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Application of Design Thinking in the Development of the Beres.in Application: an Integrated Solution for Moving and Home Cleaning Services

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ABSTRACT
The increase in mobility of urban residents, especially in Bogor City, has created a new need for moving and home cleaning services that are efficient, transparent, and easily accessible digitally. Changes in the lifestyle of urban communities that demand convenience and practicality encourage the need for integrated solutions that address the challenges of time efficiency and trust in service providers. This research aims to develop the concept and design of the "Beres.in" application as an integrated home cleaning and moving service platform using a design thinking approach. The research is carried out through four stages, namely empathize, define, ideate, and prototype, in order to understand user needs in depth and test to explore user needs and formulate empathy-based solutions. The results of the study show that potential users are dominated by Generation Z women and millennials who have a high level of digital activity and prioritize time efficiency. The main problems found include price uncertainty, lack of trust in workers, and limited schedule flexibility. Based on these findings, an application prototype was developed with automatic price estimation features, verified worker profiles, a real-time booking system, and direct communication channels to increase user trust and comfort. This research has original value in integrating two different services into one digital ecosystem based on user-centered design, and proves that the application of design thinking is effective in producing service innovations that are adaptive to the needs of modern urban society.

KEYWORDS *Beres.in, design thinking, digital services, urban mobility, user experience*

INTRODUCTION

Based on statistics on migration and lifetime migration from the Central Statistics Agency (BPS), as many as 4.5 million people migrated between provinces over the last 5 years (Statistik, 2024). Based on the publication of (Zakaria, 2024) through the digital newspaper Antara, the Population and Civil Registration Office of Bogor City, West Java, has served 1,100 residents of the Special Capital Region of Jakarta who migrated to the city of huja, Bogor. A total of 1,100 residents who migrated have transferred population data since the beginning of 2024 (Zakaria 2024). In line with this, the Jakarta Provincial Government has also appealed to the Regional Governments in the Depok, Tangerang, and Bekasi Areas to deactivate the Population Identification Number (NIK) of their citizens who are no longer domiciled in DKI Jakarta (Zakaria 2024). In 2023, there will be an increase in the population of Bogor City, which was originally 1,063.51 thousand people in 2022 to 1,070.72 thousand people (Bogor, 2024).

In general, population mobilization is carried out on the basis of economic factors (Noveria, 2010). In line with the assumption that "people will follow jobs", job opportunities in the informal sector are more open in urban areas that support migration (Noveria, 2010). Urban-centered development occurs in the economic sector, infrastructure, and social facility infrastructure are also the main reasons for people to migrate, especially from villages to cities

(Noveria 2010). In addition to economic factors, the increase in population mobility between cities is also influenced by changes in the lifestyle of urban people who tend to want efficiency and comfort in all aspects of life

One form of population mobility is the moving of houses or apartments, which is generally accompanied by packing, moving, and cleaning and rearrangement activities in new residences. This is strengthened by data that there has been an increase in urban population by 56.7% and has been predicted to increase to 66.6% by 2035 (Fadlurohman & Nur, 2023). The high number of removals makes residents need moving services as well as cleanliness that are integrated, reliable, efficient in time and transparent in cost. There is often a gap between customer expectations for cleaning services (Solikhin, Chandra, & Junaenah, 2020). In Indonesia, there has now been a proliferation of house cleaning services that can be found through application platforms, but the existing application platforms do not yet have their own specialties, so they have not been fully integrated.

Population mobility in urban areas is not only driven by economic factors and housing needs, but also influenced by changes in the lifestyle of urban people (Ismiyati & Hermawan, 2018). In the study entitled "Lifestyle as an Influential Factor to Urban Mobility Transport: A Case Study of Semarang City, Indonesia" it is explained that the mobility patterns of urban communities have shifted due to changes in life preferences, daily activity patterns, and time efficiency demands (Ismiyati and Hermawan 2018). The study emphasizes that mobility is no longer purely functional (just moving places), but has become part of an urban lifestyle that prioritizes comfort, speed of access to services, and flexibility (Ismiyati and Hermawan 2018).

Aside from the factors of convenience, speed of access to services, and flexibility, the time efficiency factor has become an important consideration in the residential decisions of urban communities (Zhang, Li, Si, Cheng, & Wang, 2023). The travel time of daily commutes, particularly to activity centers such as business districts or major public facilities, significantly influences an individual's decision to choose a place to live. The inconvenience caused by congestion and long travel times encourages residents to look for closer housing or have more efficient mobility access. This indicates that mobility is not only related to physical displacement, but also a reflection of the need for efficiency in modern lifestyles (Zhang et al., 2023). Research by (Zhang et al., 2023) emphasizes that efficiency and comfort are the core needs of urban society. Inconvenience in daily mobility is a trigger for the emergence of a preference for services that are able to reduce logistical and time burdens, including in the context of moving services and rearrangement of residences. Thus, it can be concluded that urbanization and population mobility are not just a matter of physical relocation, but rather about the search for a more efficient, practical, and hassle-free living experience (Zhang et al., 2023).

This relationship between lifestyle and mobility provides a theoretical basis that the need for services to support urban community mobilization activities such as transportation, moving services, and residential cleaning is not only triggered by physical housing moves, but also by people's preferences for ease and efficiency in managing their lives. Thus, services that offer ease of the process of moving and rearranging residences are not only functionally relevant, but also in line with the change in urban lifestyle orientation that is more practical and based on demand services. One of the innovative approaches that can be used to produce a solution to these problems is the design thinking approach. This approach consists of the stages of

problem formulation, creative idea production, solution model creation, and solution testing (Pratama, Wijayanti, & Taryana, 2024).

METHOD

This research was conducted in Bogor City in September-October 2025. Bogor City is included in the origin and destination areas of formal worker migration in West Java with the percentage of sending and receiving incoming migration migrants in 2021 recorded at 20,661 people, while outgoing migration was 17,699 people; in 2022, migration entered around 19,753 people and 16,906 people went out; and in 2023 re-entry migration increased to 19,981 people and outbound around 16,046 people (Ekawati, Herartri, Nuraini, Rahayuwati, & Sukamdi, 2018).

This research uses the design thinking approach as the main framework to visualize the problems that exist in Maasyarakat. Design thinking is a method that produces creative solutions using analytical thinking, practical skills, and creativity in thinking (Yusuf, Gunawan, Priatna, & Pardian, 2023). The design thinking method is centered on creating solutions that begin with a process of empathy for a problem in society while finding out human-centered needs (Maniek, Triayudi, & Rubhasy, 2021). Initially, design thinking consisted of three stages, namely inspiration to inspire the need for problems and the need to find solutions, ideation or the process of generating ideas, and implementation as the final stage felt by the user (Maniek et al. 2021). Now the design thinking approach is developing, there are five stages that researchers must do when using this approach, including emphatize, which is the core of the design process that is human-centered, then the definition stage as the stage of analysis or understanding the information obtained during the empathy process, then continued with the ideate stage, which focuses on producing or capturing ideas that are formed as the basis for making prototypes. Then the idea is visualized in the form of a prototype at the prototyping stage with the aim of identifying possible errors early on, so that in the final stage (testing) the possibility of errors is minimal, but at this stage users can still provide feedback. The four stages of design thinking are life cycle and allow researchers to repeat the stages and return to the previous stage if they find errors (Maniek et al. 2021).

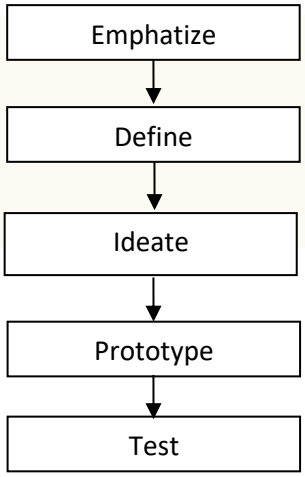

Figure 1. Research framework
Modified from (Maniek et al. 2021)

RESULT AND DISCUSSION

1. Respondent Characteristics

a. Age

The age distribution of respondents reflects that the majority of potential users are in the productive age range, which is 19 years old. This age group generally has a high level of mobility, a practical lifestyle, as well as a tendency to adopt digital services that offer time efficiency (Group, 2023). Psychographically, this segment is known as "digital adopters", which is a group that is used to using applications due to time constraints and preferences for convenience over manual effort.

b. Gender

Most of the respondents were dominated by women. This is in line with various studies that show that decisions related to household cleaning services or move preparations are more initiated or influenced by women in domestic contexts, although they also play an active role in professional activities.

c. Employment status

Respondents with entrepreneurial and freelance status dominated the composition. This indicates that the need for cleaning or moving services arises more from those who have a professional busyness and limited time to manage household activities manually. This group does not only pay attention to price, but emphasizes more on the value of efficiency and practicality of services.

d. Types of housing

Most of the respondents lived in private residences. The character of urban housing like this often has space limitations, safety rules, and the need for efficiency when the moving or cleaning process is carried out.

2. Implementation of Design Thinking

a. Emphatize (understanding user needs)

At this stage, first determine the concept to be used in the application through observation (observation). Observations were made by distributing questionnaires to respondents

representing potential users of application-based moving and household cleaning services. This method is relevant as stated by (Thomas & McDonagh, 2013) that human-centred design / empathic design, empathy towards users is developed through various research approaches such as observation, interviews, and methods that allow designers to understand the functional and emotional needs of users. Similar research was also conducted by (Chang-Arana et al., 2020), that empathy in design is not only a mindset, but also a method, and that user understanding can be obtained through a combination of surveys, observations, and quantitative/qualitative techniques.

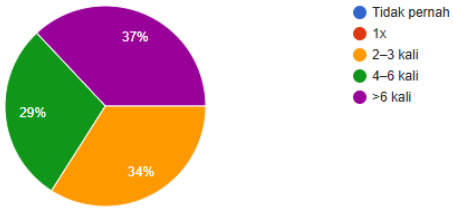

Figure 2. Results of the survey on the intensity of the use of cleaning/moving services

From the results of the questionnaire, the majority of respondents are the younger generation (18-25 years old) who are familiar with the digital world. This is consistent with the characteristics of generation Z/millennials as digital natives who tend to use devices and applications in daily activities (Alruthaya, Nguyen, & Lokuge, 2021). Furthermore, the study Determinants of Digital Payment Adoption Among Generation Z by (Al-Qudah et al., 2024) shows that the perception of security, cost, convenience, and innovation are significant factors influencing the decision of Generation Z to use digital payments. Figure 2 explains information related to the intensity of the use of cleaning/moving services for respondents in Bogor City. A total of 23% of respondents stated that the automatic price estimation feature before confirmation when choosing a cleaning/moving service platform has the highest level of importance, but the majority of respondents (31%) answered that it is not very important, namely on a scale of 3. According to the Consumers value digital trust report, trust in digital service providers (including data protection and reputation) is just as important to consumers as price and speed (Company, 2022). Meanwhile, according to the e-Conomy SEA 2023 survey, digital service users in Southeast Asia are willing to pay more if prices are clear and price transparency is accompanied by a good reputation for service providers (Compainy 2023).

Based on the results of a survey filled out by 100 respondents, it was found that in the last 2 years as many as 37 respondents had used cleaning services or moving services more than 6 times, 34 respondents used cleaning services or moving services 2-3 times, the remaining 29 people used cleaning and moving services 4-6 times. From all respondents, it was found that the main obstacle they experienced when ordering moving or cleaning services was an inflexible schedule and difficulty getting slots because the majority of respondents (32%) admitted that they received information related to cleaning or moving services conventionally or from the recommendations of friends/family. After that, from Instagram as much as 21%. The lack of information related to service workers caused respondents to feel uncomfortable.

b. Define

Based on the results of the analysis in the emphatic phase, users of moving and home cleaning services often encounter obstacles when looking for services that meet their needs. One of the main problems is the lack of clarity regarding the price and quality of the service, making it difficult for users to estimate whether the fees paid are proportional to the results received. This is in accordance with the view of (Akerlof, 1970), who explains that the difference in information between providers and users can create uncertainty and reduce trust. In addition, users also often feel insecure because there is no guarantee or system that ensures the background and reliability of workers. Trust is important in the relationship between the provider and the service user, especially when the service is carried out in a private environment such as a home. On the other hand, moving and cleaning services generally still run separately and are not yet connected in a single system, thus making the ordering and coordination process less efficient (Mayer, Davis, & Schoorman, 1995).

Based on the results of the analysis in the empathize phase, the researcher identified various problems experienced by users of moving and home cleaning services. Therefore, at the defining stage, the researcher reiterated the need for the development of a digital platform that is able to provide price information openly and ensure the safety of workers and combine various services in one system. The presence of this kind of platform is expected to help users make decisions more confidently and conveniently.

c. Ideate

The ideation stage begins with mapping solution opportunities based on the results of empathize analysis and problem formulation (define). Based on questionnaire answers, 37% of respondents used services more than six times in two years. This shows that there is real market activity and not just passive interest, so consequently, features that reduce perceived risk during pre-transactions are a priority for the product. It also shows that the need for these services is not hypothetical, but has become part of the actual consumption patterns of urban communities. This condition shows the existence of market readiness, where users are no longer in the education phase, but have experienced direct interaction with similar services. These findings reinforce the urgency of developing solutions that not only introduce services, but optimize the experience (experience optimization).

Based on the results of the questionnaire answers, 15% of respondents mentioned "unclear prices and additional costs" as the main obstacles when using moving or cleaning services. From this condition, the idea of presenting an automatic price estimation feature before confirmation that is transparent and responsive to variables such as area area, amount of labor, and duration of work emerged. This feature is the main idea element because it is able to reduce perceived risk perception which significantly affects the intention of adoption (Seim, Vitorino, & Muir, 2017). Proposals for automatic price estimation and clear cost breakdowns before confirmation are primary solutions that reduce consumer anxiety and simplify purchasing decisions as empirical evidence from studies on the value of price transparency confirms that consumers do respond positively to clear price disclosures (Seim et al., 2017).

Second, the issue of trust in providers can be seen that 20% of respondents find it difficult to find a trusted provider. In addition, the strong demand for identity verification and background checks is also considered important, as 56% of respondents rate importance on a scale of 4–5, which means that this point has a high level of importance. Therefore, product

innovation needs to include a trust architecture, by providing a verified worker profile view, work experience summaries, training documentation, and an inmanipulable rating trail, and as a design element that is not just a UI aesthetic but an operational security feature. In addition, industry practices also recommend identity and background screening to reduce operational risks on the platform

Third, time control and communication are functional needs that demand technical solutions, as the majority of respondents (59%) choose to assess real-time schedules and slot confirmations as very important on a scale of 4 and 5. For pre-service communication, respondents prioritized live chat services (33%) as well as phone confirmation (30%). This data shows that the idea of developing a solution does not stop at functional aspects such as ordering and payment, but must include a human-centered clarity system that allows two-way communication. From this came the integrative idea, namely calendar-based booking with real-time slots, progress notifications, and chat channels equipped with one-tap call options that create the illusion of control and reduce coordination friction. In addition, UX literature as well as real-time booking implementation studies show that responsive scheduling systems reduce rational uncertainty and increase booking conversions. Respondents considered it important to have real-time scheduling features and service slot confirmations indicating a preference for user-side flexibility and control.

Fourth, business modes can be developed in parallel. Because 58% of respondents showed a high tendency to subscribe. Thus, a 4×/month cleaning routine subscription model or a moving package equipped with post-move clean cleaning services can be piloted as part of a value proposition to increase customer retention and build more stable customer lifetime value. The subscription services method recommends plans that are clearly beneficial, such as per-unit discounts, slot priority, and warranties to overcome switching barriers and reinforce repeat purchase behavior.

From the synthesis of various questionnaire findings and literature, the main ideas that emerge are no longer just features, but user experience frameworks (User Journey Architecture), which include:

1) Pre-transaction → price education, worker verification, and service simulation;
2) When → transactions with a real-time booking system, direct communication support, and smart recommendations based on the highest ratings;
3) Post-transaction → a service guarantee system, a result guarantee, and a feedback mechanism that contributes to the reputation of workers.

Thus, the idea of a "Beres.in" solution for moving services and post-moving cleaning does not stand in isolation, but forms a single integrative ecosystem that has the potential to differentiate Beres.in, from similar services on the market. This solution not only answers functional needs, but also users' psychological needs for a sense of security, certainty, and control over the services they get. This combination answers the main complaints of respondents, including inflexible schedules / difficulty in finding slots, difficulty in finding reliable providers, lack of professionalism / results that do not meet expectations, slow communication and not transparent prices. In addition, it is necessary to put trust building as the foundation of services, so as to collectively reduce friction points that block adoption and loyalty. The Beres.in logo is visualized in Figure 3.

Figure 3. Beres.in Logo

d. Prototype

The prototype stage in the Design Thinking methodology is the process of formulating an initial form of digital solution based on the results of ideation that has been focused on the main needs of the user. In this phase, Beres.in begin to formulate concrete forms of features and user interaction flows based on the priority needs that emerge from the questionnaire data, namely price transparency, worker verification, ease of communication, real-time booking system, and service subscription options as visualized in Figure 4.

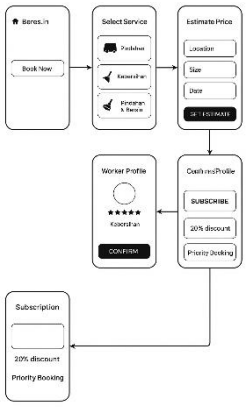

Figure 4. Initial prototype Beres.in

Based on the findings that 15% of respondents complained about non-transparent pricing and 21% had difficulty getting suitable scheduling slots, Beres.in initial prototype began by compiling a simulated flow interface in the form of a landing page → input of needs → automatic cost estimation → slot confirmation options. This view is designed with a progressive disclosure approach, which only displays information when it is relevant to the user's steps, thus speeding up the booking process without burdening cognition. The visualization of the landing page is described in Figure 5.

Figure 5. Landing page Beres.in

After the user passes through the landing page and registers, the user will go through the following stages, namely choosing the service and time slot as needed as visualized in Figure 6.

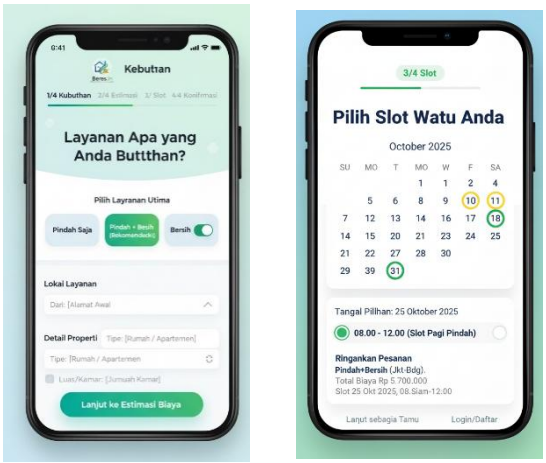

Figure 6. Customer options view

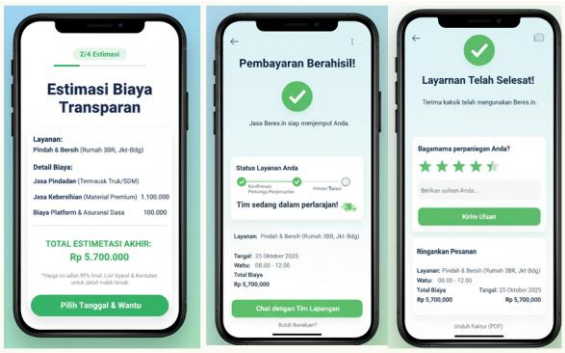

Figure 7. Order completion confirmation

Figure 7 shows the order completion confirmation flow on Beres.in app. This stage shows how the system provides transparency of fees, payment status, and feedback from users after the service is completed. At first glance, users can see a detailed cost estimate based on the type of service selected, including details of service prices, additional costs, and total estimates. This supports the principle of transparency and helps users make decisions before proceeding

with transactions. The second view shows a notification that the payment has been successfully processed, along with information about the status of the service and the implementation team that will be heading to the user's location. This stage confirms the integration between the payment system and the tracking of services in real time. Furthermore, the third view shows that the service has been completed, and the user is given the opportunity to provide an assessment and review of the quality of the service received. This feature not only serves as a form of confirmation of transaction completion, but also serves as an evaluation mechanism for service providers to improve operational quality in the future.

e. Testing

The testing stage is an evaluative process that aims to test the effectiveness of Beres.in service prototypes in answering user needs in real life based on previously simulated use scenarios. In this phase, the prototype that has been developed is not only passively shown to the user, but tested through a series of interaction scenarios to observe navigation patterns, level of understanding of features, ease of access, and perception of value to integrated moving and home cleaning services. This experiential-based testing approach is in line with the concept of user experience evaluation which emphasizes that product validation should include the functional, emotional, and cognitive dimensions of user behavior (Abras, Maloney-Krichmar, & Preece, 2004).

CONCLUSION

The results of the study show that the potential market for moving services as well as cleaning, "Beres.in" is dominated by generation Z/millennial women who work as entrepreneurs or freelancers by prioritizing time efficiency and digital convenience. The real usage pattern is summarized that 37% of users use this service >6 times in 2 years. This confirms that there is a recurring demand, not just passive interest. From the perspective of functional and psychological needs, the three main gaps identified are price transparency and surprising additional costs, a level of trust in the workforce that requires verification or background checks and track records, and limited schedule flexibility or slot availability and slow pre-service communication. The synthesis of the design thinking phase (empathize → define → ideate → prototype) gives rise to a comprehensive user experience framework that includes automatic price estimation and pre-transaction fee breakdowns, verified worker profiles and rating tracks, a real-time calendar-based booking system with notifications and chat channels, and subscription options to increase user retention. This research has successfully identified user needs and designed solutions based on a design thinking approach for Beres.in services, but there is still room for deepening and development at the implementation and validation stages. Researchers are then advised to conduct direct usability testing on prototypes to obtain empirical data on design effectiveness, user satisfaction levels, and potential technical barriers that arise in real use. In addition, the expansion of the respondent sample to other regions outside Bogor City will strengthen the results and illustrate the variation in consumer behavior in different socio-economic contexts. On the other hand, subsequent research can also integrate advanced quantitative analysis, such as Customer Journey Analytics, to test the relationship between the factors of trust, ease of use, and repeat intent to use the service. Follow-up research can explore the sustainability aspects of business models and the integration of new technologies such as AI in automated scheduling to improve

end-to-end experiences, and increase the probability of sustainable adoption as per the research findings.

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