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Analyzing Consumer Preferences for Mobile Car Washing Services: A Feasibility Study Focused on Bangalore

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ABSTRACT: This research assesses the viability of a mobile car wash and detailing business in India through an analysis of consumer demand, operational issues, and business viability.

A survey of 110 Bengaluru respondents offered insights into consumer behavior, pricing strategies, and pain points related to conventional car wash practices. The results show high demand for on-demand, environmentally friendly car wash services—particularly those with doorstep convenience and subscription options.

Prime challenges are regulatory barriers, logistical obstacles, and establishing consumer trust. From these findings, strategic suggestions are given to maximize the business model in terms of cost-effectiveness and service differentiation.

I. INTRODUCTION

India's fast-expanding urban environment and busy lifestyles have generated great demand for easy and eco-friendly car washing options. Traditional car wash shops usually struggle with operational inefficiencies, in-convenient locations, and excessive water use, rendering them unpopular among contemporary consumers.

Whereas mobile car services present an adaptable, on-demand option that provides good cleaning at the customer's convenience while encouraging environmentally friendly practices. Yet, entering the mobile service market is not without its own set of challenges—ranging from having to deal with regulatory compliance, managing logistics, and optimizing operational efficiency. This research aims to examine consumer attitudes and market trends in Bengaluru to ascertain if a mobile car washing and detailing business can be a sustainable, successful business model for India.

Research Objectives:

Main Objective:

Evaluate the viability of a mobile car washing and detailing business in India by examining consumer demand, operational limitations, and business sustainability as a whole to build an effective service model.

Secondary Objectives:

Analyze customer preferences, price models, and adoption trends within the car wash industry.

Find out major operating and regulatory impediments—e.g., permits, logistical difficulties, and following industry norms—to mobile services.

Provide suggestions for optimizing business models with attention to cost-effectiveness, convenience to customers, and service differentiation.



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II. LITERATURE REVIEW

Literature Review 1: Achieving an Eco-Friendly Management for Carwash Wastewater by Incorporating CWW Reuse Practices and Strategies.

The paper discusses how CWW reuse practices and strategies can be used to manage car wash wastewater in an environmentally friendly manner.

The work done by Dadebo et al, 2022 focuses on an analysis of the existing literature on carwash wastewater (CWW) management with particular focus on its environmental challenges and its treatment technologies.

Heavy metals, oil, grease, hydrocarbons, and surfactants are just a few of the many contaminants found in CWW that affect water bodies. Numerous contaminants that harm the environment are also present in CWW. The paper outlines the necessity of waste water treatment methods that is deemed fundamental, including coagulation membrane filtration, electrochemical oxidation, adsorption, and biological treatment procedures.

The study suggests that a multi-faceted approach, integrating advanced treatment techniques with public policy interventions, is crucial for achieving long-term sustainability in the car washing industry.

Literature Review 2: Evaluating the Impacts of Different Car Washing Systems on Carbon Footprint

In order to highlight the environmental impact of different car wash systems in Poland, Maciejewska and Reizer (2025) look at their carbon footprints (CF). Based on wastewater treatment, water use, and energy consumption, the study evaluates the carbon emissions of four different professional vehicle wash types: jet, rollover, tunnel, and hand washing.

Results show that the CF of car washes is greatly impacted by water heating and power use. Gas heating for hand washing produces the lowest emissions (0.88 kilogram CO₂ per vehicle), while electric heating for rollover systems produces the highest emissions (4.46 kg CO₂ per vehicle). Car washing services in Poland are estimated to produce between 373.5 and 709.4 Gg CO₂ yearly, or 0.13% to 0.26% of the nation's total emissions, according to the study.

The authors highlight how consumer behavior and technical improvements can reduce environmental effect by suggesting that switching to manual washing methods might cut sector-wide emissions in half.

The study promotes the use of low-carbon and energy-efficient alternatives by highlighting the significance of sustainable practices in the car wash sector. It reinforces the necessity for regular carbon footprint evaluations across related service industries and offers policymakers and industry stakeholders a useful foundation for creating environmentally friendly car wash programs.

Literature Review 3: Innovative Car Wash Wastewater Treatment and Reuse Through Nature- Based Solutions

The efficacy of Nature-Based Solutions (NbS) in cleaning and recycling wastewater from vehicle washes is investigated by Torrens et al. (2025). The project, which is being carried out at a pilot facility in Girona, Spain, assesses three systems: an Infiltration-Percolation (IP) filter, a Horizontal Flow Treatment Wetland (HFTW), and a Vertical Flow Treatment Wetland (VFTW). The goal is to ensure safe wastewater reuse while reducing the amount of potable water used.

The outcomes show how well VFTW and IP systems work to lower turbidity, COD, and microbiological pollutants including Legionella and E. coli. Up to 60% of the water can be recycled because the treated water satisfies Spanish reuse regulations. The HFTW efficiently eliminates organic materials, however its long-term effectiveness is constrained by operational issues including clogging.

The authors stress that NbS has the potential to be a sustainable and affordable substitute for traditional wastewater treatment techniques, especially in sectors that depend heavily on water use.

This study emphasizes scalable wastewater recycling techniques that support sustainability goals, making it extremely pertinent to environmentally friendly car wash services. According to the results, the car wash industry can increase productivity, lower operating expenses, and lessen its environmental effect by combining NbS with current treatment methods.



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Literature Review 4: A Scheme of Portable Car Washer for Energy Saving and Environmental Protection -Hang Zhang et.al (2019)

Due to the rapid advancement of socio-economic growth, cars are now considered as a prevalent and major means of transportation. Added to the driving, cars also require regular cleaning and servicing. However, daily life has its challenges, such as the car washing process being tedious, inefficient and expensive.

A solution is proposed in the paper, which claims that it is feasible to construct an automatic car wash cleaner based on electromechanical integration and micro-machine technologies that enhances productivity, minimizes expenses, and is hassle-free. The design combines the efficiency of a disc brush and high-pressure sprays to streamline the washing process of a vehicle. This not only maximizes the productivity of the wash, but minimizes the water usage, giving an effective and eco-friendly wash.

Additionally, the cleaning distance can also be controlled by the use of a retractable rod mechanism. The disc brush head can be replaced with ease. This design increases the functionality of the device by enabling it to meet the needs of different automotive surfaces that require cleaning. The design incorporates basic circuitry with physical buttons to simplify the function of washing cars in an orderly manner.

The car cleaner is much more energy efficient and environment friendly than the traditional car wash method.

Literature review 5: Opportunities and Challenges of Startups in India

Arora's (2024) analysis elaborates on the Indian environment for startups, highlighting the opportunities and challenges. Innovation as well as the creation of new jobs and enhanced diversity in the economy is spearheaded by Startups which are vital to fostering economic growth. The analysis emphasizes the impact of government initiatives such as Startup India and Standup India, which have made the entrepreneurial ecosystem more favorable with the provision of tax breaks, funding, and easing of regulations. Still, funding remains one of the greatest challenges for startups, as obtaining venture capital and angel investments is often extremely difficult. On top of that, the combination of regulatory compliance, competition for talent against larger firms, and opposition from well-established companies renders the chances of success for startups even more complex.

It also assesses the more entrepreneurial mindset that seems to be emerging in India as younger workers move towards self-employment rather than traditional corporate jobs. Like any other transformation, this one has its own obstacles like lack of proper infrastructure, red tapism, and unpredictable markets. To solve these issues, Arora (2024) suggests that step one would be to facilitate more interaction between both industry and academia as well as make financing more widely available. In the end, the success of India's *Ujwal*rechnung is dependent on its ability to solve these complex issues.

Literature review 6: Novel Integration of Geopolymer Pavers, Silva Cells, and Poplar Trees for In- Situ Treatment of Car-Wash Wastewater

Gupta et al. (2020) endorse a stepped, low-impact development (LID) technique for treating automobile wash wastewater. This encompasses a combination of geopolymer pavers, Silva Cells, and poplar trees. The study looks at the environmental hazards posed by untreated wastewater from auto washes usually laced with heavy metals, hydrocarbons, and cleaning chemicals that pollute water bodies.

This system combines permeable geopolymer pavers made with industrial waste that allow water infiltration and withstand urban loads. Silva Cells offer structural support to tree roots while allowing green stormwater control. Poplar trees aid in phytoremediation by taking up contaminants and thereby reducing the overall pollutant load. A real-world application examined this case study at an automobile washing facility in Punjab, India, demonstrating considerable reductions in total dissolved solids (TDS), stabilization of pH levels, and enhanced clarity of treated water.

This study reveals the potential of nature-based solutions in urban wastewater management and provides an affordable, scalable alternative to conventional wastewater treatment plants. The findings recommend further investigations on integrating green infrastructure into sustainable urban planning.



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III. RESEARCH GAPS

Despite new research on mobile service based and green car wash solutions, little is known so far about how feasible, well-accepted among customers, and challenging to run such mobile car wash and detail services are for India. Empirical studies with respect to impact of pricing structure, convenience level, and the concern for nature on consumer behaviors towards these services or products also remain limited so far.

In addition, while sustainability in mobile car washing has been defined in the context of fixed-site washing operations, little research has been done on wastewater disposal, compliance with the law, and efficiency of resource use of mobile units. Additional research is necessary to deal with scalable business models, cost feasibility, and customer loyalty models for mobile car wash services in peri-urban and urban settings.

IV. RESEARCH METHODOLOGY

A study utilizing a survey was undertaken to evaluate the practicality of a mobile car washing and detailing service. The aim was to investigate consumer demand, service preferences, pricing expectations, and levels of environmental consciousness.

A systematically designed data collection tool collected 110 responses from residents of Bengaluru in India. The survey consisted of both qualitative and quantitative inquiries, examining car washing practices, payment willingness, environmental issues, and factors influencing convenience.

The data underwent analysis to uncover significant trends, prospective challenges, and obstacles to consumer acceptance. The results will inform the development of the business model, pricing approach, and operational structure, thereby ensuring the service's feasibility.

Below is analysis of our data has led us to find a few things, which explains the feasibility of the proposed eco-friendly mobile car wash and detail services in a city like Bengaluru.

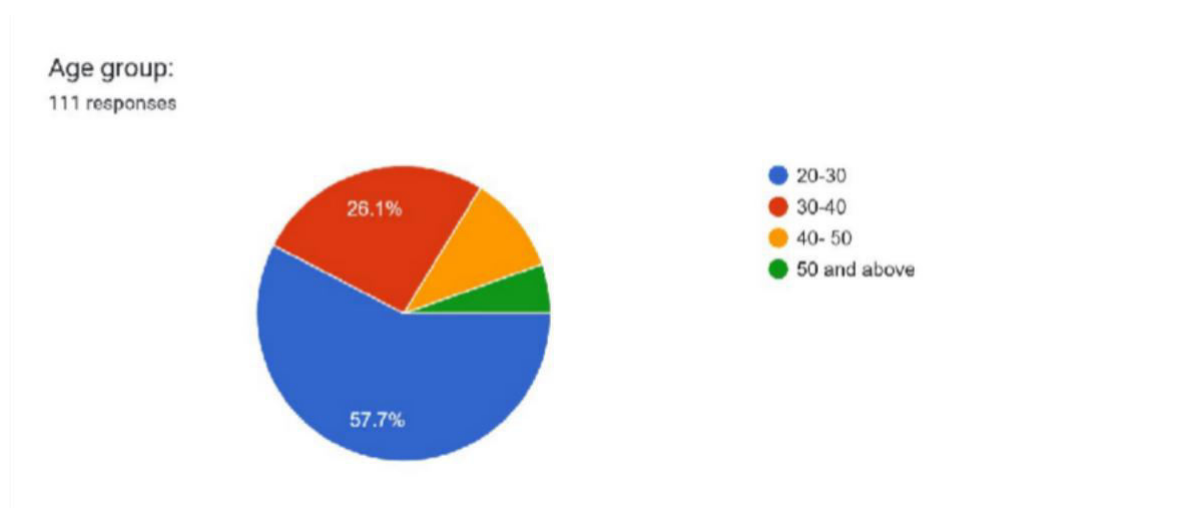


Chart1.1: Indicates the age group of the respondents to this form. Primarily most of the respondents are young adults between the ages of 20-30 years.



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Gender

111 responses

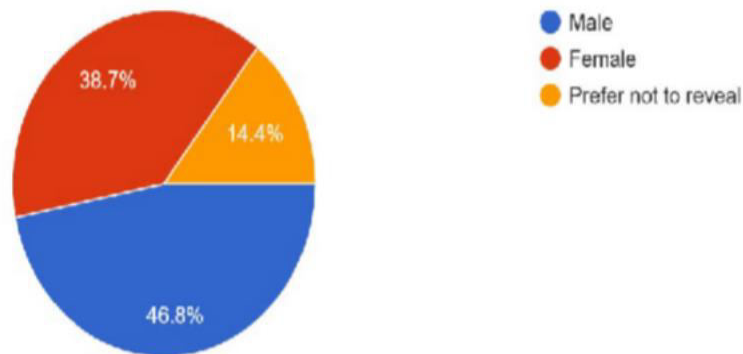


Chart1.2: Indicates that a majority of our respondents are males. While at a good number of female respondents for this form.

Location

111 responses

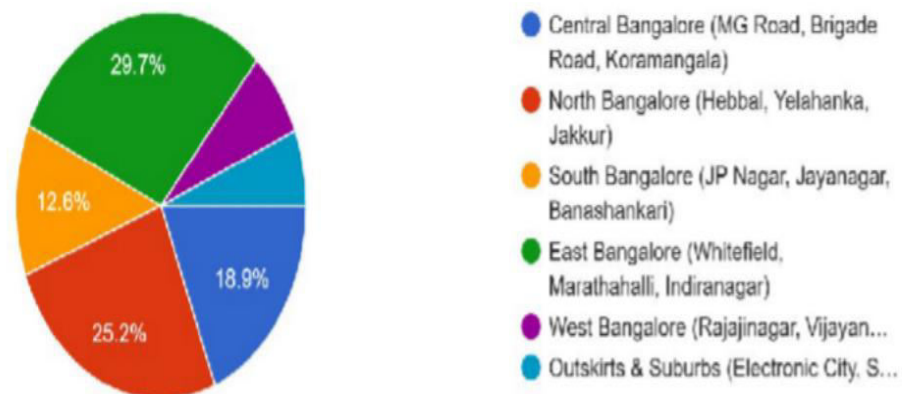


Chart1.3: Indicates the area of concentration of our respondents. Most of our respondents are from East Bengaluru. A close second is North Bengaluru. Both these areas have tech-parks and it is possible the respondents work there.



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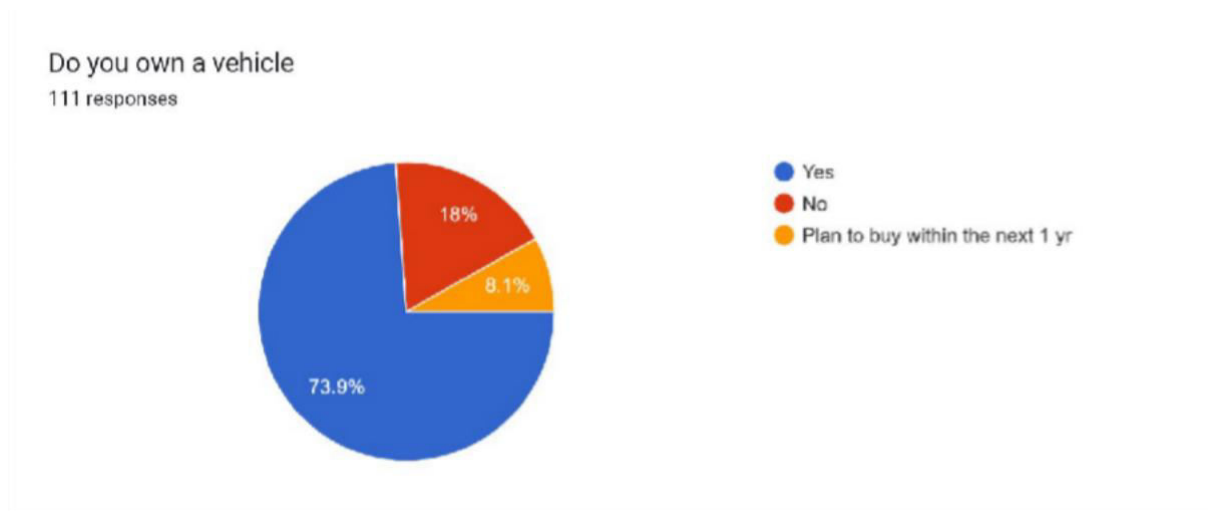


Chart1.4: Shows the percentage of respondents owning a vehicle and planning to purchase a vehicle soon.

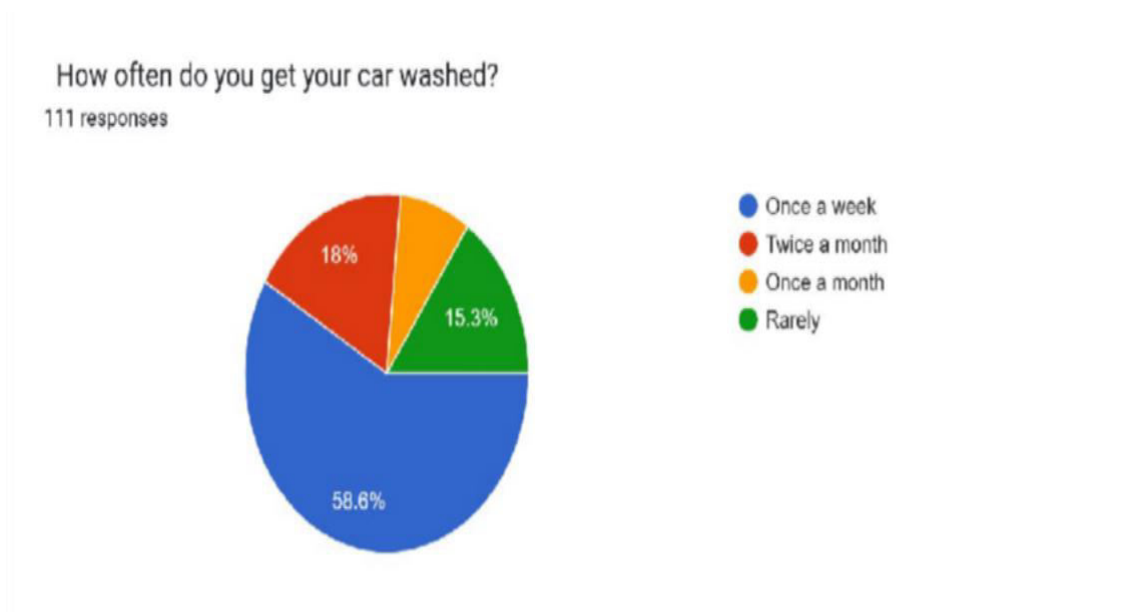


Chart1.5: This chart displays the percentage and frequency of respondents getting their cars washed.



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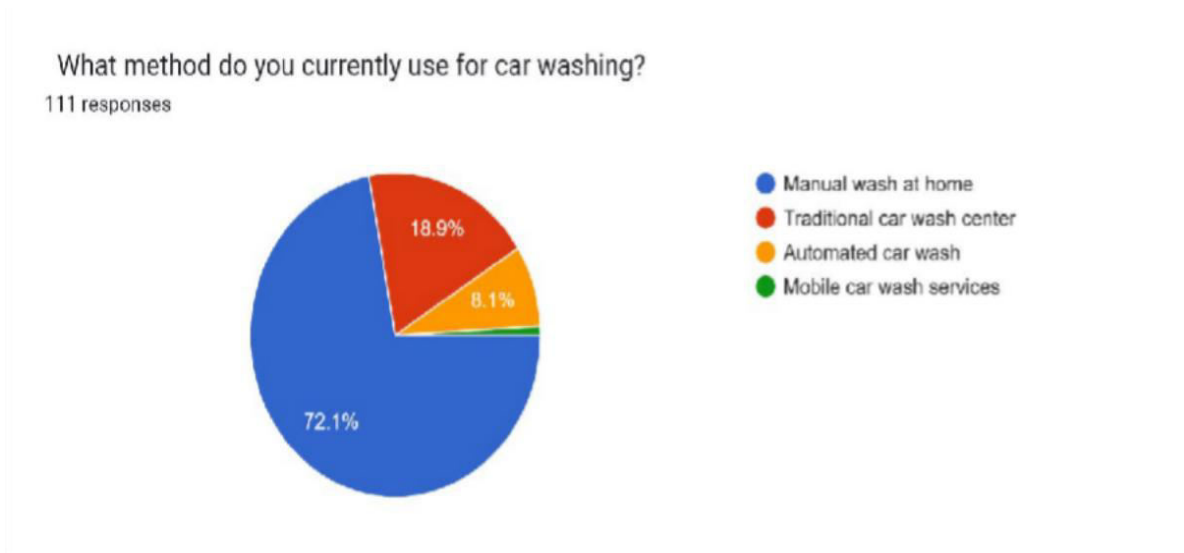


Chart1.6: The above chart describes the methods our respondents have used to get their cars cleaned. Most of them are manually getting their cars washed and less than thirty percentage of respondents have got their cars cleaned in either an

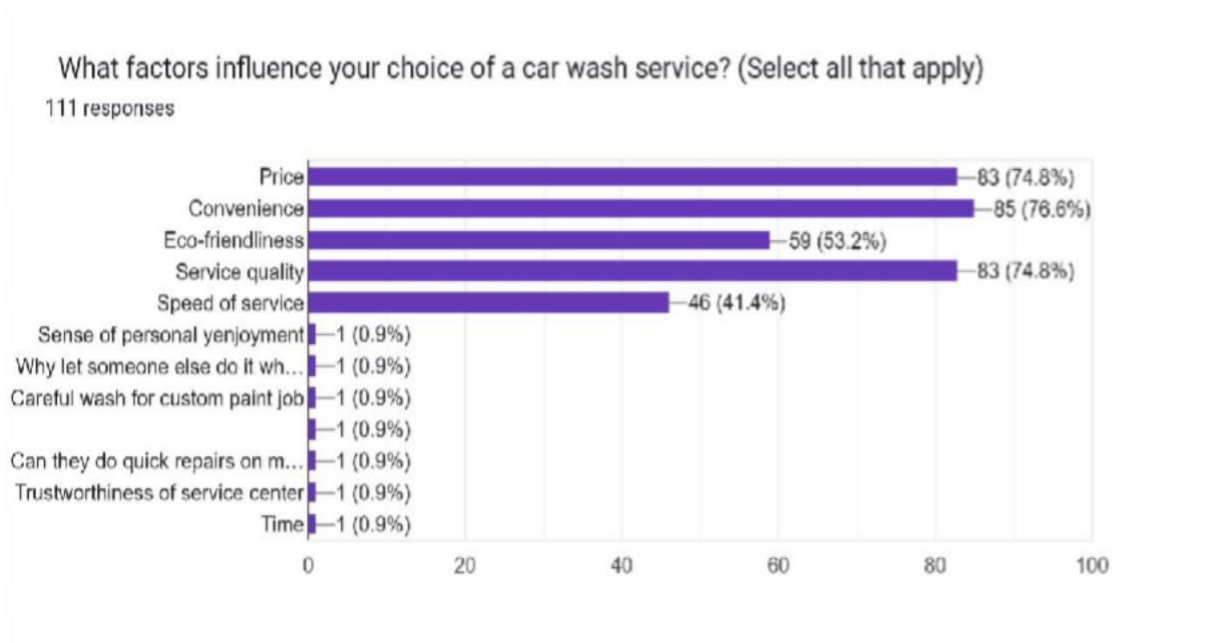


Chart 1.7: All the factors that would influence the choice of a car wash service and the biggest pain point/ factor is price and convenience. Eco-friendly services is not a huge priority.



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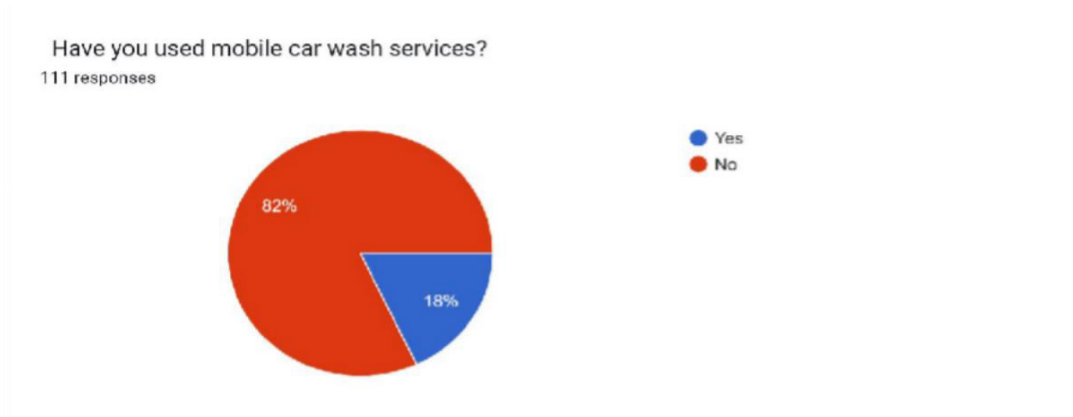


Chart 1.8: The above chart speaks about the percentage of respondents who have used mobile car wash services. Less than 20% of our respondents have utilized such services.

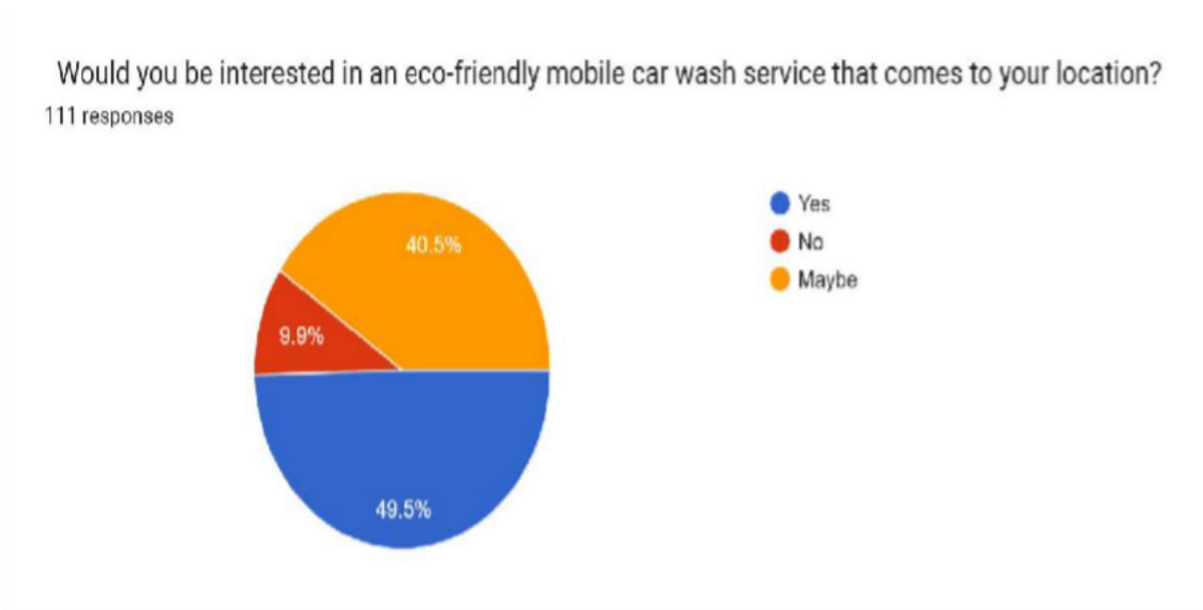


Chart 1.9: A greater majority of 49.5% are interested in eco-friendly car wash services that come to the location and clean the cars owned by the respondents. 40% is on the fence which is looking good as only 10% are not interested.



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How much extra would you be willing to pay for an eco-friendly car wash compared to a regular wash?

111 responses

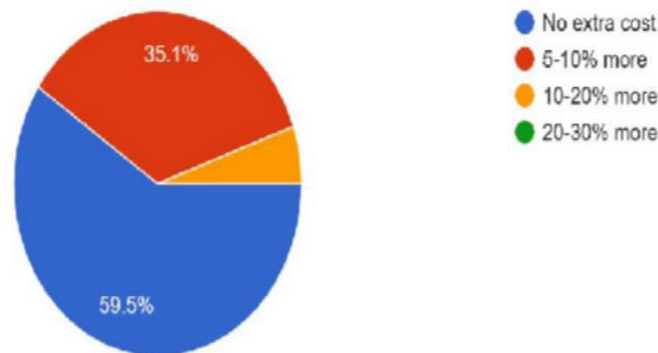


Chart1.10:59.5% of the respondents are not willing to pay any extra fares. The rest 35% are willing to pay 5-10% so this would require a basic and premium segmentation of consumers to harvest profits appropriately from the potential customers.

Would you subscribe to a monthly car wash plan (e.g., unlimited washes for a fixed fee)?

111 responses

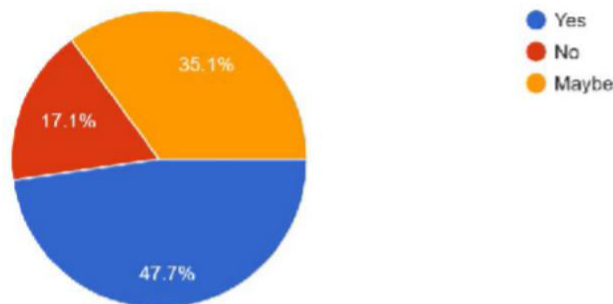


Chart 1.11: The car wash subscription is appreciated by 47.7% of the respondents and 35.1% seem to be neither for or against the idea of the subscription which means they can become potential customers with excellent service in the case of the set up of a business.



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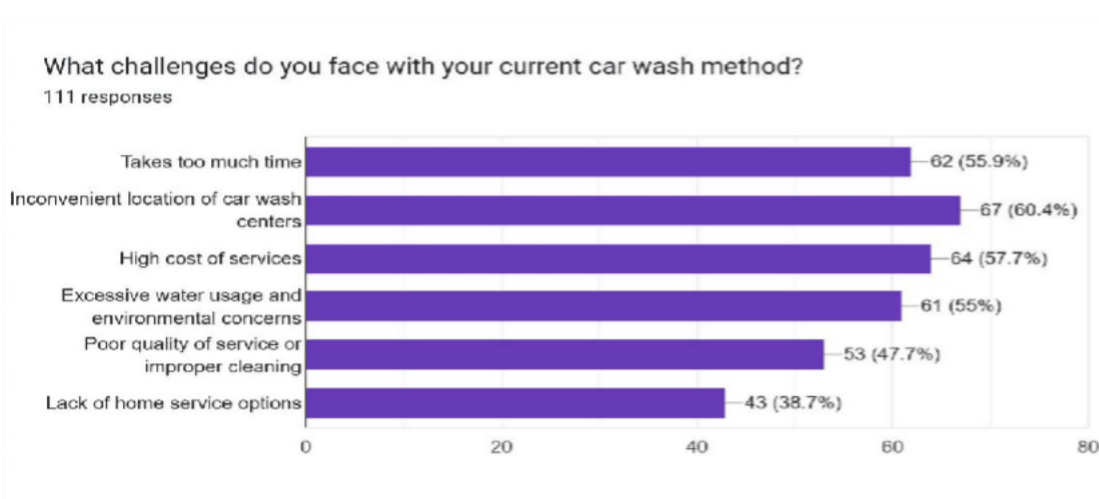


Chart 1.12: Challenges faced by respondents in current car-wash methods. Explains potential fields for profits and innovation in the car-washing field.

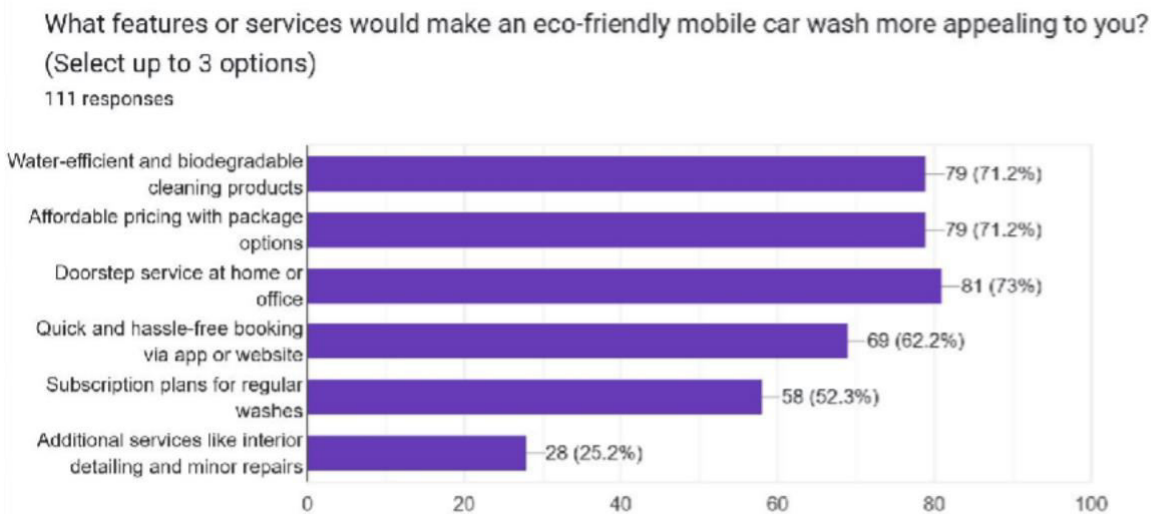


Chart 1.13: Potential solutions and what are customers looking for in such a service, gives us an insight as to what they desire and would potentially be willing to pay. Doorstep services is the main concerns here.

Key Findings:

Interest in Environmentally Friendly Options: There are some 5-20% of the respondents who would pay a premium for an environmentally friendly car wash. Both these arguments support the fundamental idea and/or confirm the existence of a target market for it.

Overall Considerations: Price, convenience, service quality, and execution speed are essential. Balance in service delivery are needed.

Mobile App: A clear interest in the car wash and mobile services justifying the requirement of the



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demand for the proposed model.

Added Value: Interior detailing and minor repairs represent better opportunities on the value chain addition and could prove a worthy strategy in the long run.

Consumer Interface Issues: These include time, location, cost, and environmental concerns that echo in the market. Ultimately, other services combined provides a direct answer to all of those.

Subscription Model Potential: Subscriptions are not the main motivation, however they ensure stability of revenue and could be investigated by various models.

With tech hubs in East and North Bangalore, high-density residential areas provide an ideal customer base for mobile car washing services.

Customer Pain Points: Current car wash methods are often inconvenient, time-consuming, expensive, and are not devised to be eco-friendly as such. The service directly addresses these.

Findings and recommendations:

Recommendations:

Business Model Refinement

Planned and tested pricing on different premium levels (basic, premium, eco-friendly) for various customer segments.

Provide subscription packages for users to maintain steady revenue.

Development of mobile application/website for easy booking and payment.

Sustainability Measures

Use biodegradable products and waterless or minimal-water washing practices. Work with local water recycling units for wastewater disposal.

Operational Strategy

Concentrate in heavily populated urban areas where demand is highest. Implement geostatistical service areas to optimize fuel and resource use.

Train staff to provide high-quality and efficacious services to enhance customer trust.

V. CONCLUSION

The literature and survey suggest high market potential for mobile car wash services in India, fueled by consumer preference for convenience and green solutions. The business model, however, needs to address regulatory compliance, logistical implementation, and consumer confidence. Suggestions are to create tiered pricing and subscription models, invest in a strong digital booking platform, and emphasize sustainable practices (e.g., biodegradable products). These measures will assist in maximizing operations, minimizing costs, and making the service stand out in a competitive market.

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