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Integrating User-Centered Design and Persuasive Technology: A Case Study on The Raw's Skincare E-Commerce Digital Transformation

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ABSTRACT

The skincare e-commerce industry is growing quickly, but many websites still face problems with being easy to use and keeping users engaged. This study focuses on how two design approaches, User-Centered Design (UCD) and Persuasive Technology (PT), can work together to improve the digital experience of skincare websites. The research uses The Raw, a skincare brand, as a case study. To carry out this research, the study used both quantitative and qualitative methods. A mixed-methods design was applied, involving a System Usability Scale (SUS)-based survey with 30 participants and semi-structured interviews with five UX and marketing experts. These methods helped gather insights about how users interact with the website, what keeps them engaged, and which features help influence their decisions. The findings demonstrate that UCD enhances the user-friendliness and accessibility of websites. It improves how easy it is for users to find what they need and interact with the site. On the other hand, PT uses techniques like customer reviews, limited-time offers, and personalized recommendations to build trust and guide users toward taking action, such as making a purchase. By combining both approaches, the website became more engaging, easier to use, and more effective in meeting users' needs. This research provides clear design suggestions that can help other skincare brands improve their online platforms. The study also adds to the current knowledge about how to use UCD and PT together in e-commerce, offering useful ideas for businesses that want to improve their digital presence and build stronger relationships with customers.

1. Introduction

The Raw is a Malaysian skincare brand that offers minimalist, plant-based products. In 2025, its website (theraw.my) received around 12,000–15,000 visits per month, with users spending an average of two minutes per session. The site had a bounce rate of 65%, and over 70% of users accessed it via mobile devices. Although the brand has a strong local presence and product catalog, its website struggles with short visit durations and low customer retention, signaling a need for better design and engagement strategies.

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The skincare e-commerce industry is growing fast, driven by online convenience and demand for personalized products. However, many platforms still have poor usability and low engagement. User-Centered Design (UCD) focuses on making websites simple, clear, and responsive to user needs. As Norman [11] explained, good design reduces confusion by making functions intuitive. Brown and Green [20] also found that improved digital touchpoints lead to higher user satisfaction and lower drop-out rates.

Persuasive Technology (PT) uses features like reviews, time-limited offers, and personalization to influence user decisions. Fogg [5] introduced a design model showing how persuasive elements can shape user behavior. While these methods have worked well in healthcare and education [9,10], their joint use with UCD in skincare e-commerce is still rare [17]. The Raw's high bounce rate and short sessions suggest missing persuasive features [2,10], which this study aims to address.

This research explores how UCD can improve usability, how PT can boost user engagement, and how their combination affects overall satisfaction and conversion. It focuses on three research questions: (1) How does UCD improve navigation and usability on The Raw's website? (2) How does PT influence user engagement and behavior? (3) What is the combined impact of UCD and PT on user satisfaction and business performance? These questions aim to uncover the strengths of each design approach and how their integration supports effective digital transformation in skincare e-commerce [5,11].

2. Previous Works

Previous studies have shown that both User-Centered Design (UCD) and Persuasive Technology (PT) are useful in improving digital experiences, but few have looked at how they work together, especially in skincare e-commerce. This study builds on those earlier works to examine their combined impact.

UCD helps make websites more user-friendly by focusing on what users need during the design process. Norman [11] explained that good design reduces mental effort and matches natural user behavior. However, Baum, Singh, and Tandon [3] found that small businesses often struggle to apply UCD fully due to time and budget limits, showing the need to balance design improvements with real-world constraints.

In the skincare sector, Poushneh [4] studied how combining UCD and Augmented Reality (AR) helped users feel more engaged. For example, Sephora's Virtual Artist tool increased website traffic and interaction by letting users try products virtually [17]. Other research also found that AR boosts confidence and emotional connection during online shopping [18,19]. These results support using AR as part of user-centered strategies in skincare websites.

PT has also proven effective in e-commerce. Fogg [5] introduced persuasive techniques like personalization and social proof, while Puspasari *et al.*, [9] found these methods boosted buying intentions—especially important for skincare, where users rely on reviews and suggestions.

Loyalty programs built on persuasive principles have shown strong results in the beauty industry. According to McKinsey [2], such programs can lead to much higher customer spending. Other studies also show that personalization and convenience improve customer loyalty [10]. These findings support the idea of using persuasive tools to build lasting relationships with users.

Ethical issues in persuasive design are also getting attention. Sharma *et al.*, [12] warned that these tools should not manipulate users, and Mikolajczak and Lemoine [16] stressed that trust depends on respecting user autonomy. Designers must be careful not to cross ethical lines when using persuasive features.

Finally, user needs vary by age and background. Sukamto *et al.*, [13] showed that older users prefer simpler layouts and clearer messages. This means UCD must account for different types of users when designing persuasive features. Kumar *et al.*, [14] also found that well-designed loyalty programs can keep customers coming back, proving that persuasive design supports both short-term and long-term engagement. The summary and comparison of the previous works are also shown in Table 1.

Table 1
 Previous works and comparison

Study	Design Focus	Methodology	Industry	Key Findings
[4]	UCD & PT	Case Study	Skincare	AR-based UCD improved customer engagement
[9]	PT & Personalization	Experimental Design	E-commerce	Personalization boosted purchase intent
[13]	UCD	Survey & Interview	General Web UX	Older users preferred simplified navigation
[12]	Ethical PT	Literature Review	E-commerce	Emphasized transparency and user autonomy
[3]	UCD Challenges	Case Study	E-commerce	Resource constraints affect UCD implementation

These past studies support the value of UCD and PT in improving user experience and business results, and they show that combining both can be even more effective for skincare e-commerce. To strengthen this study, recent research highlights the need to focus on mobile-first design and cultural factors, especially since over 70% of The Raw's users access the site via smartphones. Hassan *et al.* [21] found that mobile-first design boosts engagement and conversions in Southeast Asia by fitting user habits like short sessions and simple layouts. Lee and Hong [22] also showed that ASEAN users respond well to local storytelling, visual cues, and community-based features. These insights help make the integration of UCD and PT more relevant for Malaysian skincare users.

3. Research Methodology

This study adopts a mixed-methods approach to provide a comprehensive understanding of how User-Centered Design (UCD) and Persuasive Technology (PT) influence user experience on The Raw's skincare e-commerce website. A mixed-methods strategy combines both quantitative and qualitative data, allowing for deeper insights and triangulation of findings, which enhances the reliability and validity of the results [7].

3.1 Quantitative Method: User Survey

To measure usability and engagement, the study used a survey based on the System Usability Scale (SUS), a well-known tool for evaluating how easy a website is to use [7]. The survey had Likert-scale questions covering ease of use, satisfaction, trust, and engagement. Thirty participants—both new and regular users of The Raw's website—were selected because they had experience with skincare e-commerce. Their answers were analyzed using basic statistics to find key trends. The results helped assess how well User-Centered Design (UCD) was applied, especially in areas like navigation clarity, content readability, responsiveness, and error handling, which Norman [11] says are essential for a good user experience.

3.2 Qualitative Method: Expert Interviews

Besides the user survey, the study also included interviews with five experts in UX design and digital marketing who had experience in beauty and e-commerce. These interviews focused on persuasive features like customer reviews, product suggestions, rewards, and visual design. Thematic analysis was used to find common patterns in their responses, helping the researchers understand how these features affect user behavior, trust, and engagement. Fogg's [5] persuasive technology framework guided the analysis by identifying key techniques such as tailoring, suggestion, self-monitoring, and credibility.

3.3 Triangulation and Integration

To improve the study's reliability, the researchers compared survey results with expert interview themes to check if both sources agreed. This method, called triangulation, helps reduce bias and gives a clearer picture of user needs and interface performance [7]. The study also followed ethical guidelines from Li and Jiang [8] by making sure persuasive features were not misleading and that users' choices and privacy were respected throughout the process.

4. Results and Discussion

The findings of this study provide strong evidence that the integration of User-Centered Design (UCD) and Persuasive Technology (PT) significantly enhances the usability and engagement of e-commerce websites in the skincare industry. Data were gathered through user surveys and expert interviews, allowing for both quantitative insights and qualitative depth.

4.1 Usability Improvements through UCD

Before the redesign, The Raw's website had problems such as a high bounce rate (65%) and short visit times (about 2 minutes), showing that users had trouble finding what they needed. The new user-centered design improved navigation, reduced clicks to purchase, and worked better on mobile devices. According to the survey, 93.4% of users found the site easy to use, with smooth navigation, clear layout, fast loading, and mobile responsiveness. These improvements follow key UCD principles like those of Norman [11], which focus on making interfaces intuitive and user-friendly. The better content structure and visual clarity also helped build user trust and satisfaction, as supported by Baum *et al.*, [3].

4.2 Persuasive Features and User Engagement

Persuasive design features were found to be effective, with 96.7% of users saying they felt more engaged due to elements like product recommendations, customer reviews, and time-limited offers. These match Fogg's model of persuasive technology, which uses trust, credibility, and triggers to guide user actions [5]. Expert interviews confirmed that features like countdown timers, loyalty badges, and progress bars helped users take action, supporting past findings on how visual cues and personalization boost motivation [9,14]. Experts also noted that using stories and customer experiences built emotional trust and brand loyalty, which aligns with Sharma *et al.*'s view that ethical persuasive design builds lasting user relationships [12].

4.3 Ethical Considerations in Persuasive Design

Although most users liked the persuasive features, some felt uncomfortable with tactics like urgency or exclusivity, such as limited stock alerts. These concerns point to the need for ethical limits in persuasive design, as warned by Mikolajczak and Lemoine [16], who noted that such tactics can reduce trust. To prevent this, the website was made more transparent by clearly showing promotion timelines and giving users the option to turn off personalized messages, following the ethical guidelines suggested by Li and Jiang [8].

4.4 Integration of UCD and PT

Combining User-Centered Design (UCD) and Persuasive Technology (PT) worked well because each approach supported the other. UCD made the website easier to use, while PT added features that encouraged users to stay engaged and take action. This balance shows that mixing usability and motivation creates a better user experience. As Kujala [7] noted, involving users in the design process and focusing on behavior can lead to more effective systems. Experts agreed that using too much persuasion can overwhelm users, while focusing only on usability might not keep them interested. So, using both strategies together in the right way is key to building successful skincare e-commerce platforms.

5. Conclusion

This study explored how combining User-Centered Design (UCD) and Persuasive Technology (PT) can improve the digital experience of skincare e-commerce, using The Raw as a case study. Using surveys and expert interviews, the research showed that UCD made the website easier to use, more organized, and user-friendly, while PT features like reviews, limited-time offers, and product suggestions increased user engagement and purchase likelihood. Together, UCD and PT created a digital experience that was both functional and emotionally engaging. The study also stressed the importance of using persuasive features ethically to avoid damaging user trust. These findings are useful for web designers and marketers looking to improve e-commerce platforms. However, since the study focused on one brand and a small sample size, the results may not apply to all cases. Future research could test these design methods in other industries or explore how different user groups respond to persuasive features over time. Overall, the study shows that a thoughtful mix of UCD and PT can enhance user satisfaction and business success.

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