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Article

Enhancing After-Sales Experience in Community Grocery Apps: A User-Centered Redesign of the Duoduo Shopping Interface

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Abstract: The rapid expansion of community group-buying platforms has transformed grocery shopping experiences in China. Among them, Duoduo Grocery holds the largest market share but also ranks highest in consumer complaints, particularly regarding its after-sales processes. This study adopts a user-centered design approach to investigate the pain points faced by users—especially elderly individuals—during refund and return interactions within the app. Using mixed methods including field interviews, journey mapping, and interface audits, the study identifies key emotional and operational frictions in the user experience. Insights from persona development and user clustering reveal that confusion in money flow, lack of transparency, and the absence of human support are primary causes of frustration. Based on these findings, a redesigned interface was proposed, featuring a simplified refund process, visual emphasis on financial information, and direct contact options with service agents. The results demonstrate how targeted design improvements can enhance user trust and satisfaction in digital platforms with high complaint volumes.

Keywords: After-sales service; User-centered design; Interface redesign; Elderly users; Refund experience

1. Introduction

The proliferation of community group-buying platforms has transformed grocery shopping in China, particularly in urban and suburban settings (Yang & Qi, 2023). These platforms allow users to purchase fresh produce and daily necessities at low prices through neighborhood-based orders, offering convenience, speed, and affordability (Junaid et al., 2025). Among them, Duoduo Grocery, affiliated with Pinduoduo, has emerged as the dominant player, boasting the largest market share in this sector. Despite its commercial success, the platform has attracted widespread user dissatisfaction, especially in its after-sales service experience. On major consumer complaint platforms such as Sina's "Black Cat," Duoduo Grocery consistently ranks among the highest in unresolved user complaints, many of which center on refund processing, vague financial flows, and unresponsive customer service.

This growing discrepancy between platform popularity and user satisfaction reveals a significant gap in interaction design, particularly within the refund and return process. These issues are not only technical but experiential, often creating emotional stress, confusion, and frustration for users (Hertzum & Hornbæk, 2023). The challenges are especially pronounced for

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elderly users, who often struggle with understanding interface logic, identifying actionable elements, or navigating through refund policies. As digital service platforms become increasingly central to daily life, addressing such usability gaps is essential not only for business performance but also for ensuring digital inclusivity (Das, 2024).

While prior studies have explored the functionality of e-commerce interfaces, fewer have addressed after-sales experiences as a distinct phase of the customer journey(Patroni et al., 2016). Moreover, limited research has focused on the needs of senior users within fast-paced digital retail environments (Mariani & Nambisan, 2021). This study seeks to fill this gap by investigating the pain points that emerge during the after-sales phase in the Duoduo Grocery app and proposing targeted design improvements grounded in user-centered design (UCD) principles.

To this end, the study adopts a mixed-methods approach combining in-depth user interviews, journey mapping, persona construction, and interface audits (Al-Mhdawi et al., 2024). The research process revealed that refund-related operations often lack transparency, rely on overloaded interfaces, and fail to provide clear emotional feedback. Through synthesis of the user data and pain point analysis, we developed a design proposal that simplifies the refund path, improves the visibility of financial information, and enhances accessibility for less digitally literate users (Al-Mhdawi et al., 2024).

This study contributes to the broader discussion of how service design and interaction design intersect in mobile applications, especially in the context of daily-use platforms where user frustration can accumulate over time. It also highlights the role of emotional mapping and age-inclusive thinking in designing smoother, more reliable after-sales experiences.

The remainder of this paper is organized as follows. Section 2 reviews related work on after-sales interface design, user experience in grocery apps, and the challenges faced by elderly users in mobile interaction. Section 3 outlines the research methodology and data collection process. Section 4 presents the major findings from user studies and interface evaluations. Section 5 proposes a design intervention and interface revisions based on the pain points identified. Section 6 discusses the theoretical and practical implications of the findings. Finally, Section 7 concludes the paper and offers directions for future research.

2. Literature Review

2.1 Online Grocery Apps and User Complaints

The rapid expansion of online grocery platforms has profoundly reshaped consumption habits in China, particularly through the rise of community group-buying models (Liang & Gao, 2024). Apps such as Duoduo Grocery, Meituan Select, and Xingsheng Youxuan enable users to purchase fresh produce and daily necessities via localized bulk orders, often at prices lower than traditional supermarkets. These platforms gained unprecedented traction during the COVID-19 pandemic, as users prioritized contactless delivery and convenience. For elderly and mobility-constrained users, such platforms offered a lifeline for essential daily shopping.

Among these services, Duoduo Grocery, operated by Pinduoduo, has emerged as the most widely used. Its aggressive expansion strategy, low pricing, and seamless integration with Pinduoduo's social-commerce ecosystem have contributed to its dominant market position. However, this popularity comes with a paradox: the platform is also one of the most frequently criticized, particularly for its after-sales service. On Sina’ s Black Cat complaint platform—one of China’ s leading third-party consumer rights forums—Duoduo Grocery consistently ranks among the highest in complaint volume. Most grievances concern refund delays, inability to locate refund status, absence of human service agents, and vague system feedback.

Although existing research on community group-buying has examined areas such as logistics performance, price sensitivity, and group order behavior, the post-purchase experience remains critically underexplored, especially from a user experience (UX) perspective (Chang & Chen, 2021). The majority of user complaints are not rooted in operational errors but in interaction design oversights (Zahabi et al., 2015). For instance, users often struggle to find refund options within the interface, cannot clearly track refund progress, or become trapped in unresponsive chatbot dialogs. These design flaws—though seemingly minor—generate high emotional costs for users, especially in moments involving money, uncertainty, and lack of control (Scheirer et al., 2002).

Moreover, the design of these platforms often reflects a transaction-centric logic, emphasizing conversion, checkout, and upselling, while underinvesting in service continuity and problem resolution (Park et al., 2015). This imbalance creates a sharp contrast between pre-purchase efficiency and post-purchase frustration, breaking the user's mental model of what a reliable service should offer (Jumaan et al., 2020). In platforms like Duoduo Grocery, this is especially problematic given the low monetary value but high frequency of transactions, where users expect rapid and effortless reversibility.

Lastly, complaint narratives often reflect strong emotional reactions, particularly among older users. Feelings of confusion, helplessness, or being "ignored by the system" recur frequently in online feedback. These emotional signals indicate that after-sales design is not merely a technical layer, but a space where trust, reassurance, and human-centered design must converge. This study aims to respond to this under-addressed need by focusing on the affective and experiential dimensions of after-sales UX in the context of Duoduo Grocery.

2.2. After-Sales Experience and Elderly Users

The after-sales phase is a critical yet frequently neglected component of the digital shopping experience (Ferraz et al., 2023). In the context of mobile grocery platforms, this stage includes processes such as refund initiation, return tracking, issue resolution, and customer support engagement. While much attention is placed on optimizing front-end flows—such as browsing, checkout, and payment—after-sales interactions are often treated as auxiliary, back-office functions. However, research in user experience (UX) design consistently emphasizes that post-purchase satisfaction is a key determinant of long-term platform loyalty and trust (Jeon, 2023).

When after-sales flows are poorly designed, users may encounter multiple layers of friction: ambiguous system feedback, unclear refund timelines, inconsistent labeling, and unresponsive support. These challenges often result in cognitive overload, especially when users are forced to troubleshoot issues on their own without adequate guidance (Woods et al., 2002). The frustration intensifies when financial transactions are involved, as users seek both task completion and emotional reassurance (Ozuem et al., 2024). Several studies in service design have emphasized that lack of closure in money-related flows leads to prolonged stress, even if the actual refund succeeds eventually.

For elderly users, these issues are further magnified by age-related cognitive and perceptual limitations (Zhou et al., 2025). Research in human-computer interaction (HCI) has demonstrated that older adults experience declines in working memory, attention span, fine motor control, and visual discrimination . As a result, senior users tend to prefer linear task structures, stable layouts, and explicit system feedback. They are also more dependent on system predictability and prefer human contact when digital flows become uncertain (He et al., 2025).

However, most commercial platforms continue to apply a "one-size-fits-all" interaction model, assuming users can independently interpret and adapt to complex flows (He et al., 2025). This design bias often excludes elderly users from fully accessing post-purchase services. In

community group-buying contexts, where many senior citizens rely on mobile grocery apps as a daily necessity, this exclusion is not only inconvenient—it is structurally discriminatory.

Moreover, emotional barriers such as anxiety, fear of making mistakes, and mistrust in automated systems compound the interface challenges for older adults. Qualitative studies have shown that feelings of helplessness or abandonment emerge when users cannot confirm whether their refund was submitted or received. In the absence of clear signals, many elderly users either repeatedly check the app, contact relatives for help, or abandon the task entirely. These behaviors reflect an emotional cost often ignored in standard usability metrics (Salman et al., 2018).

Despite the growing population of elderly mobile users in China and elsewhere, relatively few design interventions have been crafted specifically for this group. Most platforms optimize for younger, digitally fluent users, overlooking the fact that design inclusivity must go beyond accessibility to address emotional and cognitive needs. This study responds to this gap by investigating how the after-sales interface of Duoduo Grocery can be redesigned to better accommodate elderly users through simplified flows, empathetic messaging, and enhanced visibility of task progression.

3. Methodology

This study adopted a service design process structured around three stages: problem discovering, problem analyzing, and problem solving. The design team conducted user interviews, empathy mapping, and journey mapping in the initial phase to uncover key emotional and functional pain points. These findings were synthesized into personas and demand maps, leading to solution ideation and iterative prototyping（Figure 1）.

3.1 Interview and Persona Building

To understand real user experiences and frustrations, semi-structured interviews were conducted with eight participants (aged 27–68), including both frequent and occasional users of Duoduo Grocery. Participants were recruited via convenience sampling, with emphasis on capturing the perspectives of elderly users. The interview questions focused on users' recent refund experiences, difficulties encountered during the return process, expectations toward customer service, and emotional responses to the app interface（Figure 2）.

Interview transcripts were thematically coded to identify recurring concerns and emotional patterns. Based on the insights gathered, two representative personas were created to embody typical user archetypes: (1) a digitally fluent young adult with moderate frustration about refund uncertainty, and (2) an elderly user with strong anxiety and a sense of helplessness when navigating after-sales procedures. These personas helped ground the design direction in concrete user needs and supported empathy-driven decision-making in later stages（Figure 3）.

3.2 Journey Mapping and Pain Point Clustering

Using qualitative data from the interviews, a customer journey map was constructed to visualize the user experience during the after-sales process（Figure 4）. Key stages—including initiating a refund, checking progress, and receiving funds—were mapped along with emotional curves and user actions. This process revealed emotional "valleys" at moments when refund status was unclear or when users were forced to interact with chatbots without meaningful guidance.

To further refine the analysis, sticky note clustering was employed to categorize pain points into three tiers: strong needs (e.g., refund visibility), general needs (e.g., real-time status updates), and weak needs (e.g., personalized refund tips). This helped prioritize redesign targets and uncover latent user expectations not directly stated in the interviews. In particular, strong

needs were often linked to emotional states like anxiety and distrust, while weak needs reflected interface convenience rather than core usability failures.

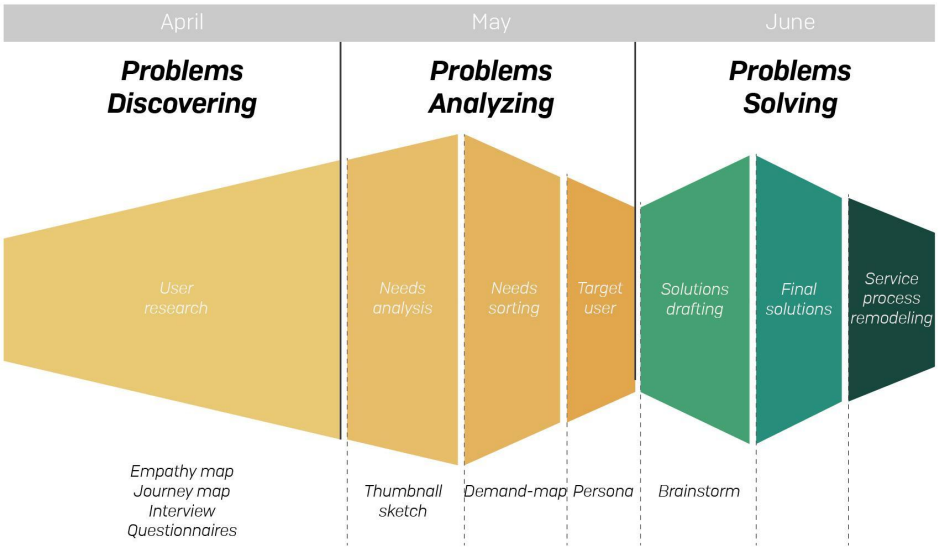

Figure 1. Service Process

3.3 Interface Audit and Design Diagnosis

The final phase involved a diagnostic evaluation of the existing Duoduo Grocery interface, focusing on the after-sales pages. Heuristic analysis and information architecture review revealed several key issues: refund pathways were buried under unrelated options, status indicators lacked clarity, and the interface suffered from visual overload due to promotional pop-ups and ads. Important financial cues—such as "refund initiated" or "amount returned"—were either hidden or presented in non-salient positions.

These findings were cross-referenced with pain point clusters and persona insights to inform design decisions. Specific attention was given to aligning system feedback with user expectations and minimizing the number of clicks required to access refund details. The audit confirmed that many frustrations reported by users were not due to technical limitations, but rather to interaction design oversights and inconsistent information flows.

4. Findings

The user interviews and journey mapping exercises revealed consistent friction points throughout the after-sales process on Duoduo Grocery. Across all participants, the most frequently cited problem was the difficulty in locating the refund entry point. Users often expected to find refund-related actions directly under the order history, but instead had to navigate through multiple unrelated submenus. This disjointed information architecture led to confusion, trial-and-error behavior, and in some cases, task abandonment.

Another key issue was the lack of real-time feedback regarding refund status. Several users described situations in which the system displayed vague progress indicators such as "refund in process" without specifying timelines, completion stages, or estimated return dates. This created uncertainty and anxiety, especially for users unfamiliar with digital finance operations. Some participants even reported re-checking the app repeatedly for updates, interpreting silence as system failure.

Elderly users, in particular, experienced heightened emotional distress. Their pain points extended beyond interface confusion to include feelings of helplessness and mistrust. For instance, one older participant mentioned assuming their refund had "disappeared" because

the app failed to provide a clear confirmation message. Others expressed discomfort with automated chatbot interactions, describing them as "cold," "repetitive," or "incomprehensible." For many senior users, the lack of human touch in customer service represented a serious barrier to trust and successful task completion.

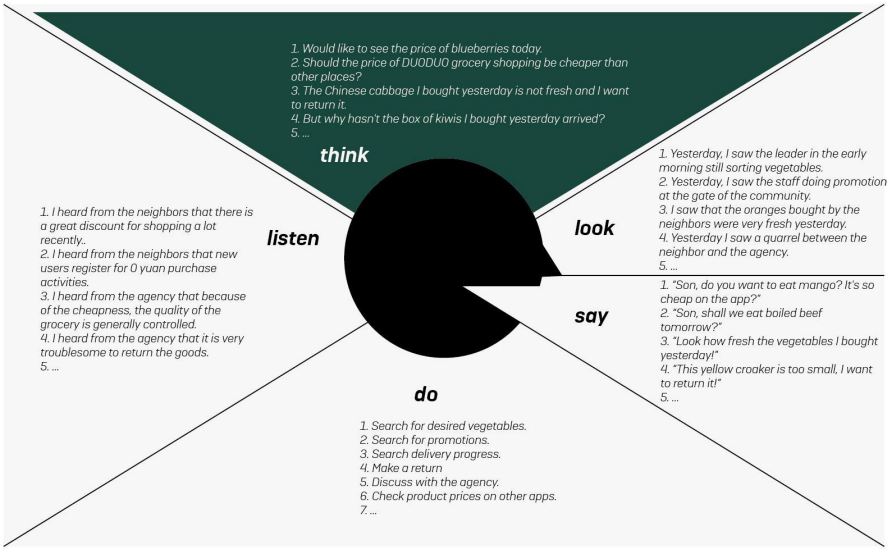

Figure 2. Five-Sense Empathy Map of User Experience

The emotional journey mapping exercise further illustrated how small interface decisions could trigger disproportionately negative emotional reactions. The absence of a "refund received" confirmation screen or a lack of visually distinct financial cues led to cognitive dissonance, especially when users had to recall whether the refund had been requested or approved. Negative emotions such as anxiety, frustration, and impatience often peaked during these moments of ambiguity.

Figure 3. Interview Source Overview

The pain point clustering helped categorize these issues into different levels of urgency. Strong needs included refund visibility, status traceability, and access to human support. General needs involved interface clarity, task guidance, and consistency in labeling. Weak needs focused on optional conveniences such as refund tips, system personalization, or non-intrusive promotions. Interestingly, many strong needs were not explicitly articulated by users but

inferred through behavioral patterns and emotional cues—highlighting the importance of empathy-driven analysis in the design process.

In terms of persona validation, the elderly persona showed strong alignment with themes of disempowerment and interface-related fear. This group tended to second-guess their own actions, often questioning whether a button had been pressed correctly or whether the refund process had truly begun. The younger persona, by contrast, exhibited more frustration with inefficiency and lack of control, expressing a preference for precise information, quick confirmation, and seamless self-navigation.

The interface audit confirmed the behavioral and emotional pain points raised during interviews. Visual clutter, frequent pop-ups, inconsistent labeling, and deeply buried refund options all contributed to poor usability. Furthermore, the platform’s visual hierarchy placed greater emphasis on advertisements and product recommendations than on financial feedback or transaction updates. This misalignment between system goals and user expectations amplified user dissatisfaction during the after-sales phase.

Taken together, the findings reveal a mismatch between the app’s interface design and the mental models of its users—especially older ones. While the transactional design may function well during the purchase phase, it fails to support emotional reassurance, cognitive clarity, and task closure during the refund process. These insights directly informed the redesign strategies presented in the following section.

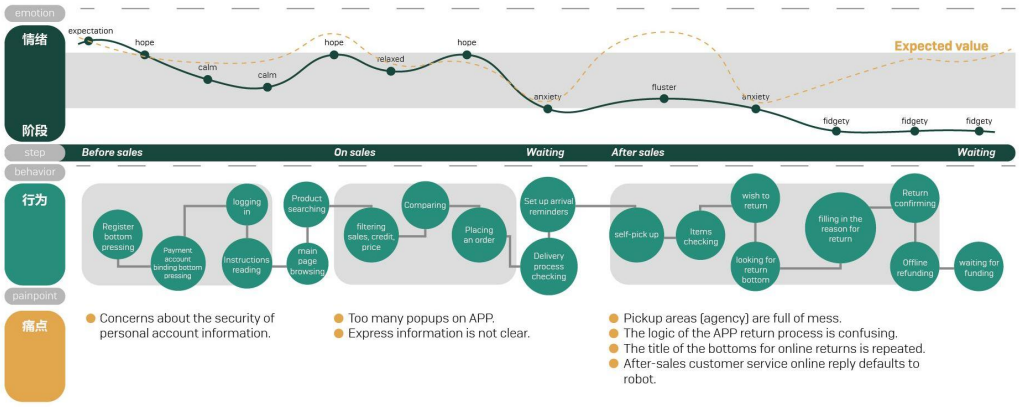

Figure 4. User Journey

5. Design Intervention

Based on the findings from user interviews, journey mapping, and interface audits, this section presents a targeted redesign of the Duoduo Grocery after-sales experience. The proposed solution focuses on simplifying the refund process, enhancing information visibility, and addressing the unique needs of elderly users. The intervention draws on user-centered design principles and prioritizes emotional clarity alongside functional usability.

5.1 Problem-Driven Redesign

The redesign was driven by three core problem areas identified in the research phase: (1) difficulty locating refund-related actions, (2) lack of transparency regarding refund progress, and (3) insufficient support for users under emotional stress, especially older adults.

To address these issues, the design team restructured the refund entry point to be accessible directly from the order list, removing the need to search within submenus. Refund status was reconceptualized as a visual process tracker, clearly separating stages such as “request submitted,” “processing,” “approved,” and “transferred.” These labels use simple, recognizable language supported by icons and color-coded states to enhance clarity（Figure 5）.

In parallel, redundant promotional content and non-contextual ads were removed from the refund interface to reduce visual overload. Attention was redirected toward essential information, such as refund amount, timeline, and support options, aligning the interface's visual hierarchy with user priorities.

5.2 Interface Flow Optimization

A revised interaction flow was developed to minimize steps and support intuitive decision-making. The new refund process requires no more than three taps from the main order page to status confirmation. At each step, visual anchors—such as progress bars, checkmarks, and action summaries—reinforce user understanding and reduce cognitive load.

To support elderly users, several accessibility enhancements were introduced. These include larger tap targets, increased font size in key areas, and high-contrast elements for status indicators. Labels were rewritten to avoid ambiguous or technical wording—for example, replacing "Your refund is under verification" with "We've received your refund request. Please expect a result within 24 hours." These changes aim to build reassurance and trust through more human-centric system language.

A new optional module titled "Need Help?" was introduced beneath the status bar. This lightweight intervention offers quick access to human support or frequently asked questions tailored to refund-related concerns. Unlike the previous chatbot-first approach, this flow allows users—particularly the elderly—to bypass repetitive bot dialogs and seek human reassurance when needed.

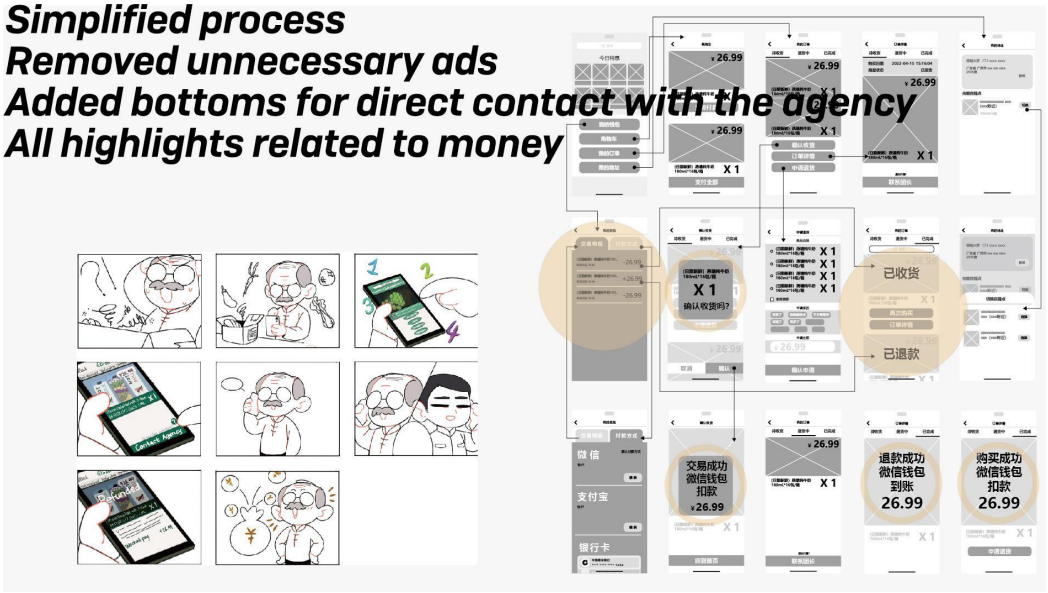

Figure 5. Storyboard

5.3 Final Prototype and Highlights

The final prototype integrates the aforementioned improvements into a cohesive user experience. A streamlined refund dashboard presents all relevant details in one view: product name, refund amount, current stage, estimated completion time, and available actions（Figure 6）. The visual design minimizes distractions and reinforces a sense of control.

Figure 7 illustrates the redesigned interaction sequence, highlighting the reduced number of steps and improved clarity at each transition. Each action—whether submitting a request or checking refund status—results in an immediate visual confirmation, reducing uncertainty and preventing redundant user behaviors such as rechecking or re-clicking.

One of the most positively received features in user testing was the "Refund Completed" confirmation screen, which uses friendly iconography and a soft color palette to deliver closure. For elderly users, this provided a strong psychological anchor signaling that the task was truly finished（Figure 8）.

Together, these design changes not only address functional pain points but also acknowledge the emotional labor involved in digital after-sales interactions. By restoring a sense of predictability, transparency, and empathy, the redesigned experience helps bridge the gap between operational efficiency and user satisfaction（Figure 9）.

6. Discussion

As This study set out to investigate the after-sales experience of users on Duoduo Grocery, with a particular emphasis on identifying pain points in refund-related interactions and addressing the emotional needs of elderly users. The findings and proposed design interventions offer both practical implications for digital platform development and theoretical contributions to the study of user experience in high-stakes service contexts.

One key contribution lies in repositioning the after-sales process as a critical component of user experience design, rather than a peripheral function. While most digital grocery platforms prioritize purchase flows and promotional mechanics, this research highlights that post-purchase interactions are equally central to user satisfaction, retention, and trust (Kumar et al., 2022). By mapping user emotions and behavioral responses across the refund journey, the study reveals how poor system feedback, unclear pathways, and lack of emotional closure can damage user confidence—even if the technical process eventually succeeds. This affirms the growing need to design for emotional UX, especially in tasks involving money, waiting, and uncertainty.

From a socio-technical perspective, the study underscores the importance of designing for marginalized digital groups, particularly elderly users who remain underserved in fast-evolving mobile commerce environments. While existing literature often frames older adults as "digitally lagging," our findings suggest that design failures—such as ambiguous labels or buried features—play a more decisive role in excluding these users than the users' own limitations. The proposed interface adjustments demonstrate that small but deliberate changes—such as language simplification, clearer progress indicators, and bypasses for chatbot loops—can dramatically improve usability and reduce anxiety. In doing so, this study contributes to inclusive design practice and reinforces the call for age-sensitive interaction models.

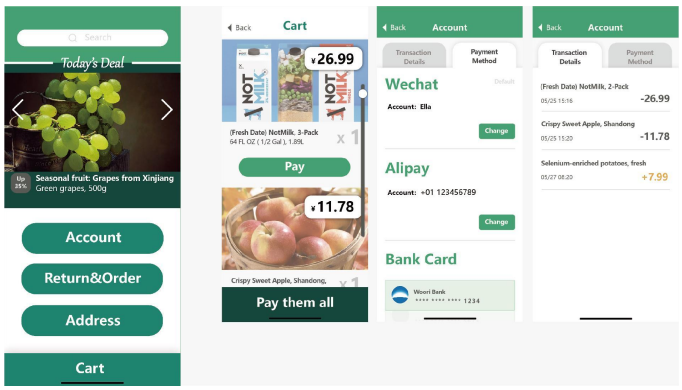

Figure 6. Final Interface Prototype 1

In practical terms, the research provides actionable guidelines for platform developers. First, refund status and timeline information should be made visually prominent and linguistically reassuring, especially in applications dealing with low-cost, high-frequency purchases like groceries. Second, support pathways should accommodate users with varying

digital fluency, allowing alternatives to default chatbot flows. Third, the visual hierarchy should reflect user priorities, ensuring that transactional feedback is not overshadowed by promotional content or unrelated functions. These recommendations can be generalized beyond Duoduo Grocery to similar platforms operating in community commerce, online retail, or public service delivery.

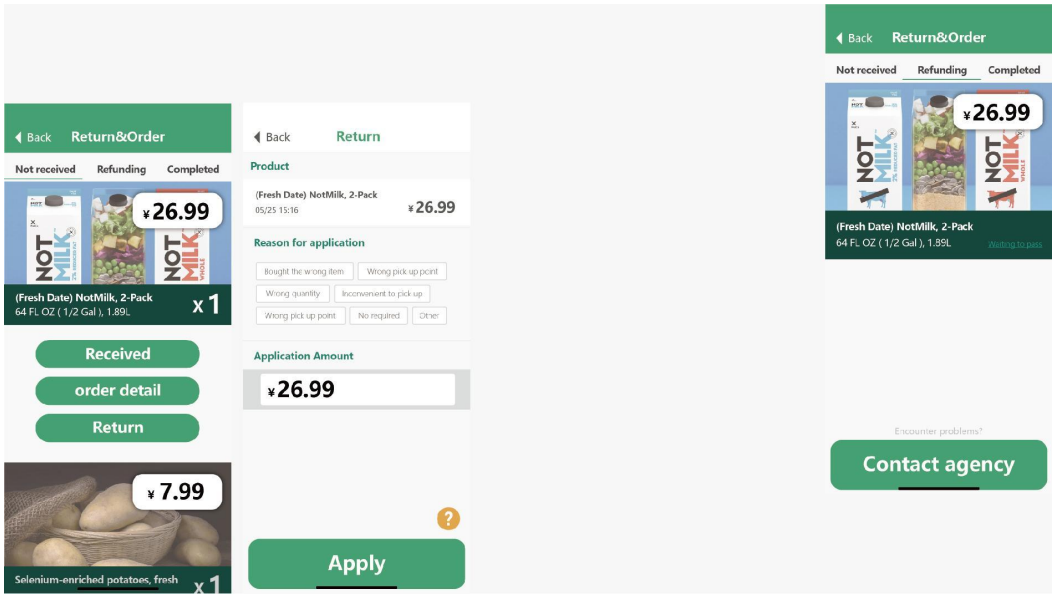

Figure 7. Final Interface Prototype 2

Despite its contributions, this study is not without limitations. The sample size for interviews was relatively small and geographically localized, which may affect the generalizability of user personas and emotional patterns. Moreover, the proposed redesign was evaluated based on expert review and heuristic validation rather than large-scale usability testing. As a result, quantitative measures of performance improvement, task success rates, or emotional relief were not included. Future studies should incorporate A/B testing or real-world deployment to assess the practical efficacy of such design interventions in live environments.

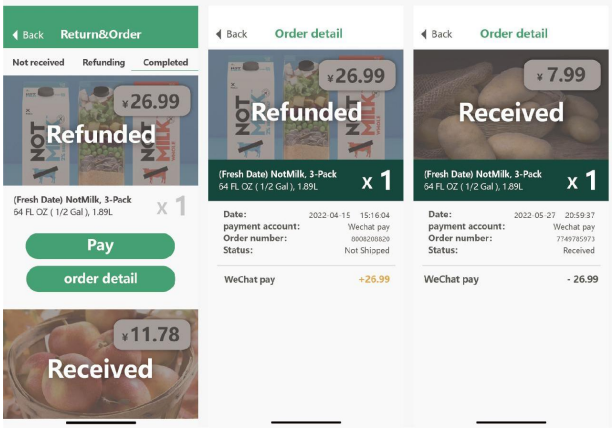

Figure 8. Final Interface Prototype 3

Another limitation concerns the focus on visual and interaction-layer improvements, without deeper exploration into systemic design tensions, such as backend process delays or policy-based restrictions on refunds. While interaction design can mitigate perceived risk and confusion, full user satisfaction often requires coordination between interface layers, service policies, and customer operations. An interdisciplinary approach that integrates HCI, service design, and platform governance would be valuable for future exploration.

Finally, the emotional mapping methods used in this study may benefit from further formalization. While journey maps and qualitative codes were effective for identifying emotional pain points, more structured tools—such as sentiment diaries, biometric feedback, or longitudinal studies—could offer deeper insight into how user emotions evolve over time in after-sales contexts.

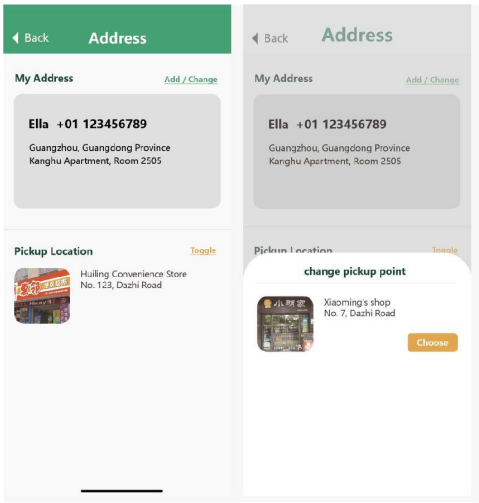

Figure 9. Final Interface Prototype 4

In conclusion, this study sheds light on the overlooked but emotionally charged experience of digital refunds, particularly for elderly users navigating ambiguous systems. It advances both theory and practice by demonstrating how empathy-driven, minimal interventions can significantly reduce friction, build trust, and support inclusive digital engagement in everyday life.

7. Conclusion

This study explored the after-sales user experience of Duoduo Grocery, focusing on the challenges users—especially elderly ones—face when navigating refund and return processes. Through user interviews, journey mapping, and interface audits, the research identified core pain points such as difficulty locating refund options, lack of status transparency, and emotionally stressful chatbot interactions.

To address these issues, a user-centered design approach was employed to develop a streamlined, accessible, and emotionally supportive refund interface. The redesigned solution emphasizes visual clarity, simplified workflows, and direct access to support. Particular attention was given to elderly users, whose needs are often overlooked in mobile commerce platforms. By prioritizing cognitive ease and emotional reassurance, the intervention demonstrates how relatively modest design changes can lead to significant improvements in user trust and satisfaction.

The findings contribute to ongoing discussions in human-computer interaction and service design by reframing the after-sales phase as a critical point in the digital customer journey. The study also highlights the importance of inclusive design practices in building equitable digital environments.

While limited in scale, this research offers actionable insights for platform developers and lays the groundwork for future empirical evaluations. As online grocery services continue to expand, ensuring that all users—regardless of age or digital fluency—can confidently complete post-purchase tasks is both a design responsibility and a business imperative.

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