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REVIEW ARTICLE

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## AUTOMOBILE BUSINESS IN THE DIGITAL ERA

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### ABSTRACT

We have carried out research in the fields of implications, the future growth and the various trends seen in the automobile industry of the digital era. We have also conducted a survey based on 10 questions and asked a few people to fill it and have analysed the responses of the same. We have conducted an analysis of the overall impact of digitization of the various facilities on the industry of automobiles.

## INTRODUCTION

The automobile industry in India has undergone remarkable growth and transformation over the years, evolving from a nascent sector to one of the largest and most dynamic industries in the country. The Indian automobile business is not only a significant contributor to the nation's economy but also a key player in the global automotive landscape. This article provides an overview of the evolution, current state, challenges, and future prospects of the automobile business in India.

### Historical Evolution

The history of the automobile industry in India dates back to the early 20th century when the first cars were imported. However, it wasn't until the mid-1940s that Hindustan Motors started manufacturing vehicles, with the iconic Ambassador becoming one of the first indigenous cars. The 1980s marked a turning point with the entry of Maruti Suzuki, a joint venture between the Indian government and Suzuki Motors of Japan. The Maruti 800, launched in 1983, became a symbol of middle-class mobility and revolutionized the automobile landscape in India. This marked the beginning of mass-market car manufacturing in the country.

### Current Landscape

Today, the Indian automobile industry encompasses a wide range of vehicles, including cars, two-wheeled, commercial vehicles, and

tractors. It is characterized by the presence of both domestic and international players, contributing to healthy competition and innovation. Maruti Suzuki, Tata Motors, Mahindra and Mahindra, Hyundai, and Honda are among the major car manufacturers. The two-wheeler segment is dominated by companies like Hero MotoCorp, Bajaj Auto, and TVS Motors.

### Key Contributors to Growth

Several factors have contributed to the growth of the automobile business in India:

- Economic Growth:** The steady growth of the Indian economy has led to increased disposable income, enabling more people to afford vehicles.
- Urbanization:** Rapid urbanization has created a need for convenient and reliable transportation options, driving the demand for automobiles.
- Government Policies:** The Indian government has implemented various policies to promote the automotive sector, such as the 'Make in India' initiative and favorable foreign direct investment (FDI) policies.
- Technological Advancements:** The industry has embraced technological advancements, resulting in the development of more fuel-efficient and environmentally-friendly vehicles.
- Globalization:** The integration of India into the global economy has led to the establishment of international manufacturing plants and collaborations with global automotive giants.

## Challenges and Concerns

Despite its growth, the Indian automobile business faces several challenges:

- 1. Environmental Concerns:** The rapid growth of the automobile industry has contributed to increased pollution and environmental degradation. The need for cleaner and more sustainable transportation options is paramount.
- 2. Traffic Congestion:** Many Indian cities suffer from severe traffic congestion, necessitating improved urban planning and public transportation systems.
- 3. Safety Concerns:** Road safety remains a significant concern, and there is a need for stricter regulations and enhanced awareness campaigns.
- 4. Infrastructure Development:** The development of robust road infrastructure is crucial to support the growing number of vehicles on the road.
- 5. Changing Consumer Preferences:** With the rise of ride-sharing and the sharing economy, there is a shift in consumer preferences from vehicle ownership to mobility solutions.

## Future Prospects

The Indian automobile industry is poised for continued growth and transformation:

- 1. Electric Mobility:** With a growing emphasis on environmental sustainability, the adoption of electric vehicles (EVs) is expected to increase. The government's push for EVs through incentives and policy support will play a pivotal role in this transition.
- 2. Connected and Autonomous Vehicles:** Advancements in technology are leading to the development of connected and autonomous vehicles, which have the potential to revolutionize the way people commute and travel.
- 3. Global Market Integration:** Indian manufacturers are expanding their presence in international markets, making the country a hub for both manufacturing and export.
- 4. R & D and Innovation:** The industry is focusing on research and development to create vehicles that cater to changing consumer needs, safety standards, and environmental regulations.

In conclusion, the Indian automobile business has come a long way from its modest beginnings to becoming a significant player on the global stage. The industry's growth has been driven by economic expansion, urbanization, government support, technological advancements, and evolving consumer preferences. While challenges like pollution, traffic congestion, and road safety persist, the industry's future prospects remain bright with the shift towards electric mobility, connected vehicles, and increased global market integration. As the industry continues to adapt and innovate, it will contribute significantly to India's economic development and shape the future of transportation in the country.

## RESEARCH QUESTIONS

### Electric Vehicle (EV) Adoption

1. What are the main factors influencing consumer adoption of electric vehicles in the modern automobile market?
2. How do government incentives and policies impact the growth of the electric vehicle sector?

### Autonomous Vehicles (AVs)

3. What are the current technological limitations and safety

concerns associated with autonomous vehicles?

### Sustainability and Environmental Impact

4. What is the carbon footprint of the modern automobile, including manufacturing, use, and end-of-life considerations?

### Connected Vehicles and IoT

5. How are advancements in IoT technology impacting the functionality and connectivity of modern automobiles?

### Consumer Preferences and Mobility Services

6. How are changing consumer preferences, including the rise of ride-sharing and subscription-based mobility services, affecting the automobile market?
7. What role do user interfaces, infotainment systems, and in-car connectivity play in influencing consumer choices?

### Emerging Markets and Innovation

8. What are the emerging markets in the modern automobile industry, and what factors are driving growth in these regions?
9. How is innovation in materials, design, and manufacturing processes shaping the future of automobiles?
10. What role do startups and new entrants play in disrupting and innovating within the automotive sector? How are regulatory bodies adapting to the changing landscape of electric and autonomous vehicles?

## REVIEW OF LITERATURE

In recent times, the digital transformation has also reached physical industriousness through the incorporation of increasingly important microprocessors and memory, broadband communication, and effective power operation into artificial-age products (Yoo *et al.*, 2010). Scholars have excavated this phenomenon, e.g., for cameras (e.g., Lucas and Goh 2009), phones (e.g., Selander *et al.*, 2010), and motorcars (e.g., King and Lyytinen 2005). This development, in convergence with the increased penetration of IS into everyday life affords new openings for invention. Following Schumpeter's (1934) understanding of invention, define digital invention as "the carrying out of new combinations of digital and physical factors to produce new products." This integration of digital technologies, i.e., "combinations of information, computing, communication, and connectivity technologies" into physical products enables the development of new products, service designs, business models, and organizational forms (Fichman *et al.* Thus, digital technologies offer new openings for product-developing enterprises by encompassing both the addition and enhancement of previously being business models as well as a generation of radically new bones (Hylving *et al.*, 2012; Jonsson *et al.* 2008). In the automotive sedulity, this phenomenon is being observed as manufacturers incorporate digital technologies into their motorcars to gain precious data for a plethora of operations and offer an adding number of services analogous as advanced diagnostics, communication and entertainment systems, automobilist backing, and routing. These developments have formerly been excavated in detail by former academic work. For case, King and Lyytinen (2005) inquiry a business model where sensor data is used for vehicle diagnostics and related conservation services. Likewise, Lenfle and Midler (2009) describe an IT-enabled, subscription-predicated service that automatically conducts emergency calls in case of accidents or breakdowns.

In primarily physical diligence (Hanelt *et al.*, 2015a), digital invention implies a hybridization of digital and physical factors as well as their associated modes of product and association sense (Hylving and Schulze 2013). Still, when digital factors are implanted in palpable products, being product designs and associated organizational

processes are put under pressure (Hylving *et al.*, 2012). The automotive assiduity traditionally follows a dominant engineering sense whereby the palpable goods (i.e., the buses) enthral center stage and both product design as well as organizational sense have evolved over numerous times of incremental refinement (Hylving *et al.*, 2012; Wikhamn *et al.*, 2013). Traditional manufacturing relies on direct and successional product processes, between which quality controls are conducted in a planned manner (Cooper 1990; Wikhamn *et al.*, 2013). Thereby, the complete product process follows strict targets, as the wholeness of the products' functionalities and all applicable factors are determined and designed beforehand. Once the product characteristics are settled, enterprises concentrate on process invention and husbandry of scale rather than incubating technology invention (Hylving *et al.*, 2012; Murmann and Frenken 2006). In discrepancy, digital inventions follow a different sense with reference to their armature (Yoo *et al.* 2012). While physical products (e.g., buses) make upon a modular armature whereby interlocking factors are assembled to a single physical reality (Lusch and Nambisan 2015), digital technologies calculate on a concentrated armature in which each of the approximately coupled layers of bias, networks, services, and contents follows a different functional design scale (Gao and Iyer 2006; Yoo *et al.*, 2010). Therefore, the physical aspects of digital vestiges (i.e., tackle) are separate from the non-physical function (i.e., software).

### Leveraging external knowledge for innovation

Each invention process, at least to a certain degree, relies on the extension of an establishment's knowledge. While an increase of the knowledge base might also be achieved by several internal enterprise, external knowledge is of specific significance when companies enter different surrounds, e.g., new request settings (de Man and Duysters 2005) or discontinuous technologies, as these constantly represent business sense distinct from the established one. Thus, by exercising external knowledge, enterprises primarily try to pierce chops and capabilities to introduce in previously unknown business areas, as is the case for multitudinous traditional enterprises entering the digital period. West and Bogers (2014) describe the using of external sources of invention, including request or technology knowledge, as a three-phase process comprising an carrying, integrating, and commercializing phase (all of the phases are told by commerce procedures, analogous as feedback systems). M&A s are among the most prominent forms of the original phase of carrying external knowledge and "down when independent companies combine their operations into one new reality" (de Man and Duysters 2005). Although former disquisition "demonstrates that accessions expose enterprises to new ideas and in the long run lead to broader knowledge" (Kathuria *et al.*, 2011), empirical examinations concerning the consequences of M&A s on the innovativeness of the separate companies are rather disenchanting. In the swish case, neutral goods of M&A s have been discovered in former disquisition, as the integration of a whole establishment brings along multiple and different managerial challenges analogous as the deterioration of invention processes (De Man and Duysters 2005; Haspelslagh and Jemison 1991). Negative impacts on innovativeness are also set up by Lin (2009), who analyzes M&A s in the global machine sedulity and attributes these negative impacts to the high trade costs, distraction of operation attention down from internal invention, and general organizational walls, e.g., concerning communication. Still, the impacts of M&A s on innovativeness have been relativized by disquisition pressing the significance of the specific type of knowledge that is involved in the deal.

Eventually, in the commercialization phase, the achieved labors of the invention process manifest themselves, e.g., through the achieved value creation and value prisoner, which, taken together, constitute an establishment's business model (Rai and Tang 2014; West and Bogers 2014). Business models are abstract tools that describe the core sense of a business and comprise colorful rudiments, similar as the value proposition of the immolation or the client relationship (Osterwalder *et al.*, 2005). The focus on business models is of particular significance when fastening on invention, as exploration has set up agreement on the notion that the value of new ideas or technologies is dependent on

the separate business model in which they are incorporated (Al Debei and Avison 2010; Cavalcante 2014). As an establishment's success depends greatly on the fit of its business model with the external terrain, to benefit from invention sweats, it isn't enough to just develop and patent new technologies. Chesbrough (2007) countries, "moment, invention must include business models, rather than just technology and R&D". While substantial exploration has described the factors and taxonomies of business models, therefore employing a stationary view on the conception, a dynamic view is needed when logic about invention. Due to their tricks, especially their overarching nature performing from their multiple different factors, business model inventions are getting an decreasingly important unit of analysis for transformative change in colorful diligence, especially through digital inventions (Fichmann *et al.*, 2014).

### Automobile Industry is in the Development Stage

In the period of digital economy, the machine sedulity, as one of the important fields of manufacturing sedulity, should play a more important part. How to adjust and optimize the artificial structure in the period of digital economy and accelerate the conversion of new and old kinetic energy is a major disquisition content of artificial elevation. With the development of the digital economy period, the machine sedulity has changed mainly in the following four aspects. Data as the force and demand medium operation of product factors. With the deepening and invention of data conflation, "new models" related to the machine sedulity are gradually arising. The connection and collaborative influence of machine and affiliated industriousness under the "Internet of Everything" promote each other. The machine ecology of "R&D, product, deals and use" centered on buses has changed.

### The Automobile Industry will be paying more attention to the construction of ecological competition

In the period of digital economy 3.0, we should promote the integration and development of digital economy and real economy. predicated on data, we should make a new ecological competition of the machine sedulity with "people, vehicles and terrain" as the main body, enable all links of the machine sedulity chain, bring new requests, new models and new technologies, and promote the intelligent operation of the machine sedulity. In the digital economy 3.0 period, the machine sedulity will form a new business model, that is, from the direct thinking centered on the development and manufacturing of motorcars to the ecological allowing centered on the service operation of people, meeting the substantiated conditions of mass consumers will come the pursuit direction of the marketable value of machine enterprises, and the low-cost, high-quality real-time service capability will also come the introductory capability of machine enterprises. In the automotive sedulity chain, product planning, R&D design, test verification and product manufacturing are all to B, and marketing, use and conservation, relief gyration and scrap recycling are to C. The integration of to B and to C is the trend in the 3.0 period of digital economy. The service mode of the automotive sedulity will gradually evolve from to B single wheel drive to to B to C double wheel drive. On the one hand, a group position collaborative office platform will be established to make a supportive digital structure. To make business operation more nimble, on the other hand, establish a consumer acquainted intelligent commerce platform, form a consumer predicated automotive sedulity ecology through real-time touch, analysis, prophecy and other demand perceptivity, achieve multiple data closed-circle, and meliorate the delicacy of decision-making. In the future, the organic combination of intelligent connected vehicles, intelligent transportation and smart metropolises will serve as the base for the effective and cooperative operation of "people vehicle road pall network" integration, and will concertedly make a new artificial ecosystem to achieve connectivity.

## RESEARCH METHODOLOGY

### 1: Research Objectives

Due to the use of digital technology in the modern period, the automotive industry is going through substantial changes. The next

research goals can be outlined in order to examine the many components of this transformation:

**1: Understanding the impact of digital technologies on vehicle design:** In response to consumer needs and trends, automobile firms may now incorporate cutting-edge features and services into their product design processes thanks to digitalization and new technology. This goal entails researching how digital tools, such as machine learning and data analytics, are applied to enhance the design process and the user experience as a whole.

**2: Analysing consumer preferences for connected cars:** The development of linked automobiles, which offer a variety of features and services to improve the driving experience, is a result of the growth of the Internet of Things (IoT) and connection. The future of automotive technology would be better understood by examining consumer preferences for these linked cars, which would also enable businesses to better adapt their products to suit the needs of their target markets.

**3: Assessing the role of data analytics in supply chain management:** The automobile industry's supply chain management has been touched by digital transformation as well. Companies may optimize their supply chain processes, increase efficiency, and cut costs by analyzing data from numerous sources. This goal entails researching the application of data analytics in supply chain management and how it affects the performance of automotive companies as a whole.

**4: Exploring the challenges and opportunities of digital transformation in the automotive industry:** For the automotive industry, digital transformation brings both opportunity and constraints. Companies should establish successful strategies to traverse the digital ecosystem and maintain competitiveness by being aware of these opportunities and difficulties. Studying the many factors driving, trends, and use cases of digital transformation in the automobile industry would help achieve this goal.

Numerous research papers, industry reports, and news pieces have discussed the digital transformation of the automotive sector. The main conclusions are summarised here:

Digital technologies are creating new interdependencies with businesses beyond the automobile industry and fostering industrial transformation, according to a 2022 research report. Unconnected and autonomous driving, mobility as a service, digital information sources for car purchases, and big data are only a few of the topics and actors covered in a different report from 2020 that examines the process of digital transformation in the automobile industry. According to the study's findings, digital transformation is having a substantial impact on how automakers and service providers conduct business as well as changing the global automotive industry landscape quickly. The automobile sector is changing, and established business models are being disrupted by digital technology, according to a research study from 2022, which creates new business prospects.

## DATA COLLECTION

Sources of data on the automobile industry in the digital era include:

**1: Academic studies:** Academic research, like the one on PMC - NCBI, can shed light on how the automobile sector will be affected by digital transformation. These studies may address issues including big data, linked and automated driving, mobility as a service, and the use of digital information sources while buying cars.

**2: Industry publications:** Information about the most recent trends and advancements in the automotive industry, including the effects of digitalization, may be found in publications like Politico.eu and Forbes. These articles may address subjects including remote diagnostics and repair, shared mobility models, personalized insurance policies, and preventative maintenance services.

**3: Data analytics companies:** Big data in the automobile sector can be outlined by organizations like DataMyte. These businesses may use data analysis to gather information about the market from a variety of sources, including sensors, cameras, and devices that are connected to the internet.

**4: Consumer research:** Consumer research can reveal how consumers are utilizing online resources to study and buy vehicles, such as the figures from Think with Google. For instance, twice as many automobile purchasers start their investigation online than at a dealer and 95% of them use digital sources of information.

## Technology Trends

The latest digital technologies shaping the automobile industry include:

**1: Autonomous vehicles:** Sensors, cameras, and other technologies are installed in autonomous vehicles to allow for autonomous operation. This technology is anticipated to transform the transportation sector by lowering accident rates, enhancing traffic flow, and enhancing mobility for those who are unable to drive.

**2: Electric vehicles:** Electricity is used to power electric vehicles (EVs) instead of petrol or diesel fuel. Due to their cheaper operating costs, lower emissions, and increased performance, EVs are growing in popularity.

**3: Connected car platforms:** Internet connectivity is used by connected car platforms to allow communication between automobiles, infrastructure, and the cloud. Predictive maintenance services, real-time traffic data, and remote diagnosis and repair are just a few advantages this technology may offer.

**4: Mobility-as-a-service (MaaS) solutions:** MaaS solutions provide on-demand access to transportation services, such as ride-sharing, car-sharing, and public transit. MaaS solutions are designed to provide a more efficient and convenient transportation experience for users.

These technologies impact various aspects of the business, from production to marketing. For example:

### Production

Different manufacturing procedures are needed for EVs and autonomous vehicles compared to conventional vehicles. To create these automobiles, manufacturers must make investments in new machinery and retrain their staff.

### Maintenance

Remote diagnosis and repair are made possible by connected car platforms, which can lessen the requirement for in-person maintenance. Additionally, this technology can offer predictive maintenance services, which can aid in averting failures and decreasing downtime.

### Marketing

MaaS solutions demand a different kind of marketing strategy than conventional auto sales. The advantages of on-demand transport services, such as convenience and cost savings, must be emphasized by businesses. Overall, cutting-edge digital technologies are revolutionizing the automotive sector by enhancing customer safety, lowering pollution, and offering new mobility possibilities.

## IMPLICATIONS OF AUTOMOBILE INDUSTRY

### Supply Chain Management

The vital role of supply chain management (SCM) in augmenting the automotive performance cannot be undermined and as a major source of competitive advantage to the automobile industry. Ambe and

Badenhorst-Weiss (2010) observe that changing market conditions of the 21st century, along with globalization, economic uncertainty towards newer technologies and growing consumer demands are critical issues for concern. The automotive supply chains have become increasingly complex, seriously affecting profitability and shareholder value in terms of longer order-to-delivery lead times, surplus inventory across supply chains, unreliability in production schedules, and lack of supply chain visibility. Hence, adopting an effective and efficient supply chain strategy is necessary for automotive and their component manufacturers to address ever-changing consumer demands. Supply Chain Management (SCM) gains considerable attention for its focus on material, information as well as cash flows in the total supply chain right from suppliers' suppliers through customers' customers and vice-versa. A noted feature of present day business is the idea that supply chains compete, not companies and the success or failure of supply chains are ultimately determined by the end-consumer in the marketplace. It is contingent upon businesses for their survival and competitive success to get the right product, at the right price, at the right time to their final consumers. Hence, marketplace understanding, and customer satisfaction are critical elements to be considered while establishing a supply chain strategy.

Against this backdrop, the past two decades or more has seen supply chain management highly concentrating on lean concepts. Strategies such as, just-in-time (JIT), virtual inventory, outsourcing, waste minimization (value stream mapping), reduction of buffers in materials, time and capacities, customized and global networks etc., have enabled organizations in reducing overall costs and enhancing supply chain performance. In a continuously changing competitive environment, an organization's supply chain agility has a direct impact on its ability to produce and deliver innovative products for their customers in a cost-effective and timely manner (Swafford et al., 2006). Agility is a business-wide capability that embraces organizational structures, information systems, logistics processes and in particular, mindsets. In addition to the above, recent academia and scholarly attention have focused towards a hybrid approach (e.g., leagile) supply chain strategy which is a combination of both lean and agile strategies. The concept of 'leagile' is opined to address business uncertainties, market and customer needs more proactively while also maintaining higher levels of operational efficiency (Lee, 2004). In spite of the advancement of the hybrid (leagile) strategy concept, much effort is required to uncover the use and impact of this strategy in automotive companies, thereby instigating a need for practical investigation and explaining the advantages of the leagile strategy.

### Consumer Behavior in Automobile Business

Consumer behaviour is critical for both prior and subsequent purchasing choices. Without a thorough grasp of consumer behaviour, it is impossible to succeed in today's tough and competitive market. A promoter's grasp of the purchasers allows them to make forward-thinking judgments that are appropriate for their clients' demands. According to the findings, there are many primary groups of consumer behaviour determinants and expectations, including demographic, socioeconomic, product, and technological factors. Vehicle manufacturers will be able to change their procedures in response to client behaviour if buyer behaviour is further factored into these classes. Purchaser dynamics are influenced by aspects such as product quality, performance, and eco-friendliness. These are the primary factors that a manufacturer should consider while developing a strategy in this industry. Two-wheelers, trucks, automobiles, buses, and three-wheelers are all part of the Indian automobile sector, which contributes significantly to the country's economic prosperity. India has overtaken Japan, South Korea, and Thailand as Asia's fourth largest exporter of autos. By 2050, the country is predicted to be the world's largest auto market, with over 611 million vehicles on the roads. The number of products and services produced, which provide transportation capacity and drive car sales, is a measure of this industry's economic growth. The need for various raw materials, including as steel, rubber, plastics, glass, paint, electronics, and services, has increased dramatically as a result of the massive expansion in automotive manufacturing. Testing infrastructure in the

country is being upgraded to fulfil the concurrent testing and certification operations linked to increased safety Page | 11 and emission regulations. With industry engagement, a substantial amount of public investment is being planned for modernising the testing infrastructure.

### FUTURE GROWTH IN THE AUTOMOBILE INDUSTRY

The future growth of the automobile industry is expected to be influenced by various factors and trends. As of my last knowledge update in January 2022, here are some key considerations for the future growth of the automobile industry:

- 1. Connected Vehicles:** The integration of advanced connectivity features in vehicles is on the rise. This includes features such as in-car infotainment systems, telematics, and vehicle-to-everything (V2X) communication.
- 2. Environmental Regulations:** Stringent emissions standards and environmental regulations are influencing the development of cleaner and more fuel-efficient vehicles. Hybrid technologies and alternative fuels are being explored.
- 3. Digitalization and Industry 4.0:** The adoption of digital technologies, including artificial intelligence, IoT, and data analytics, is transforming manufacturing processes. This leads to improved efficiency, reduced costs, and enhanced product quality.
- 4. Supply Chain Resilience:** The industry is focusing on building resilient supply chains, especially in the wake of disruptions like the COVID-19 pandemic. Companies are reevaluating supply chain strategies and considering local sourcing.
- 5. Consumer Preferences:** Shifting consumer preferences, including a demand for sustainability, connectivity, and advanced safety features, are influencing vehicle design and manufacturing.
- 6. Economic Factors:** Economic conditions, including GDP growth, interest rates, and consumer confidence, play a significant role in determining the overall demand for vehicles.
- 7. Regulatory Landscape:** Ongoing changes in regulations, including safety standards, emissions requirements, and trade policies, can impact the industry's growth trajectory.
- 8. Infrastructure Development:** The growth of the electric vehicle market is closely tied to the development of charging infrastructure. Governments and private entities are investing in building a robust charging network.
- 9. Global Markets:** Expanding into emerging markets and adapting to regional preferences and regulations contribute to the growth strategies of automotive companies.

It's essential to note that the automotive industry is dynamic, and trends may evolve over time. Additionally, unforeseen events, such as global economic shifts, geopolitical factors, or public health crises, can also influence the industry's trajectory. For the most current and specific insights, it's recommended to refer to the latest industry reports and analysis

### CHANGE IN TRENDS OF AUTOMOBILE INDUSTRY

**Electric Vehicles (EVs):** With numerous major automakers making significant investments in the development of electric cars, there has been an increasing attention on EVs. This trend was being driven by advancements in battery technology, an expansion of the charging infrastructure, and environmental concerns.

**Autonomous Vehicles:** Research and testing on self-driving, or autonomous, vehicles were gathering steam. To develop the capabilities of autonomous driving, businesses were investing in technology like artificial intelligence, machine learning, and sophisticated sensors.

**Connectivity and Internet of Things Integration:** With features like sophisticated infotainment systems, smartphone integration, and Internet of Things (IoT) connectivity, cars were becoming more and more connected. This tendency made driving more enjoyable overall and made new services possible.

**Shared Mobility:** The conventional ownership paradigm was being impacted by the emergence of ride-sharing services and the idea of Mobility as a Service. A lot of customers were gravitating toward shared mobility solutions, which caused businesses to rethink their business strategies.

**Sustainability and Green Initiatives:** With the use of eco-friendly materials, lower emissions, and green production techniques, automakers were emphasizing sustainability more. The need for eco-friendly items among consumers contributed to this trend.

**Advanced Driver Assistance Systems (ADAS):** Autonomous emergency braking, adaptive cruise control, and lanekeeping assistance are just a few of the advanced safety features and driver support technologies that are becoming more and more common in cars.

**Digitalization of Services:** As virtual showrooms, online sales platforms, and digital consumer experiences proliferated, the sector was going through a digital revolution.

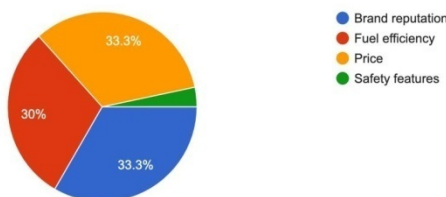
Though automobile components industries around the world are restructuring because of the expanded global outsourcing of automobile manufacturers in general, western automakers are leading the trend in reducing their herd of suppliers. While assembler-level manufacturers in the automobile industry push forward with restructuring efforts and global strategies, that same wave of globalization and the structural changes that result from it are rolling through the automobile components industry where local business structures and systems differ from country to country. These structural changes are being caused in part by the expanded global outsourcing that automobile manufacturers have marked as a pillar move in their development strategies. Another driving factor behind the structural changes is the globalization of the automobile components suppliers themselves who are integrating, merging and building network tie-ups on their own according as well as stepping into the driver's seat with globalization strategies of their own.

## RESEARCH ANALYSIS

### Question 1 Responses

**Interpretation:** It is seen that majority of the people chose brand reputation as the primary factor influencing consumer choices in the Indian automobile industry.

What is the primary factor influencing consumer choices in the Indian automobile market?  
30 responses

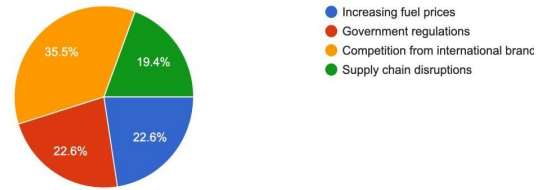


### Question 2 Responses

**Interpretation:** It is seen that there is a tie between responses of people who choose government regulations and increasing fuel prices.

The majority of the people chose Competition from international brands as the most significant challenge

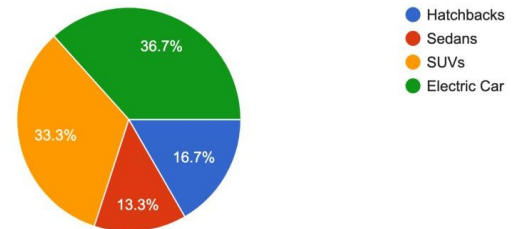
What is the most significant challenge faced by the Indian automobile industry today?  
31 responses



### Question 3 Responses

**Interpretation:** According to the responses, Electric Car is the most popular because it runs on electricity, the vehicle emits no exhaust from a tailpipe and does not contain the typical liquid fuel components, such as a fuel pump, fuel line, or fuel tank.

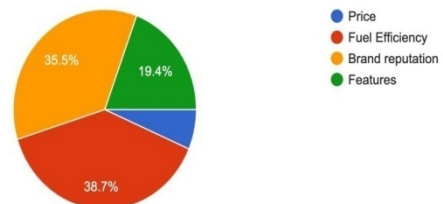
What is the most popular segment of cars in India?  
30 responses



### Question 4 Responses

**Interpretation:** Due to rising pollution levels with rapid changing technology, Fuel efficiency is most considered by people when purchasing a vehicle

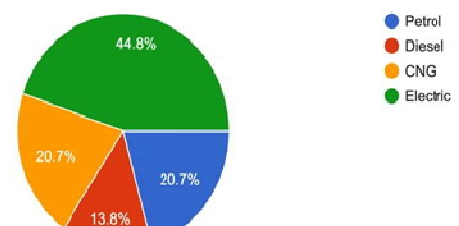
What factors are most important to you when purchasing a vehicle? (e.g., price, fuel efficiency, brand reputation, features)  
31 responses



### Question 5 Responses

**Interpretation:** Electric is the fuel most recommended in Indian vehicles due to rising pollution levels.

Which type of fuel is currently the most recommended in Indian vehicle?  
29 responses

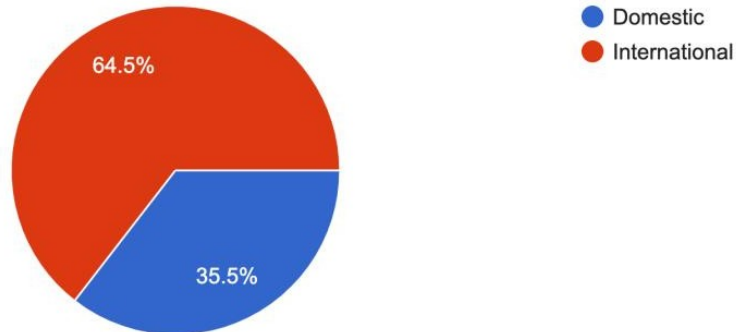


**Question 6 Responses**

**Interpretation:** Majority of the people has chosen International brands as their preferred option due to the rising stigma that foreign brands are of better quality than domestic ones.

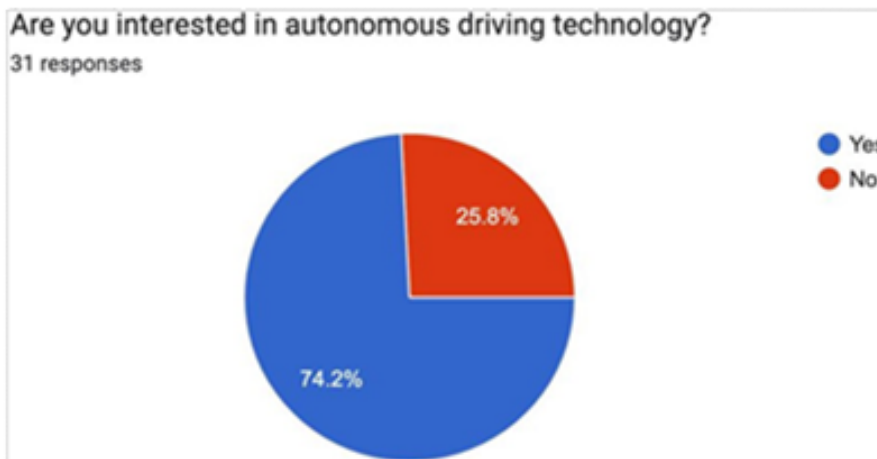
Are you more inclined towards domestic or international automobile brands?

31 responses



**Question 7 Responses**

**Interpretation:** Majority of the people are interested in autonomous driving technology.

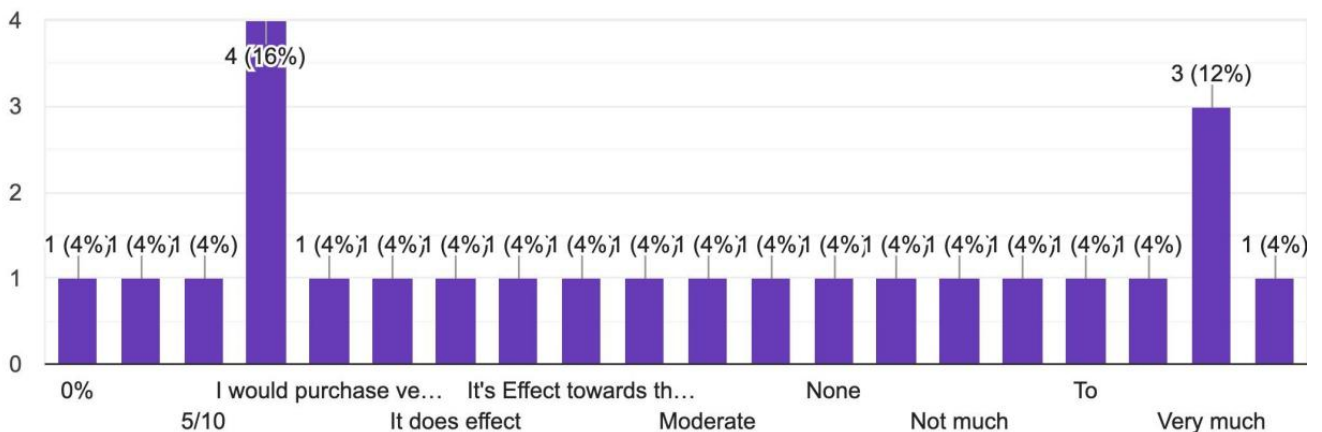


**Question 8 Responses**

**Interpretation:** This question was not of MCQ format and the individuals had given their varying opinions on the question.

To what extent does environmental sustainability influence your vehicle purchase decisions?

25 responses

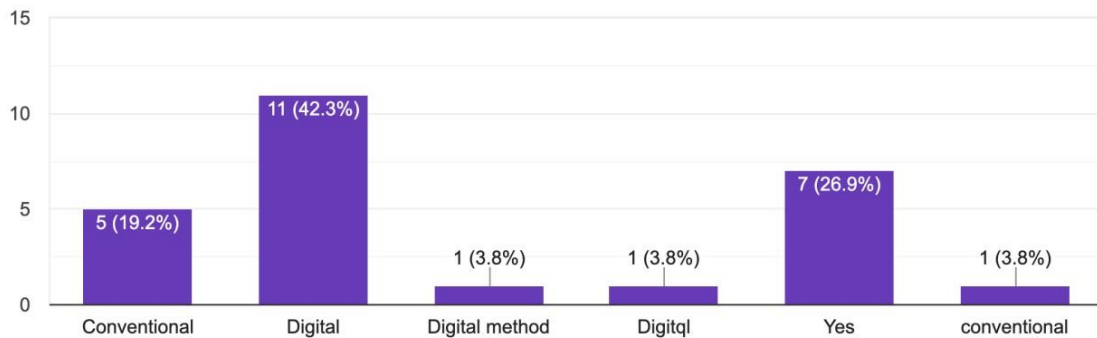


**Question 9 Responses**

**Interpretation:** By analysing the bar chart, we can see that majority of the people has chosen Digital method as being a better option for automobile industry to thrive in the market

Do you think the automobile industry in India is having the scope in Digital or conventional method?

26 responses

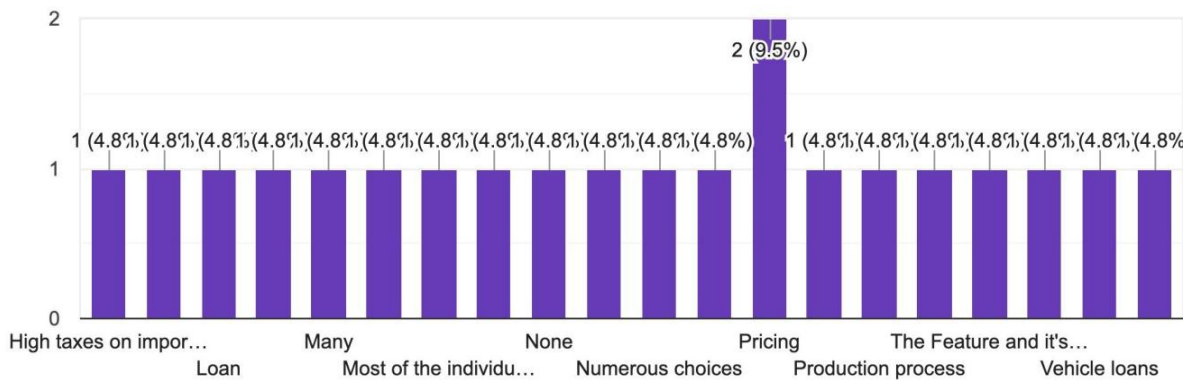


**Question 10 Responses**

**Interpretation:** It is seen that majority of the people think pricing is the most important challenge faced while purchasing automobiles in India

What challenges do you face when it comes to the automobile purchasing process in India?

21 responses



**CONCLUSION**

In the digital age, the automotive sector is undergoing a dramatic transformation characterised by the incorporation of AI, IoT, and the growing popularity of electric vehicles. The industry's future development is influenced by its combined emphasis on sustainability and technology innovation, especially in the areas of connectedness and autonomous driving. These patterns show a more general change in customer preferences towards shared and electrified mobility options. It is becoming more and more important to keep up with evolving technology as the industry adjusts to these developments. For professionals to successfully navigate the changing market, they must constantly refresh their skill set. The aforementioned dynamic environment highlights the necessity of adopting a proactive and learning- centric approach in order to maintain relevance and competitiveness in the dynamic automotive industry.

**REFERENCES**

1. [https://link.springer.com/chapter/10.1007/978-981-13-8102-7\\_19](https://link.springer.com/chapter/10.1007/978-981-13-8102-7_19)
2. <https://www.spyne.ai/blogs/automotive-industry-trends#:~:text=Some%20common%20areas%20of%20focus,and%20sales%20and%20distribution%20models>
3. [https://www.researchgate.net/profile/Andre-Hanelt-2/publication/299598625\\_Entering\\_the\\_Digital\\_Era\\_-\\_The\\_Impact\\_of\\_Digital\\_Technology-related\\_MAs\\_on\\_Business\\_Model\\_Innovations\\_of\\_Automobile\\_OEMs/links/5749697d08ae5c51e29e743c/Entering-the-Digital-Era-The-Impact-of-Digital-Technology-related-M-As-on-Business-Model-Innovations-of-Automobile-OEMs.pdf](https://www.researchgate.net/profile/Andre-Hanelt-2/publication/299598625_Entering_the_Digital_Era_-_The_Impact_of_Digital_Technology-related_MAs_on_Business_Model_Innovations_of_Automobile_OEMs/links/5749697d08ae5c51e29e743c/Entering-the-Digital-Era-The-Impact-of-Digital-Technology-related-M-As-on-Business-Model-Innovations-of-Automobile-OEMs.pdf)

5. [https://www.clausiuspress.com/assets/default/article/2022/12/14/article\\_1671073744.pdf](https://www.clausiuspress.com/assets/default/article/2022/12/14/article_1671073744.pdf)
6. <https://www.linkedin.com/pulse/top-10-technology-innovation-trends-automotive- bapat-pmp-csm-/>
7. <https://research.aimultiple.com/digital-transformation-automotive/>
8. <https://www.autonews.com/technology/auto-industrys-innovative-technologies-2023>
9. <https://www.cravingtech.com/11-recent-technological-trends-in-the-automobile- sector.html>
10. <https://www.notarize.com/blog/12-emerging-automotive-industry-technology-trends- to-know>
11. <https://www.spyne.ai/blogs/digital-transformation-in-automotive-industry>
12. Modern Research in consumer behaviour and marketing research - scripown. (n.d.). [https://www.scripown.com/docs/ EBOOK\\_20230412\\_040703.pdf](https://www.scripown.com/docs/ EBOOK_20230412_040703.pdf)
13. Iyengar, V. and Bharathi, S.V. (2018) *Bibliometric analysis of Lean, agile, and leagile supply chains in automobile industry (1990 - 2017), International Journal of Information Systems and Supply Chain Management (IJISSCM)*. Available at: <https://www.igi-global.com/article/bibliometric-analysis-of-lean-agile-and-leagile-supply-chains-in-automobile-industry-1990---2017/206161> (Accessed: 26 December 2023).
14. <https://dspace.mit.edu/handle/1721.1/1417>  
<https://enterslice.com/future-of-automobile-industry-india>