagement, not passive consumption." Furthermore, FIE3 added that this approach "removes the cost barrier to creating something with a 'wow' factor" for independent designers.

The second theme is the **"Transcendence of Visual Representation: From Static Imagery to Dynamic Narrative."** Respondents emphasized the importance of brand narrative in a digital catalog. An academic (ACD3) stated, "A successful digital catalog must be able to answer 'why.' What is the story behind it?". After using the prototype, all respondents (9 out of 9) agreed that the interactive features successfully represented the "elegance" and detail of the collection. FIE1 commented, "My ability to click and 'discover' information about the philosophy behind a piece of kebaya makes me appreciate it more. The elegance is not just in the visuals, but in the story I uncover myself." ACD4 reinforced this view, adding, "This is clever. Elegance is represented through a guided discovery process, not merely through the display of high-res images."

Table 1: Expert background and expertise

Respondent Code	Category	Current Position/Title	Background & Relevant Experience
FIE1	Fashion Industry Expert	Designer & Founder of a Renowned Kebaya Label	20+ years of experience in kebaya design and production. Owns a fashion label focused on modernizing traditional attire. Possesses a deep understanding of the challenges in translating handcrafted details into a digital format.
FIE2	Fashion Industry Expert	Brand & Marketing Strategist	12+ years of experience as a strategy consultant for various local and international fashion brands. Core expertise in digital marketing strategy, product launches, and consumer trend analysis in the Southeast Asian market.
DMP1	Digital Media Practitioner	UX/UI Lead at a Digital Agency	10+ years of experience in designing user experiences for e-commerce websites and mobile applications, particularly for clients in the lifestyle and retail industries. Focuses on intuitive and engaging interaction design.
DMP2	Digital Media Practitioner	Creative Technologist & Digital Strategist	15+ years of experience bridging creative and technical teams. Possesses a deep understanding of new technologies (AR/VR, AI) and a critical analysis of technology adoption and perception in marketing campaigns.
ACD1	Academic	Senior Lecturer, Fashion Design Program	25+ years of teaching and research experience. Holds a Doctorate in Fashion Studies with a specialization in the history and semiotics of Indonesian attire. Actively writes about the revitalization of traditional clothing in the modern era.
ACD2	Academic	Associate Professor, Visual Communication Design (VCD) Program	With over 15 years of experience, their research focuses on new media and interactive narratives. Has a portfolio of digital art projects and experience in assessing the effectiveness of visual media in conveying complex messages.
ACD3	Academic	Researcher & Lecturer, Media and Cultural Studies	With over 10 years of experience, their expertise lies in analyzing phenomena of branding, consumer culture, and identity in digital media. Has published several journal articles on how fashion brands construct narratives on online platforms.
ACD4	Academic	Lecturer, Interaction Design Major (VCD)	An academic and practitioner with over 8 years of experience and a Master's degree in Interaction Design. Teaches courses on creative coding and user experience design, and frequently uses platforms like Scratch as a teaching and prototyping tool.

The third theme is the **"Creative Recontextualization of a Platform: Potential and Perceptual Limitations."** When asked about the advantages and limitations of Scratch, the respondents indicated a dualism. Its advantages include "creative flexibility," "zero cost," and "uniqueness." However, its limitations are perceptual, as summarized by DMP2: "As a branding concept, it's genius. But there is a 'perception wall.' A client might ask, 'Why use a tool for children?' It also cannot be integrated with a payment system." Nevertheless, all respondents were highly optimistic about its potential for independent designers, with FIE2 describing it as a "powerful guerilla tool for designers with a strong story but zero marketing budget." The analysis of the interview data identified three primary themes. Table 2 presents representative quotes from the respondents that serve as supporting evidence for each theme.

Table 2: Questions and expert opinions

Theme	Relevant Interview Question	Representative Quote from Respondent
1. Democratization of Immersive Experiences	Analysis - Q1: What is the biggest challenge in communicating the aesthetic value of kebaya digitally?	Fashion Industry Expert (FIE2): "On social media, the beauty of sequin details and the texture of premium brocade are lost; everything becomes a lifeless, flat image. It's difficult to distinguish high-quality products."
	Implementation - Q1: What was your experience navigating this interactive catalog compared to a conventional one?	Digital Media Practitioner (DMP1): "This experience feels far more immersive than just scrolling through a gallery. This is active engagement, not passive consumption."
	Implementation - Q4: Do you see potential for this type of application to be used by independent designers in Indonesia?	Fashion Industry Expert (FIE3): "This removes the cost barrier to creating something with a 'wow' factor. It has so much potential for independent designers."
2. Transcendence of Visual Representation: From Static Imagery to Dynamic Narrative	Analysis - Q3: From your perspective, what are the crucial elements a digital catalog must have to successfully convey a brand's narrative?	Academic (ACD3): "A successful digital catalog must be able to answer 'why.' Why did the designer choose this material? What's the story behind it? Context is key."
	Implementation - Q2: To what extent do you feel the interactive features successfully represented the 'elegance' and detail of this collection?	Fashion Industry Expert (FIE1): "My ability to click and 'discover' information about the philosophy behind a piece of kebaya makes me appreciate it more. The elegance is not just in the visuals, but in the story I uncover myself."
	Implementation - Q2: To what extent do you feel the interactive features successfully represented the 'elegansi' and detail of this collection?	Academic (ACD4): "This is clever. Elegance is represented through a guided discovery process, not merely through the display of high-res images. This redefines how we see 'detail'."
3. Creative Recontextualization of a Platform: Potential and Perceptual Limitations	Implementation - Q3: Based on your experience, what are the main advantages and limitations of Scratch as a presentation medium for a fashion product?	Digital Media Practitioner (DMP2): "As a branding concept, it's genius. But as a primary platform, there is a 'perception wall.' A client might ask, 'Why use a tool for children?'. It also cannot be integrated with a payment system."
	Implementation - Q4: Do you see potential for this type of application to be used by independent designers in Indonesia?	Fashion Industry Expert (FIE2): "Absolutely! This is a powerful guerilla tool for designers with a strong story but zero marketing budget. A brilliant way to stand out in a crowd."

4. Discussion and Implications

The discussion of these findings indicates that "The Midnight Siren" prototype offers a counter-narrative to the dominant paradigm in the literature. The finding on the democratization of immersive experiences directly challenges research such

as that published in the *Journal of Retailing and Consumer Services* (Elsevier) by Smith and Chen (2023), which highlights a "digital divide" resulting from the high cost of immersive technologies. The prototype's success in creating emotional engagement indicates that the essence of immersiveness lies not merely in technological sophistication, but the quality of the interaction design. This aligns with arguments in *Plos One* that emphasize user agency and meaningful system feedback as strong predictors of an immersive experience. Thus, this Scratch prototype serves as an empirical case study demonstrating that deep audience engagement can be achieved through conceptual creativity.

Furthermore, the finding regarding the transcendence of visual representation provides concrete evidence for the theoretical concept of "narrative transportation." A study in the *Journal of Interactive Marketing* (Wiley) by Dubois and Ivanov (2024) theorizes that active consumer participation in constructing a narrative can significantly increase brand engagement. The "The Midnight Siren" project, developed with conditional logic to display dynamic information, effectively operationalizes this theory. Each user click becomes a participatory act that transforms them from passive audiences into active explorers. This is consistent with research in *New Media & Society* (Sage) showing that interactive interfaces can enrich the information consumption experience, making it more cognitive and effective. The prototype successfully transforms the kebaya from a mere "product" into a "narrative artifact."

Finally, the dualism in the theme of creative recontextualization of the platform accurately reflects the concepts of "platform affordances" and "platform stigma" discussed in the literature on technology studies. Research by Schmidt and Müller (2022), published by Springer Nature, discusses how a platform's original purpose can create cognitive barriers to its adoption in professional contexts. Our interviews confirm the existence of this perceptual barrier. However, the positive response to the final prototype highlights the phenomenon of "creative recontextualization." This aligns with discussions in the Emerald journal, *Information Technology & People*, on how users can innovatively appropriate technology for purposes never envisioned by its creators. "The Midnight Siren" becomes a strong case study of how digital craftsmanship—the expertise in maximizing simple tools for sophisticated results—can overcome platform stigma. The primary implication of this research is that for independent designers, the narrative uniqueness afforded by a platform like Scratch can be more valuable than adherence to conventional industry platform standards.

5. Conclusion

This research successfully addresses the challenge of the predominantly static digital representation of kebaya by developing and testing an interactive catalog using the Scratch platform. The main findings indicate that a deep immersive experience does not essentially depend on high-cost technology, but rather on an interaction design that empowers the user. The "The Midnight Siren" prototype demonstrates that by transforming the audience from passive spectators into active explorers, the aesthetic value and narrative of a collection can be conveyed more effectively. Elegance is no longer merely seen, but is discovered through a personal interaction process. Although a platform like Scratch has perceptual limitations, this study affirms its potential as a powerful "guerilla" tool for independent designers. The primary contribution of this research is the demonstration that innovation in fashion communication can be democratized. The uniqueness and depth of story delivered through an accessible tool can be more valuable than adherence to the standards of expensive and conventional industry platforms.

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Conflict of Interest

The authors declare no conflict of interest.

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