



## **A Comprehensive Study on Operational Excellence in the Evolving Car Wash Industry**

*<sup>1</sup>Anju S, <sup>2</sup>Sourav Saha, <sup>3</sup>Mithilesh VP, <sup>4</sup>Jayashakthivel P, <sup>5</sup>Aswini Preetha S, <sup>6</sup>Gopalakrishnan Chinnasamy, <sup>7</sup>Vinoth.S*

<sup>1,2,3,4,5</sup> MBA Student, Faculty of management studies [CMS BUSINESS SCHOOL], Jain deemed to be University, Bengaluru.

<sup>6,7</sup> Faculty of Management Studies (CMS Business School), Jain Deemed to be University, Bengaluru.

### ABSTRACT :

The car washing industry is undergoing increased competition as customers seek efficient, cost-effective, and eco-friendly services. This research aims to address these challenges by proposing an innovative solution, the Insta Car Wash model, which integrates cutting-edge technology and practices to provide an unparalleled car wash experience. The model prioritizes customer benefits, such as promo codes, gift cards, and competitive pricing on unlimited wash packages. The research methodology involves a convenient sampling method, analyzing data from 63 respondents through percentage analysis and presenting findings using pie charts. The analysis and interpretation highlight key trends in demographics and preferences, providing valuable insights for potential business strategies in the car washing industry. The conclusion emphasizes the time-saving and convenience aspects of the proposed model, targeting working professionals near shopping malls or offices.

Keywords: Car washing industry, Innovative solution, Insta Car Wash model, Customer benefits, Convenience

### INTRODUCTION :

In today's dynamic market, the car washing industry is witnessing a surge in competition as customers increasingly demand efficient, cost-effective, and eco-friendly services. Our research endeavours to revolutionize this industry by offering a ground-breaking solution that amalgamates discontinuous innovation and cutting-edge technology, setting us apart from the competition. At the heart of our approach lies a commitment to delivering an unparalleled car wash experience, ensuring a pristine shine inside and out, complemented by a suite of customer benefits including promo codes, gift cards, and unbeatable pricing on unlimited wash packages.

Driven by a mission to simplify our customers' lives, we prioritize friendly, swift, and exceptional automotive care services. Central to our ethos is the recognition of the value of our team members, as we offer opportunities for growth and a comprehensive benefits package. Moreover, we are deeply rooted in community engagement, forging partnerships with local non-profit organizations to give back to society.

With a relentless focus on value and quality, our solution aims to not just meet but exceed customer expectations, setting a new standard in the car washing industry. Recognizing the diverse segmentation within our customer base, spanning demographics, psychographics, and behavior, we tailor our services to cater to individual needs.

Our strategy is underpinned by a strategic decision to target consumers within shopping mall premises, tapping into the bustling foot traffic and capitalizing on their leisure time spent at these establishments. This strategic placement not only enhances customer convenience but also generates revenue for our mall partners. With Bangalore boasting a rapidly growing culture, our decision to concentrate on this segment underscores our commitment to tapping into a thriving and lucrative market.

Furthermore, as the number of automobiles on Indian roads continues to soar, the need for rapid, efficient, and eco-conscious car washing solutions becomes increasingly paramount. Our project not only addresses this pressing need but also aligns with the growing consumer inclination towards maintaining the aesthetic appeal of their vehicles while prioritizing environmental sustainability.

Drawing insights from the International Carwash Association's findings, which indicate a significant shift towards professional car washing services, we are poised to capitalize on this trend by offering tailored services to various customer segments. Whether it's regular car owners seeking convenience, luxury car enthusiasts craving specialized detailing, or commercial vehicle owners requiring regular maintenance, our comprehensive approach ensures that every customer's needs are met with precision and care.

In terms of revenue projections, while the sales potential of a car washing centre can vary based on numerous factors, including location and competition, our conservative estimates suggest a promising annual sales range of Rs. 10 Lakhs to Rs. 50 Lakhs. However, we remain cognizant of the dynamic nature of the market and are prepared to adapt our strategies accordingly to maximize profitability and sustainability.

---

### STATEMENT OF PROBLEM :

We recognize the increasing demand for professional car wash services and aim to capture market share by strategically locating our services in shopping mall parking lots. This approach not only maximizes convenience for customers but also generates revenue for partnering malls. Our research acknowledges the growing concerns regarding water pollution and wastewater management in car washing operations, emphasizing the need for advanced, environmentally friendly technologies. By understanding consumer preferences and industry dynamics, this research seeks to develop effective strategies for sustainable growth and profitability within the evolving car washing sector in India. Our objective is to provide customers with an outstanding car washing experience, including interior and exterior shine, complemented by additional benefits such as promo codes and gift cards. We strive to simplify customers' lives through prompt, friendly, and high-quality automotive care services while fostering employee development and community engagement.

---

### REVIEW OF LITERATURE :

Liu and Zhang (2021) explore various aspects of the control design, including programming logic, sensor integration, and feedback mechanisms to optimize the performance of the car washing machine. The study contributes to the advancement of car washing technology by introducing intelligent automation solutions that enhance efficiency and reliability in car washing operations. Chen, Wang, and Ni (2013) provide valuable insights into the feasibility and effectiveness of utilizing electric cars as part of public transportation solutions. This study contributes to the existing literature on sustainable transportation practices, offering valuable considerations for policymakers, urban planners, and transportation stakeholders aiming to reduce carbon emissions and promote environmentally friendly mobility options. Lalluwadia, Bhatia, and Rana (2017) provide insights into the design and functionality of modern car washing systems, with implications for enhancing efficiency and convenience in automotive maintenance. This study contributes to the field of automation and automotive engineering, offering practical solutions for streamlining car washing processes. Pinjari, Hadpad, Sukale, Mulgoankar, and Aswar (2020) provide insights into the design, functionality, and potential benefits of microcontroller-based car washing systems, offering valuable considerations for improving efficiency and convenience in automotive maintenance. Trovao (2022) sheds light on key technological innovations, such as autonomous driving systems, connectivity solutions, and electrification, driving transformation within the automotive industry. The author discusses the implications of these developments on vehicle performance, safety, and user experience, highlighting the need for continued research and collaboration in automotive electronics. This review serves as a valuable resource for researchers, practitioners, and industry stakeholders seeking to understand and navigate the dynamic landscape of automotive electronics. Monye, Afolalu, and Lawal (2023) shed light on issues such as technological limitations, infrastructure deficiencies, market dynamics, and regulatory challenges. This study contributes to a deeper understanding of the unique challenges faced by the automotive industry in the developing world. R.V., Varghese, and V.V. (2018) present a study on the design and fabrication of an automatic trash removal machine for use in automobile service stations. The study contributes to enhancing efficiency and cleanliness in automotive service operations, with implications for service station managers, technicians, and researchers interested in improving service quality and customer satisfaction in the automotive industry.

---

### RESEARCH GAP :

Among the numerous studies investigating various aspects of car washing technology, sustainable transportation practices, automotive engineering, and advancements in automotive electronics, a significant research gap emerges regarding the integration of these disparate elements into a holistic approach to eco-friendly, efficient, and technologically advanced car washing systems. While separate studies focus on specific topics such as control design, electric vehicle integration, current car washing systems, and microcontroller-based solutions, there is a dearth of comprehensive research that combines these advancements into a coherent framework. In particular, there is a lack of literature on the intersection of intelligent automation, sustainable mobility, and technological improvements in automotive electronics in the context of vehicle washing operations. Understanding the synergies and potential trade-offs across these domains could lead to the development of integrated solutions that improve efficiency, reduce environmental impact, and improve user experience in car wash facilities. Such research would help policymakers, industry stakeholders, and researchers design and deploy next-generation car washing systems that are aligned with changing consumer desires and sustainability goals.

---

### OBJECTIVE OF THE STUDY :

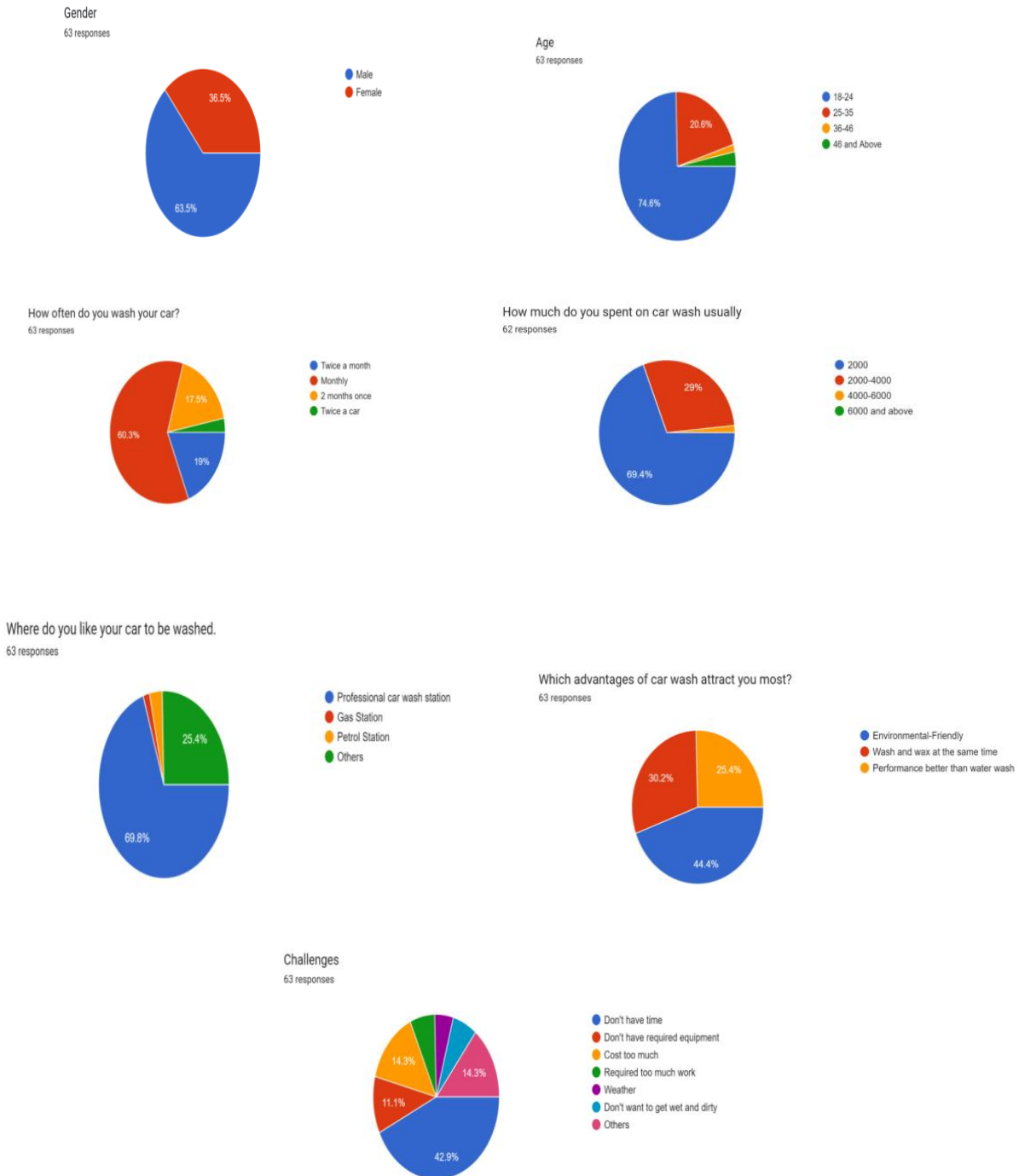
- Study the viability of incorporating automation, sustainable transportation methods, and automotive electronics improvements to improve car wash efficiency while lowering environmental effect.
- Identify the synergies and trade-offs between automation, sustainable mobility, and automotive electronics to create best practices for next-generation vehicle washing systems.

**RESEARCH METHODOLOGY :**

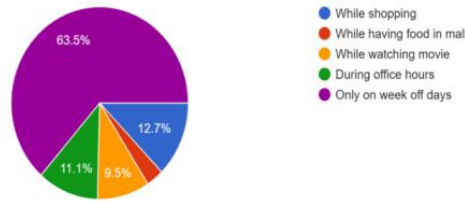
The research employed a convenient sampling method to gather insights from 63 respondents regarding their preferences and habits related to car washing. The structured questionnaire have been circulated to collect the required data. The Bengaluru city is the study area where there are lots of shopping malls located in it. The data was analyzed using percentage analysis, and the findings are presented through pie charts. There are some limitations such as the data have been collected with only small number of peoples using non-probability sampling may leads to bias. Still, the due care have been taken to reduce any biases in the outcome of the study.

**ANALYSIS AND INTERPRETATION :**

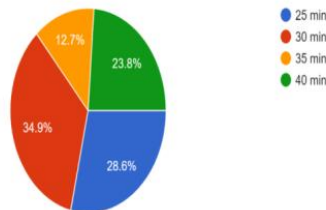
The below are the outcome of the responses collected from the respondents and it has been represented through pie chart with a detailed interpretation.



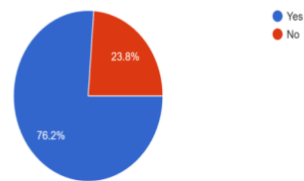
When do you like your car to be washed?  
63 responses



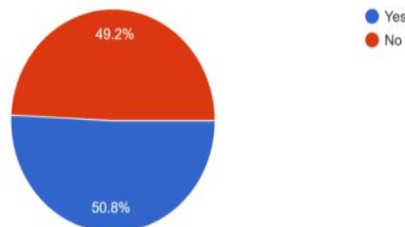
Time limitations for car washing  
63 responses



Would you be interested in an on-demand mobile car wash  
63 responses



Would you be interested in monthly subscription payment car wash  
63 responses



The results indicate notable trends in the respondents' demographics and preferences. Firstly, 63.5% of the respondents identified as male, suggesting a higher interest in the car washing concept among males than females. In terms of age distribution, 74.6% fell within the 18-24 age range, indicating a predominant interest in the car washing concept among younger individuals. Monthly car washing frequency was explored, with 60.3% of respondents expressing a preference for washing their cars on a monthly basis. Financial preferences were also assessed, revealing that 69.4% of respondents were willing to spend 2000 bucks for car washing. Additionally, 69.8% preferred professional car wash stations, emphasizing a preference for expert services. Environmental considerations played a role, as 44.4% of respondents appreciated the environmental-friendly advantage of car washing. Further insights include unwillingness among 42.9% of respondents to get wet and dirty while washing their cars. Weekend car washing was favored by 63.5% of respondents, while 34.9% desired a time limit of 30 minutes for car washing. The interest in on-demand car wash services was notably high, with 76.2% expressing interest. Lastly, 50.8% of respondents were inclined towards monthly subscription payment plans for car wash services. These findings provide valuable insights into customer preferences, informing potential business strategies and service offerings in the car washing industry.

## CONCLUSION :

The idea of starting an automobile washing Service Company comes into picture. This completely focuses on the working professionals to reduce their burden on some aspects without taking or giving extra hours. So, we have come up with an idea for the working professionals to loosen their burden on some aspects without taking extra hours other than the time they spend at shopping malls. For this we require an immovable plot near the parking area with proper waste water treatment and a spacious place. The main objective is to save time of the working professionals so that while spending their

leisure time they can use it as a useful time. This provides people a good time at their shopping, watching movies, purchasing households or stationeries etc. the fact people can enjoy is time value where many families want to spent their time with family and need to wash their automobile and taking it over to service centers where it can take 1 day, where we ask for pickup and drop but coming to our services it's not required. The benefits of the in-bay/roll-over automatic vehicle wash services include simpler customer interaction, spontaneous purchasing, and the flexibility to fit into more compact spaces. Additionally, the growing trend of convenience shops adopting tunnel wash systems suggests a fresh prospective market opportunity. Additionally, a significant portion of customers are drawn to effective vehicle cleaning services because of their emphasis on environmentally friendly tactics. Additionally, the industry's growing number of vehicle dealerships has encouraged the construction of automatic wash facilities on its grounds. To improve their Customer Satisfaction Index (CSI) numbers, auto dealerships install automatic car washes, with in-bay washes being the most preferred option among customers. The demand for in-bay/roll-over automated vehicle wash services increases as a result. So, the driving person or family won't be bored. The targeted place to setup is near malls or near offices, it helps them to work fast. We get serviced all segment of car. To start the business we require equipment cost, licensing cost and permit, expenses, chemicals, rents and website designing .The marketing plan is to make consumer time and money valuable, we will make our outlets near malls and offices or in parking lot so that they can come and give the car for services and go, by not affecting their leisure time and work their car will get serviced as well as washed. According to the Financial Analysis in the data and calculations we can say we need 2 years to recover all investments and start gaining the profit amount, So, first two years we will be under loss. And as our total investment is around 50 Lakhs we need just two years to recover as our expenses are low. And we are using proper strategies to sell our product by attracting consumers.

#### REFERENCES :

1. Liu, S., & Zhang, L. (2021). Control Design of Automatic Intelligent Car Washing Machine Based on PLC. Proceedings of the 2021 10th International Conference on Applied Science, Engineering and Technology (ICASET 2021).
2. Chen, J. M., Wang, L. X., & Ni, Y. L. (2013).The Research of Public Rental System with Electric Car.Advanced Materials Research, 834-836, 1659-1662. DOI: 10.4028/www.scientific.net/AMR.834-836.1659
3. Lalluwadia, Z., Bhatia, N., &Rana, J. (2017).Automatic car washing system using PLC.International Journal of Innovative Research in Technology, 3(9), 40. ISSN: 2349-6002. IJIRT 144239.
4. Suroso, A. I. (2021). The Objective Conditions of the Competency of Labor Social Security Practitioners in Facing Future Jobs. GATR Journal of Business and Economics Review (GATR-JBER), 5(4), Jan-Mar. 2021.
5. Pinjari, T. S., Hadpad, M., Sukale, D., Mulgoankar, D., &Aswar, P. (2020).Automatic car washing system using microcontroller.International Research Journal of Engineering and Technology (IRJET), 7\*(6)\*, 2711.e-ISSN: 2395-0056. p-ISSN: 2395-0072.
6. Trovao, J. P. F. (2022). The Vehicle Industry Is Moving Fast [Automotive Electronics]. IEEE Vehicular Technology Magazine, 17(1), 98-107. DOI: 10.1109/MVT.2021.3130399
7. Kaur, A. (2020). An Analysis of the Performance of Automobile Industry in India. Asian Journal of Applied Science and Technology (AJAST), 4(2), 82-90.
8. Monye, S. I., Afolalu, A. S., &Lawal, L. S. (2023). Now and Future Challenges of the Automobile Industry in the Developing World. E3S Web of Conferences, 430. DOI: 10.1051/e3sconf/202343001221
9. Miglani, S. (2019). The Growth of the Indian Automobile Industry: Analysis of the Roles of Government Policy and Other Enabling Factors. In ARCIALA Series on Intellectual Assets and Law in Asia.
10. Menaka, R., &Ashath, K. (2016).A study on emerging trends in Indian automobile industry and its customer satisfaction.Shanlax International Journal of Commerce, 4(1), 88. ISSN: 2320-4168.
11. Zhao, T. S., &Pattanayanon, S. P. (2021). Customer value and customer brand engagement: Their effects on brand loyalty in automobile business. Innovative Marketing.
12. G., Manoj, L., Jeneffa, & K., Çapraz. (2022). Impact of Green HRM on Work-Life Balance of Employees in Automobile Industry: An Empirical Investigation. Quality - Access to Success.
13. Nwakanma, C. I., Ahakonye, L. A. C., & Kim, D. S. (2023). Explainable Artificial Intelligence (XAI) for Intrusion Detection and Mitigation in Intelligent Connected Vehicles: A Review. Applied Sciences (Switzerland).
14. R.V., Ravi, J. S. Varghese, and V. V., Adarsh. (2018). Design and Fabrication of Automatic Trash Removal Machine Using In Automobile Service Stations. International Research Journal of Automotive Technology.