

Handy Fix: A Service Design for a Location-Based Mobile Application for Acquiring On-Demand Local Handyman Services in Metro Manila

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Abstract

This research paper aims to develop a mobile application that provides users with a structured approach to acquiring local handyman services in their specified location. Using a mixed methods approach and data from 414 randomly sampled households in Metro Manila, the study identifies Plumbing, Electrical Work, and Carpentry Services as commonly requested tasks. Word of mouth is the primary method for finding handymen, while Text and Call are preferred for communication. Paying By the day is favored over By the job. Statistical tests were used to explore the relationship between challenges and finding, communicating, and paying methods, highlighting concerns about verifying handymen's competence and credentials. Location posed challenges such as higher transportation fees and delays. Key features were prioritized that inform the design of HandyFix, including Location-based Service, Convenient Scheduling, and Issue Submission via Image. User Acceptance Testing shows a significant increase in user satisfaction, with the app rated highly for convenience, issue resolution, and addressing user challenges. The results demonstrate improved user satisfaction and validate HandyFix as an effective and user-friendly platform for acquiring handyman services.

Keywords

Handyman Services, Mobile Application, Location-based Services, Mix-Methods, User Acceptance Testing

1. Introduction

In the Philippines, the services sector has maintained its position as its main growth driver, contributing to 61% of the gross domestic product (GDP) and 57% of employment (National Economic & Development Authority, 2022). In 2021, 40% of the Philippines' GDP came from digital products or services, according to a study by Microsoft. Digitalization creates a window of opportunity for the service sector to prosper through on-demand applications. It can facilitate digital transactions and interactions, reduce labor requirements, promote inventory efficiencies, and cut real estate costs, offering productivity gains. Based on the Visa Consumer Payment Attitudes Study, 6 in 10 Filipinos have used on-demand services using apps in the Philippines. According to Harvard Business Review, The on-demand app industry is attracting over 22.4 million users annually to spend around \$57.6 billion to get real-time, location-based services, and they are happy making the payment (Saxena, 2022). Customers prefer convenient booking platforms where many service professionals accumulate in a single window.

According to a study in Indonesia, there are 82% of homeowners have difficulty making an appointment to order a handyman service as needed, according to expertise, and on schedule (Nafis 2019). Over the years, it has been increasingly challenging to locate and hire a skilled trustworthy handyman service in a community with many untrustworthy handymen stealing employees' personal belongings, poor job completion, and a lack of adequate skills in performing the task. We see signposts defaced with posters everywhere in Metro Manila (Chua 2019).

If the home repair and maintenance tasks are not appropriately done, household owners will be unsatisfied and may face further issues and hazards in the future. In cases where the emergency is serious such as an electric faulty wiring from electronic equipment, this could result in incidents like fire, which would have serious consequences. A highly skilled qualified handyman can do the job better as they have the necessary knowledge and the right

tools to safely handle the task. However, handyman services are hired in an unstructured way which requires time and personal effort.

As advances in technology drive globalization and digital transformation, it has revolutionized how information travels, people engage, and businesses operate via mobile devices using mobile applications. This year 2022, there are 84.7 million mobile phone users in the Philippines, which is more than half of the population, according to Statista (Philippines: Smartphone Users 2017-2026, 2022). With the vast number of users of mobile devices, its ease of use has aided in its development as businesses are progressively shifting to mobile phones, where products and services are available online. It has changed the consumer journey as on-demand apps like Uber, Netflix, and Airbnb, have emerged to bridge the gap between customers and businesses.

1.1 Objectives

This study aimed to develop a mobile application that provides a structured approach to acquiring local handyman services within a user's specified location through service design.

Specifically, this study intended to achieve the following:

- To identify the most common and requested handyman services by household owners.
- To identify the current methods of finding, communicating, and paying with handyman service providers
- To identify challenges encountered with the current methods of finding, communicating, and paying with handyman service provider.
- To develop a mobile application that determines reliable handyman services within a specific location through service design.

2. Literature Review

2.1 Homeowners

In the Philippines, urban areas have the majority of homeowners. According to the Philippine Statistics Authority, approximately 57% of the Philippine population lived in urban areas in 2021 from 48% in 2017 (Philippine Statistics Authority, 2021). Based on an article from the Asian Parent Philippines, The rise in urbanization and improved living conditions has increased the demand for handyman services. (TheAsianParentPH 2021).

Busy working individuals, like working professionals and busy parents, prefer the convenience of hiring handymen, rather than doing maintenance and repair work themselves, due to their hectic schedules. (Localiq, 2021). According to the Philippine Statistics Authority, in 2017 over 60% of Filipino families had two working parents (Philippine Statistics Authority 2017). With the majority of Filipino families having two working parents, they often do not have the time or skills to complete these projects on their own, leading to the need for handyman services.

2.2 On-Demand App Industry

In the Philippines, the services sector has maintained its position as its main growth driver, contributing to 61% of the gross domestic product (GDP) and 57% of employment (National Economic & Development Authority, 2022). In 2021, 40% of the Philippines' GDP came from digital products or services, according to a study by Microsoft (Microsoft Philippines Communications Team, 2018). Digitalization creates a window of opportunity for the service sector to prosper through on-demand applications. It can facilitate digital transactions and interactions, reduce labor requirements, promote inventory efficiencies, and cut real estate costs, offering productivity gains.

2.3 Handyman Services

A professional handyman is a person who has expertise in a wide variety of minimal home repair and maintenance jobs around the house (Orrico, 2019). These common general repairs could include maintenance work, odd jobs, and fix-up tasks that include both interior and exterior home repairs or maintenance (Jeffrey 2018). They have various expertise around their belt on different house tasks that don't require a license to be done and are generally not dangerous that will require a licensed specialist (Same Day Pros 2022). Most projects requiring local handyman services are mostly on a small to medium scale, but it is recommended to hire certified professionals and contractors for major repairs that necessitate certain licenses and permits (Jeffrey 2018).

2.4 Methods of Finding Handyman Service

85.7% of the respondents that were surveyed are having challenges in finding handyman services, according to a study by Denis Gikundi, (Gikundi 2017). Based on a study in Indonesia, there are 81.7% of service user respondents have difficulty making an appointment to order a handyman service as needed, according to experts, and on schedule (Nafis 2019). Finding a qualified, and reliable handyman service is a challenging, often time-consuming task because the information is scattered across different channels. Household owners must do their research first which would take them some time, patience and effort.

From a 2021 survey conducted by Localiq, they discovered the top resources homeowners use to search for home service providers. Recommendations/word-of-mouth was the top resource to find a home services professional followed by search engines, then social media (Localiq 2021). Word-of-mouth referrals play a significant role in the success of handymen, with many of them receiving the majority of their business through recommendations from satisfied clients (Muehlbauer 2019). Trust in the experiences of others and the presence of mutual acquaintances can enhance the customer's confidence in a particular handyman (Sparks 2022).

Social media platforms, such as Facebook, have become essential for both connecting directly with businesses and researching local service providers, including handymen (Heitman 2022). Filipinos, in particular, are highly active on social media and often utilize messaging features to reach out to businesses (Meta Platforms, Inc. and Boston Consulting Group, Inc. 2022).

Alternatively, online search engines like Google can be used to find local handymen by searching general phrases such as "handyman in my area" (Jim The Handyman 2022). Local hardware stores can also be a valuable resource, as employees may provide recommendations or have information on local handymen (Handyman Connection, 2019). However, it's important to consider the limited business hours of hardware stores when seeking advice at night (Pierce 2021).

2.5 Verifying Handyman Service

When it comes to choosing a home services provider, Localiq asked what homeowners prioritize. Trust was the number one factor, followed by reasonable prices, and a respectable reputation. It is interesting to note, however, that price was the most important factor in choosing a home services business for millennials, followed by trust then convenient scheduling, and positive reviews (Localiq 2021).

Before hiring a handyman, consider online reviews for insight into their reliability and past achievements (Walker, 2020). Research shows that consumers read around 10 reviews before trusting a local business (Ray et al., 2022). Additionally, 9 out of 10 global consumers read reviews before online purchases (Shaw, 2022). Showcasing a portfolio of past projects establishes legitimacy, expertise, and capabilities (Jobber Academy, 2021). Hiring a certified and trained handyman, like those trained by TESDA in the Philippines, ensures competence and reliability (Jim the Handyman 2022).

2.6 Methods of Communication with Handyman

Providing excellent service is all about seamless, convenient communication and quick problem-solving, and the key to achieving that is using the right channel at the right time. According to a 2022 Buyer Experience Survey of Invoca, most people prefer to complete transactions online, in person, and on the phone, respectively. They found that the phone is the most preferred communication channel when consumers are having a problem and need help, up 8% since 2021 and overtaking online as the preferred channel (Invoca 2022).

2.7 Pricing Methods of Handyman Services

Per hour pricing on handyman services is not common in the Philippines. However, we've accustomed to a pricing method that is quite similar. We typically call this pricing setup "Arawan" or pricing "By the Day". With this pricing method, the handyman would be needing the attention of the client to complete the job. They would have to come to the client for materials to complete the job (Mr. Butler Home Services, 2021). Pricing method that Filipino handymen normally employ is what we call "Pakyawan" or "By the Job" pricing. In this pricing method, the handymen starts the assessment and would normally quote a fixed labor rate to complete the job specified by the client and the client agrees to a fixed rate to complete the job. The agreement normally includes the scope of the job, its duration, and also the materials if needed (Mr. Butler Home Services 2021).

2.8 Challenges Encountered in Handyman Services

When hiring a handyman, it's important to watch out for certain red flags. If pricing information is not available on the website or provided when contacted, it can be a cause for concern (PreFix 2022). To ensure clarity and avoid misunderstandings, it's advisable for the customer and the handyman to establish a contract that outlines

timelines, expectations, and payment details (Bennett 2021). The contract should clearly specify the scope of work, including material and labor costs, as well as payment arrangements and start/finish dates (Nidirect 2022).

Customers should also be cautious if a handyman requests a large down payment before completing the service (Khountham 2022). Paying for unfinished work can put the customer at a disadvantage, as the handyman may not fulfill their obligations. Additionally, it's essential to verify the handyman's competence and credentials before hiring them. This includes checking references, certifications, and experience to ensure they have the necessary skills for the job. It's also important to ensure the handyman arrives with proper equipment and safety gear, as a lack thereof may indicate unprofessionalism and subpar quality (United Field Services 2022).

2.9 Service Design

Service Design is an emerging field focused on improving customer experience by addressing organizational weaknesses (Verschelde 2022). It revolves around three components: people, props, and processes. "People" includes those involved in creating or using the service. "Props" refer to the physical or digital artifacts needed for service delivery. "Processes" encompass the workflows and procedures necessary for successful service delivery (Verschelde 2022). Service design aims to optimize these components to enhance the overall service experience for customers.

2.10 Location-Based Services

Location-based services (LBS) refers to services that are based on the location of a mobile user as determined by the device's geographical location. LBS applications provide services and information that are most relevant to the user at that location (Heavy et al. 2022). Whether used for locating friends in the area, finding the nearest restaurant or advertising deals to shoppers who are in the neighborhood, location-based services (LBS) grant users access to relevant, up-to-date information about their surroundings and allow businesses to provide current updates to their customers. All these features offer a dynamic user experience, providing a new level of convenience that changes the way businesses interact with customers and other enterprises (Rajendran & Buczkowski 2017) Building a location aware application is a rather complex process, because it involves interconnecting several components, features and players.

3. Methods

The study utilized a mixed methods research design, employing an online survey with both quantitative and qualitative questions through a sequential explanatory approach. A simple random sampling approach was used to select 400 household respondents from Metro Manila. The research instruments included an online survey with sections for data consent, demographics, Likert-scale questions, and open-ended questions. Computer software such as Microsoft Excel, R, and R-Studio were used for data analysis, organization, reliability testing, and statistical analysis.

4. Data Collection

For the gathering of data, the researchers virtually administered survey questionnaires. The researchers distributed their online survey, using Google Forms as the medium, over social media channels, and reach out to their respondents which are households from Metro Manila. Survey forms are used to gather data from the specific target respondents. A letter of consent was included in the form in accordance with the Data Privacy Act of 2012 followed by the survey proper. The data that was collected was then transferred to an online database called Google Sheets.

5. Results and Discussion

5.1 Reliability Test

Cronbach's alpha was used to assess the study's reliability. Two sets of questions were included: one for respondents with experience and one for those without experience. Table 1 shows that for respondents with experience acquiring handyman services, the questions had a high internal consistency with a Cronbach's alpha of 0.85. This indicates that the responses can be combined to provide meaningful insights. For respondents without experience, Cronbach's alpha was 0.72, which meets the acceptable threshold, showing reasonably reliable measures.

Table 1. Cronbach's Alpha Results

Set of Question	Cronbach's Alpha	Number of Items
With Experience	0.85	26
Without Experience	0.72	14

5.2 Presentation of Data

Table 2 summarizes the demographic background of 414 study participants. The majority of respondents were Millennials (54%), followed by Generation Z (31%), Generation X (12%), and Baby Boomers (3%). Manila had the highest number of respondents (29%), followed by Las Piñas (16%) and Makati (11%). Navotas and San Juan had the fewest respondents (0% and 0.5% respectively). The largest income group earned between PHP 21,000 and PHP 40,000 per month (55%), while only 1% had a monthly income exceeding PHP 100,000. Additionally, 7% of respondents chose not to disclose their income. The majority of respondents lived in a House and Lot (73%), followed by Condominium (10%), Townhouse (8%), and Apartment (9%).

Table 2. Demographic Profile of Respondents

Categorical Variable	Variables	Percentage
Age Group	18-26 years old (Generation Z)	31%
	27-45 years old (Millennial)	54%
	46-57 years old (Generation X)	12%
	58-65 years old (Baby Boomer)	3%
City of Residence	Manila	29%
	Las Piñas	16%
	Makati	11%
	Mandaluyong	8%
	Muntinlupa	7%
	Parañaque	7%
	Malabon	4%
	Caloocan	3%
	Marikina	3%
	Quezon City	3%
	Taguig	3%
	Pasay	2%
	Pasig	2%
	Pateros	1%
Valenzuela	1%	
Monthly Income	Less than PHP10 000	4%
	More than PHP100 000	1%
	PHP10 000 - PHP20 000	13%
	PHP21 000 - PHP40 000	55%
	PHP41 000 - PHP70 000	17%
	PHP71 000 - PHP100 000	4%
	Prefer not to say	7%
Type of House	Apartment	9%
	Condominium	10%
	House and Lot	73%
	Townhouse	8%

5.2.1 Most Requested Handyman Services

Majority of the respondents have acquired the services of a handyman, which is 78% of the total respondents. According to [Figure 1](#), it summarizes the frequency distribution of respondents' usage of various handyman services. Plumbing, electrical work, and carpentry services were used most frequently, with over 85% of respondents hiring a handyman for these tasks "often" or "always." In comparison, handyman services like gutter repair or appliance repair were used less often, with only about 25% of respondents using a handyman for these types of needs regularly. Overall, the results indicate that while professional handymen market a range of services, the bulk of their business likely comes from providing basic repair and maintenance tasks that homeowners need regularly but cannot easily do themselves.

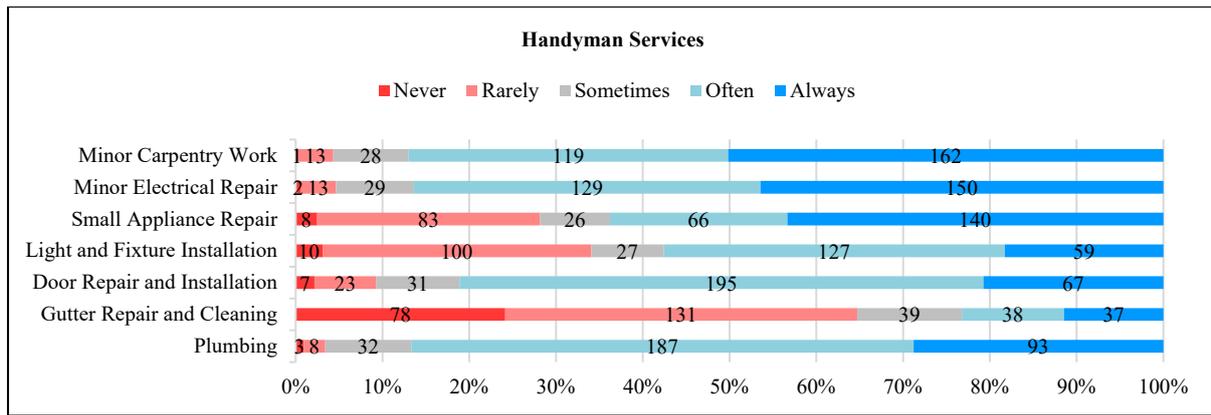


Figure 1. Bar Chart of Most Requested Handyman Services

5.2.2 Method of Finding

Figure 2 illustrates the percentage of responses for different methods used to find handyman services. Word of mouth is the most common method, with 61% of respondents always relying on recommendations. Social media follows at 39%, while Google is used often by 34% of respondents. Local hardware stores are the least popular method, with only 15% always using this approach. Overall, people heavily depend on recommendations and online platforms to find handyman services, while local hardware stores are less frequently utilized.

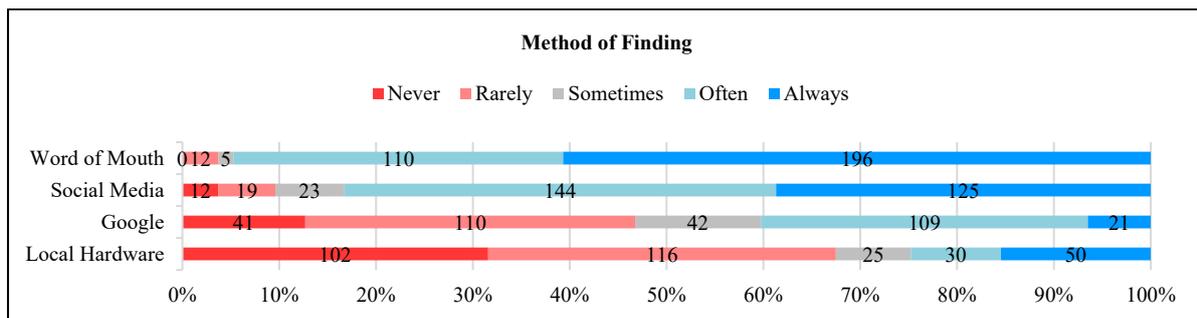


Figure 2. Bar Chart of Method of Finding

5.2.3 Method of Communication

Figure 3 shows the frequency of communication methods used by the respondents. The most frequently used method of communication is Text and Call, with 78% of respondents reporting that they always use this method. Social Media is the second most common method, with 54% of respondents reporting that they always use this method. In-person visits are less frequent, with only 21% of respondents stating that they often or always use this method. Email is the least popular method, with 42% of respondents stating that they never use it and only 2% stating that they always use it. The results suggest that communication methods that are convenient and immediate are more preferred.

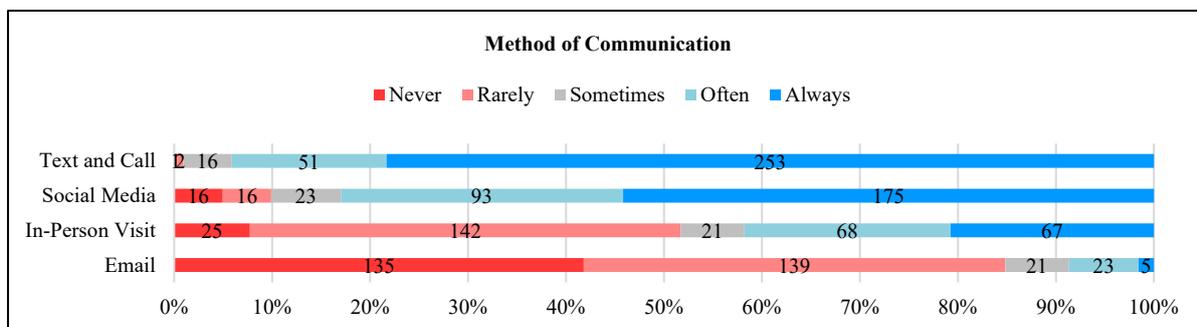


Figure 3. Bar Chart of Method of Communication

5.2.4 Method of Paying

Figure 4 indicates that the majority of customers reported paying "By the Day" often, while the "By the Job" payment method was less commonly used. Specifically, 59% of customers reported often paying "By the Day," while 27% reported often paying "By the Job."

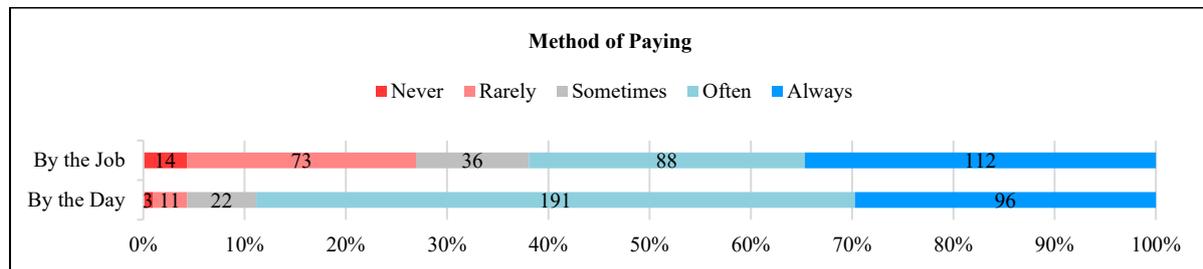


Figure 4. Bar Chart of Method of Paying

5.2.5 Challenges Experienced

Figure 5 illustrates the frequency and percentage of responses for the different levels of challenges experienced. The findings highlight a number of issues that compromise customer satisfaction and quality of service. Specifically, the inability to verify the competence and credentials of the handyman was reported as a frequent or always challenge by 89.17% of respondents. Similarly, the lack of contract was noted as a frequent or always challenge by 92.26% of respondents. The no fixed duration of the job was cited as a frequent or always a challenge by 87.62% of respondents. Furthermore, the survey shows proper tools, equipment, and safety practices were often lacking. Over 85% noted the handymen did not provide their own tools and supplies, and nearly 90% said the handymen were not dressed in appropriate work attire or protective equipment.

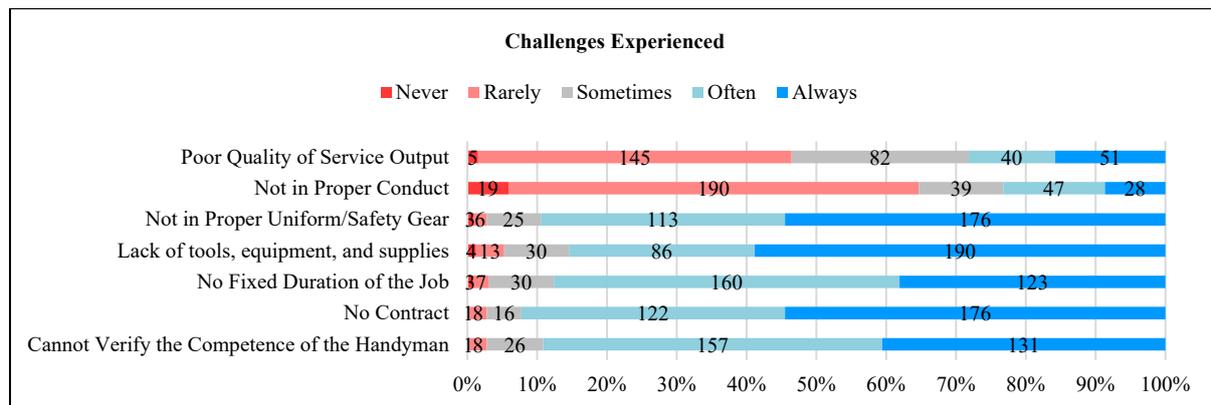


Figure 5. Bar Chart of Challenges Experienced

5.2.6 Essential Features for a Handyman Application

The survey revealed that 99% of respondents find mobile phones to be convenient for finding handyman services, indicating that a mobile app would be a useful platform for hiring handymen. Furthermore, 80% of respondents gave the highest rating of 5, indicating that they are highly likely to use a handyman service mobile application. These findings suggest that there is a strong acceptance of using a mobile app to hire handymen. In light of these results, we consider the key features that a handyman application should have in order to meet users' needs and preferences effectively.

Figure 6 provides insight into the level of importance that customers place on different features when selecting a handyman service. The results show that the majority of participants rated Location-based Service as very important, with 88% and 10% reporting it as somewhat important. Convenient scheduling was also rated as very important by a majority of participants, with 66% reporting it as such and 30% reporting it as somewhat important. Issue Submission via Image, Customer Reviews, and Instant Messaging, upload were also rated as very important by a majority of participants, with 85% rating each of them as very important. Fixed contract and payment method were rated as somewhat important or neutral by a majority of participants, with 58% and 50% rating them as somewhat important, respectively.

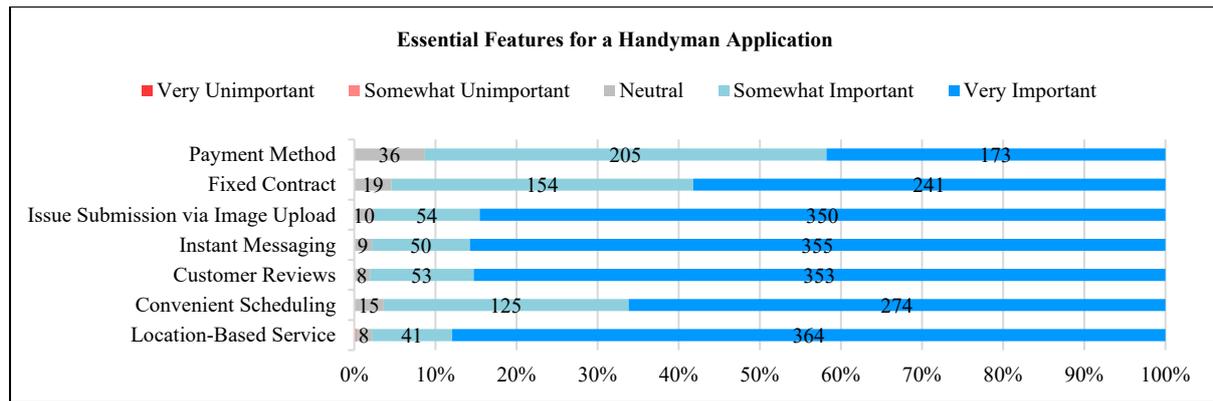


Figure 6. Bar Chart of Essential Features for a Handyman Mobile Application

5.3 Analysis of Data

5.3.1 Relationship between the Challenges and Methods of Finding, Communicating and Paying Handyman Services

Chi-square tests and Cramer's V were used to examine the relationship between challenges faced by users when hiring a handyman and factors related to finding, communicating, and paying for handyman services. The results from Table 3 show that there is a significant relationship between these challenges and the factors studied, rejecting the null hypothesis. Table 4 reveals that the competence of the handyman is a major concern for users, regardless of the method used to find, communicate, and pay for services. The lack of a contract outlining scope, costs, and materials requirements is associated with all factors. Challenges related to no fixed duration of the job are strongly associated with word of mouth and social media. Lack of tools, equipment, and supplies is associated with all factors except email. Improper uniform/safety gear is associated with all factors except social media and email. Improper conduct is a significant concern across different hiring methods, particularly with Google, local hardware stores, and in-person visits. Poor quality of service output is associated with all factors, especially with word of mouth, social media, Google, local hardware stores, and in-person visits. Overall, these findings suggest that the challenges faced by users when hiring a handyman are moderately associated with various factors related to finding, communicating, and paying for handyman services. This information can guide the design of a mobile application to address these challenges and enhance the user experience.

Table 3. Chi-Square Test Results of the Relationship between the Challenges and Methods of Finding, Communicating and Paying Handyman Service

	Word of mouth	Social media	Google	Local hardware store	Text and call	Email	Social media	In-person visit	By the day	By the job
Competence of the handyman	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
Lack of contract outlining scope, costs, and materials requirement	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
No fixed duration of the job	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
Lack of tools, equipment, and supplies	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
Improper uniform/safety gear	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
Improper conduct	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
Poor quality of service output	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05

Table 4. Cramer's V Results of the Relationship between the Challenges and Methods of Finding, Communicating and Paying Handyman Service

	Word of mouth	Social media	Google	Local hardware store	Text and call	Email	Social media	In-person visit	By the day	By the job
Competence of the handyman	>.30	>.30	>.10	>.10	>.10	>.10	>.30	>.30	>.30	>.10
Lack of contract outlining scope, costs, and materials requirement	>.30	>.10	>.10	>.10	>.10	>.10	>.10	>.10	>.30	>.10
No fixed duration of the job	>.30	>.10	>.10	>.10	>.10	>.10	>.10	>.10	>.10	>.10
Lack of tools, equipment, and supplies	>.10	>.30	>.10	>.10	>.10	>.10	>.10	>.10	>.30	>.10
Improper uniform/safety gear	>.30	>.10	>.10	>.10	>.10	>.10	>.10	>.10	>.30	>.10
Improper conduct	>.10	>.10	>.10	>.30	>.10	>.10	>.10	>.30	>.10	>.10
Poor quality of service output	>.30	>.30	>.30	>.30	>.10	>.30	>.10	>.30	>.10	>.10

5.3.2 Open Ended Survey Questionnaire

Based on the open-ended responses, the main challenges users experience with handyman services can be summarized as follows:

1. The handyman's location being far from the user's home, resulting in higher transportation fees, and difficulty finding their location
2. Difficulty finding handyman services in their area and contacting them.
3. Incomplete work and delays in finishing the job.
4. Late arrival or not arriving on time during emergencies.
5. Communication issues, such as handymen only being reachable through landline or not using preferred communication platforms like Facebook Messenger.
6. Multiple visits required for project evaluation, supply purchase, and actual work, leading to increased costs and inefficiencies.
7. Trust issues, especially for users who are new to a city.
8. Poor quality of work and cleanliness.
9. Handymen lacking necessary tools and supplies, or users being required to purchase them.
10. Limited payment options, such as cash-only deals.
11. Scheduling issues and tardiness.

These challenges further emphasize the need for a mobile application that offers convenient and efficient solutions to address these concerns, such as location-based services, easy communication methods, verified information about handymen in a specific area, flexible payment options, and quality assurance

6. Conclusion

This aspect of the study shows how each statement of the problems was addressed upon the completion of this research. Research Question 1 aimed to identify the most common and requested handyman services by household owners. Based on the data results, the most commonly requested handyman services by household owners are plumbing, electrical work, and carpentry services. These services were used most frequently, with over 85% of respondents hiring a handyman for these tasks "often" or "always." In contrast, services such as gutter repair or appliance repair were used less often, with only about 25% of respondents using a handyman for these types of needs regularly. Therefore, the most common and requested handyman services are plumbing, electrical work, and carpentry services.

Research Question 2 aimed to identify the current methods of finding, communicating, and paying with handyman service providers. The results shows that respondents primarily rely on word of mouth to find handyman services, indicating that they always use this method, followed by social media and Google. Texting and calling are the most common communication methods, with in-person visits and email being less popular.

When it comes to payment, the majority of customers pay "By the Day" instead of "By the Job." In summary, people tend to rely on personal recommendations when finding a handyman, prefer convenient and immediate communication methods, and often pay for services by the day.

Research Question 3 aimed to identify the challenges customers face when hiring a handyman using the current methods of finding, communicating, and paying for services. The study found that customers face several challenges when hiring a handyman, with the most significant being the inability to verify the competence and credentials of the handyman. There is a strong relationship between the challenges faced by users and various factors related to finding, communicating, and paying for handyman services, with the competence of the handyman being a significant concern for users regardless of the method used. These findings suggest that there is a need to address the issue of verifying the competence and credentials of handymen to improve customer satisfaction and service quality.

Research Question 4 aimed to explore the design of a mobile application for determining handyman services within a specific location. The study found that customers prioritize Location-based Service, Convenient scheduling, and Issue Submission via Image when selecting a handyman service. The open-ended survey responses revealed that users face challenges related to location that can result in higher transportation fees, delays, and inefficiencies.

A mobile application for determining handyman services within a specific location could be designed to address these concerns. The application could offer location-based services and verified information about handymen in the area, as well as facilitate convenient scheduling and issue submission via image. Overall, service design for the mobile application should prioritize offering convenient and efficient solutions to address the challenges faced by users when selecting and hiring a handyman service.

6.1 User Acceptance Test

Table 5 presents the results of User Acceptance Testing for the Handyman Mobile Application. It evaluated user satisfaction with previous experiences, ease of use, effectiveness, and overall performance. The mean satisfaction score for previous experiences was low at 1.3, while the overall satisfaction with the app was high at 5. Users found the app convenient for scheduling appointments (mean score 4.9) and helpful in addressing issues (mean score 4.9). The app effectively addressed users' challenges with a mean score of 5. The t-test indicated a significant difference between satisfaction with previous experiences and overall app performance, with a negative t-value of -38.789 and a p-value less than 2.2e-16. The 95% confidence interval for the difference in means was -3.8231 to -3.4436, indicating higher satisfaction with the app's performance compared to finding handyman services. These results highlight improved user satisfaction and the app's effectiveness in addressing user needs.

Table 5. User Acceptance Test Results

Variable	Min	Median	Mean	Max	Remarks
How satisfied have you been with your previous experiences in finding and acquiring handyman services?	1	1	1.3	2	Very Unsatisfied
How easy was it to search for handymen based on your location?	4	5	4.9	5	Very Easy
How satisfied were you with the convenience of scheduling appointments?	4	5	4.9	5	Very Satisfied
Did you find the process of submitting an issue through the Handyman mobile application helpful in addressing your issue with a handyman?	4	5	4.9	5	Very Helpful
Based on your experience using the Handyman mobile application, do you feel that it effectively addressed the challenges you faced before in acquiring a handyman service?	5	5	5	5	Extremely Effective
How satisfied were you with the overall performance of the Handyman mobile application?	4	5	5	5	Very Satisfied

7. Recommendation

This study presents opportunities for further research on the relationship between age groups and preferences for handyman services. The findings can be used to customize service offerings and marketing strategies in the mobile

application for different age groups. Additional research should explore homeowners' motivations and decision-making processes for outsourcing home repairs through methods like focus group discussions or interviews. To enhance the user experience, the mobile application can incorporate features like a rating and review system, in-app messaging for direct communication with service providers, and payment options that are widely used in the Philippines. Further research on pricing should consider market trends and cost factors to ensure competitiveness and profitability.

References

- Bennett, P., What to do After a Bad Handyman Service, Available: <https://www.angi.com/articles/getting-help-after-bad-handyman-service.htm>, Accessed on November 20, 2022.
- Chua, J., *Here's a list of handy home service providers whenever you need them*, Nolisoli, Available: <https://nolisoli.ph/57961/home-service-providers-jchua-zacosta-20190227/>, Accessed on October 5, 2022.
- Gikundi, D., *A Mobile application for locating the available handyman services within a locality*, Semantic Scholar, Available: <https://www.semanticscholar.org/paper/A-Mobile-application-for-locating-the-available-Gikundi/00e989fc7b3767bde018a6f9a064060c56e32470>, Accessed on November 6, 2022.
- Handyman Connection, *5 Ways to Find a Good Local Handyman*. *Handyman Connection*. Available: <https://handymanconnection.com/matthews/2019/05/5-ways-to-find-a-good-local-handyman/>, Accessed on November 6, 2022.
- Heavy.ai, *What are Location-Based Services? Definition and FAQs*. HEAVY.AI, Available: <https://www.heavy.ai/technical-glossary/location-based-services>, Accessed on December 1, 2022.
- Heitman, S., *8 Data-Backed Home Services Marketing Tips to Win More Jobs*. LocaliQ, <https://localiq.com/blog/data-backed-home-services-marketing-tips/>, Accessed on November 20, 2022.
- Invoca, *Invoca Buyer Experience Benchmark Report 2022*, Available: <https://experience.invoca.com/2022-invoca-buyer-experience-report/p/3>, Accessed on November 15, 2022.
- Jobber Academy, *Top 9 Handyman Websites and What They Get Right [Examples]*, Jobber Academy, Available: <https://academy.getjobber.com/handyman-websites-examples/>, Accessed on November 8, 2022.
- Jeffrey, K. (2018, October 11). *What does a handyman do?* Service.com.au. Available: November 17, 2022, from <https://www.service.com.au/articles/handyman/what-does-a-handyman-do>, Accessed on
- Jim the Handyman, *Tips for Choosing Best Handyman Service*. *Jim The Handyman*, Available: <https://www.jimthehandyman.com/tips-for-choosing-best-handyman-service/>, Accessed on November 6, 2022.
- Jobber, *Offer These 19 Handyman Services to Clients [Free Download]*, Jobber Academy, Available <https://academy.getjobber.com/handyman-services-list/>, Accessed on November 20, 2022.
- Khountham, A., *10 Signs of a Bad Contractor & Tips on Finding a Great One*, Fit Small Business, Available: <https://fitsmallbusiness.com/signs-you-hired-a-bad-contractor/>, Accessed on November 20, 2022.
- LocaliQ. (2021, September 7). *Exclusive Data: Home Services Marketing in 2021*. LocaliQ. Available: <https://localiq.com/resources/home-services-marketing-in-2021/>, Accessed on November 6, 2022.
- Meta Platforms, Inc., and Boston Consulting Group, Inc. (2022, October). *Business Messaging: The Quiet Channel Revolution Across Tech*. Facebook. Available: <https://www.facebook.com/business/news/business-messaging-report-APAC-BCG-Meta>, Accessed on November 6, 2022.
- Microsoft Philippines Communications Team. (2018, February 14). *Digital Transformation to Contribute US\$8 Billion to The Philippines GDP by 2021*. Microsoft News. Available: November 30, 2022, from <https://news.microsoft.com/en-ph/2018/02/14/digital-transformation-contribute-us8-billion-philippines-gdp-2021/>, Accessed on
- Mr. Butler Home Services, *Arawan vs. Pakywan: Which is the best for you?*, Mr. Butler Home Services Philippines, Available: <https://mrbutler.com.ph/uncategorized/by-the-hour-arawan-vs-by-the-job-pakyawan-which-pricing-method-is-the-best-for-you/>, Accessed on January 28, 2023.
- Muehlbauer, T., *How to Hire a Reliable, Responsible Handyman. No Ordinary Homestead*. Available: <https://www.noordinaryhomestead.com/how-to-hire-a-reliable-responsible-handyman/>, Accessed on November 5, 2022.
- Nafis, R. M., *Application for Booking Handyman Services Using Webhook and Google Event Calendar Technology*, <https://elibrary.unikom.ac.id/id/eprint/1535/14/>, Accessed on November 5, 2022.
- National Economic and Development Authority, *Updated Philippine Development Plan 2017- 2022 - Philippine Development Plan*. - Philippine Development Plan, Available: <https://pdp.neda.gov.ph/updated-pdp-2017-2022/>, Accessed on October 4, 2022.
- Nidirect, *Home maintenance and repairs*, NI Direct, Available: <https://www.nidirect.gov.uk/articles/home-maintenance-and-repairs>, Accessed on November 20, 2022.

- Orrico, J., *What Is a Handyman and What Are Handyman Services?* Punch List Pros, Available: <https://punchlistpros.com/what-is-a-handyman-and-what-are-handyman-services/>, Accessed on November 17, 2022.
- Philippines: Smartphone Users 2017-2026, *Statista*, Available: <https://www.statista.com/statistics/467186/forecast-of-smartphone-users-in-the-philippines/>, Accessed on October 24, 2022.
- Philippine Statistics Authority. (2017, August 10). *Family Income and Expenditure Survey (FIES)*. Philippine Statistics Authority. Available: <https://psa.gov.ph/family-income-and-expenditure-survey>, Accessed on Philippine Statistics Authority, *Housing and Living Conditions Survey*. Available: <https://psa.gov.ph/content/housing-and-living-conditions-survey-hiles-0>, Accessed on February 2, 2023.
- Rajendran, V., & Buczkowski, A., *Location Based Services: Expected Trends and Technological Advancements*. Geoawesomeness, Available: <https://geoawesomeness.com/expected-trends-technological-advancements-location-based-services/>, Accessed on December 1, 2022.
- Ray, O., McCoy, M., & Andersen, D., *35 Statistics Home Services Marketers Need to Know in 2023*, *Invoca*, Available: <https://www.invoca.com/blog/home-services-marketing-stats>, Accessed on October 26, 2022.
- Same Day Pros, *Professional Handyman Service, Local Handyman*, SameDayPros, Available: <https://www.samedaypros.com/handyman-service/>, Accessed on November 17, 2022.
- Saxena, P., *Statistics on the Multi-Billion On-Demand Mobile App Economy*, Appinventiv, Available: <https://appinventiv.com/blog/on-demand-mobile-app-economy-statistics/>, Accessed on October 5, 2022.
- Sherman, J., *What Can a Handyman Do in Just a Few Hours*, Puls Blog, Available: <https://blog.puls.com/handyman-hours-services>, Accessed on November 20, 2022.
- Shaw, N., 10 Stats That Prove The Value of Reviews For Ecommerce, CustomerThink, Available: <https://customerthink.com/10-stats-that-prove-the-value-of-reviews-for-ecommerce/>, Accessed on October 27, 2022.
- Sparks, V., *How to Find A Great Handyman For Your House Woes* | 21Oak, 21OAK, Available: <https://www.21oak.com/home-maintenance/how-to-find-a-handyman/>, Accessed on November 6, 2022.
- TheAsianParentPH, *The Benefits of Hiring a Handyman in the Philippines*, AsianParent, Available: <https://ph.theasianparent.com/the-benefits-of-hiring-handyman-in-the-philippines>, Accessed on February 3, 2023.
- United Field Services, *9 Warning Signs of Bad Contractors*, United Field Services, Available: <https://www.unitedffs.com/warning-signs-of-bad-contractors/>, Accessed on November 20, 2022.
- Vershelde, O., *What is service design?* EHL Insights, Available: <https://hospitalityinsights.ehl.edu/what-is-service-design>, Accessed on December 1, 2022.
- Walker, T. B., *What to Look for in a Good Handyman for Your Home*, Clare Courier, Available: <http://www.clarecourier.ie/what-to-look-for-in-a-good-handyman-for-your-home/>, Accessed on November 8, 2022.

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