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A STUDY OF FACTORS AFFECTING CUSTOMER'S PURCHASE INTENTION TOWARDS THE SPORTS UTILITY VEHICLE (SUV) SEGMENT IN INDIA

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Abstract : The main purpose of this research work is to explore the consumer priorities, preference of consumers on Sports Utility Vehicle. The research work is planned to focus on understanding the key factors which trigger the consumers purchasing decision of SUV cars in the Indian market scenario. A detailed study has been planned to identify the different criteria which will be the deciding factors of selecting this particular segment of passenger car from a particular brand. Comparison has been made by considering some leading brands available in the Indian Automobile sector. Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) as a multi criteria decision making (MCDM) tool has been used to accomplish the research objectives.

Keywords: TOPSIS, Multi Criteria Decision Making, Sports Utility Vehicle, Automobile Sector
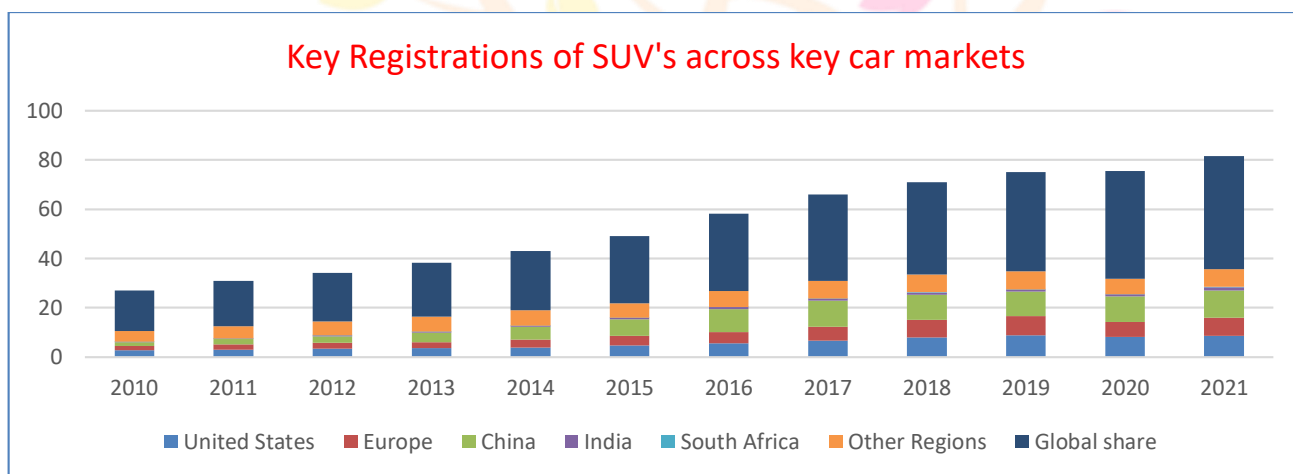
1. INTRODUCTION

SUV is an abbreviation for "sports utility vehicle." It is a kind of car with characteristics of both an on- and off-road vehicle, including high ground clearance, sizable tyres, and a potent engine (Car & Driver, 2020). SUVs are made to be able to handle severe terrain and difficult weather conditions, as well as to offer a comfortable ride and a roomy interior. According to older ideas which defined SUVs should be with light truck chassis, although broader definition considers SUV as vehicle with off-road design features. Another variant named in this perspective as crossover SUV which is integrated in line with same frame or chassis of a passenger car so nowadays the descriptions are gradually indistinct regarding the capacity, labelling and electrification of new models (Wardlaw, Christian, 2021). The types of passenger vehicles are divided among different categories while there are numerous types of cars being built with the advancement of technology the basic types of passenger vehicles are listed below. Sedan, Coupe, Sports Car, Station Wagon, Hatchback, Convertible, Sports Utility Vehicle, Minivan and Pickup Truck. One big feature which differentiates Sports utility vehicles from other cars is higher ground clearance. Ground clearance is the distance between the lowest point of the vehicle with respect to the ground. Secondly, SUVs also have a stronger engine compared to other passenger cars. This makes them suitable for off-road activities and difficult terrain. This is an important factor for the consumer's tastes and preferences as well since consumers demand a durable vehicle. SUV's also employ a body-on-frame structure which differs them from other vehicles. The body-on-frame structure means the structure of the body and chassis are constructed separately and then brought together during the production process. The similar method is also used for the construction of other vehicles and may not be only used for SUV cars particularly. SUV's are gaining popularity in recent years. It is currently accounted for 45.9% of the world's passenger car market (Iea,2021) and became the world's largest automotive segment. The following table shows the SUV units sold across leading countries from the year 2010 to 2023.

Table 1:

| Units: million								
	United States	Europe	China	India	South Africa	Other Regions	Global share	
2010	2.8	1.6	1.6	0.2	0.1	4.3	16.5	
2011	3	2.1	2.1	0.3	0.1	4.8	18.6	
2012	3.5	2.2	2.7	0.4	0.1	5.5	19.8	
2013	3.6	2.4	3.8	0.5	0.1	5.9	21.9	
2014	3.9	3.1	5.2	0.5	0.1	6.1	24.1	
2015	4.7	3.8	6.9	0.5	0.1	5.8	27.4	
2016	5.5	4.7	9.3	0.7	0.1	6.4	31.6	
2017	6.6	5.7	10.5	0.9	0.1	7	35.2	
2018	8	7.2	10.1	0.9	0.1	7.2	37.5	
2019	8.9	7.7	9.9	0.9	0.1	7.4	40.3	
2020	8.1	6.2	10.4	0.7	0.1	6.3	43.7	
2021	8.6	7.3	11.2	1.3	0.1	7.1	45.9	

Figure 1:

The discussion is relevant also from the perspective of India especially. Below mentioned, the table and graphical illustration for production trend for the last 5 years (SIAM 2023)

Table 2:

Category	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Passenger Vehicles	4,020,267	4,028,471	3,424,564	30,62,280	36,50,698	45,78,639

SIAM 2023

Figure 2
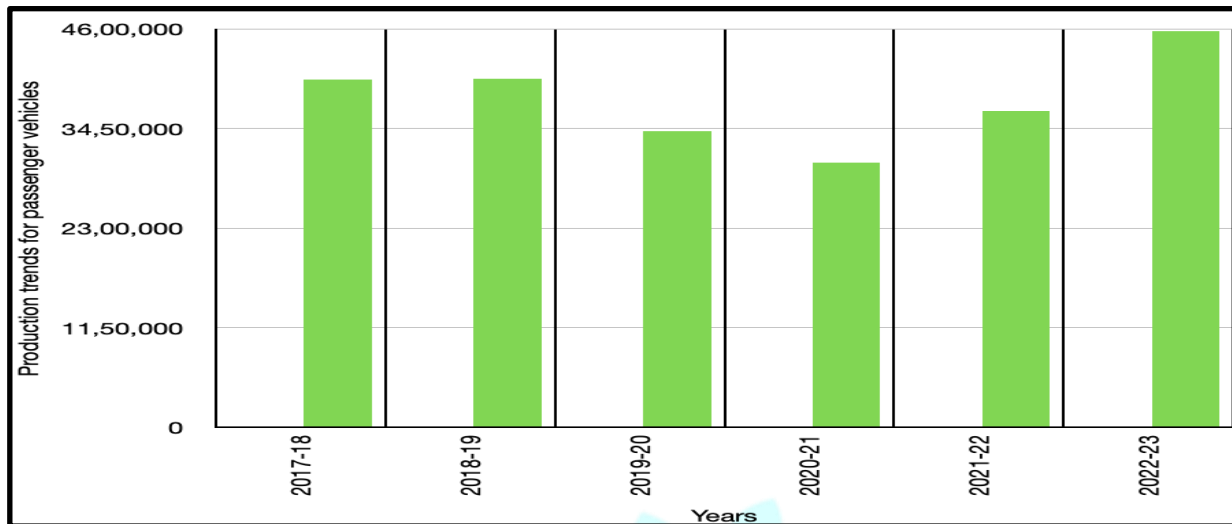
Data Source: SIAM 2023

The graph above shows the production trends for passenger vehicles from 2017 to the year of 2022-23. The following graph indicates the fall in production from the year of 2019 to 2021 which was primarily because of the impact of covid-19. The pandemic has had a big impact on economies all over the world. It is quite evident that the automobile sector which currently (SIAM,2023) contributes to 7.1% of India's GDP would also be affected. During the initial time period of the downfall of the production of 2019 the trend fell from 4,028,471 to 3,424,564 for passenger vehicles. This was the time period when the pandemic did not strike and one of the main reasons for this downfall were low sales. During this time, the Indian economy slowed, with decreased consumer demand and lower spending power. The economic slump was made worse by factors such as liquidity limitations, high inflation, and low confidence among consumers. As a result, many postponed or curtailed their discretionary expenditure, including new vehicle purchases, resulting in a decrease in automobile production. The automotive sector was also impacted by the installation of new rules and policies. To combat vehicular pollution, the Indian government implemented new emission standards known as Bharat Stage VI (BS-VI) in 2019 (SIAM, 2023). To meet the tougher emission regulations, automakers had to modify their production methods and engines. This caused a brief halt in output as manufacturers focused on emptying the decks.

The focus of this research project is to explore and study factors that influence consumer decisions to buy the Sports Utility Vehicle (SUV) segment in India with the primary focus on purchasing behavior of consumers towards sports utility vehicles. Five brands of the SUV's derived based on market surveys conducted by visiting leading car dealerships in Kolkata. Secondary data has also been collected from different websites of the selected brands chosen. The selected brands are Mahindra Thar, Maruti Brezza, Hyundai Creta, Tata Nexon and Kia Sonnet. The homogeneity of price range has been maintained towards the selection of the brands. The paper also aims to study the numerous aspects of the Indian SUV market and provide an overview of its current state. The paper's major goal is to examine the attributes that are influencing the purchasing decision of the consumers to buy the SUV category in India, such as changing customer tastes, lifestyle changes, and improved road infrastructure. It dives into market dynamics, investigating customer behavior and preferences for SUVs, as well as the industry's obstacles, such as regulatory issues, environmental concerns, and competition from other vehicle segments. The paper has been arranged as follows. The first part aims on discussion of introduction and the factors influencing the purchase of SUV's in the Indian Market. The next section attempts to throw some light on the previous literatures on methodology applied. Third part discusses the research methodology with findings and analysis. The last part concludes.

1.1.Factors Influencing the demand for SUVs:

Price: Price is an important factor that has an important role on industry consumer demand. The impact of price is a significant indicator in consumer decision making. SUV car prices in India have fluctuated according to market conditions. In recent years, the general pattern is upward, with pricing gradually increasing across several SUV segments. Inflation, growing production costs, the application of new safety and emission requirements, and the introduction of additional features and technologies in newer models all contribute to price rises.

Fuel Efficiency: SUVs often have inferior fuel efficiency when compared to smaller and lighter vehicles. When petrol prices are high, the cost of powering an SUV rises, discouraging some people from purchasing SUVs. Higher petrol prices may make fuel-efficient vehicles more desirable to people concerned about fuel costs, such as smaller cars or electric vehicles.

Aesthetic Features: When selecting an SUV, some consumers value features such as size, spaciousness, comfort, and off-road capability. The increased capacity of people that it can transport is a major reason why the SUV industry in India is rising. Since these large and heavy vehicles can transport more people, Indian families prefer to purchase them in order to maintain a sense of unity and allow the entire family to travel comfortably. As infrastructure and weather conditions in India are often harsh, Indian consumers choose more durable automobiles. For tourism purpose SUVs are becoming popular owing to the road conditions and weather.

2. Literature Review

There has been a major role played by Indian automobile sector in India's economic growth (Ramey and Vine, 2004). It has 7.1% contribution of India's total GDP and the sector has potential to grow 12% by the 2026 (PIB, 2019a, 2019b). 49% constitution of manufacturing GDP and 27% constitution of industrial GDP has been backed by automobile sector and it acts as one of the largest employment sector of India,(PIB, 2019a, 2019b). Overall Indian Automotive sector is the fifth largest in the world (Kumar et al. 2020). It could be claimed that Indian automotive sector is the third largest keeping in mind the transitional economy (Meena et al. 2021). SUV's are considered as family oriented car and popular among the urban young due to its modern designs, sporting appeal and covers wide range of sizes, prices and features. The constant shift and evolving nature of this sector and the entry of some multinational firm such as Kia and MG motors has turned the inclination of consumers towards purchasing SUV. SUVs are also viewed as aspirational vehicles that combine functionality, performance, and a sense of adventure. SUVs exist in a wide range of sizes, prices, and features. This category does not have a particular audience. However, the upper middle class now chooses to buy mid-range SUVs because of the social stigma that possessing a larger car implies being more respected in the society.SUV purchases by Indians are likewise at an all-time high, and they won't go down anytime soon. Hatchbacks made up 49 percent of all passenger car sales in India in 2015, compared to 14 percent for SUVs.In contrast, 2021 SUVs made for over 38% of the total, up from 29% in 2020(Rout et al. 2022). Regarding factors influencing purchase behavior towards SUV's in Indian increasing living standards backed by population expansion (Shen 1997) and rise in the discretionary income (Monga et al.) can be made responsible. Factors also can be considered such as consumer satisfaction related to brand image and information collected from media, friends, family members (Stella & Rejeswari 2012). the most important factors are price of the car, low maintenance, high quality and long durability (Gupta et al. 2017).The present study focuses on consumer buying decision connected with rational brand choice in the SUV segment of India. Decision making involves interconnection in complex situations analyzing multiple objectives targeting the outcomes (Azis, 2005).

The use of multicriteria/multi attribute decision making model may add value to increase the preciseness of approximation of decision-making process. Whenever there is a role of consumer perception selecting the best criteria among multiple criterions there lies individual differences. MCDM/MADM can be considered as one of the fruitful and scientific applications in solving critical decision-making issues. In this study MADM has been applied to analyze consumer buying decision making process while purchasing SUV. The buying decision basically comprises of evaluating two or more alternatives and finally attain the process of decision making (Schiffman & Kanuk, 2004). Buying decision process is the stages evolved for shaping the choices of a particular product (Levy & Lee, 2004;Kohli, Devaraj, & Mahmood, 2004;Johansson & Burt, 2004).Technique for order preference by similarity to ideal solution has been considered appropriate here to apply in analyzing this consumer buying decision process for ceramic tiles. TOPSIS under MCDM/MADM area has many-sided application like manufacturing decision making process, financial performance analysis (Bulgurcu B (Kiran), 2012), Mukherjee & Nath, 2005), educational selection applications (Nanayakkara C., 2019). Application of TOPSIS Technique for Financial Performance Evaluation of Technology Firms in Istanbul Stock Exchange (Bulgurcu, 2012), because of its robust mathematical base, easy application methodology and simplicity (Yeh, 2002). This method is popular because it is able to select the best alternative from a number of alternatives based on the specific criteria or attributes (Ho & Dey,2010).

3. Research Methodology

3.1. Data collection

In this study to analyze the consumer purchase decision influenced by different criteria and alternatives in the SUV segment of the Indian Automobile Sector. A market survey has been conducted for collecting the consumer purchase intention of SUV car. The survey has been conducted by visiting 6 renowned car dealerships in urban metropolitan area of Kolkata City. The data has been collected by taking offline interview of the walk-in customers as well as the marketing executives of the shops. The total duration of this survey is 3 months starting from February 2023 to April 2023. TOPSIS method under the MCDM or MADM domain have been applied here. The key criteria and alternatives are shown in the following list:

Table 3:

Alternatives	BRANDS
A1	Maruti Brezza
A2	Tata Nexon
A3	Kia Sonet
A4	Mahindra Thar
A5	Hyundai Creta

Table 4:

CRITERIA		ATTRIBUTES/COST
C1	Prices	Minimization (C)
C2	Engine Capacity	Maximization(A)
C3	Fuel Efficiency	Maximization(A)
C4	Size of the Car	Maximisation(A)
C5	Safety Measure Ranking	Maximisation(A)

3.2. Methodology

TOPSIS is a multi-criteria decision-making method used in research to analyze and rank various options based on numerous factors or attributes. It helps in selecting the best option from a range of alternatives. The TOPSIS technique considers both the positive and negative characteristics of the options and gives an indicator to quantify each alternative's relative closeness or similarity to an ideal answer. The best values for each criterion are represented by the ideal solution, while the worst values are represented by the negative ideal solution. The foundations of the TOPSIS method were presented in the work of (Hwang, Yoon, 1981). The basis of the analysis is the decision matrix Q_{mxn} including ratings of considered alternatives i = 1, 2, ..., m in the context of the accepted criteria j = 1, 2, ..., n:

$$\mathbf{Q}_{m,n} = \begin{bmatrix} Q_{1,1} & Q_{1,2} & \cdots & Q_{1,n} \\ Q_{2,1} & Q_{2,2} & \cdots & Q_{2,n} \\ \cdots & \cdots & \cdots & \cdots \\ Q_{m,1} & Q_{m,2} & \cdots & Q_{m,n} \end{bmatrix}$$

On the basis of which there have been calculated normalized ratings of particular alternatives:

$$n_{i,j} = \frac{Q_{i,j}}{\sqrt{\sum_{i=1}^{m} Q_{i,j}^2}}$$

In the phase of normalized rating it is possible to use the formulas (Ishizaka, Nemery, 2013):
– for the benefits criterion

$$n_{i,j} = \frac{Q_{i,j}}{Q_{max}}$$

– for the cost criterion

$$n_i = \frac{Q_{min}}{Q_{i,j}}$$

normalization causes all the criteria to have the character of a benefits criterion. Corrected ratings (with the use of weights of the assigned criteria) are calculated as:

$$v_{i,j} = w_j n_{i,j}$$

Then, there is an identification of the ideal solution conducted (V+) and negative-ideal solution (V−) with the use of corrected assessments. The ideal solution is defined as:

$$\text{where } v_j^+ = \left(\left(\max_i v_{i,j} \mid j \in C_{\text{benefits}}\right), \left(\min_i v_{i,j} \mid j \in C_{\text{costs}}\right)\right)$$

i = 1, 2,..., m, while the negative-ideal approach is defined as:

$$V^- = \{v_1^-, v_2^-, ..., v_n^-\}$$

where $v_j^- = \left(\left(\min_i v_{i,j} \mid j \in C_{\text{benefits}}\right), \left(\max_i v_{i,j} \mid j \in C_{\text{costs}}\right)\right)$, i = 1, 2, ..., m. In the above equations v_j^+ and v_j^- are the values defining ideal and negative-ideal solutions in the context of criterion (j), however, C_{benefits}, C_{costs} are respectively benefits and costs criteria subsets.

After identifying the ideal and negative-ideal solutions, the distances i d + and id- among them and subsequent alternatives are calculated:

$$d_i^+ = \sqrt{\sum_{j=1}^{n} \left(v_{i,j} - v_j^+\right)^2}$$

$$d_i^- = \sqrt{\sum_{j=1}^{n} \left(v_{i,j} - v_j^-\right)^2}$$

On the foundation of d_i + and d_i−, the coefficient of the specific alternatives indicated is ranked:

$$R_i = \frac{d_i^-}{d_i^- + d_i^+}$$

The approach concludes with the evaluation of the alternatives in decreasing order of the Ri value rating.

3.3.Results and Findings

After selecting the criteria and alternatives and assigning the equal weights for each criteria the weighted normalized matrix has been presented in table 5 below.

Table 5

Alternatives/ Criteria	Price (Cost)	Engine Capacity (Benefit)	Fuel Efficiency (Benefit)	Size of the Car (Benefit)	Safety Measure Ranking (Benefit)
Tata Nexon	0.88	109.96	1.71	0.40	0.03
Hyundai Creta	1.62	122.88	1.71	0.42	0.24
Kia Sonet	0.88	93.87	2.08	0.42	0.43
Maruti Brezza	0.89	129.34	1.88	0.98	0.11
Mahindra Thar	1.27	204.98	1.09	0.53	0.67
Ideal Best (Vj+)	0.88	204.98	2.08	0.98	0.67
Ideal worst (Vj-)	1.62	93.87	1.09	0.40	0.03

Following the above-mentioned steps in TOPSIS   calculation based on positive ideal solution and negative ideal solution the performance ranking has been executed which has been shown in **Table 6**

Table 6:

Alternatives	Brands	Si*+	Si*-	Pi*	Rank
A1	**Tata Nexon**	**95.03**	**16.11**	**0.14**	**4**
A2	**Hyundai Creta**	**82.11**	**29.01**	**0.26**	**3**
A3	**Kia Sonet**	**111.11**	**1.30**	**0.01**	**5**
A4	**Maruti Brezza**	**75.64**	**35.49**	**0.32**	**2**
A5	**Mahindra Thar**	**1.15**	**111.11**	**0.99**	**1**

Table 6 is showing that Mahindra Thar is ranked as one, Maruti Brezza comes at second position, Hyundai Creta at third position, Tata Nexon at fourth position and Kia Sonet at the fifth position. The ranking has been calculated taken into account the Euclidean distance from the ideal best (Si*+) and Euclidean distance from the ideal worst(Si*-) respectively and the pi is the performance score obtained for each alternative based on the criteria.

4. Conclusion

The study has made an attempt to suggest customer purchase intention towards purchasing SUV from five leading brands of passenger cars in India. The criteria has been chosen as price, engine capacity, fuel efficiency, size of the car and Safety measure ranking. Application of TOPSIS methodology is appropriate under the framework of a multicriteria/attribute decision making environment. For that purpose leading brands as alternatives have been considered and ranking has been made using TOPSIS to better understand and suggest to the customers which brands of SUVs are most preferred. It has been found that Mahindra Thar is the top ranked preferred SUV, Maruti Brezza and Hyundai Creta obtained the 2nd and 3rd position. Tata Nexon is at 4th and Kia Sonet is at the 5th position. The research work could be used as a pathfinder for automobile firms as well as the potential consumers if more objective criteria have been incorporated with addition of more leading alternatives.

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