

DEVELOPMENT OF E-COMMERCE PLATFORM FOR POSTNATAL CONFINEMENT SERVICES: BRIDGING MATERNAL HEALTH AND DIGITAL INNOVATION

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ABSTRACT: Accessing reliable postnatal confinement care remains a challenge for many expectant women due to the fragmented nature of available services. Currently, there is no centralized platform that allows expectant women to efficiently search for, compare, and evaluate service providers. Information about caregiver qualifications, experience, pricing, and service availability is scattered across multiple sources, making the process time-consuming and often frustrating. The lack of verified reviews and recommendations further contributes to concerns regarding safety and service quality. This paper introduces Pantang.com, a Business-to-Consumer (B2C) e-commerce platform developed to streamline access to postnatal confinement services. Employing the Agile development methodology, the platform was iteratively designed based on continuous user feedback to ensure responsiveness to user needs. Key components of the development process include user requirement gathering through surveys, intuitive interface design, and the implementation of features to enhance usability and trust. Pantang.com offers comprehensive caregiver profiles, user ratings, and verified reviews to promote transparency and informed decision-making. Filtering tools allow users to search by location, price, and service type, while integrated booking and secure payment functionalities improve convenience and transactional safety. To ensure platform effectiveness, ongoing testing and iterative updates are conducted based on user engagement and feedback. By addressing existing market inefficiencies and leveraging digital innovation, Pantang.com provides a centralized, user-centric solution for postnatal care. The platform aims to empower mothers with accessible, trustworthy, and efficient support during the critical postnatal period.

KEY WORDS: *Postnatal care, E-Commerce, Online marketplace, Confinement services, Maternal health*

1. INTRODUCTION

Accessing reliable postnatal confinement services is a significant challenge for many new mothers, particularly due to the absence of centralized platforms that facilitate the search, comparison, and evaluation of such services. This fragmentation often results in time-consuming and frustrating experiences, as mothers navigate multiple sources to gather information on caregiver qualifications, experiences, and service offerings. The lack of standardized reviews and recommendations further exacerbates concerns regarding safety and reliability in postnatal care.

The integration of e-commerce into healthcare services has shown promise in enhancing accessibility and convenience for patients. Digital health interventions have been effective in improving maternal and neonatal health outcomes by providing platforms for education, support, and service delivery. For instance, a systematic review and meta-analysis highlighted that technology-mediated interventions can be as effective, or even superior, to routine care in enhancing maternal health outcomes (Zhou et al., 2025). However, despite the proliferation of digital health applications, there remains a paucity of platforms specifically tailored to postnatal confinement services.

Addressing this gap, the development of a Business-to-Consumer (B2C) e-commerce platform dedicated to postnatal confinement services could significantly streamline the process for expectant women seeking quality confinement care. By consolidating various confinement service providers into a single, user-friendly interface, such a platform can offer comprehensive caregiver profiles, verified reviews, and secure booking systems. This approach not only enhances user convenience but also fosters trust and informed decision-making in selecting postnatal care services.

This paper introduces Pantang.com, an innovative business-to-consumer (B2C) e-commerce platform developed to consolidate a variety of postnatal care services—ranging from freelance nannies to certified confinement centers—into a centralized digital marketplace. The platform is designed to address prevailing challenges experienced by expectant mothers in searching for postnatal care services, particularly the fragmented and inconsistent access to reliable information, service availability, and caregiver quality. Leveraging the Agile software development methodology, Pantang.com offers a dynamic and user-centric solution aimed at enhancing accessibility, transparency, and trust in the selection and delivery of confinement services. The key features of the platform would include comprehensive confinement agency or caregiver profiles, user-generated ratings and reviews, customizable confinement service packages, and a secure, integrated payment system. These functionalities are intended to improve and streamline the decision-making process for new and expectant mothers, empowering them to make informed choices that best suit their individual needs, cultural preferences, and budget considerations.

The objectives of this study are twofold. First, it seeks to identify the key problems and challenges faced by expectant women when searching for postnatal confinement care services through digital means. Second, it aims to design and develop a centralized B2C e-commerce platform that integrates various types of confinement services, features, and packages into a single, cohesive ecosystem. By addressing these objectives, this study aims to contribute to both the e-

commerce and maternal health domains, proposing a scalable digital solution for a traditionally informal and localized service sector.

2. LITERATURE REVIEW

The postpartum period is a critical phase for maternal recovery and infant care, during which new mothers often seek specialized support services. Traditional postnatal confinement practices, deeply rooted in various cultures, aim to provide such support. A qualitative meta-synthesis by Xin et al. (2024) explored the experiences of postpartum Chinese women undergoing confinement practices, revealing a complex interplay of cultural adherence, personal comfort, and the need for professional care. However, accessing reliable postnatal care services remains a challenge, particularly in low- and middle-income countries (LMICs), where significant inequities have been documented. A systematic review and meta-analysis by Langlois et al. (2015) highlighted disparities in postnatal care utilization, with urban, higher-income women more likely to receive adequate services compared to their rural, lower-income counterparts.

The advent of digital health technologies has transformed healthcare delivery, offering innovative solutions to bridge gaps in maternal care. Digital health interventions have been increasingly integrated into antenatal and postnatal care, enhancing service delivery and patient engagement. A scoping review by Khatri et al. (2024) mapped the role of digital health solutions in improving the quality of antenatal care services, emphasizing their potential to enhance effective coverage. Similarly, a systematic scoping review by Hausvater et al. (2024) examined digital health interventions aimed at optimizing postpartum cardiovascular health, underscoring the efficacy of these technologies in managing postnatal health concerns.

Despite these advancements, the application of digital health technologies specifically tailored to postnatal confinement services remains limited. The integration of e-commerce platforms into healthcare has shown promise in improving accessibility and convenience for patients. However, there is a notable gap in the development of platforms dedicated to postnatal confinement care. Addressing this gap could significantly enhance the accessibility and quality of postnatal care services, providing new mothers with reliable, user-friendly platforms to connect with qualified caregivers.

2.1. Reviews on Existing Online Postnatal Care Services

This section presents a critical analysis of three currently available postnatal care service platforms. Each application is evaluated based on its core features, usability, accessibility, and the extent to which it meets the needs of postpartum mothers. The strengths and limitations of these platforms are examined to inform strategic decisions in the design and development of the proposed system. This comparative review serves as a foundation for determining which elements should be adapted, improved, or innovated in the creation of a more effective and user-centric e-commerce platform for postnatal confinement services.

2.1.1. Case Study 1: Nejlika

Nejlika is a confinement service centre based in Kuala Lumpur, Malaysia, that offers postnatal care by integrating both Western medical practices and traditional Chinese confinement methods. The centre aims to provide holistic postnatal care

tailored to the needs of Malaysian women, with a focus on specialized confinement diets, lifestyle guidance, and therapeutic practices. Nejlika promotes its services primarily through its official website, which serves as an informational portal for the offerings available at the Nejlika Mother & Baby Centre. These services include postnatal rejuvenation therapies, parenting education courses, customized confinement meals, and breastfeeding support (Nejlika, n.d) .

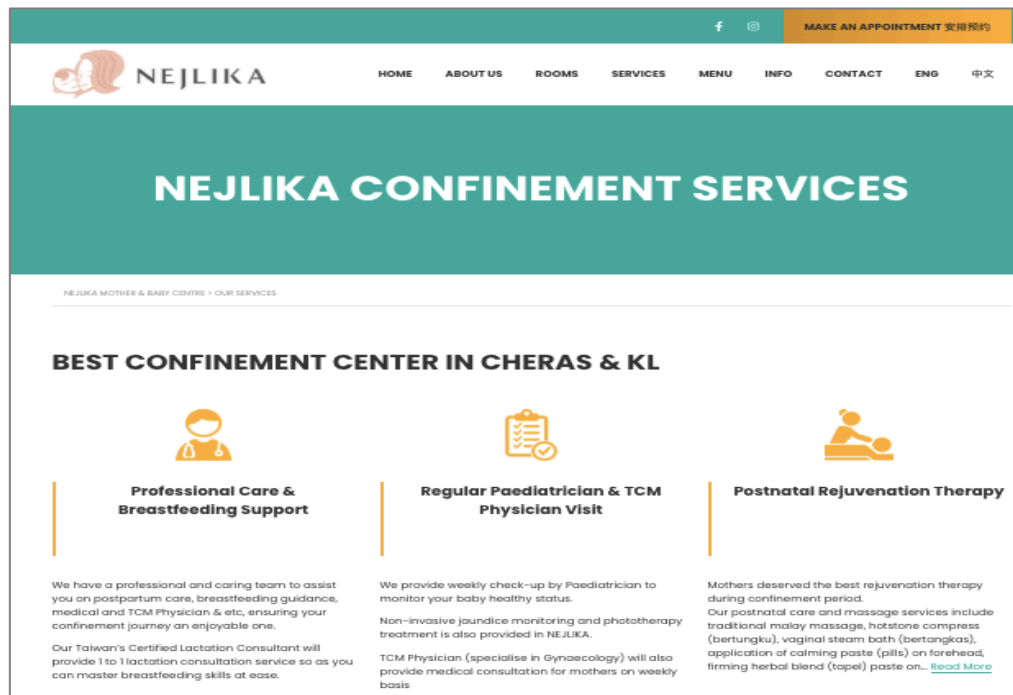


Fig. 1. Nejlika website

A notable feature of the Nejlika website is its provision of an exclusive appointment system, allowing prospective clients or expectant mothers to schedule site visits and participate in meal tasting sessions. This feature enhances client engagement by offering an immersive, firsthand experience of the centre's facilities and services. Additionally, the website's professional and visually appealing user interface contributes positively to its credibility and brand image. However, the platform presents certain limitations from an e-commerce perspective. The website does not display pricing information, nor does it support online bookings or transactions for its confinement services. Instead, users are directed to contact the centre via WhatsApp for further inquiries or reservations. This suggests that the platform functions more as a content management system rather than a fully developed e-commerce site. Its primary role is promotional rather than transactional, lacking the core features of digital marketplaces such as online payment integration, real-time availability tracking, or package comparison. Consequently, while the Nejlika website effectively markets the brand and its services, it does not fully utilize the potential of e-commerce technologies in streamlining the service procurement process.

2.1.2. Case Study 2: MummyNanny

MummyNanny is a digital platform that specializes in offering postnatal confinement services across various regions. It connects new mothers with service providers, including freelance confinement nannies and confinement centres,

through job advertisements posted either by mothers, confinement centres, or third-party agents. To support informed decision-making and ensure a level of trust in hiring, the platform incorporates filtering features that allow users to refine search results based on factors such as budget, type of cuisine, preferred language, sleeping arrangements, and specific caregiver qualities.

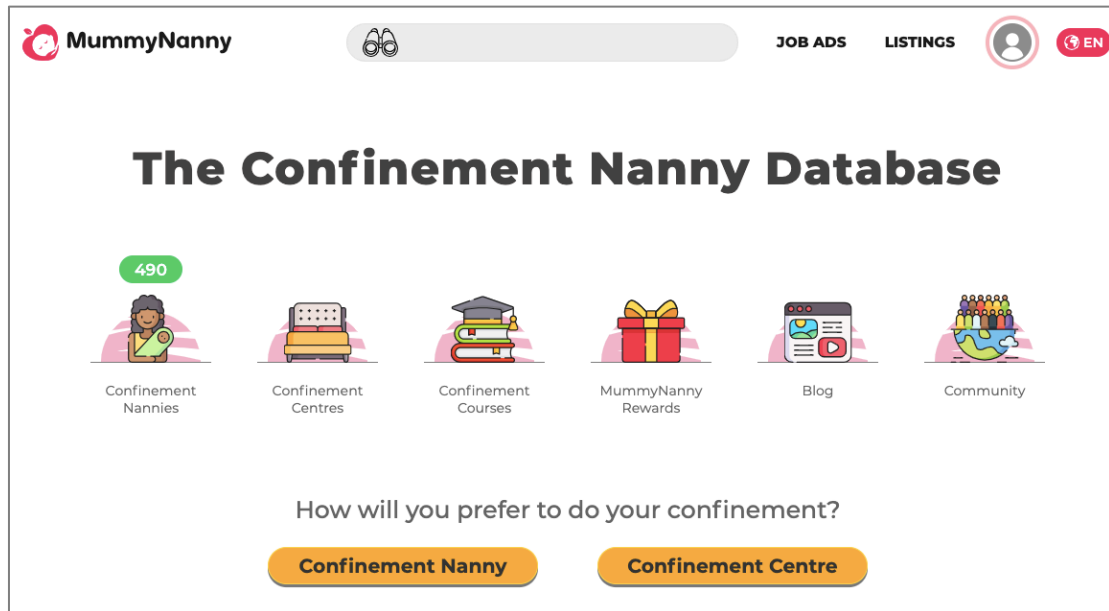


Fig. 2. MummyNanny website enable user to search for freelance confinement nanny or confinement centre.

The platform is designed to provide personalized care plans tailored to the unique needs of mothers and their newborns. In addition to listing freelance nannies, MummyNanny includes a searchable database of confinement centers, allowing users to browse based on geographical location and dietary options offered at each center. This dual approach broadens access and accommodates varying preferences for in-home or center-based care.

One of the platform's notable strengths lies in its support infrastructure and transparency. Customer service is readily available to address user inquiries, and the platform enables users to filter nanny availability according to preferred dates. Mothers can also leave public reviews and complaints, thereby contributing to a collective evaluation system that promotes accountability. A unique feature includes the visualization of complaints in graphical format, providing insights into the frequency and nature of grievances linked to specific service providers. Furthermore, MummyNanny emphasizes transparency by clearly displaying nanny ratings and background details, aiding users in making more informed selections.

Despite these advantages, the platform has several limitations. Pricing information for individual nannies is not readily available, and there is a lack of clarity regarding the packages or service bundles offered. Moreover, users are not able to compare prices or offerings across different confinement agencies within the platform. This lack of standardization may contribute to trust issues, particularly when dealing with freelance nannies whose qualifications are not consistently verified or clearly documented. These shortcomings may affect the decision-making

confidence of new mothers, especially those seeking professional assurance and quality assurance in postnatal care services (MummyNanny, n.d.)

2.1.3. Case Study 3: NannyStreet

NannyStreet is recognized as Singapore's first e-commerce marketplace dedicated specifically to postnatal confinement services. The platform functions as a centralized hub where various confinement agencies and freelance nannies can advertise their services, providing users with streamlined access to a wide array of confinement care options within a single digital ecosystem. Available as a mobile application on both the Google Play Store and Apple App Store, NannyStreet addresses the common issue of service fragmentation, whereby users previously had to visit multiple individual websites to compare and book confinement care providers.

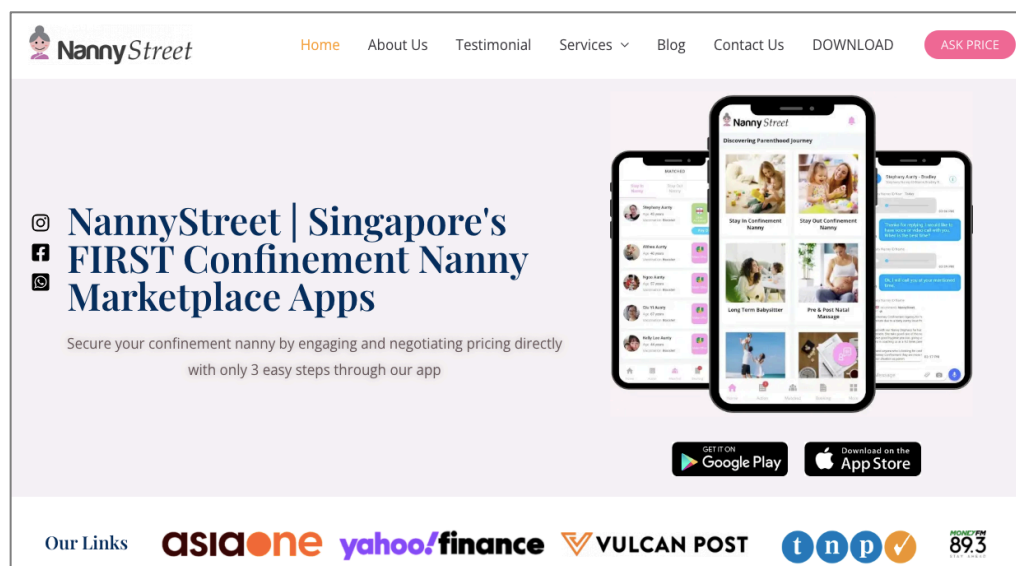


Fig. 3. The NannyStreet website

One of the platform's notable features is its ability to showcase various confinement packages and services, allowing users to explore offerings based on their individual needs and preferences. It enhances user engagement through integrated customer support and also facilitates preliminary interviews with prospective nannies. This not only adds a layer of personalization but also helps in fostering trust between the client and the caregiver. Furthermore, the platform supports negotiation of both the job scope and service fees prior to any deposit being made. This flexibility empowers users to customize their confinement care arrangements, including the creation of personalized service quotations that reflect specific household needs, cultural practices, or dietary requirements.

While the platform offers substantial user-centric features and simplifies the process of securing confinement services, its current availability is geographically limited to Singapore. This restriction poses a limitation in terms of scalability and regional applicability, especially for users outside of the country seeking similar solutions. Nonetheless, within its local context, NannyStreet represents a significant innovation in the digitalization of postnatal care services, aligning with broader trends in platform-based service delivery in the healthcare and wellness sectors. (NannyStreet, n.d.).

The comparative analysis of the three case studies – Nejlika, MummyNanny, and NannyStreet reveals distinct approaches to the digital delivery of postnatal confinement services, each with its own strengths and limitations. Nejlika operates as a traditional service centre with a professionally designed website that serves primarily as a promotional tool, lacking e-commerce functionalities such as online booking and payment. MummyNanny, while offering a wider range of freelance and agency-based service providers, also falls short in terms of pricing transparency, service package comparison, and verified caregiver qualifications. NannyStreet, the most advanced in terms of marketplace features, facilitates service negotiation, caregiver interviews, and customized quotations through a dedicated mobile app; however, its services are geographically limited to Singapore. These limitations across the platforms point to a clear gap in the market for a centralized, scalable, and fully transactional e-commerce solution tailored specifically for the Malaysian context.

Pantang.com has the potential to address these gaps by serving as a comprehensive B2C marketplace that consolidates confinement service providers—including freelance nannies, certified agencies, and wellness centres—into a single digital platform. By integrating features such as verified caregiver profiles, transparent pricing, real-time booking, package comparison, user reviews, and secure payment systems, Pantang.com could streamline the decision-making process for expectant mothers while enhancing accessibility, trust, and convenience in Malaysia’s postnatal care landscape.

The following Table 1 summarized the comparison between Nejlika, MummyNanny, NannyStreet and Pantang.com.

Table 1: Comparison of Existing Confinement Service Platforms and Pantang.com

Feature	Nejlika	MummyNanny	NannyStreet	Pantang.com (Proposed)
Platform Type	Informational website	Freelance platform	Freelance platform	Centralized B2C E-Commerce marketplace
Geographical Coverage	Malaysia (Kuala Lumpur only)	Multiple regions (including Malaysia)	Singapore only	Malaysia (nationwide)
Service Providers	In-house confinement centre only	Freelance nannies and confinement centre	Freelance nannies	Certified nannies, registered confinement agencies
Booking & Payment method	Manual via WhatsApp	No direct booking or payment on site	Customer pay deposits via app	Real-time booking with secure online payment
Pricing Transparency	Not available	Limited (only estimate), actual price not shown	Partial; user can negotiate fee with the nanny	Full transparency with price comparison
Service Customization	Limited to in-centre service options	Filter options (budget, cuisine, language, etc.)	Custom quotes based on user preferences	High customization based on user preferences

User Reviews & Ratings	Not supported	Only rating for nannies are visible, rating for confinement centre not shown	Limited, only selected reviews shown	User reviews and rating are transparent
Caregiver Verification	Internal staff only	Self-verified by user	Self-verified by user	Verified caregiver certification

3. METHODOLOGY

For the development of the Pantang.com e-commerce platform, the Agile methodology has been selected as the primary development approach. Agile is widely recognized for its emphasis on collaborative communication and customer feedback throughout the development process, ensuring that the product aligns closely with user needs and expectations (Batra, Xia, & Zhang, 2017; Dingsøyr, Falessi, & Power, 2019). This iterative process fosters continuous improvement, enabling flexibility and rapid adjustments based on feedback from stakeholders.

The first phase of the Agile process involves the requirements definition stage, during which the project's goals, scope, and budget are established. Developers work closely with clients to analyze the platform's concept and identify key features for integration. This collaborative effort ensures that the features selected align with the intended business objectives and are feasible within the project's constraints (Teffo, Sigama, & Kanobe, 2023). The iterative design and development phase involves continuous user feedback throughout each development cycle, known as an "iteration." This approach allows for frequent testing of features, helping to identify issues early and ensuring that the product evolves according to customer feedback. Each iteration culminates in the release of a functional product version, which is then tested for usability, functionality, and performance (Batra et al., 2017).

Once the product is released and tested, user training is provided to ensure effective platform use. If errors are detected during this phase, they are promptly addressed through further iterations to enhance the product's performance. Upon successful testing and resolution of issues, the platform is deployed and made available to users. The final deployment marks the transition of the product from development to live use, but the work does not stop there. The final phase involves monitoring and reviewing the system to ensure its continued effectiveness and smooth operation post-launch. Agile emphasizes the importance of post-deployment support and continuous evaluation to meet user needs and expectations (Dingsøyr et al., 2019). This ongoing monitoring also allows for future iterations based on user feedback, supporting the platform's long-term success and adaptability.

3.1. Requirements Specification

In order to inform the development of the Pantang.com e-commerce platform, a survey was conducted with the objective of gathering insights from potential users, particularly expectant women. The purpose of the survey was to understand the challenges that expectant mothers face when searching for postnatal care services and to identify their preferences for the features and functionalities that should be integrated into the platform. Additionally, the survey sought to explore the usability and accessibility expectations for the platform, ensuring that the final product would

meet the needs of users with varying levels of technical expertise. This user-centered approach is intended to guide the design and development of a digital solution that effectively addresses the pain points of the target audience and improves their experience in accessing confinement services.

The survey had several specific objectives. First, it aimed to identify the key pain points and challenges that expectant mothers face when searching for confinement services, such as difficulties in finding reliable information, evaluating service quality, or accessing affordable options. Second, the survey sought to gather feedback on the key features that users would like to see in the Pantang.com platform, including caregiver profiles, ratings and reviews, booking functionality, and secure payment options. Finally, the survey was designed to assess the usability and accessibility expectations of users, with a focus on their preferences for ease of use, intuitive navigation, and mobile compatibility.

3.1.1. Study Design

The survey employed an online questionnaire methodology, which was distributed to a targeted group of respondents specifically expectant mothers who had experience searching for confinement services online. The online format allowed for efficient and wide-reaching data collection, ensuring that a diverse group of respondents was included in the survey. The questionnaire was structured into three main sections to capture comprehensive insights; i) Part A focused on gathering demographic information about the respondents, including age, and previous experiences with confinement services; ii) Part B aimed to identify the specific problems or challenges users face when searching for postnatal care services, with questions designed to capture common difficulties in service discovery, trust issues, and availability and iii) Part C gathered user requirements for the online marketplace, focusing on essential platform features such as search functionalities, service provider profiles, user reviews, booking options, and payment mechanisms. The target respondents for the survey were primarily expectant mothers who had experience searching for postnatal care services online. These respondents were selected based on their relevant experience in the context of confinement services, ensuring that the data collected was both relevant and representative of the platform's user base. The convenience sampling method was employed to gather responses from readily accessible individuals who were willing to participate in the survey.

3.1.2. Participant Demographics

In total, the survey received 35 responses, which were analysed to gain a deeper understanding of the users' needs and preferences. The following Table 2 summarizes the demographic characteristics of the survey participants, which include age, gender distribution, and platform used to search for confinement services.

Table 2: Participant demographics

Item	Options	N	%
Age range	Below 20 years old	0	0
	21 – 30 years old	23	65.7
	31 – 40 years old	9	25.7
	41 – 50 years old	1	2.9

	Above 50 years old	2	5.7
Gender	Male	9	25.7
	Female	26	74.3
Platform used to search for confinement services (may choose more than one)	Search engine (e.g. Google Bing)	21	60
	Social media (e.g. Facebook, Instagram)	29	82.9
	Online forums or communities	5	14.3
	Dedicated websites / apps	10	28.6
	Recommendation from friends or family	21	60

Based on Table 2 above, substantial proportion of participants were aged between 21 and 30 years (65.7%), indicating that this age group is the primary demographic seeking online postnatal services. Studies have shown that younger women, particularly first-time mothers, are more likely to engage with digital platforms for health-related information (Wallwiener et al. 2016). A smaller percentage (25.7%) of participants were between 31 and 40 years old, suggesting that women in their 30s are also actively seeking online confinement services, though at a slightly lower rate. The underrepresentation of participants older than 40 years (8.6% combined in the 41-50 and 50+ age ranges) may reflect fewer older women seeking online postnatal care services (potentially for their daughter).

The gender distribution reflected the expected trends, with 74.3% of participants identifying as female. This is consistent with the broader literature, which suggests that women are the primary decision-makers when it comes to maternal healthcare (Murugesu et al. 2021). However, the inclusion of 25.7% male participants highlights the growing role of male partners in postnatal care decisions, potentially driven by increased awareness of paternal involvement in early childrearing (Firouzan et al. 2018).

Participants were also asked to select the platforms they used to search for confinement services, and the results reveal important trends regarding user engagement with different online channels. Social media emerged as the most frequently used platform, with 82.9% of participants indicating that they utilized platforms such as Facebook and Instagram to search for confinement services. The dominance of social media in this context is consistent with a study by Baker and Yang (2018) which demonstrate substantial role of social media as an additional source of both information and social support throughout the perinatal period in transitioning to the role of mother. Search engines were used by 60% of participants, suggesting that many users initiate their search for postnatal services through Google or Bing. This finding suggests that optimizing a website for search engines (through SEO strategies) is therefore critical for ensuring that postnatal services appear prominently in relevant search results.

Personal recommendations from friends or family were also cited by 60% of participants. Word-of-mouth has long been identified as a crucial factor in healthcare decision-making (Pauli et al. 2023). Trust in personal recommendations often supersedes online reviews, particularly in sensitive areas like postnatal care, where safety and reliability are paramount. This finding underscores the importance of integrating trust-building features, such as user testimonials and referral systems, into the design of an e-commerce marketplace for postnatal services.

Dedicated websites or apps for postnatal services were used by 28.6% of participants. While this percentage is lower than the usage of social media and

search engines, it indicates an opportunity for growth in the market for specialized platforms. Meanwhile, only 14.3% of participants used online forums or communities. Although this represents a smaller proportion, it suggests that peer support and shared experiences remain an important source of information for some users. Thus, E-commerce platforms focusing on postnatal care might consider incorporating community features, such as discussion boards or user groups to engage this segment and provide personalized, peer-driven content.

3.1.3. Challenges of Searching for Confinement Services

Table 3 presents the challenges experienced by participants when searching for confinement services online.

Table 3: Challenges searching for confinement services online

Item	Options	N	%
What are the challenges of searching for confinement services online? (may choose more than one)	Concerns about the reliability and safety of the confinement lady/caretaker	30	85.7
	Difficulty accessing accurate and relevant information about the confinement agencies and services offered.	23	65.7
	Lack of transparency regarding the qualifications and experience of the confinement lady/caretaker	21	60.0
	Limited ability to compare prices, packages, and services across different confinement service providers	19	54.3
	Insufficient user reviews/ feedback / testimonials to assess the quality or performance of the confinement service provider.	18	51.4
	Difficulty customizing postnatal care packages to individual needs.	16	45.7
	Overwhelming or unclear information in promotional materials and advertisements.	8	22.9
How satisfied are you with the information you found online about confinement services?	Very dissatisfied	0	.0.0
	Dissatisfied	2	5.7
	Neutral	21	60.0
	Satisfied	9	25.7
	Very Satisfied	3	8.6
How would you rate your overall experience in finding confinement services online?	Very difficult	0	0.0
	Difficult	6	17.1
	Neutral	16	45.7
	Easy	10	28.6
	Very Easy	3	8.6

Based on Table 3 above, participants were asked to identify the issues they encountered during their search, with multiple responses allowed. The most significant challenge, cited by 85.7% of participants, was concerns about the reliability and safety of the confinement lady or caretaker. Additionally, 60% of participants concerns about lack of transparency regarding the qualifications and experience of the confinement lady caretakers. This finding highlights a critical issue in the online postnatal service marketplace i.e. trust. Reliability and safety are paramount when selecting a caregiver for vulnerable individuals in a sensitive context. A lack of face-to-face interactions and the inability to conduct in-person

interviews with potential caretakers exacerbate these concerns in an online environment. Thus, in order to ensure positive user experience in postnatal care, E-commerce platforms should strive for transparency in online environments by giving users access to necessary information to help them make an informed decisions (Wang et al. 2023).

Another common problem (65.7%) was difficulty accessing accurate and relevant information about the confinement agencies and the services offered. The lack of easily accessible, trustworthy information can hinder users from making informed decisions. Given that postnatal care involves critical health decisions, clear, concise, and accurate service information is essential for both user satisfaction and service quality. Besides, more than half of the respondents (54.3%) reported a limited ability to compare prices, packages, and services across different confinement service providers. This challenge underscores the need for comparison tools on e-commerce platforms. Consumers often rely on comparison features when purchasing services online, and the absence of such features can lead to frustration and suboptimal decision-making. Integrating a comparison tool into the platform could provide users with an easier way to evaluate and choose services that best meet their needs and budget (Hanna et al. 2019).

Additionally, the absence of user reviews or testimonials to assess the quality of service was a concern for 51.4% of participants. Reviews and feedback are critical in influencing consumer behavior, particularly in health-related sectors. The lack of social proof in the form of testimonials or reviews is a missed opportunity to build trust and provide validation for potential customers (Chen et al. 2022). Customization of postnatal care packages was also a challenge for 45.7% of participants. The inability to personalized confinement services to individual needs could lead to dissatisfaction and underutilization. A platform that offers customization options, such as flexible care packages and a variety of service options, would better meet the diverse needs of expectant mothers.

Our participants were asked to rate their satisfaction with the information they found online about confinement services. The results indicate that, majority of participants (60%) felt neutral about the information they found, with 25.7% expressing satisfaction. However, the fact that 5.7% were dissatisfied suggests that there is still room for improvement in terms of the quality and accessibility of information. The relatively high percentage of neutral responses could indicate that while users were able to find some information, it may not have been comprehensive or fully aligned with their expectations, This finding emphasizes the need for more detailed, user-friendly, and well-organized content on e-commerce platforms to improve user satisfaction.

When asked about their overall experience in finding confinement services online, participants reported the following, majority of our participants (45.7%) rated the experience as neutral, indicating that while they did not find the process overly difficult, it was not entirely easy either. Only 28.6% found the process easy, and 8.6% found it very easy. These results may suggest that while some users had a relatively smooth experience, there are substantial barriers to ease of use that need to be addressed. Simplifying the online search process and providing clear, intuitive navigation could help improve the overall experience for future users.

3.1.4. User Needs and Preferences

The following Table 4 presents the user requirements for an E-commerce marketplace of online confinement services.

Table 4: User Requirements for Online Confinement Services

Item	Options	N	%
How likely would you use E-Commerce platform for confinement services?	Very unlikely	0	0.0
	Unlikely	1	2.9
	Neutral	2	5.7
	Likely	12	34.3
	Very likely	20	57.1
Relevant features in an E-Commerce platform for confinement services	Ability to search for postnatal services based on price range or personal budget.	30	85.7
	Access to customer reviews and star ratings for confinement service providers.	30	85.7
	Filter and display available confinement service agencies or packages based on user location or preferred area.	29	82.9
	Visibility of confinement lady/ caretaker credentials, including experience and qualifications.	29	82.9
	Categorization of confinement services by package type(e.g. stay-in, daily visits).	27	77.1
	Display comprehensive list of available postnatal care treatments (e.g. sauna, postnatal massage, body scrub etc.)	26	74.3
	Display confinement meals options with dietary details.	21	60.0
	Booking system for confinement service purchases and scheduling.	20	57.1

We first asked the likelihood of participants to use an e-commerce platform for confinement services. Based on Table 4 above, the survey results demonstrate a strong inclination toward using digital platforms for accessing postnatal care services. A significant 57.1% of participants indicated they were very likely to use an e-commerce platform for confinement services, and 34.3% were likely to do so. This represents a substantial 91.4% of respondents who are inclined to use such platforms, highlighting a positive reception to digital solutions in the confinement services sector. The findings align with broader trends in healthcare, where the adoption of online platforms especially in postnatal care, is on the rise (Sardi et al., 2020). However, a small portion (2.9%) of respondents were unlikely, and 5.7% felt neutral, suggesting that some concerns or barriers to full adoption remain, such as trust or technology accessibility.

Participants were also asked about the features they find most relevant in an e-commerce platform for confinement services. An overwhelming 85.7% of respondents indicated that the ability to search for services based on price range or personal budget is a crucial feature. Budget is often a key determinant in healthcare service decisions, and this preference underscores the importance of providing transparent pricing structures. Previous studies have highlighted that price is a significant factor in consumer decision-making. Offering price filters or

budget-based searches could increase the platform's appeal and ensure it meets diverse financial needs (Hanna et al. 2019).

Equally important, with 85.7% of respondents selecting this feature, is the ability to access customer reviews and star ratings for service providers. Trust and social proof play a critical role in the decision-making process for healthcare services (Han et al., 2021). Reviews offer valuable insights into the quality of service, caregiver professionalism, and overall user experience. A platform with integrated review systems can enhance transparency and assist potential users in making more informed decisions.

Location-based filtering was considered relevant by 82.9% of participants. This feature allows users to easily find services available in their geographical area, ensuring convenience and reducing logistical barriers. The importance of localized services has been emphasized in health service delivery, particularly for maternal care, where proximity to care providers is often a critical factor (Hwang and Park, 2019). Incorporating location-based filters would optimize the search process and improve user satisfaction.

A substantial 82.9% of respondents also indicated that it is important for platforms to display the credentials of confinement ladies, including their qualifications and experience. As trust in caregivers is a central concern for many expectant mothers, transparency about qualifications can help address safety concerns and build confidence in the service provider. Previous research has underscored the importance of professional credentials in healthcare-related services, where perceived qualifications significantly impact consumer trust (Song et al., 2024).

The ability to categorize services based on package types (e.g., stay-in versus daily visits) was considered important by 77.1% of respondents. This feature allows users to more easily navigate the different types of services available and select those that best meet their needs. Categorization simplifies the decision-making process and can increase user engagement with the platform by making it easier to compare options. Besides, a comprehensive list of available postnatal treatments, such as sauna, postnatal massage, and body scrub, was considered relevant by 74.3% of participants. Offering detailed information about supplementary services is likely to enhance the appeal of a platform by providing users with a broader array of choices. Many new mothers seek diverse postnatal treatments to aid recovery, and a platform that integrates these options can better meet their needs.

The option to view confinement meals with dietary details was considered important by 60% of participants. Nutritional care is an essential aspect of postnatal recovery, and the inclusion of this feature highlights the increasing demand for comprehensive care. Dietary information also caters to individual preferences and restrictions, which can increase the attractiveness of a platform offering personalized postnatal care (Basir et al., 2018). Additionally, the ability to book services and schedule appointments directly through the platform was considered relevant by 57.1% of participants. A streamlined booking system is essential for enhancing user convenience and ensuring a smooth service experience. Simplifying the process of booking and managing services can contribute to higher user satisfaction and reduce barriers to service adoption.

In summary, to effectively meet user needs, e-commerce platforms for confinement services should integrate the relevant features identified in this survey, such as user-friendly search and comparison tools, clear service categorization, and robust trust-building mechanisms like reviews and caregiver credentials. Future research should investigate the specific barriers to adoption for the small portion of respondents who were neutral or unlikely to use online confinement services, to understand and address potential obstacles to wider acceptance of e-commerce platforms in this domain.

4. PROTOTYPE DEVELOPMENT

In this section, we would present development of the Pantang.com, an E-Commerce marketplace platform for confinement service. The system is built through a combination of a user-friendly frontend, developed using Visual Studio Code and a reliable backend, managed with phpMyAdmin. The integration of front-end and back-end systems offers seamless functionality, ensuring a smooth and efficient process for users to explore the website's features effortlessly. The following Figure x present the homepage of Pantang.com.

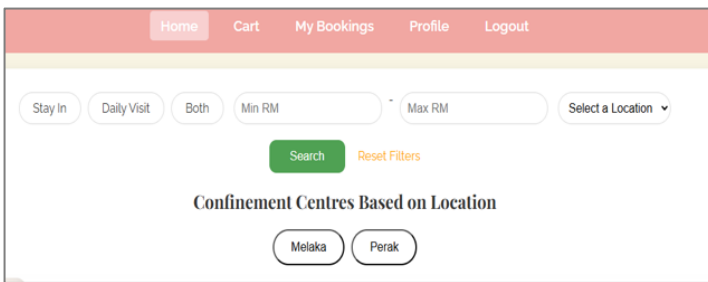
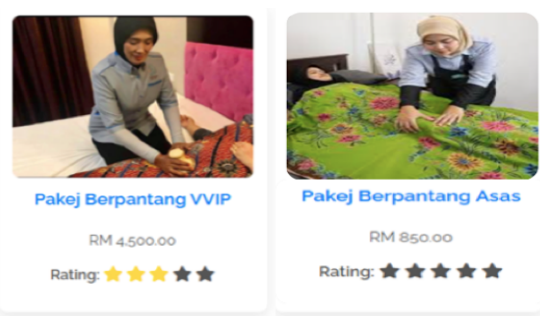
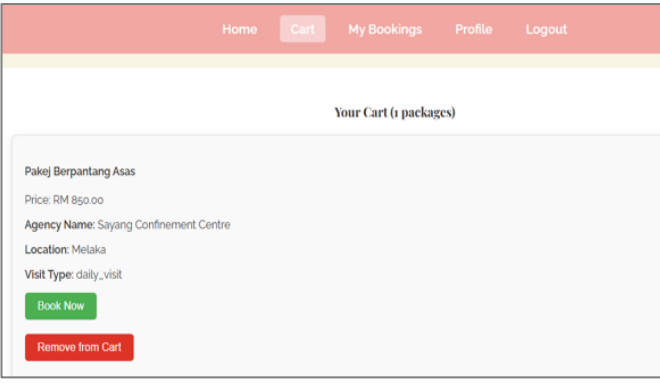


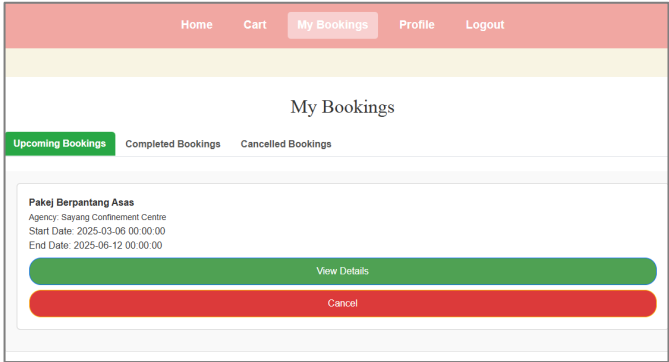
Fig. 4. Homepage of Pantang.com

Pantang.com's homepage was designed with a modern, user-friendly layout. At the top, it features a heart-warming image of a caregiver holding a baby, accompanied by a bold tagline stating "Expert Confinement Care Tailored for You" and a prominent gold-coloured call-to-action button labelled "Start Now" to encourage user engagement. Below, a section presents four visually distinct feature boxes with icons that are imported from AJAX library with titles written, "Trusted and Credible", "Budget Filtering", "Licensed Agencies", and "User-friendly", aims to convinced users that Pantang.com is a trusted E-commerce site as all the confinement agencies are registered and licensed.

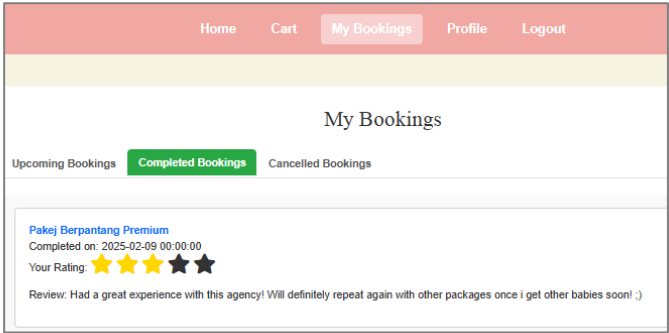
Additionally, the main page also presents a four-step ‘quick start’ for users, including signing in or signing up, setting preferences, booking a package, and being ready for nannies. The footer, designed with a dark contrasting background, provides essential contact information, including an email address, phone number, and physical office address, ensuring accessibility for inquiries. The entire page structure relies on HTML for content organization, CSS for the elegant color scheme and layout styling, and JavaScript for enhancing interactive elements such as the call-to-action button and step-by-step user guidance, making it both visually engaging and functional. Pantang.com has two different user access which are customers and admin. The following Table 5 presents different user interface for customer site.

Table 5: The user interface of customer site in Pantang.com

The User Interface	Description
	Customers can filter packages according to their preferences (e.g. based on location, budget or preferred package)
	Customers can see available packages and ratings
	Customer can book / purchase their preferred confinement service package online.




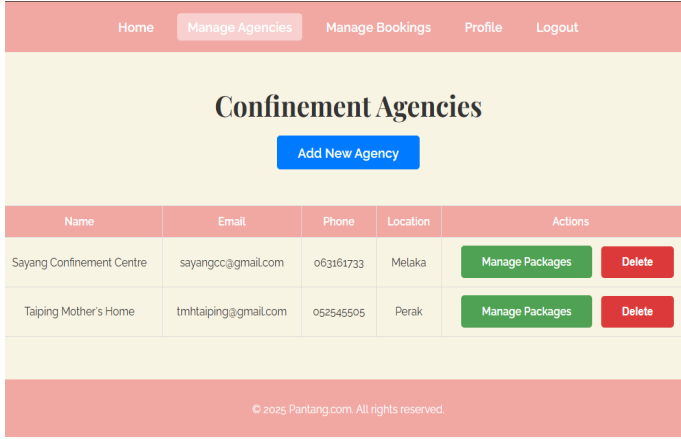
Customer can cancel their booking online up until a specific date as agreed with the service provider.




Once the confinement service had been completed, user may post a review evaluating their services.

The following Table 6 presents different user interface for admin.

Table 6: The user interface of admin site in Pantang.com

The User Interface	Description
	Admin can register a new confinement agency into the system. Prior to registration, verification are required to ensure the agency is indeed a registered business entity and certified postnatal care professionals).
	Admin can edit and delete agency, and also manage confinement packages managed by the agency.



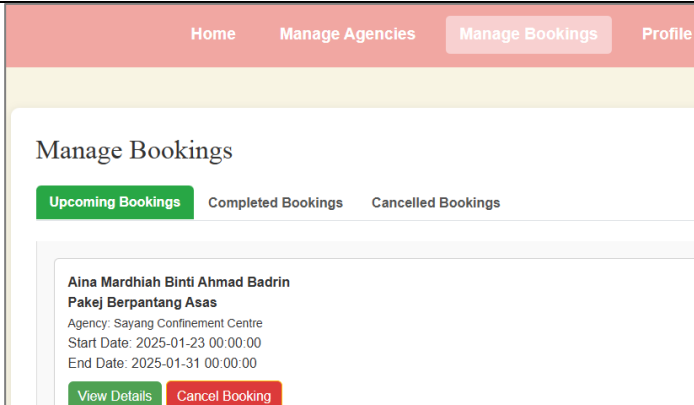
Manage Packages for Sayang Confinement Centre

[Add New Package](#)

Existing Packages

#	Package Name	Price (RM)	Description	Visit Type	Photos	Actions
1	Pakej Berpantang Asas	RM 850.00	Pakej Berpantang Asas menawarkan perkhidmatan berpantang selama 28 hari dengan menu makanan berpantang harian. Ia juga termasuk pakaian berpantang, pemantauan kesihatan ibu dan bayi, satu kali sesi urutan badan, dan kelas penyusuan ibu untuk membantu ibu baru menguruskan penyusuan dengan lebih baik.	Daily Visit		Edit Delete
			Pakej Berpantang Premium memberikan perkhidmatan selama 44 hari dengan menu makanan berpantang yang lengkap (3 kali			

Admin can modify information related to confinement packages and services offered by confinement agencies.



Manage Bookings

[Upcoming Bookings](#) [Completed Bookings](#) [Cancelled Bookings](#)

Aina Mardhiah Binti Ahmad Badrin
Pakej Berpantang Asas
 Agency: Sayang Confinement Centre
 Start Date: 2025-01-23 00:00:00
 End Date: 2025-01-31 00:00:00

[View Details](#) [Cancel Booking](#)

Admin can track customer's order, monitor upcoming confinement service booking, completed booking, and approved cancelled booking as requested by the user.

5. USER TESTING

User testing was carried out to assess the functionality and usability of the e-commerce website for confinement care services. This testing phase aimed to ensure that key features, including user registration, package filtering, viewing shop pages, package reviews, and booking tracking, were fully operational and met the expectations of end-users. The primary goal of UAT was to validate that the system functions as intended and is user-friendly, ensuring readiness for deployment.

5.1. User Testing Procedures

The user testing was conducted on personal laptops using popular browsers like Chrome and Firefox, with a stable home Wi-Fi connection, simulating the typical conditions in which the system would be used by real customers. The scope of the testing focused on the most crucial functionalities, such as user registration, filtering available confinement packages, viewing confinement agency pages, reading package reviews, and tracking bookings. The testing was conducted in three (3) phases; i) pre-test phase, which involved asking participants on their demographic details and experience with similar systems, ii) intervention phase where participants were asked to follow a predefined test cases and scenarios to interact with Pantang.com. They were asked to carefully observed the system's behaviour, reported any issues encountered and iii) post-test phase, where the participants were asked about their experience interacting with Pantang.com, any problems and challenges they experience and if they had any suggestions to improve the functionalities of the system leading to a better user experience.

6. RESULTS AND DISCUSSION

A total of five participants involved in the session. The participants were selected to reflect a diverse range of backgrounds in terms of age, occupation, and level of technical experience, ensuring a well-rounded perspective on the platform's design and functionality. The following Table 7 presents the demographic details of the participants.

Table 7: Participant demographic for user testing

Participant ID	Age	Occupation	Level of technical experience
P1	30	Housewife	Moderate
P2	32	Professional	Moderate
P3	24	Professional	Moderate
P4	41	Professional	Expert
P5	45	Freelancer	Moderate

Based on the above table 7, participants ranged in age from 24 to 45 years, with an average age of 34.4 years. This range effectively represents the typical demographic of postnatal care service users and decision-makers. The group included a mix of professions, 60% were professionals (P2, P3, P4), one participant identified as a housewife (P1), and one was a freelancer (P5). The majority of participants (4 out of 5) rated themselves as having a moderate level of technical experience, while one participant (P4) had expert-level proficiency. This mix ensures the platform is tested for both average and advanced users, which is critical for an inclusive user experience design.

6.2. Usability of the System

The following Table 8 presents the result of post-test user evaluation.

Table 8: Results of user evaluation

No.	Questions	P1	P2	P3	P4	P5	Mean, M
1	Navigating through pages in Pantang.com was easy.	5	5	5	5	5	5.0
2	Filtering confinement services based on my preferences (e.g., location, budget) was effective and efficient.	5	5	5	5	5	5.0
3	The process of adding items to the cart and booking confinement services in Pantang.com was intuitive and user-friendly.	5	5	5	5	5	5.0
4	Tracking my bookings on Pantang.com was clear and straightforward.	5	5	5	5	5	5.0
5	Cancelling a booking and seeing the update reflected in the system was seamless.	5	5	5	5	5	5.0
6	The features provided in Pantang.com met my expectations for functionality and control.	5	5	5	5	5	5.0
7	The design and layout of Pantang.com is visually appealing and well-organized.	5	5	4	5	5	4.8
8	Overall, I was satisfied with my experience using Pantang.com	5	5	5	5	5	5.0
9	I would recommend Pantang.com to others seeking postnatal confinement services.	5	5	5	5	5	5.0

Based on Table 8 above, the findings revealed uniformly high scores across all evaluation items. Participants unanimously agreed (mean score = 5.0) that Pantang.com was easy to navigate, filtering of services based on user preferences (e.g., location and budget) was efficient, and the process of adding services to the cart and completing bookings was intuitive. Similarly, users rated the booking tracking system (including upcoming, completed, and cancelled services) and the cancellation process as seamless and straightforward. The platform's functionality also met or exceeded user expectation. Besides, our participants also expressed complete satisfaction with their overall experience ($M = 5.0$).

The only slight deviation from a perfect rating was in visual design, which received a mean score of 4.8. While this score remains within an excellent range, it suggests minor opportunities for improvement in terms of aesthetics and interface layout. Previous research has highlighted the influence of visual appeal on perceived credibility and user satisfaction in digital health platforms (Bandhari et al., 2019). Enhancing interface consistency, incorporating modern UI design trends, or offering personalization options (e.g., light/dark mode) could further improve user experience without disrupting the functional strengths of the system.

Based on the results, several design implications can be drawn. First, the current information architecture and booking workflow should be preserved as they provide a high degree of usability and user confidence. Second, minor refinements in the platform's aesthetic design could be explored through A/B testing or user-driven customization features. Finally, while the current proposed features of the E-commerce platform is well-received, any future additions should be approached cautiously to avoid overwhelming users, in line with usability principles that advocate for simplicity and minimal cognitive load.

In conclusion, the user testing confirms that Pantang.com offers an effective and easy to use platform for booking postnatal confinement services. These findings not only validate the platform's design approach but also provide actionable insights for iterative improvements and future scalability. The positive outcomes reinforce the growing body of evidence that supports digital platforms as viable and efficient tools for maternal health service delivery in the postnatal period (Zhou et al., 2025).

6.3. Suggestions for Improvement

In addition to the quantitative usability assessment, participants were invited to provide open-ended feedback regarding potential improvements to Pantang.com. The qualitative responses revealed valuable insights for enhancing both user experience and system efficiency. Several recurring themes emerged, including dynamic interaction design, visual appeal, mobile optimization, system notifications, and administrative efficiency.

One participant (P1) highlighted the filtering system's functionality but suggested that the platform would benefit from a more dynamic search experience, specifically by implementing real-time updating of results without requiring the user to click a search button.

'The filtering system is functional, but it would be better if the search results updated dynamically without needing to click the search button. It would make the experience smoother and faster. (P1)

This suggestion aligns with modern user interface design principles that emphasize immediate system feedback and reduced user effort (Harley, 2018). Research has shown that such interactive enhancements can significantly reduce cognitive load and improve the perceived responsiveness of web-based platforms.

Additionally, visual design and text readability were also another areas for improvement. P2 recommended the incorporation of more color and graphical elements to improve the attractiveness of UI design, as well as the optimization of text size for better readability on mobile devices.

'I found the booking process simple and clear, but the UI could use more color or graphics to make it look more modern and engaging. The text is (also) too small on mobile devices, making it a bit hard to read' (P2)

This feedback effectively highlights the significant role that visual aesthetics, readability, and screen size play in enhancing user experience and performance on mobile devices. As the study by Perrig et al. (2023) suggests, aesthetics contribute not only to the subjective experience but also to the objective performance of users, which is critical for the success of mobile web applications. When users are presented with an aesthetically pleasing interface, they are more likely to engage positively and perform better, which can certainly provide a competitive edge to businesses or developers.

Moreover, the point about readability and legibility of text is crucial. The study by Al Ghamdi et al. (2016) underscores the importance of optimizing content for mobile screens, especially since smaller screens can negatively impact the ease of reading. Larger screen sizes tend to improve clarity and reduce reading time, which highlights the need for mobile-friendly design choices, including optimal font sizes. This can be particularly challenging on mobile devices with limited screen space, but addressing these concerns by adjusting font size and layout can drastically improve the user experience.

Another participant (P3) noted the absence of automatic notifications for key user events such as booking confirmations or cancellations.

'The system works well overall, but I think it would be more convenient if it sent notifications to alert customers about updates, like booking confirmations or cancellations. This way, I wouldn't need to check manually.' (P3)

Incorporating automated alerts either via email, SMS, or in-app messaging is essential for maintaining user engagement and reducing the mental workload required to manually track booking statuses. Prior studies emphasize that timely and relevant notifications improve the user experience and satisfaction (Gavilan & Martinez-Navarro, 2022). Implementing such features would also support continuity of care, an essential component in postnatal services.

On the administrative side, P5 recommended enhancing the dashboard with a visual summary section displaying key metrics, such as total bookings or revenue trends.

‘Everything works fine for managing agencies and bookings, but the dashboard feels a bit cluttered. It would be better to have a summary section showing key stats, like total bookings or revenue trends’ (P5).

Dashboards that highlight actionable data through visual summaries are known to improve decision-making and user satisfaction among administrators.

Overall, the qualitative feedback from participants reinforces the quantitative findings by affirming the platform’s core usability, while offering actionable enhancements that align with established usability heuristics and contemporary e-commerce design trends. Implementing these user-driven suggestions can further refine the platform, making it more adaptive, engaging, and efficient for both end-users and administrative stakeholders.

7. CONCLUSION

This study propose a specialized e-commerce marketplace that addresses the growing demand for postnatal confinement services. The initiative responds to a notable gap in the formalization and accessibility of confinement care, which remains largely fragmented and difficult to navigate for new mothers. By integrating e-commerce features into this culturally grounded domain, the proposed platform offers a structured, scalable, and user-centred approach to delivering confinement care services.

The developed system demonstrates key features including search and filtering based on user preferences, confinement service customization, confinement agency and caretaker profiles and credentials, user feedback and reviews and online booking mechanisms. These features were designed in alignment with user needs and usability standards, with the aim of improving both maternal care outcomes and service provider visibility. The platform not only simplifies the process of discovering and booking confinement services but also enhances trust and transparency – two critical factors in maternal health decision-making.

However, this study is not without limitations. As a conceptual and developmental initiative, the platform has yet to undergo large-scale testing and user adoption studies. Additionally, the scope was limited to prototype development and core functionality, without integration into broader healthcare systems or engagement with regulatory stakeholders. These constraints suggest the need for cautious interpretation of the platform’s potential until further empirical validation is conducted.

Future research should conduct more user testing sessions with end-users i.e. both mothers and service providers, to assess usability, satisfaction, and health outcomes. Besides, there is opportunities to refine the platform through mobile app development and data-driven personalization. Longitudinal studies could also explore how digital platforms influence maternal care behaviors and postpartum recovery. Overall, this study lays the groundwork for a culturally aware, digitally enabled postnatal care solution, indicating a promising direction for e-commerce applications to support maternal health.

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