



Research Paper

# Comparative Analysis of Consumers' Perception of Different Transmission Technologies on Cars Based on Demographics

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**ABSTRACT:** This study presents a comprehensive comparative analysis of consumers' perceptions regarding various transmission technologies in cars, with a primary focus on the role of demographic factors in shaping these perceptions. The automotive industry has witnessed significant advancements in transmission technologies over the years, including traditional manual, automatic, continuously variable transmission (CVT), and dual-clutch transmission (DCT). Understanding consumers' preferences and attitudes towards these transmission options is crucial for automakers and policymakers in their efforts to meet the evolving demands of the market. To conduct this research, a structured questionnaire was developed, encompassing various aspects of transmission technologies and their perceived advantages and drawbacks. A diverse sample of car buyers and owners from different demographic backgrounds participated in the survey, representing various age groups, income levels, geographical locations, and cultural backgrounds. Overall, this research provides valuable insights into the complex interplay between consumers' demographic characteristics and their perceptions of different transmission technologies, contributing to the development of more customer-centric and sustainable automotive solutions

**KEYWORDS:** Perception, AMT, CVT, DCT, Consumer.

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## I. INTRODUCTION

Today, the automobile sector is one of the country's important sectors contributing the most to India's economic development. The challenges that today's automotive manufacturers face are enormous. Internationalization, the rapid pace of technological progress, and customer demand have all had an impact on how businesses are conducted. Product innovation has been a trademark of the auto industry for the last decades. One of the major innovations of automakers is the development of automatic transmission technologies in a different form which has been successfully adopted by Major players like Maruti, Hyundai, Tata and others to lower driving efforts and to experience stress-free driving among consumers. Apart from manual transmission technology which is very common to the consumers, the different types of transmission technology available in the Indian car market are AMT ( Automated Manual Transmission), CVT ( Continuous Variable Transmission) , DCT ( Dual Clutch Transmission) , IMT ( Intelligent Manual Transmission) and AT ( Automatic Transmission). Apart from Manual Transmission, all other technologies are 2-pedal technology i.e clutch-pedal less technology.

## II. LITERATURE REVIEW

The literature review is an important aspect of research since it enables the researcher to learn and comprehend the concept of the study and the topic he or she will investigate. The literature review is also beneficial for learning about the applicability of various statistical tools by comparing the tools used in the past study by various means and methods of doing research, as well as the outcomes and theoretical significance of such research. Rogers (1995) highlighted the study on consumer acceptability of technology and its theoretical

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framework through the diffusion of innovation theory. No home in modern society exists without an automobile. Several individuals have the notion that driving an automobile is simple; this is the AMT/AT car. Several people are discussing and writing about it. Muruganandam (1997) claimed in his study titled "A Consumer Brand Preference for Motor Vehicles in Coimbatore City" that pricing, design, and after-sales services offered by the dealer influence consumers' preferences for a car. He found that pricing and design influenced the purchase of Maruti and Ambassador automobiles more, and he also disclosed that after-sales service was satisfactory. In their article titled, Kaur and Sandhu (2004) investigate the aspects that consumers evaluate when purchasing a new automobile. This study focuses on the car owners residing in the major cities of the Indian states of Punjab and Chandigarh. The respondents ranked safety and comfort as the most essential characteristics of a passenger vehicle, followed by luxury. So, manufacturers must design their products with greatest emphasis on these characteristics. In her research conducted in Karnataka, Kusuma (2015) examined customer behaviour patterns regarding the purchase of tiny automobiles. A framework has been established to examine the behavioural patterns that influence the buying choice of consumers for compact automobiles. Influencing the market are elements such as resale value, monetary value, market reputation, and accessibility. External aspects of influence include family, parents, and colleagues. Product influence includes manufacturers, brands, mileage, performance, pricing, exterior and interior design, safety and comfort characteristics. A major study on the level of client happiness with AMT cars in Erode identified the most peculiar aspect as the amount of buyer contentment (Vijayalakshmi, 2018). Individuals between the ages of 35 and 45 are the majority of AMT car owners. This study concludes that AMT car owners have encountered issues such as lower fuel economy, driving difficulty in hilly terrain, expensive replacement parts, and inadequate service support.

### **III. RESEARCH METHODOLOGY**

The study of descriptive research is carried out for finding the taste and attitudes among car owners about the different MT/AMT/AT cars in different locations across India (segmented as semi-urban, urban and rural areas ) with different age groups (between 18 to 60) and different income groups segmented as ( below 6 Lakhs, between 6 Lakhs to 12 Lakhs, and above 12 Lakhs ). The survey was conducted through a structured questionnaire format to get the response. The Total No of Respondents is 259 among them 153 (Manual transmission car users and 106 AT/AMT car users). The parameters considered here are fuel economy, reliability of technology, price and ease to drive to understand the user's satisfaction level. This study is based on Demographics (Age, gender , income group ). As it is easier to measure the other segmentation variables in research.

### **IV. THEORETICAL BACKGROUND ON AT/AMT TECHNOLOGY**

The different types of AT /AMT Technologies used apart from manual transmission in India in cars

#### AMT

AMT, or Automatic Manual Transmission, is a semi-automatic transmission system. Yet, a number of automakers also refer to it by various brand names. Maruti Suzuki cars including as Swift, Celerio, WagonR, New Baleno2022, espresso, etc. feature Auto Gear Shift, or AGS, which is commonly referred to by the manufacturer's name. The AMT employs a conventional clutch and gear structure, but simulates manual gear operation using sensors, actuators, processors, and pneumatics. This transmission type is less expensive than conventional automatic transmissions, yet it gives users with excellent fuel economy and the comfort of dual-pedal technology. Tata Motors utilises AMT in its Nexon SUV, Tigor compact car, Tiago, and Punch models, in addition to Maruti Suzuki. AMT technology is also utilised by the Hyundai Santro, Renault Kwid, and Triber easy-R models.

#### CVT

Continuously Variable Transmission is an automatic transmission with the abbreviation CVT. This technique uses belts or pulleys in place of conventional steel gears. It allows seamless gear shifting with a variety of ratios depending on the engine's revolutions per minute (RPM). A CVT transmission prioritises excellent fuel economy while retaining continuous acceleration. Compared to other types of automatic gearbox systems, the engine noise in a CVT-equipped vehicle may be quite loud. In India, vehicles including the Maruti Suzuki Baleno, Honda Jazz, Nissan Micra, and Honda Amaze are equipped with a continuously variable gearbox (CVT).

### IVT

The new IVT conducts continuous shifts to achieve greater fuel economy than automatic transmissions, similar to a continuously variable gearbox. This is achieved by adjusting the pressure of the transmission's pulley system in reaction to the driver's input and driving conditions. Its pulley mechanism has a high ratio, which immediately translates to a significantly greater operating range than many other transmission techniques. This explains why higher gear ratios provide greater fuel efficiency and lower gear ratios provide greater performance. This technology was used in the Hyundai Verana, Elantra, and i20.

### Torque Converter

. Conventional automatic gearboxes, also known as torque converter automatic transmissions, are the most prevalent self-shifting system featured in the majority of automobiles. In lieu of a clutch, a hydraulic fluid coupling or torque converter is utilised to change gears. The Engine Control Unit (ECU) of the vehicle is directly connected to the system in order to provide precise and smooth engine control. These innovations Several automobiles and SUVs manufactured in India by Hyundai, Mercedes-Benz, BMW, and Audi feature automatic gearbox.

### IMT

Hyundai will be the first manufacturer in India to incorporate this technology into a subcompact SUV, the Venue. This technology was expected to debut during the premiere of the upcoming Kia Sonet subcompact SUV, the Venue's sibling. There will also be an iMT version of the Kia Sonet. The Kia Rio also has this technology on the international market. It was created specifically for hybrid vehicles. The diesel-powered Toyota Fortuner also comes in an iMT configuration. Driving in traffic may become easier, which may be the greatest benefit. In addition, when shifting gears, it retains the feel of a manual car. Also, the electronically regulated clutch movements of iMT technology are supposed to improve fuel economy.

### DCT

DCT, or Dual Clutch Transmission, is a combination of automatic and manual gearbox technologies. Unlike conventional automatic transmissions, it lacks a torque converter. This technology features two distinct shafts with their own clutches for gear shifting, one for even-numbered gears and the other for odd-numbered gears. This technique allows for a seamless transition between higher and lower ratios, however the gear shift might become noisy and jerky at times. DCT is a dry transmission system that never requires the transmission fluid to be changed. This technique keeps the clutches dry, and the frictional quality ultimately degrades due to normal wear and tear. This technology was utilised by the Kia Seltos and Hyundai Venue.

## **V. OBJECTIVES**

The objectives of the study are

- To identify the association between car ownership, and car performance satisfaction level with users based on demographics ( age,& income group)
- To identify the association between different types of cars owned and performance satisfaction levels.
- To explore the shifting condition of manual transmission car users from MT to AT/AMT technologies
- To find the consumers preferences among users based on demographics ( age and income group)

## **VI. Analysis & Interpretation**

Problem 1: To identify the association between age group and car ownership(AT, AMT or MT).

### **Hypothesis**

**H1: There is a significant association between age group and car ownership**

		CAR_OWNED			Total
		MT	AMT	AT	
AGE_GROUP	18-30	48	6	1	55
	31-40	78	20	7	105

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	41-50	22	29	14	65
	51-60	5	8	21	34
Total		153	63	43	259

From the table, Manual car owners are -153 ,  
Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	102.340 <sup>a</sup>	6	.000
Likelihood Ratio	95.317	6	.000
Linear-by-Linear Association	80.594	1	.000
N of Valid Cases	259		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.64.

From the Chi-Square Tests, it is clear that there is a significant association at a 5% significance level between the Age group of the respondents and car-owned ( AT, AMT,MT) (  $\chi^2 = 102.34$ , df= 6, p =.000). So H1 is supported

From the above table, it is shown that more than 87% of the respondents of the age group between ( 18 -30) and about 74% of the respondents of the age group between (31-40)have manual transmission cars . But more than 66% of the respondents of age group between (41-50) and more than 85% of the respondents of age group between (51-60) have AT/AMT cars. From this data, it is clear that product needs and uses depend on the consumer's age in the Automobile sector. AT/AMT cars are preferred by more aged persons as they required less effort & stress to drive.

Problem 2: To identify the association between the annual income of people and car ownership(AT, AMT or MT).

Hypothesis

H2: There is a significant association between the annual income of people and car ownership

CAR\_OWNED

		CAR_OWNED			
		MT	AMT	AT	Total
ANNUAL_INCOME	< 6LAKH	64	16	1	81
	6- 12 LAKH	32	15	14	61
	>12LAKH	57	32	28	117
Total		153	63	43	259

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	25.954 <sup>a</sup>	4	.000
Likelihood Ratio	33.169	4	.000
Linear-by-Linear Association	21.756	1	.000
N of Valid Cases	259		

a. 0 cells (0.0%) have an expected count of less than 5. The minimum expected count is 10.13.

From the Chi-Square Tests, it is clear that there is a significant association at a 5% significance level between the annual income of the respondents and car owned ( AT, AMT, MT) (  $\chi^2 = 25.954$ , df= 4, p =.000). So H2. is supported

From the above table, it is clear that almost 80% of respondents with an annual income (<6 Lakhs) per annum have owned Manual transmission cars and 52% of respondents with an annual income ( Between 6 to 12 Lakhs) have owned manual transmission cars and almost 49% of respondents of annual income (>12 Lakhs) has owned manual transmission cars. It is observed that ownership of AMT& AT cars significantly increases as the income increases, there is only about 26% among income groups below 6 Lakhs, 47.5 % among income groups between(6 Lakhs to 12 Lakhs) and 51.28% among income groups above 12 Lakhs. These data show that acceptance of AMT /AT cars is more prominent among higher-income people due to higher purchasing power. it may be correlated to the social status of the respondents. There is always a price gap between 50 K to 1.5Lakhs price difference between MT cars and AMT/AT cars of the same brand and same variants. which is given in a separate table.

Problem 3: To identify the association between age group and car performance satisfaction level.

Hypothesis

H3: There is a significant association between age group and car performance satisfaction level

		PERFORMANCE_SATISFACTION LEVEL			Total
		AVERAGE	HIGH	VERY HIGH	
AGE_GROUP	18-30	37	13	5	55
	31-40	69	26	10	105
	41-50	38	3	24	65
	51-60	14	2	18	34
Total		158	44	57	259

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	49.447 <sup>a</sup>	6	.000
Likelihood Ratio	50.224	6	.000
Linear-by-Linear Association	20.111	1	.000
N of Valid Cases	259		

a. 0 cells (0.0%) have an expected count of less than 5. The minimum expected count is 5.78.

From the Chi-Square Tests, it is strong that there is a significant association at a 5% significance level between the Age group of the respondents and car performance satisfaction level ( $\chi^2 = 49.447$ ,  $df = 6$ ,  $p = .000$ ). So H2 is supported

From the above table, about 67% of the respondents of the age group (18-30) and 65% of the respondents of the age group (31-40) have an average satisfaction level with car performance .but about 41% of respondents of age group between(41-50) and 58% of the respondents of age group (51-60) are highly satisfied with own car performance level. Product satisfaction depends upon the consumer's age. Every age group has its own mindset & precedence regarding the perception of cars , which has a huge diversification. Since more than 50% of the respondents of the age group (51-60) owned AT/AMT cars & they are highly satisfied with their car performance.

Problem 4: To identify the association car owned (AMT/AT/MT)and car performance satisfaction level.

Hypothesis

H4: There is a significant association between types of car-owned (AMT/AT/MT) and car performance satisfaction level

		PERFORMANCE_SATISFACTIONLEVEL			Total
		AVERAGE	HIGH	VERY HIGH	
CAR OWNED	MT	125	26	2	153
	AMT	27	16	20	63
	AT	6	2	35	43
Total		158	44	57	259

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	137.637 <sup>a</sup>	4	.000
Likelihood Ratio	138.876	4	.000
Linear-by-Linear Association	117.149	1	.000
N of Valid Cases	259		

a. 0 cells (0.0%) have an expected count of less than 5. The minimum expected count is 7.31.

From the Chi-Square Tests, it is strong that there is a significant association at a 5% significance level between the types of car ownership(AT/AMT/MT) of the respondents and car performance satisfaction level ( $\chi^2 = 137.637$ ,  $df= 6$ ,  $p =.000$ ). So H3 is supported

The above table shows that more than 68% of AT /AMT car owners are highly satisfied with car performance whereas more than 80% of manual transmission car owners are moderately satisfied with the car performance. The performance satisfaction level is different on different technology depending upon the variant used (MT/AMT /AT). Different technologies in cars have different attributes and advantages which influence the uses or car owners .

Correlation table

Performance satisfaction level on MT Cars

Item	Pearson correlation	Significant level
Reliability on Technology	-0.218	.007*
Price	0.34	0.000*
Fuel Economy	0.131	0.106
Easier to drive	0.304	0.000*

The performance satisfaction level of Respondents on MT car owners depends on reliability on technology, price and easier to drive.

Performance satisfaction level on AT/AMT cars

Item	Pearson correlation	Significant level
Reliability on Technology	-0.541	0.000*
Price	0.434	0.000*
Fuel Economy	-0.109	0.199
Easier to drive	0.964	0.000*

The performance satisfaction level of Respondents on AMT/AT car owners depends on reliability on technology, price and easier to drive. After comparing these two tables, it is observed that performance satisfaction levels have some differences correction table between MT and AT/AMT cars. Most of the respondents have doubts about AT/AMT technology more than Manual transmission Technology as it is a newer technology. Reliability on Technology, Price and Easier to Drive these three are highly significant to performance satisfaction levels. In case of AMT/AT cars easier to drive is very highly positively correlated to satisfaction level . where as in case of MT cars Price, Easier to Drive low to moderate positively correlated to satisfaction level .

Problem 5: To identify the association between age group and willingness to pay extra money to shift from MT cars to AT/AMT cars.

Hypothesis

H5: There is a significant association between age group and willingness to pay extra money to move from MT cars to AT/AMT cars

		WILLINGNESS_TO_PAY_EXTRA MONEY_TO_BUY_AT/AMT_CARS			
		YES	MAYBE	NO	Total
AGE_GROUP	18-30	47	0	1	48
	31-40	65	9	4	78
	41-50	11	4	7	22
	51-60	2	0	3	5
Total		125	13	15	153

Chi-Square Tests

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	27.052 <sup>a</sup>	6	.000
Likelihood Ratio	28.136	6	.000
Linear-by-Linear Association	15.611	1	.000
N of Valid Cases	153		

a. 6 cells (50.0%) have an expected count of less than 5. The minimum expected count is .33.

From the Chi-Square Tests, it is strong that there is a significant association at a 5% significance level between the age group of the respondents and willingness to pay extra money to shift from MT cars to AMT/A ( $\chi^2 = 27.052$ ,  $df = 6$ ,  $p = .000$ ). So H4 is supported

From the above table, more than 97% of the respondents of the age group between(18-30) and 83% of the respondents of the age group between(31-40) are willing to pay extra money to buy AT/AMT cars which is very much significant. From these tables willingness to shift to newer technology by paying extra money is more prominent among the young age group. They are more willing to accept the perceived risk of newer technology.

Problem 6: To identify the association between the age group and how much extra money willing to pay to buy an AT/AMT car.

Hypothesis

H6: There is a significant association between age group and the amount to pay extra to shift from MT cars to AT/AMT cars

		AMOUNT TO PAY EXTRA					
		10K-20K	21K-30K	31K-40K	41K-50K	51K-60K	Total
AGE_GROUP	18-30	18	11	9	6	3	47
	31-40	51	19	1	3	0	74
	41-50	9	5	1	0	0	15
	51-60	1	1	0	0	0	2
Total		79	36	11	9	3	138

Chi-Square Tests

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	32.200 <sup>a</sup>	12	.001
Likelihood Ratio	33.622	12	.001
Linear-by-Linear Association	8.543	1	.003
N of Valid Cases	143		

13 cells (65.0%) have an expected count of less than 5. The minimum expected count is .08.

From the Chi-Square Tests, it is clear that there is a significant association at a 5% significance level between the age group of the respondents and the amount to pay extra to shift from MT cars to AMT/AT cars ( $\chi^2 = 32.200$ ,  $df = 12$ ,  $p = .001$ ). So H5 is supported.

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More than 70% of the total respondents of the group between (18-40) are willing to pay (10k to 30 k) more than manual Transmission cars.

The price difference between cars and AT /AMT cars of some popular cars

Manufacturer	Model	Price MT	Price with /CVT)	Price with AMT	Technology Used	Variants	Price Difference
Renault	Kwid	522694	567657		AMT	RXL	44963
Maruti Suzuki	S PRESSEO	495452	549145		AMT	VXI	53693
Maruti Suzuki	CELERIO	618773	672615		AMT	VXI	53842
Maruti Suzuki	SWIFT	732523	786605		AMT	VXI	54082
Hyundai	SANTRO	600594	655757		AMT	MAGNA	55163
Hyundai	Aura	775438	831614		AMT	S	56176
Renault	Kiger	742708	798911		AMT	RXL	56203
Maruti Suzuki	WAGONR	598173	654377		AMT	VXI	56204
Maruti Suzuki	DESIRE	815634	871923		AMT	VXI	56289
Maruti Suzuki	IGNIS	665616	721905		AMT	DELTA	56289
Tata	Tigor	720706	782155		AMT	XM	61449
Tata	Tiago	659256	720706		AMT	XT	61450
Tata	Punch	733107	800145		AMT	Adventure	67038
Hyundai	GRAND10 Nios	686952	762728		AMT	MAGNA	75776
Hyundai	i20	884300	998737		Turboengine & IMT	SPORTS	114437
Kia motors	SONET	996652	1119237		Turbo engine & IMT	HTK	122585
Toyota	Glanza	848981	981793		CVT	G	132812
Maruti Suzuki	BALENO	784113	919205		CVT	DELTA	135092

But from the current market scenario, the actual price to shift from MT cars to AMT/AT cars of different brands and variants starts from (45k to 50k) to 1.5 Lakhs depending upon different taxes on different states .so there is a gap observed between the consumers' expectation of price and actual price. This may lead to barriers to adopting AMT/AT cars because price is the most prominent parameter for buying the product.



Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	60.206 <sup>a</sup>	15	.000
Likelihood Ratio	59.434	15	.000

		VALUE_FOR_MONEY_TECHNOLOGY							
		AMT	CVT	DCT	IMT	MANUAL TRANSMISSION	AT		
AGE_GROUP	18-30	12	9	9	12	10	3	55	
	31-40	49	11	20	13	7	5	105	
	41-50	8	6	11	17	12	11	65	
	51-60	3	6	2	8	4	11	34	
Total		72	32	42	50	33	30	259	
Linear-by-Linear Association		17.143	1						.000
N of Valid Cases		259							

a. 3 cells (12.5%) have an expected count of less than 5. The minimum expected count is 3.94.

From the Chi-Square Tests, it is clear that there is a significant association at a 5% significance level between the age group of the respondents and the Value for money technology ( $\chi^2 = 60.206$ ,  $df = 15$ ,  $p = .000$ ). So H6 is supported.

From the table, about 46% of the respondents in the age group between (31-40) believe that AMT is the most value-for-money technology and about 43% of the respondents in the age group between (18-30) believe that AMT and IMT are the value for money technology. But more than 32% of the respondents in the age group between (51-60) believe that AT is the value for money technology.

Problem 7: To identify the association between different income groups people and beliefs on Value for money technology

Hypothesis

H7: There is a significant association between different annual income groups people and their belief about Value for money technology

		VALUE_FOR_MONEY_TECHNOLOGY						
		AMT	CVT	DCT	IMT	MANUAL TRANSMISSION	AT	Total
ANNUAL_INCOME	< 6LAKH	66	11	2	2	0	0	81
	6- 12 LAKH	6	20	25	8	1	1	61
	>12LAKH	0	1	15	40	32	29	117
Total		72	32	42	50	33	30	259

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	284.700 <sup>a</sup>	10	.000
Likelihood Ratio	313.347	10	.000
Linear-by-Linear Association	185.805	1	.000
N of Valid Cases	259		

a. 0 cells (0.0%) have an expected count of less than 5. The minimum expected count is 7.07.

From the Chi-Square Tests, it is clear that there is a significant association at a 5% significance level between the age group of the respondents and the Value for money technology ( $\chi^2 = 284.700$ ,  $df = 10$ ,  $p = .000$ ). So H7 is accepted

From the above table, more than 81% of respondents of the annual income group below 6 Lakh have faith in AMT technology as a value-for-money Technology. More than 73% of the annual income group between (6Lakh to 12 Lakh) believe that CVT and DCT are valued for money technology. But in higher income groups people's concepts of value for money technology are different. more than 61.5% of people believe in IMT and Manual Transmission as value-for-money technology. Perception of product preference depends on a different level of income. Different income groups have different choices of Technology. This is because different income groups may have different education, different peer groups and different culture.

	AMT	CVT	DCT	IMT	MANUAL TRANSMISSION	AT	Total
MALE	52	23	26	37	24	17	179
FEMALE	20	9	16	13	9	13	80
Total	72	32	42	50	33	30	259

But from the above observation of Value for money technology for both the gender is the same, I.e AMT (Automated Manual Transmission)

**VI.CONCLUSION**

From the above data, the perception behaviors of users of AT/AMT and manual transmission cars are quite different and interesting and depend upon the consumers' demographic profile. It is observed that there is a prominent relation between car ownership and car performance satisfaction level with variations of age & income group. It is because each income group has a different expectation of the level & understanding of product usability. The purpose of car uses among consumers also influences the perception. From this study tradition of shifting the manual transmission to AT/AMT cars has been identified. The price difference between manual and AT/AMT cars in reality is playing a major role in the adoption process. There is a break between the consumer's expectancy of AT/AMT cars' price and the actual price of the cars. As the price is a sensitive issue among potential buyers so manufacturers should think about lowering the price of AT/AMT cars so that the price gap between manual & AT/AMT cars is limited to around 50k. As more of the respondents believe that AMT is the most value of money technology so there is the possibility of growth of AMT technology in future among all the different types of AT technology.

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