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The Dynamics Of Shared Mobility Adoption: An Extended TAM-TPB Analysis Of Two-Wheeler Platforms In Urban India

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Abstract: Rapid urbanization, chronic traffic congestion, and the pervasive reliance on private two-wheelers necessitate the scaled adoption of shared, sustainable transport solutions in Indian cities. This empirical investigation addresses the limited academic focus on two-wheeler sharing dynamics by proposing and validating an integrated theoretical framework: the Extended Technology Acceptance Model (TAM) combined with the Theory of Planned Behavior (TPB), augmented by the context-specific variables of Cost-Effectiveness (CE) and Trust and Safety Perception (TS). Primary quantitative data were collected via a structured questionnaire employing a 5-point Likert scale from 120 respondents—predominantly young working professionals and students—across three socio-economically diverse cities (Pune, Vadodara, and Daman). Analysis utilized correlation and multiple regression techniques to test the proposed causal relationships. The empirical findings establish a clear hierarchy of drivers: economic feasibility (CE, Mean=4.32) and functional utility (Perceived Usefulness, Mean=4.21) are the strongest positive predictors of adoption intention. Conversely, Trust and Safety Perception, which registered the lowest mean score (3.78), was identified as the key psychological barrier, directly moderating the conversion of high user intention into consistent, habitual usage. The extended model demonstrated robust explanatory power, collectively accounting for 73% of the variability in user adoption behavior (R^2=0.73). The results confirm the superior utility of incorporating contextual factors in predicting adoption within price-sensitive emerging markets. Managerially, the study underscores the critical need for platforms to invest heavily in operational integrity, visible vehicle quality control, and robust safety protocols to solidify user trust and accelerate the sustainable urban mobility transition.

Index Terms - Shared Mobility, Two-Wheeler, Technology Acceptance Model, Theory of Planned Behavior, User Adoption, Emerging Market, Cost-Effectiveness, Trust.

INTRODUCTION

RAPID URBANIZATION AND ESCALATING DEMOGRAPHIC DENSITY IN INDIAN CITIES HAVE GENERATED INTENSE PRESSURE ON EXISTING INFRASTRUCTURE, LEADING TO CHRONIC ISSUES SUCH AS TRAFFIC CONGESTION, AIR QUALITY DEGRADATION, AND INSUFFICIENT LAST-MILE CONNECTIVITY.[1] THIS SYSTEMIC STRAIN NECESSITATES THE EXPLORATION AND SCALED ADOPTION OF FLEXIBLE, EFFICIENT, AND SHARED TRANSPORTATION ALTERNATIVES THAT MINIMIZE RELIANCE ON PRIVATE VEHICLE OWNERSHIP.[1] THE TRADITIONAL RELIANCE ON PERSONAL TWO-WHEELERS, A PREVALENT MODE OF TRANSPORT IN INDIA, CONTRIBUTES SIGNIFICANTLY TO THESE ENVIRONMENTAL AND CONGESTION CHALLENGES.[1]

IN RESPONSE, DIGITAL, APP-BASED TWO-WHEELER SHARING PLATFORMS (E.G., RIDEAWAY, BOUNCE, VOGO, YULU) HAVE EMERGED AS AN INNOVATIVE SOLUTION TO ADDRESS URBAN COMMUTING FRICTION.[1] THESE SERVICES OFFER USERS SHORT-TERM RENTALS, LONG-TERM SUBSCRIPTIONS, OR ACCESS TO PEER-TO-PEER (P2P) SHARED VEHICLES, MANAGED SEAMLESSLY THROUGH SMARTPHONE APPLICATIONS.[1] THIS MODEL ALIGNS WITH INDIA'S VISION FOR SMARTER AND MORE SUSTAINABLE URBAN ECOSYSTEMS BY OFFERING AFFORDABILITY, CONVENIENCE, AND REDUCED CARBON EMISSIONS COMPARED TO CONVENTIONAL PRIVATE OWNERSHIP.[1]

WHILE EXTENSIVE LITERATURE EXISTS ON SHARED MOBILITY, ACADEMIC ATTENTION FOCUSED SPECIFICALLY ON THE ADOPTION DYNAMICS OF TWO-WHEELER SHARING PLATFORMS WITHIN THE UNIQUE SOCIO-ECONOMIC LANDSCAPE OF INDIAN CITIES REMAINS LIMITED.[1] UNDERSTANDING THE BEHAVIORAL DETERMINANTS SPECIFIC TO THIS SEGMENT—A CRITICAL FACTOR FOR THEIR LONG-TERM VIABILITY—IS THE CORE OBJECTIVE OF THIS STUDY.

THIS RESEARCH ADDRESSES THIS GAP BY VALIDATING AN **EXTENDED TECHNOLOGY ACCEPTANCE MODEL (TAM) INTEGRATED WITH THE THEORY OF PLANNED BEHAVIOR (TPB)**.[1] THIS EXTENDED FRAMEWORK IS ESSENTIAL FOR EMERGING MARKETS AS IT INCORPORATES TWO PROVEN CONTEXTUAL VARIABLES: COST-EFFECTIVENESS (CE) AND TRUST AND SAFETY PERCEPTION (TS).[3] THE RESULTING MODEL EMPIRICALLY ACCOUNTS FOR 73% OF THE VARIABILITY IN USER ADOPTION BEHAVIOR ($R^2=0.73$) [1], CONFIRMING ITS UTILITY IN UNDERSTANDING THE HIGH-RISK, PRICE-SENSITIVE CONSUMER ENVIRONMENT.

II. THEORETICAL FOUNDATIONS AND EXTENDED FRAMEWORK

THE THEORETICAL FOUNDATION FOR THIS STUDY RESTS ON TWO ESTABLISHED BEHAVIORAL MODELS: THE TECHNOLOGY ACCEPTANCE MODEL (TAM) AND THE THEORY OF PLANNED BEHAVIOR (TPB).[1]

2.1 CORE BEHAVIORAL MODELS

THE TAM, PROPOSED BY DAVIS IN 1989, POSITS THAT A USER'S ACCEPTANCE OF TECHNOLOGY IS PRIMARILY DRIVEN BY: **PERCEIVED USEFULNESS (PU)**, THE BELIEF THAT THE SYSTEM ENHANCES PERFORMANCE; AND **PERCEIVED EASE OF USE (PEOU)**, THE BELIEF THAT USING THE SYSTEM IS FREE OF EFFORT.[1] BOTH CONSTRUCTS INFLUENCE THE USER'S **ATTITUDE TOWARD USAGE (ATU)**, WHICH IN TURN PREDICTS **BEHAVIORAL INTENTION (BI)** TO USE THE SERVICE.[1]

THE TPB, DEVELOPED BY AJZEN IN 1991, EXPANDS ON BI BY INCORPORATING SOCIAL AND VOLITIONAL CONTEXT, DRIVEN BY **SUBJECTIVE NORMS (SN)** (SOCIAL PRESSURE) AND **PERCEIVED BEHAVIORAL CONTROL (PBC)** (PERCEIVED ABILITY AND RESOURCE AVAILABILITY).[1] INTEGRATING TAM AND TPB PROVIDES A ROBUST, HOLISTIC VIEW, CAPTURING BOTH THE TECHNOLOGICAL PERCEPTIONS AND THE BROADER PSYCHOLOGICAL CONTEXT OF ADOPTION.[1]

2.2 EXTENDING THE FRAMEWORK FOR EMERGING MARKETS

WHILE THE INTEGRATED TAM-TPB MODEL IS FUNDAMENTAL, THE ADOPTION OF SHARED SERVICES IN CONTEXTS LIKE INDIA IS HIGHLY SENSITIVE TO FINANCIAL CONSIDERATIONS AND RISK PERCEPTION.[3] THEREFORE, THE TRADITIONAL FRAMEWORK IS EXTENDED WITH TWO CONTEXTUAL CONSTRUCTS:

1. **COST-EFFECTIVENESS (CE):** IN PRICE-SENSITIVE ENVIRONMENTS, THE FINANCIAL TRADE-OFF BETWEEN FLEXIBLE, PAY-PER-USE SHARING AND HIGH PRIVATE OWNERSHIP COSTS IS PARAMOUNT.[1] EMPIRICAL FINDINGS IDENTIFIED COST-EFFECTIVENESS AS THE VARIABLE WITH THE HIGHEST INITIAL PERCEIVED VALUE (MEAN = 4.32).[1]

2. **Trust and Safety Perception (TS):** Trust is critical in the shared economy, covering platform security, vehicle maintenance standards, and personal safety.[3] Empirical data revealed that TS received the lowest mean score among motivational factors (Mean = 3.78) [1], indicating that perceived risk is the primary impedance to long-term adoption.

III. HYPOTHESIS DEVELOPMENT

Based on the validated models and contextual extensions, the following hypotheses were empirically tested:

No.	Hypothesis Statement
H1	Perceived Usefulness has a positive effect on Behavioral Intention to adopt two-wheeler sharing platforms.[1]
H2	Perceived Ease of Use positively influences Attitude toward using two-wheeler sharing platforms.[1]
H3	Cost-Effectiveness positively influences user adoption.[1]
H4	Trust and Safety Perception have a significant effect on user intention to use the platform.[1]

IV. RESEARCH METHODOLOGY

4.1 Research Design and Sampling

The study utilized a combined descriptive and explanatory design.[1] The target population comprised users and potential users (aged 18–45) of two-wheeler sharing platforms in urban and semi-urban India.[1] Convenience sampling was employed, yielding a final sample size of 120 respondents.[1]

To ensure external validity across diverse economies, data collection targeted three distinct cities [1]:

- **Pune:** A metropolitan, technology-centric hub.
- **Vadodara:** An industrial and educational Tier 2 center.
- **Daman:** A service and tourism-driven semi-urban area.

Data collection occurred between August 2025 and October 2025 using a structured questionnaire with closed-ended questions based on a 5-point Likert Scale (1 = Strongly Disagree to 5 = Strongly Agree).[1]

4.2 Analytical Framework

Quantitative analysis was conducted using statistical software (SPSS) and Microsoft Excel.[1] The primary techniques used were:

1. **Descriptive Statistics:** To summarize the sample profile and calculate mean scores for all constructs.[1]
2. **Correlation Analysis (Pearson r):** To measure the strength and direction of the linear relationships between the independent and dependent variables.[1]
3. **Multiple Regression Analysis:** To test the hypotheses (H1–H4) and assess the overall explanatory power (R^2) of the extended theoretical model on user adoption.[1]

V. RESULTS AND DISCUSSION

5.1 Descriptive Statistics and User Hierarchy

The demographic analysis confirmed that the primary user base is young (79% aged 18–35), consisting mainly of working professionals (52%) and students (30%).[1] Awareness was high (92%), but consistent daily usage was moderate (20%).[1] Descriptive statistics established a clear hierarchy of perceived value (Table 1).

Variable	Mean Score (1-5)	Interpretation
Cost-Effectiveness (CE)	4.32	Strongest driver; high perceived value of affordability.[1]
Perceived Usefulness (PU)	4.21	High belief in functional benefits (time/effort saving).[1]
Perceived Ease of Use (PEOU)	4.05	Strong digital acceptance and usability.[1]
Behavioral Intention (BI)	4.12	Strong willingness for future use.[1]
Trust & Safety (TS)	3.78	Lowest score among motivational factors; identifies a core barrier.[1]

The results confirm that Cost-Effectiveness (4.32) and Perceived Usefulness (4.21) are the most dominant 'pull' factors, appealing to the economic sensitivity and functional needs of the target demographic.[1] Conversely, the relatively low score for Trust and Safety (3.78) indicates a key area of friction for conversion to habitual usage.[1]

5.2 Correlation and Hypothesis Testing

Correlation analysis revealed strong, positive, and statistically significant relationships among all tested variables.[1]

Hypothesis	Relationship Tested	Correlation (r)	P-Value	Result
H1	Perceived Usefulness < Behavioral Intention	0.72	<0.05	Supported[1]
H2	Perceived Ease of Use < Attitude	0.68	<0.05	Supported[1]
H3	Cost-Effectiveness < Adoption	0.70	<0.05	Supported[1]
H4	Trust and Safety < Behavioral Intention	0.61	<0.05	Supported[1]

The strong correlation coefficients, particularly for H1 ($r=0.72$) and H3 ($r=0.70$), validate the primary role of functional utility and economic motivation in driving adoption intent.[1] While H4 ($r=0.61$) is significant, it confirms that trust, while necessary, is a moderate driver compared to cost and utility, acting more as a barrier that prevents users from moving from the intention phase to consistent usage.[1]

5.3 Model Validation and Explanatory Power

Multiple regression analysis was performed on the integrated model to predict Behavioral Intention and subsequent Adoption. The model achieved a coefficient of determination (R^2) of **0.73**.[1] This high explanatory power statistically confirms the suitability and superiority of the extended TAM-TPB framework, demonstrating that the constructs—including the context-specific factors of CE and TS—effectively explain 73% of the variance in two-wheeler sharing adoption behavior in this market.[1]

VI. CONCLUSION

This research establishes that two-wheeler sharing platforms are a vital component of India's evolving urban mobility ecosystem, providing a sustainable, time-saving, and cost-effective alternative to private vehicle ownership.[1] The study successfully validates an extended theoretical model, demonstrating that user adoption is driven robustly by perceived utility and affordability, but moderated critically by trust and safety concerns.[1] While high user awareness and behavioral intention exist, converting this latent demand into habitual, consistent use remains contingent upon platforms bridging the prevailing psychological gap related to perceived risk, vehicle quality, and operational reliability.[1]

VII. THEORETICAL AND MANAGERIAL IMPLICATIONS

7.1 Theoretical Contributions

This study significantly advances the Technology Acceptance literature by providing empirical validation of the extended TAM-TPB model within the specific context of physical shared mobility in a developing economy.[1]

- **Enhanced Predictive Validity:** The high R^2 value (0.73) confirms that explicitly including Cost-Effectiveness and Trust/Safety Perception as core theoretical constructs enhances predictive power beyond traditional models in price-sensitive emerging markets.[1]
- **Behavioral Hierarchy Mapping:** The research offers a data-driven hierarchy of adoption factors, confirming that economic feasibility (CE) functions as the primary prerequisite for initial engagement, followed by functional utility (PU).[1]

7.2 Managerial and Practical Implications

The findings offer actionable strategies for platform operators, investors, and urban policymakers:

- **Prioritize Trust Building:** Given the low TS score, operators must invest heavily in visible quality control, including strict vehicle maintenance, cleaning protocols, verifiable digital identification, and comprehensive insurance and emergency support systems.[1] This is essential for converting occasional users into loyal customers.
- **Sustain Affordability:** Platforms should leverage the high CE motivation by maintaining competitive pricing structures, offering tiered subscriptions, and developing loyalty and referral programs to reinforce the long-term economic superiority over private ownership.[1]
- **Policy Integration and Green Transition:** Policymakers should support this sector by facilitating infrastructure improvements, such as designated parking and pick-up/drop-off zones near transport hubs.[1] Furthermore, actively supporting the transition of shared fleets to electric two-wheelers will amplify the cost advantage and align commercial success with national green mobility objectives.[1]

VIII. LIMITATIONS AND FUTURE RESEARCH

8.1 Study Limitations

The findings are subject to limitations, including the use of convenience sampling (N=120), which restricts full generalizability to the entire Indian population.[1] The cross-sectional nature of the data captures behavior at a single point in time, and results relying on self-reported perceptions may not perfectly reflect long-term behavior.[1]

8.2 Future Research Directions

Future academic inquiry should focus on:

1. **Longitudinal Analysis:** Tracking users over an extended period to precisely analyze the intention-behavior gap and the temporal impact of operational improvements on habitual use.[1]
2. **Advanced Causal Modeling:** Utilizing Structural Equation Modeling (SEM) to rigorously test the mediating roles of attitude and trust within the integrated model.[1]
3. **Comparative Modal Analysis:** Conducting comparative studies to understand the differential adoption drivers between shared two-wheelers, e-bikes, and public transit systems.[1]

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