Designing Through User Experience Evaluation: A Performance Metrics and Experiential Rating Approach

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Abstract

The rapid growth of e-commerce in Indonesia has intensified competition among online retailers, particularly in the sneaker sector, where web interface quality has become a critical determinant of user satisfaction and transaction success. However, empirical studies evaluating sneaker retail web interfaces using a multi-method User Experience (UX) framework remain limited. This study evaluates three sneaker sales web interface designs Web Interface 1 (navigation-focused), Web Interface 2 (aesthetics-focused), and Web Interface 3 (simplicity-focused) to identify usability strengths and weaknesses and generate evidence-based recommendations. A preliminary Product Reaction Cards study revealed mixed perceptions, with Easy to Use (13 votes) and Boring (9 votes) as top descriptors, indicating an unresolved tension between navigational clarity and visual engagement. Four user personas were developed to represent target user profiles. The evaluation integrated three dimensions: Performance Metrics (task success rate, time on task, and lostness), Post-Session Rating (Single Ease Question, System Usability Scale, and Questionnaire for User Interaction Satisfaction), and Experiential Rating (USE Questionnaire and Product Reaction Cards), applied across five task scenarios representing the complete transaction journey. A Figma-based prototype integrating strengths from both interfaces was validated, achieving a task completion time of 40 seconds and a lostness score of 0.30, representing improvements of 11.1% and 33.3% over the best-performing existing interface design from the experiment, demonstrating that a multi-method UX evaluation can systematically guide the development of more usable and user-centered e-commerce interfaces.

Keywords: *Cognitive Ergonomics; Human Factors; Usability Testing; User Experience; Web Interface Design*

1. Introduction

In Indonesia, a rapid advancement of information technology fundamentally transformed commercial activities has been particularly pronounced, with the number of e-commerce users growing substantially from 38.7 million in 2020 to 65.6 million in 2024 [1]. This growth has intensified competition among online retailers, particularly in the fashion and footwear sector where sneaker products have emerged as one of the most actively traded categories in the digital marketplace [2]. As a result, the competitive focus among e-commerce platforms has shifted from mere product availability toward the overall quality of the user experience (UX) that a platform delivers.

Common issues include product mismatches between descriptions and actual items, inefficient navigation flows, and complex checkout procedures that contribute to elevated bounce rates and abandoned transactions [2]. These challenges underscore the critical role of ease of use as a central determinant of user satisfaction, trust, and behavioral intention. Research shows that ease of use directly influences both perceived usefulness and user behavioral intention toward information systems [3]. In web-based e-commerce environments, this translates into design considerations such as navigational clarity, information hierarchy, interface consistency, and the efficiency of transactional workflows [4].

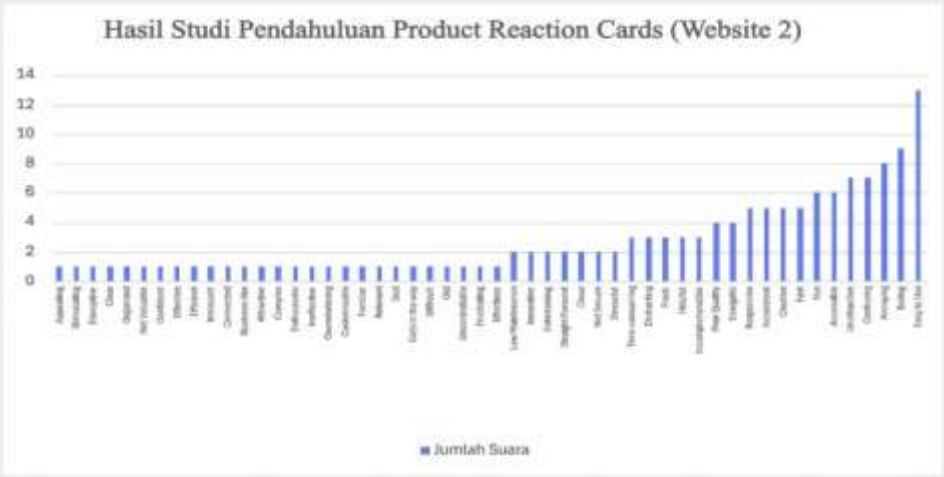


Fig. 1. Product Reaction Cards Response on Existing Website Interface

A sneaker sales web platform under development currently offers alternative interface design. To establish an initial understanding of user perceptions toward the design, a preliminary study was conducted using Product Reaction Cards, in which participants selected descriptive adjectives from a standardized list of 118 words to characterize their experience as seen as Figure 1. The five most frequently selected descriptors were Easy to Use (13 votes), Boring (9 votes), Annoying (8 votes), Unattractive (7 votes), and Confusing (7 votes) [5]. These mixed results, combining a positive impression of usability with predominantly negative affective responses, indicate that the existing designs have not yet achieved satisfactorily, warranting a more comprehensive and structured evaluation.

To ensure that the evaluation remains grounded in the characteristics and needs of the actual target user population, four representative user personas were developed based on demographic data and behavioral profiles of participants who are roughly by the age of 19-21 years old.

Table 1. User Persona

Attribute	Persona 1	Persona 2	Persona 3	Persona 4
ID	Alya	Luna	Ananda	Bagas
Status	Non-User	Active User	Active User	Non-User
Profile	University student; prefers physical stores; finds online shopping impractical	University student; shops online frequently but disappointed by product mismatches	University student; relies on e-commerce but prioritizes security and clear navigation	Final-year student; avoids online shopping due to complexity and time consumption
Needs	Simple process without mandatory registration	Seamless login-to-checkout flow; accurate product info	Clear UI/UX navigation; transparent transaction security	Quick purchase process; no repetitive login
Key Challenges	Lengthy registration; size uncertainty; product-photo discrepancy	Size inaccuracy; misleading product photos; complex checkout	Data privacy concerns; inconsistent navigation; complicated return process	Long registration; repetitive login; perceives e-commerce as less practical than physical stores
Opportunity	Guest checkout feature	Multi-angle product photos; streamlined checkout	Secure payment badge; transparent security info on checkout page	One-click repeat order; auto-login with user consent

Performance Metrics including task success rate, time on task, and lostness provide objective, behavioral evidence of user efficiency and effectiveness [6]. Post-session rating instruments such as the Single Ease Question (SEQ), System Usability Scale (SUS), and Questionnaire for User Interaction Satisfaction (QUIS) capture users' subjective perceptions of usability across standardized dimensions

[7][8][9]. Experiential rating approaches, particularly the Product Reaction Cards method and the USE Questionnaire, extend the evaluation by capturing affective and emotional dimensions of user experience that quantitative metrics alone are insufficient to reveal [10][11].

Furthermore, studies employing a multi-method evaluation framework that simultaneously integrates performance, subjective, and affective measurement instruments are relatively scarce in the existing literature [12]. This gap is significant, as each method captures distinct aspects of user experience, and reliance on any single instrument risks producing an incomplete assessment of interface quality.

This study addresses this gap by conducting a structured, multi-method UX evaluation of the three sneaker sales web interface alternatives, with the aim of objectively identifying the usability strengths and weaknesses of each design and generating empirically grounded design recommendations.

2. Method

This study employed a structured User Experience (UX) evaluation framework to comparatively assess three alternative web interface designs for a sneaker sales platform.

2.1. Task Scenario

Five task scenarios were constructed based on the primary activities most performed by users on e-commerce platforms [1]. Each task was performed by participants on all three web interface alternatives to enable a direct comparative evaluation across the designs. Task 1: Login represents the first point of interaction between a user and an e-commerce platform. Nielsen Norman Group [13] emphasizes that the login experience is a critical determinant of first impressions; a frustrating or confusing authentication flow significantly increases the likelihood of user abandonment before any transactional activity takes place. Task 2: Product Search captures one of the most fundamental and frequently performed activities in online shopping. Moe [14] identified product search as a core behavioral pattern among e-commerce users, distinguishing it from browsing as a goal-directed activity with explicit purchase intent. Task 3 Add to Cart represents the transitional step between product discovery and purchase commitment. Nielsen Norman Group [15] notes that the shopping cart serves not only as a holding mechanism but also as a space for final purchase deliberation. Task 4 Checkout is widely recognized as the highest-friction stage in the e-commerce user journey. Research by Lisowska et al. [16] found that complex or ambiguous checkout processes are a primary cause of cart abandonment, as users encounter cognitive overload from excessive form fields, unclear navigation, or confusing confirmation flows. Task 5 Discount Application reflects an increasingly standard feature expectation among online shoppers. Mishra and Sengupta [17] demonstrated that the ability to apply promotional codes during checkout has a measurable influence on user satisfaction and continued platform usage intention. Another research [18] has noted that some aspects do influence the intention of online shopping in Indonesia.

Table 2. Conducted Task Scenario

No.	Task	Activity
1	Login	Log into the website using a provided account
2	Product Search	Search for a sneaker product from the main page
3	Add to Cart	Add a selected product to the shopping cart
4	Checkout	Complete the checkout process
5	Discount Application	Apply a discount code during checkout

Each task was performed by participants on all three website alternatives to enable comparative evaluation across the designs.

2.2. UX Evaluation

The UX evaluation was conducted with 20 participants aged 19–21 years, consisting of students who met the criteria of being active website users and prioritizing ease of use in online shopping. The evaluation framework combined three complementary measurement approaches:

Performance Metrics

Performance Metrics were used to objectively measure user effectiveness and efficiency during task completion. Three indicators were measured. First, Task Success: The proportion of participants who successfully completed each task, measured using a binary success scale. And then Time on Task: The duration (in seconds) required by each participant to complete each task. The third instrument is Efficiency (Lostness): The level of navigational difficulty experienced by participants, assessed through the number of unnecessary steps taken relative to the optimal path with the formula stated.

$$L = \sqrt{[\ (N / S - 1)^2 + (R / N - 1)^2\ ]}$$

L = Lostness score (ranges from 0 to 1, where values above 0.5 indicate user disorientation)
N = Number of unique pages visited during the task
S = Total number of pages visited (including repeated visits)
R = Minimum number of unique pages needed to complete the task efficiently

Post-Session Rating

Post-session ratings were collected using three standardized questionnaire instruments administered after participants completed all tasks on each website. First, Single Ease Question (SEQ): A single-item, 7-point scale measuring the perceived ease of each task immediately after completion. Second, System Usability Scale (SUS): A 10-item questionnaire assessing overall system usability across learnability and usability dimensions. Third, Questionnaire for User Interaction Satisfaction (QUIS): A multi-dimensional instrument evaluating user satisfaction across interface aspects including screen layout, terminology, learning, and system capabilities.

Experiential Rating

Experiential rating was conducted using two instruments to capture emotional and perceptual responses such as USE Questionnaire: Measured usability across three dimensions such as usefulness, satisfaction, and ease of use presented through a radar diagram for comparative visualization. Another instrument is Product Reaction Cards: Participants selected descriptive words from a standardized list of 118 adjectives to express their emotional reactions and perceptions toward each website interface. This method captured affective responses that quantitative metrics alone cannot reveal.

3. Results and Discussion

3.1. Performance Metrics Results

Task Success Rate

All 20 participants successfully completed all five tasks across all three web interface designs, yielding a task success rate of 100% for each design. The uniformity of this result indicates that all three designs were sufficiently functional to support users in completing basic e-commerce activities.

Time on Task

Time on task was measured in seconds for each participant across all five tasks. Table 3 summarizes the average time on task per design.

Table 3. Average Time on Task per Interface

Task	Web 1	Web 2	Web 3
1	17	18	19
2	8	9	10
3	11	9	11
4	9	6	10
5	3.3	3	3.3
Total	48.3	45	53.3

The results reveal that no single design was consistently fastest across all tasks. Web interface 2 demonstrated the shortest completion time in Tasks 3 and 4, achieving 9 seconds for Add to Cart and 6 seconds for Checkout, notably faster than Web interface 1 (11 and 9 seconds respectively). This suggests that the aesthetics-focused layout of Web interface 2 provided clearer visual cues for product

selection and checkout navigation. Web interface 1, however, outperformed others in Tasks 1 and 2, recording the shortest times for Login (17 seconds) and Product Search (8 seconds), reflecting its strength in early-stage navigation. Web interface 3 consistently recorded the longest task completion times, indicating that its simplified interface did not sufficiently support efficient user interaction.

Efficiency by Lostness

Lostness scores assess navigational efficiency, where 0 indicates perfect efficiency and above 0.40 signals navigational difficulty. Table 4 presents average lostness scores per task.

Table 4. Average Lostness Score per Interface

Task	Web 1	Web 2	Web 3
1	0	0	0
2	0.4	0.15	0.5
3	0	0	0
4	0.7	0.3	0.7
5	0	0	0
Total	1.1	0.45	1.2

Lostness results present a more nuanced picture than time-on-task alone. Web interface 2 achieved the lowest overall lostness score (0.45), outperforming both Web interface 1 (1.10) and Web interface 3 (1.20). In Task 2 (Product Search), Web interface 2 recorded only 0.15, far lower than Web interface 1 (0.40) and Web interface 3 (0.50), both exceeding the critical threshold. In Task 4 (Checkout), Web interface 2 again demonstrated superior efficiency with a lostness score of 0.30, compared to 0.70 for both Web interfaces 1 and 3. These findings suggest Web interface 2 provided more efficient navigational pathways during mid-to-late-stage transaction flows.

3.2. Post-Session Rating

Single Ease Question (SEQ)

SEQ scores were collected on a 7-point scale after each task, with higher scores indicating greater perceived ease. Table 5 presents average SEQ scores per task.

Table 5. Average SEQ Scores per Task

Task	Web 1	Web 2	Web 3
1	4.8	4.55	4.6
2	4.15	4.25	2.65
3	4	4.25	3.30
4	4.45	4.6	3.9
5	4.7	4.5	4.35
Average	4.42	4.43	3.76

SEQ results reveal a closely competitive performance between Web interfaces 1 and 2. Web interface 1 achieved the highest perceived ease in Tasks 1 and 5, reflecting user comfort during login and discount application. Web interface 2, however, recorded higher SEQ scores in Tasks 2, 3, and 4, the three tasks most central to the product browsing and purchasing journey. Notably, Task 4 (Checkout) yielded scores of 4.60 for Web interface 2 versus 4.45 for Web interface 1, while Task 2 (Product Search) recorded 4.25 versus 4.15. These consistent marginal differences suggest that users perceived the purchasing flow of Web interface 2 as slightly more intuitive. Web interface 3 recorded the lowest SEQ scores across all tasks, most critically in Task 2 (2.65), confirming significant ease-of-use deficiencies in its product search interface.

System Usability Scale (SUS)

Table 6 presents average SUS scores across the three interface designs.

Table 6. Average SUS Scores

Metrics	Web 1	Web 2	Web 3
Average Score	31.5	30.95	30.85

All three designs yielded SUS scores within the poor or not acceptable range based on the international SUS grading scale, confirming that none of the existing designs fully satisfied standard usability criteria and collectively validating the need for a comprehensive redesign. Among the three, Web interface 1 achieved the highest SUS score (31.50), followed by Web interface 2 (30.95) and Web interface 3 (30.85). Although the differences are narrow, the consistent positioning of Web interface 1 at the top in this globally standardized measure carries meaningful weight in design selection.

Questionnaire for User Interaction Satisfaction (QUIS)

QUIS scores were normalized to a 100-point scale based on 27 items rated on a 9-point scale. Table 7 presents average QUIS scores.

Table 7. Average QUIS Scores

Metrics	Web 1	Web 2	Web 3
Average Score	76.3	76.54	70.7
Standard Deviation	12.7	12.77	14.77

Web interface 2 achieved the highest QUIS score (76.54), marginally outperforming Web interface 1 (76.30), consistent with its aesthetics-focused philosophy that prioritizes visual and interactive quality. Web interface 3 scored considerably lower (70.70) with the highest standard deviation (14.77), indicating greater inconsistency in user satisfaction and a polarizing effect likely caused by its overly minimal visual approach.

3.3. Experiential Rating Results

USE Questionnaire

The Usefulness, Satisfaction, Ease of use (USE) Questionnaire highlights the strongest attribute under four dimensions with straightforward scoring using Likert scale consisting of 1-7 whereas 1 indicates Strongly Disagree and 7 indicates Strongly Agree. The USE questionnaire assessed four dimensions: Usefulness, Ease of Use, Learnability, and Satisfaction, visualized through radar diagrams. Key findings are as follows:



Fig. 2. Web 1 Interface's USE Results

Web Interface 2 recorded the highest Usefulness score among the three designs, attributed to its richer feature presentation and visually informative product layout. Users perceived this design as most capable of supporting their shopping goals.



Fig. 3. Web 2 Interface's USE Results

Web Interface 3 consistently recorded the lowest scores across all four USE dimensions, particularly in Ease of Use and Satisfaction, confirming that its simplified design did not sufficiently support a satisfying user experience.



Fig. 4. Web 3 Interface's USE Results

Product Reaction Cards

Each participant selected five descriptive words from a standardized list of 118 adjectives. The most frequently selected descriptors for each design were as follows: Web Interface 1 has dominant descriptor of Easy to Use, reflecting users' positive perception of navigational clarity and low interaction complexity. Web Interface 2 has dominant descriptor of Useful. Web Interface 3 has most frequently selected descriptor Boring, accompanied by Confusing and Unattractive, indicating that its overly simplified presentation failed to engage users and introduced navigational ambiguity.

The Product Reaction Card result provided a critical affective dimension to the evaluation. The contrasting profiles of Web interface 1 (Easy to Use) and Web interface 2 (Useful) highlight a meaningful trade-off between navigational simplicity and feature richness, both valuable in e-commerce interface design. Web interface 3's dominant negative descriptors confirm that visual minimalism, when taken to an extreme, can undermine the user experience.

3.4. Overall Ranking and Design Selection

Based on aggregated results across all evaluation dimensions, Table 8 presents the overall ranking.

Table 8. Overall Ranking

Dimension	Web 1	Web 2	Web 3
Time on Task	2	1	3
Efficiency	2	1	3
Ease of Use	2	1	3
Usability	1	2	3

The overall ranking reveals a closely contested evaluation between Web interfaces 1 and 2, with Web interface 3 consistently ranked last. Web interface 2 ranked first in Time on Task, Efficiency, Ease of Use (SEQ), and Interface Satisfaction (QUIS), demonstrating strength in mid-to-late-stage transaction flows.

Despite Web interface 2's strong quantitative performance, Web interface 1 was selected as the primary reference for the redesign proposal based on several considerations. First, Web interface 1 achieved the highest SUS score, a globally standardized and widely accepted measure of holistic system usability. Second, its dominant user descriptor Easy to Use directly aligns with the core research objective of this study, which places ease of use as the primary design criterion. Third, its navigational structure demonstrated consistent strength in early-stage interaction (login and product search), which are critical first touchpoints shaping overall user perception and initial trust. Finally, the performance gaps identified in Web interface 1, particularly in checkout efficiency and visual appeal, were assessed as addressable through targeted redesign, whereas its simpler structural base offered a more controllable and extensible foundation for improvement.

3.5. Web Interface Redesign

The redesigned interface was developed in Figma using Web interface 1 as the primary structural reference, while selectively integrating the visual strengths and functional features identified in Web interface 2. This hybrid approach aimed to preserve the navigational simplicity and ease of use of Web interface 1, while enhancing its visual engagement and checkout efficiency. The redesign covered ten key interface pages: Login, Sign-Up, Profile, Top-Up, Product Search, Add Product, Added-to-Cart, Checkout, Checkout with Discount, and Successful Checkout.

3.6. Interface Redesign Validation

The redesigned prototype was validated using only with the Performance Metrics framework applied in the initial evaluation, enabling a direct before-and-after comparison across all four interfaces the three existing designs and the new prototype. The other measurements such as Post-Session and Experiential Rating were not used. Table 9 presents comparative results.

Table 9. Performance Metrics Comparison with New Design

Dimension	Interface 1	Interface 2	Interface 3	New Design
Task Success Rate (%)	100	100	100	100
Total Time on Task (s)	48.3	45	53.3	40
Total Lostness Score	1.1	0.45	1.2	0.30
Ranking for Time on Task	2	3	4	1
Ranking for Efficiency	2	3	4	1

The validation results demonstrate a clear and consistent improvement in user performance with the new design across all measured dimensions. In terms of Time on Task, the new design achieved the shortest total task completion time of 40 seconds. This represents a reduction of 11.1% compared to the best-performing existing design (Web Interface 2), indicating that the hybrid redesign approach combining Web Interface 2's navigational clarity with Web Interface 1's checkout efficiency produced a measurable improvement in interaction speed.

In terms of navigational efficiency (lostness), the new design achieved the lowest total lostness score of 0.30, confirming acceptable navigational efficiency indicates that the restructured checkout flow and enhanced navigational cues successfully reduced unnecessary steps during task completion. Task success remained at 100% for all designs, consistent with initial evaluation findings.

These results confirm that the empirically grounded redesign process informed by a multi-method evaluation combining Performance Metrics, Post-Session Rating, and Experiential Rating produced a web interface that not only preserved the usability strengths of the selected reference design but demonstrably enhanced user efficiency and navigational performance across all five task scenarios.

4. Conclusion

This study conducted a structured, multi-method User Experience (UX) evaluation of three alternative sneaker sales web interface designs. Web Interface 1 was selected as the primary reference for redesign based on its superior SUS score and alignment with the study's core criterion of ease of use. The Figma-based prototype integrated the visual strengths and checkout efficiency of Web Interface 2 into the navigational foundation of Web Interface 1. Validation testing confirmed the effectiveness of this approach: the new design achieved a total task completion time of 40 seconds and a lostness score of 0.30 representing an 11.1% and 33.3% reduction respectively over the best-performing existing design while maintaining a 100% task success rate. These results demonstrate that an empirically grounded, multi-method UX evaluation can systematically produce a more usable and user-centered interface design.

Several directions are recommended to deepen the evaluation of sneaker web interface usability. First, the integration of eye-tracking technology would provide objective, real-time data on user visual attention and gaze patterns, enabling identification of specific interface elements that attract or confuse users beyond what behavioral and self-report instruments can reveal [19]. Second, heuristic evaluation by usability experts would complement user-based findings by identifying design violations and interface inconsistencies from a specialist perspective [20]. Third, neurophysiological methods such as electroencephalography (EEG) or galvanic skin response (GSR) measurement would extend affective evaluation beyond Product Reaction Cards by capturing unconscious emotional and cognitive responses to interface stimuli [21].

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