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An Analysis of Passenger Experience with PMPML Services in Pune

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ABSTRACT:

The study focuses on the variables that affect passengers' decisions to utilize PMPML services, assesses customer satisfaction, looks into the significance of environmental elements, and offers suggestions for enhancing public transportation in Pune. The study uses a variety of research instruments and methods, such as ANOVA, hypothesis testing, and the analysis of survey data. Among the most important findings are insights into passenger demographics, travel objectives, and frequency. The need of increasing accessibility and the allure of local and metro transportation are also emphasized in the report. It also displays the distribution of upkeep and cleanliness scores, highlighting areas that require attention. ANOVA analysis reveals significant differences in group passenger satisfaction. The fact that the null hypothesis was rejected indicates that there is a connection between a number of variables and passenger satisfaction. This study establishes the foundation for enhancing PMPML services in Pune and contributes to a better understanding of passenger preferences. In addition to evaluating passenger's overall happiness, this study looks at the factors that influence passenger's decisions to use Pune Mahanagar Parivahan Mahamandal Limited (PMPML) services. Significant variations in group passenger satisfaction are revealed by the influence of ambient factors on passenger's deANOVA analysis. The fact that the null hypothesis was disproved suggests that a variety of factors and passenger pleasure are related. This study helps to a better knowledge of passenger preferences and lays the groundwork for improving PMPML services in Pune.Also investigated are decisions to employ PMPML services. The study employs a range of research methodologies, including statistical testing, data analysis using tools like advanced MS-Excel and IBM SPSS Statistics 23, and data collection using questionnaires at many Pimpri-Chinchwad bus stations. The study provides information on demographics, trip frequency, preferred PMPML alternatives, accessibility, cleanliness, and maintenance standards. The investigation indicates that there is space for improvement with regard to cleanliness, accessibility, and passenger happiness. It also shows glaring differences in passenger satisfaction scores, underscoring the need to enhance PMPML services in order to provide commuters with a better experience.

Keywords: Pune Mananagar Parivahan Mahamandal Limited (PMPML), satisfaction, commuters.

Introduction:

Public transportation is a lifeline for millions of people worldwide and is a crucial component of urban infrastructure. Pune Mahanagar Parivahan Mahamandal Limited (PMPML) is a vital entity in the provision of affordable and easily accessible public transportation services in fast developing urban areas such as Pune, India, where environmental issues and traffic congestion are mounting. Understanding the consumer behavior of PMPML service customers is critically important for the sustainable development of urban transportation networks.Consumer behavior in the context of public transportation refers to a wide range of factors that influence people's choices and behaviors. These characteristics include, but are not limited to, socioeconomic status, comfort, cost, accessibility, service quality, and overall enjoyment. Customer behavior analysis regarding PMPML can provide valuable insights into the advantages and disadvantages of the current public transportation system, identify opportunities for improvement, and direct policy decisions that would raise the standard and efficacy of public transportation in Pune.

This analytical study aims to investigate the many aspects of customer behavior related to PMPML. It seeks to address significant questions such as: What are the demographic attributes of PMPML passengers? How do they choose between using other modes of transportation and PMPML services? What special concerns and preferences do the passengers have, and how satisfied are they with the quality of PMPML services as it stands right now? We seek to increase our understanding of the elements that affect how Punekar use public transit by providing answers to these questions.

The study employs a mixed-methods approach, combining quantitative data collection through structured surveys with qualitative insights gathered from focus group discussions and interviews with PMPML passengers. This holistic approach allows for a comprehensive analysis of consumer behavior, taking into account both the statistical trends and the narratives of the passengers themselves.

The study's conclusions will be a priceless resource for Pune's urban planners, legislators, and PMPML representatives. By better meeting the needs and preferences of the people who utilize the public transit system, we may work to create a transportation network that is more efficient, user-friendly, and sustainable. Our research ultimately intends to contribute to the larger goals of improving Pune residents' overall standard of living, reducing traffic congestion, boosting urban mobility, and mitigating environmental concerns.

Review of Literature:

Litman, (2020). Research conducted in similar urban settings has highlighted the influence of demographics on public transportation usage. Age, income, education level, and occupation are key determinants. Younger individuals, students, and those with lower incomes are often more reliant on public transit. Understanding the demographic profiles of PMPML passengers will help tailor services to specific user groups

Cervero & Kockelman, (1997).Accessibility and Connectivity: Studies have consistently emphasized the importance of accessibility and connectivity in attracting passengers to public transportation. Research specific to PMPML may examine how well the transit system is integrated into the broader transportation network, and how factors like the proximity of bus stops to residential areas and workplaces affect ridership

(Preston, 2012). Pricing strategies and affordability have a significant impact on consumer behavior. Research may explore the relationship between PMPML fares, income levels, and ridership. Additionally, examining the effects of fare subsidies or discounts on ridership can provide valuable insights

(Hensher et al., 2003). Passenger satisfaction is a critical determinant of public transit usage. Studies have shown that factors such as reliability, punctuality, cleanliness, safety, and the behavior of staff significantly influence passenger satisfaction. Analyzing PMPML's performance in these areas and identifying areas for improvement is essential

(Gatersleben & Uzzell, 2007). Growing environmental concerns have led to an increased interest in sustainable transportation options. Public transportation is often considered more environmentally friendly than private vehicles. Research may explore the extent to which environmental considerations impact passenger choices when using PMPML services

(Shaheen et al., 2017). Public transit often competes with other modes of transportation, such as private cars, two-wheelers, and ridesharing services. Understanding the factors that influence individuals to choose PMPML over alternative modes of transport can inform strategies for increasing ridership

(Cats et al., 2019). The integration of technology, such as mobile apps for ticketing and real-time transit information, can enhance the attractiveness of public transportation. Research may investigate the role of technology in improving the passenger experience and increasing ridership

(Banister, 2008). Policy and Planning: Urban policies, transportation planning, and funding play a pivotal role in the development and maintenance of public transit systems. Evaluating the alignment of PMPML's policies with passenger needs and urban development goals can provide insights into the system's effectiveness

By reviewing and synthesizing existing literature on these topics within the context of PMPML, this study aims to contribute to a deeper understanding of consumer behavior towards public transportation in Pune, India. The findings and recommendations resulting from this research will be valuable for PMPML authorities, urban planners, and policymakers seeking to enhance the efficiency and attractiveness of public transportation services in the city.

Objective:

1) To determine and examine the elements that affect passengers' decisions about the use of PMPML services.

2) To assess the general satisfaction of PMPML customers.

3) To examine how environmental factors affect travellers' decisions to use PMPML service.

3) Make suggestions that can be put into practice to enhance Pune's public transportation system.

Research Methodology:

Research methodology is a systematic and structured approach that outlines the processes, techniques, and principles used in conducting research. It provides a framework for researchers to design, carry out, and analyze their studies effectively. Research methodology typically.

Types of research:

An analytical study of the Pune Mahanagar Parivahan Mahamandal Limited (PMPML) could encompass various types of research depending on its specific objectives and methodologies

Tools and Techniques used in Study

Platforms used for information gathering: Google

Tools: IBM SPSS Statistics 23, Advance MS-Excel

Hypothesis:

H0: There is no association between satisfaction of passengers travelling by PMPML

H1: There is association between satisfaction of passengers travelling by PMPML

Techniques:

Descriptive Analytics: Descriptive Data Analysis is used.

- Data Visualization using various graphs like Bar Graph, Pie Chart.
- Quantitative and Primary Data used for proper analysis purpose.
- Data is collected from survey conducted at various bus stop in pimpri-chinchawad.
- Data primarily comprises numerical values, such as percentages representing the satisfaction levels of male and female bus commuters and their preferences for alternatives.
- Sampling Techniques: Simple Random Sampling from Probability Sampling method is used.
- **Simple Random Sampling -** Random respondents were chosen from the population, making it the most suitable approach for the study's objectives.

Descriptive research is a type of research design that focuses on describing and documenting the characteristics, features, behaviors, or attributes of a particular subject or phenomenon without manipulating or intervening in it. In descriptive research, the primary objective is to provide a detailed and comprehensive account of what is observed or measured, often answering questions such as "what," "who," "where," and "how."

Descriptive research involves the systematic collection of data through various methods such as surveys, interviews, observations, questionnaires, or content analysis.

Data Analysis & Interpretation-

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.761	.759	11

Case Processing Summary

		N	%
Cases	Valid	52	100.0
	Excluded[a]	0	.0
	Total	52	100.0

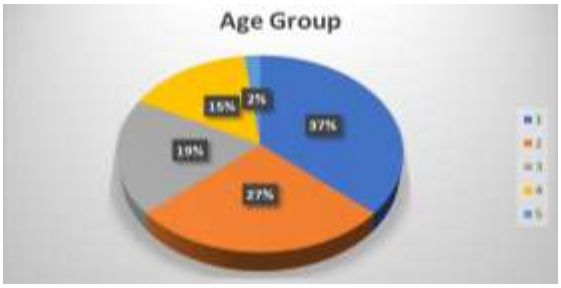
a. Listwise deletion based on all variables in the procedure.

Interpretation: From the above table, A Cronbach Alpha value of 0.761 suggests a moderate level of internal consistency among the items in the survey. The items are related to each other to a reasonable extent. Here Alpha is equal to 0.761which is greater than0.7.

Item Statistics

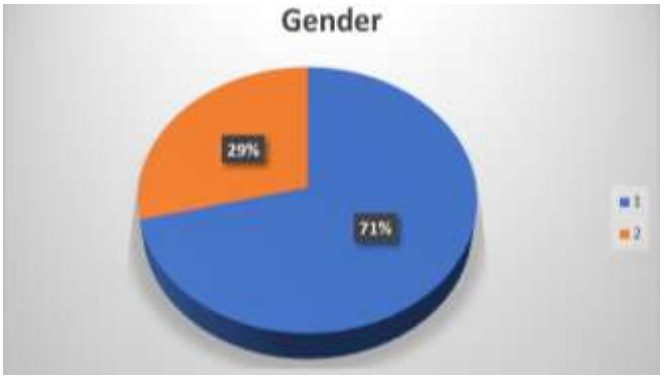
	Mean	Std. Deviation	N
Age	2.19	1.155	52
Q2. How often do you travel through PMPML?	2.44	1.074	52
Q3. For what purpose are you travelling for ?	2.33	.734	52
Q4. Boarding Point ?	3.42	1.016	52
Q6. Travelling time ?	3.13	1.314	52
Q9. Overall Experience ?	3.19	.864	52
Q11. How do you puchase tickets for PMPML servies?	2.02	1.038	52
Q12. How satisfied are you with the punctuality of PMPML buses?	3.35	.837	52
Q13. Rate the cleanliness & maintenance of PMPML buses?	2.77	.783	52
Q14. Are you satisfied with the information provided at bus stops & inside buses?	2.27	.689	52
Q15. How would you rate the accessibility fo PMPML buses for people with disabilities or special needs or women ?	3.83	.857	52

Interpretation: From the above table, Item Statistics mean is 2.82, standard deviation is 0.942 and size of sample is 52.



	Age Group
1	15-25
2	25-35
3	35-45
4	45-55
5	55+

Interpretation: From the above figure, Researcher found from the pie chart segment representing the age group 15-25 at 37% and 25-35 at 27% indicates that approximately two-third of the sample falls within this specific age range.



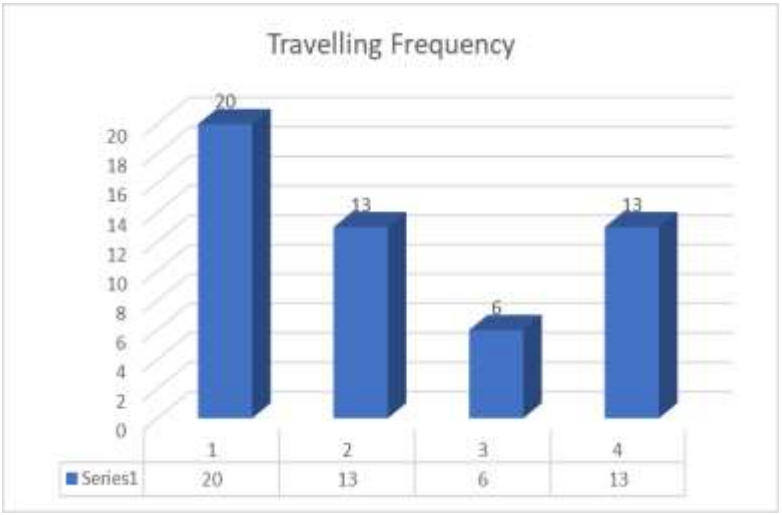
	Gender
1	Male
2	Female

Interpretation:

From the above figure, It is observed that 71% male and 29% female commuters were travelling in PMPML buses. In bus comparatively female travel more than men because then have given some special concessions like seats reserved for female in bus as well as Maharashtra government give female 50% discount on tickets.

	Purpose of Travel
1	Work
2	School / College
3	Other

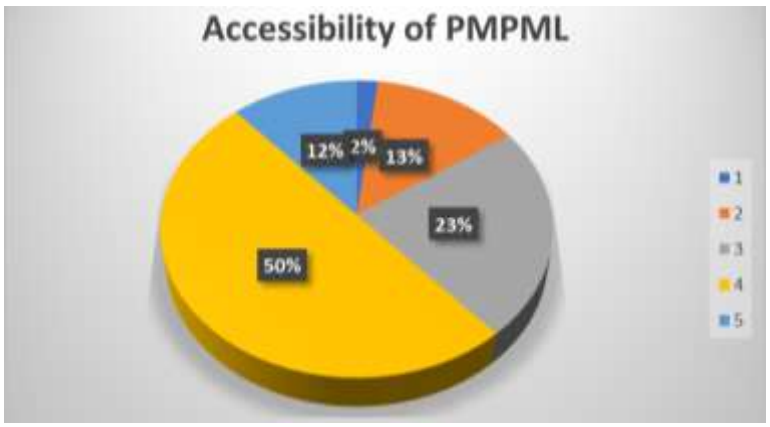
Interpretation: From the above figure, In the surveyed population, 29% of individuals engage in work-related travel, 36% commute for educational purposes, while the remaining 35% travel for various other reasons or activities, reflecting a diverse range of travel motivations and destinations.



Interpretation: From the above figure, out of a total of 52 individuals, 20 people engage in daily travel, 13 make weekly journeys, 6 opt for monthly trips, while the remaining 13 individuals travel on a rarely occurring basis. This distribution highlights a varied frequency of travel among the surveyed population.

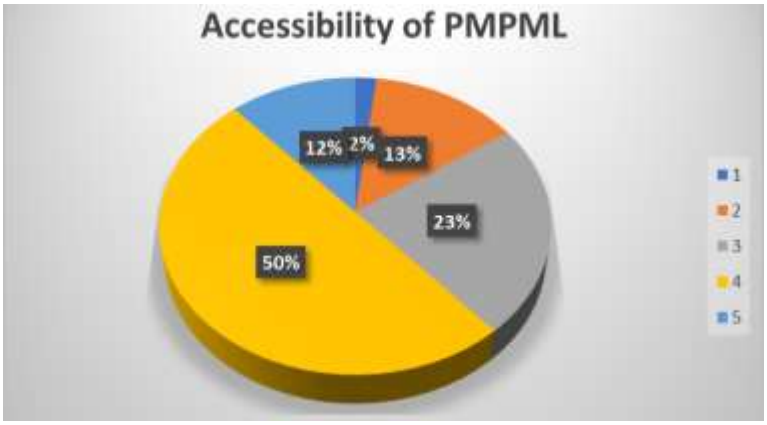
	Alternatives
1	Auto
2	CAB
3	Local
4	Metro

Interpretation: From the above figure, The distribution percentages suggest that the most preferred mode of transportation is metro (40%), followed by local transport (30%). Cabs are chosen by 20% of commuters, while only 10% opt for private vehicles (auto), highlighting the significant popularity of mass transit options like the metro and local services.

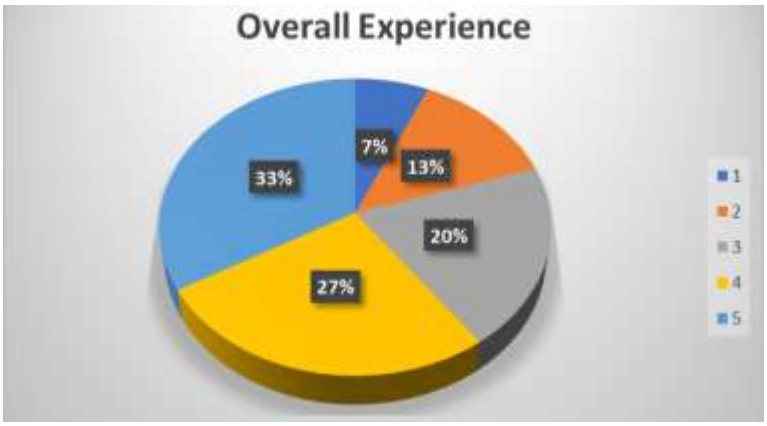


Interpretation: From the above figure, The accessibility ratings reveal that a majority of the area (62%) is either neutral or accessible, indicating reasonable ease of access. However, a significant portion (25%) falls under the highly accessible category, while a smaller proportion (15%) is classified as either inaccessible or moderately inaccessible, indicating room for improvement in enhancing overall accessibility.

Interpretation: From the above figure, The data on cleanliness and maintenance suggests that there is room for improvement, with a majority (54%) falling into the "dirty" or "very dirty" categories. Approximately 29% of the area is considered neutral, while 17% falls under "clean." The absence of a "very clean" category implies that enhancements in maintenance practices could significantly improve overall cleanliness.



Interpretation: The accessibility assessment indicates a balanced distribution of accessibility levels. A majority of 50% falls into the "accessible" category, indicating a reasonably good level of accessibility. However, 25% of areas are either "inaccessible" or "highly inaccessible," suggesting room for improvement in enhancing accessibility for these regions. Additionally, the 12% in the "highly accessible" category highlights pockets of excellence in terms of accessibility.



Interpretation: From the above figure, The data on satisfaction levels demonstrates a generally positive trend, with a significant 60% of respondents falling into the "satisfied" or "highly satisfied" categories. Notably, a substantial 33% express "highly satisfied" sentiment, indicating a strong degree of contentment. However, 20% being "neutral" suggests room for improvement in addressing concerns of those who haven't formed a strong opinion, while the 20% who are "dissatisfied" or "highly dissatisfied" also require attention to enhance overall satisfaction.

ANOVA

		Sum of Squares	df	Mean Square	F	Sig
Between People		152.439	51	2.989		
Within People	Between Items	188.157	10	18.816	26.335	.000
	Residual	364.388	510	.714		
	Total	552.545	520	1.063		
Total		704.984	571	1.235		

Grand Mean = 2.81

Interpretation: The F-test value of 26.335 indicates that there are significant differences between the variances of the groups being compared. In the context of an analysis of variance (ANOVA), this value is typically used to assess whether there are statistically significant differences in the means of these groups.

From the above table the significance value is less than 0.05 which is 0.000 and hence the null hypothesis is rejected and alternative hypothesis is accepted and researcher concludes that there is association between satisfaction of passenger traveling by PMPML.

Conclusion:

In conclusion, this study sought to identify and analyze the variables that affect passengers' decisions regarding PMPML services, gauge overall passenger satisfaction, investigate the significance of environmental factors, and offer practical suggestions for improving public transportation in Pune.

To generate actionable insights, the study used a thorough research process that included data collecting, descriptive analytics, and statistical tests. The research showed that the survey items had a moderate level of internal consistency, which suggests dependability. The survey covered a range of topics, including demographics of the passengers, their travel habits, alternatives, accessibility, cleanliness, and satisfaction levels.

The main findings demonstrated the dominance of local and metro transit, with cabs and cars receiving less attention. While the cleanliness analysis revealed space for improvement, particularly with regard to preserving cleanliness and hygiene, the accessibility assessment showed a balanced distribution.

The study also found that a sizable portion of customers were extremely satisfied (33%) and stressed the importance of addressing the problems of passengers who fell into the neutral (20%), dissatisfied (13%), and severely dissatisfied (7%) categories. varied passenger groups showed significantly varied levels of pleasure, according to statistical tests like ANOVA.

Overall, this study offers the PMPML authorities useful information that will help them make defensible choices to raise the caliber and happiness of Pune's public transportation services.

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