Automobile Industry on Challenges Business Strategy Revolution, Trends & Unsolved Problems

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Abstract: *The automotive industry is facing new and pressing challenges. Globalization, individualization, digitalization and increasing competition are changing the face of the industry as we know it. In addition, increasing safety requirements and voluntary environmental commitments by the automotive industry will also contribute to the changes ahead. Size is no longer a guarantee of success. Only those companies that find new ways to create value will prosper in the future. The purpose of this paper is to present a short overview of the automotive industry today and highlight challenges facing the industry.*

Key Words: *Automobile Industry, Challenges, Issues &Trends, Unsolved problem.*

1. INTRODUCTION:

Peter Drucker has called the automobile industry as "the industry of industries". During the last few years, the production and management systems have been revolutionized worldwide in the automobile industry. One of the major changes in the industry has been the opening up and growth of several emerging markets. The automotive industry is now facing new and pressing challenges. Globalization, individualizations, digitalization and increasing competition are changing the face of the industry.

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The automotive industry is undergoing a period of mass disruption and transformation. A convergence between technology companies and auto manufacturers is blurring industry lines and expanding the bounds of the traditional automotive company. Consumers are changing and evolving from an ownership-centric mindset to service-centric demand. Supply chain will be at the core of this transformation. Here's a look at five of the major challenges and disruptions in the auto industry as we look to the year ahead. The global automotive manufacturing industry is growing, and with that growth comes the need for evolution and change. By 2019 it is estimated that manufacturers will be producing a staggering 100 million light vehicles per year, but in order to share in this prosperity companies are being forced to adapt critical processes.

Overcapacity. Like all industries, automobile manufacturing experiences ups and downs. Overcapacity is the problem that occurs when a manufacturer has already invested the resources (such as payroll and materials) into building a certain quantity, only to discover later that they do not need to produce as much as they had planned for. The result is an over-expenditure that can damage cash flow and result in waste. The best way to avoid overcapacity is to invest in increased production floor responsiveness and better master production scheduling .

Sustainability. Consumers are increasingly concerned about sustainability. Manufacturers, therefore, must strive to create more eco-friendly cars and to be more efficient in production.

Globalization. Increased global competition means lower market prices for many vehicles: once again, most solutions call for increased efficiency in order to offset a lower margin of profit.

Urbanization. Modern consumers have a different set of criteria for their cars, many of which are related to urbanization. They include smaller vehicles, better maneuverability, and increased fuel mileage,

Attracting talent. As the automobile industry continues changing, manufacturers will need to continue attracting the best and the brightest talent in order to adapt to the times.

2. The biggest headaches facing automotive manufacturers in the next 4 years:

2.1 Complexity and product variation

The number of vehicle models for sale worldwide is sky rocketing! In Europe alone the number of available car types is expected to increase by more than 20% from 2012 to 2019[2], when approximately 230 different models will be on offer. And given that each of these models is available with multiple customization options, that equates to

hundreds of trillions of possibilities. But it doesn't stop there. Across the US and Europe car companies are strategically consolidating their operations – moving towards producing more vehicle models in the same plant, even on the same production line. Managing this unfathomable level of complexity and product variation presents an enormous array of business-critical challenges.

2.2 Cost and waste reduction

Vehicle manufacturers are constantly required to demonstrate innovation and add new features, but this has not been matched by the sale price of their products. Buyers are savvier now too and won't purchase unless the product meets their desired specifications as well as representing good value. Then there's the increasing number of government-backed mandates, such as the requirement to hit reduced CO2 emission targets. Just meeting the most essential needs for product development increases overheads by around 4% each year, yet vehicle companies are unable to off-set this expense onto customers. The only way to remain profitable in this environment is to cut costs and waste.

2.3 Accelerating pace of innovation

The percentage of each vehicle's sale value that comes from its component parts is on the rise, and this is driving a fundamental shift in the market environment. Innovation that occurs on a supplier level is immediately and simultaneously available to all OEMs. No one can afford to fall behind, but the increased up-take of new parts means that costly assembly line re-fits are required more and more frequently.

3. INDIA'S AUTOMOBILE SECTOR:

Increased and better forms of mobility are one of the key outcomes of growth and development of any economy. It can also be argued that increased mobility will further promote economic growth and development since it connects people to jobs, markets, and services, and gives people a chance to gain equity in the political, economic, and social spheres. Considering an insatiable demand for vehicles in an economy that is expected to grow at an average of 7% for the next 20 years, the automobile sector in the country will require disproportionate amounts of natural resources which will not only have economic cost implications, but also have strong environmental and social impacts. Future growth will be associated with increased raw material extraction, pollution arising from production, processing of primary materials for production of auto components, GHG emissions during the manufacturing phase, use/operation phase, traffic congestion, etc.

TERI in association with GIZ India is undertaking a project supported by Federal Ministry for the Environment, Nature Conservation, Building and Nuclear safety (BMUB) and Ministry of Environment Forest and Climate Change, to understand the existing and future dependence on material resources of India's growing automobile sector and exploring opportunities of saving resources along the value chain for improved sustainability of the sector. The consortium is working with medium and small-scale industries producing auto components as well as the end of life vehicle (ELV) dismantlers in implementing pilot interventions to achieve material use efficiency. The three year project will also be developing policy framework and guidelines that would facilitate adoption of resource efficiency interventions across the automobile industry in India.

3.1 Facts & Figures

Automotive industry grew at the rate of 14.4% over the past decade, making India the world's sixth largest producer of automotives in terms of volume and value.

The sector employed 12.5 million people (about one per cent of India's population), directly and indirectly, and contributing nearly five per cent to India's GDP.

Currently, India's share to global production of automobiles is 4.9 per cent, making it the fifth largest producer after China, Japan, Germany, and South Korea. Government of India aims to make automobiles manufacturing the main driver of 'Make in India' initiative, as it expects passenger vehicles market to triple to 9.4 million units by 2026, as highlighted in the Auto Mission Plan (AMP) 2016-26.

3.2 Business Strategy in the Automotive Industry

During the past 10 years and up to 2014, the automotive industry has been experiencing a nearly worldwide slowdown in sales growth due to declining new passenger car registrations in key markets such as the United States, Europe, and Japan. This slowdown is a result of a combination of factors including slowing economies, but principally because of higher oil prices that affect both the type of vehicles purchased and the amount of discretionary funds available to buyers. This trend has reversed temporarily in 2014-2016 due to the sharp decline in oil prices that resulted in a surge in car sales notably in North America. The question is how long the oil prices will remain depressed? The Economist Intelligence Unit indicates several areas of growth, or potential for growth, in the industry. Clearly, there will be losers as a result of these bleak conditions, but the winners will be those that can refocus their resources to create and exploit comparative advantages in the face of increasing competition.

According to Grant (2008), companies gain a competitive advantage through both internal and external resources .Externally, firms are affected by natural resource availability, social culture and values of both local buyers and labor forces, and the structure of the environment relative to both competitors and suppliers. Internally, companies develop competencies that help them create value more efficiently than competitors.

The strategy consists of a variety of measures, including the following:

3.2.1 Global strategy

Formulating a world-leading, advanced domestic market focusing on global challenges including environmental and energy limitation, as well as encouraging global operational presence:

- Encouraging global operational presence (strategically utilizing EPAs and other international frameworks);
- Stimulating domestic markets (revision of motor vehicle taxation, etc.);
- Promoting next-generation vehicles (creation of initial demand, acceleration of infrastructure development); and
- Promoting research and development of innovative internal combustion engines.

3.2.2 Strategy towards creating a comprehensive business model utilizing a social system centered on vehicles.

Addressing a variety of challenges, including an aging society, urbanization, environmental issues, and disaster control, utilizing a social system centered on vehicle so as to produce new sources of competitiveness which will drive the industry to hold a leading position in the world:

- Automated driving (development of hazard anticipation and avoidance technologies, international standardization of the technologies, and study for legal and regulatory issues; and
- Big data/information services (study for a new business model).

3.2.3 Strategy for research, development, and human resources

Conducting efforts for strategic selection and concentration as well as for developing R&D and production systems, while enhancing collaboration frameworks through industry-academia partnership, amid growing needs for cost reduction, diversification of automobile models, and expansion of technology fields concerned:

3.2.4 Enhancing collaboration frameworks (identification of six prioritized fields, specification of the areas in which they collaborate, and formulation of a road map.

- Pursuing coexistence and co-prosperity between the automobile industry and the automobile parts, components and materials industry (support for the global niche top companies, promotion of appropriate transactions of the auto industry, developing structure for compliance relating to the competition laws).

3.2.5 Strategies for motorbikes, buses, trucks, forklifts, and wheeled devices for transportation

Challenges and measures for overcoming the challenges for industries concerning motorbikes, busses, trucks, forklifts, and wheeled devices for transportation were compiled.

4. THE AUTOMOTIVE REVOLUTION:

New gadgets and innovative technologies are driving a disruptive change that experts agree will reshape the foundations of the automotive industry as we know it. McKinsey's 2016 prognosis for the automotive industry's future has identified four important technology-driven changes affecting the market.

4.1 New technologies: Electrification, connectivity & autonomous driving

While we're talking about changes that are more disruptive than simply hooking up cars with the latest of gear, it is embedded technology that has enabled these trends to emerge. So it's important that we analyze just what kind of automotive technology is in the making. The steadily dropping price of batteries as well as other technologies has enabled electric cars to pop up on our roads, and experts agree that hybrid or fully electric cars will soon be cost-competitive with conventional automobiles. Interest in efficient and eco-friendly technologies is also on the rise.

The addition of connectivity capabilities has paved the way for autonomous vehicles. Due to large-scale research projects by Google, Apple, and practically all of the leading carmakers, self-driving cars have been in the centre of attention recently. While the use of fully autonomous vehicles in real traffic situations may be further down the road, advanced driver-assistance systems (ADAS) that rely on similar technology have already started partially taking over control from human drivers. This will help shape public opinion and safety/security regulations, but will also drive further innovation in this area.As software plays an increasingly important role in how modern cars operate, competition will likely force innovation to speed up, and new functionality may be added to your car with a simple software update. Upgradability will become vital. The intertwining issues of cybersecurity and road safety will gain further importance.

Perhaps a less immediate change, but automotive experts and researchers also believe that technologies such as 3D printing and machine learning (AI) will have a great impact on the auto industry. 3D printing may allow us to

build better, safer, but not as long-lasting bodies for our cars, allowing more economical accident repair, while artificial intelligence (AI) could help us ensure the security of data.

4.2 Changing value chain in the automotive industry: Compete or cooperate?

Not only will companies have to reimagine their opportunities for realizing revenue in an agile way, but they will also be forced to think about how they compete, and who they compete with. The auto industry hasn't fundamentally changed since the first cars were manufactured: there are a handful of major carmakers that make profit by selling cars and other (hardware) products, and some services. With the automotive revolution that the above trends outline, it's inevitable that new, non-traditional players will enter the market.

To compete with these new entrants, carmakers will have to redefine their role in the auto industry, and either assume new business models, or gain new competences. For instance, as software becomes increasingly important, they will need to build solid proficiency in software development, or partner with a tech company that has the necessary capabilities

4.3 How we relate to mobility: Changes in consumer behavior

Interestingly, as technology makes vehicles safer, cleaner, and more convenient, it seems like consumers are less likely to get emotionally attached to their cars. McKinsey forecasts that in 2030, 1 out of 10 cars sold could be a shared vehicle. The signs of declining ownership are already apparent, and the report expects this trend to continue and even accelerate in coming decades.

Mobility providers such as Uber and others will enable consumers to simply rent a (shared) car as an on-demand service, specifically for their intended purpose and for a set travel itinerary or period of time. Ownership is expected to be less important, and car customizability will be achieved by modularization and via flexibly configurable software with personal profiles.

4.4 Where carmakers make their money: New sources of revenue

Mobility solutions aren't the only new avenues of business opening up for the auto industry. Surpassing the traditional notion of revenue streams (car sales and aftermarket products/services), companies will find new ways to realize value, disrupting and transforming business models on the automotive market. Some new, viable forms of business models may not even have been devised yet.

Connectivity allows vast amounts of valuable data to be generated, enabling the capitalization of data-driven services. Expanding autonomous technology will enable transit time to be used for personal activities, opening up new revenue streams for automotive companies (in the form of entertainment, media, and other services). This will most likely attract new providers to the market, and/or require traditional auto companies to gain competences in new areas – leading us to the last very important trend that is already shaping the automotive industry.

5. UNSOLVED PROBLEMS IN AUTOMOBILES

There are unsolved problems in the field of automobile engineering and the automotive manufacturing sector. The unsolved problems exist in both the automobile product and manufacturing process. Some of them are listed below:

- The IC engine technology, as such is one of the oldest. Truly speaking, its been almost a century, since the internal combustion engine has been in use, and no major technological changes have occurred in it. Same old petrol or diesel fuel, gets converted to mechanical power by means of controlled combustion. Why hasn't the technology gone further? Why haven't any alternate fuel or renewable power source appeared as a dependable technology (Is it due to the crude oil mafia played by Big brother and its European counterpart Lots of unexplored areas like organic fuels (Jatropha), harnessing solar energy, etc.
- Truck manufacturers, esp. Indian industry struggle a lot in finding solutions for pre mature Tyre wear. The tyre wear is a complex phenomenon that involves suspension and steering geometry, road conditions, weight distribution and overall vehicle dynamics. Still a single mathematical formula is yet to be arrived at, to sum-up the rate of tyre wear for a vehicle… Well, anyone out there with solutions.
- People in countries which have a high density of vehicle population, tend to over use their horns. Honking is a highly irritable phenomenon in Indian roads and people in general don't know why they honk their horn but keep honking them sub consciously. Any technology to address this?
- Here is another one related to legislation and judiciary! Commercial trucks and tippers in India are loaded much higher than their rated pay load. Even up to 2 times their rated payload. There is legislation in place for preventing this. Also technology is also available (Load sensing valve) with OEMs, but they don't provide this in their vehicle. Reason: More for less attitude - More load for a less number or trips. This over loading is

done by 75% of trucks and tippers in India. Government and RTOs are well aware of this, but they don't take any action and instead take bribes. This leads to an increase in road accidents, frequent damage to roads(owing to higher point load on tyres) Now coming to the relevance of the question, this problem needs to be solved through law enforcement! It is a problem related to not obeying the laws of government.

- Two wheeler riders need a helmet which has better air circulation and cooling mechanism which is inbuilt. Riding a two wheeler with a helmet in a hot day is really tiresome, when the ride duration gets longer. The head needs to be always kept cool, so as to enjoy the journey and also ride safely. Some kind of an innovation is expected so that the oncoming air enters and leaves the helmet shell, and in the process cool down the surface temperature of the head.
- An on board diagnostics for cars, which incorporates driver behavior tracking. This includes a series of sensors like speed sensor, GPS, yaw angle sensor, gravity sensor, accelerometer, gyros and along with a driver facing motion sensing camera. This will track the number of times the driver honks the horn, whether the turn indicators are used appropriately in turns, any sudden acceleration or deceleration patterns, high beam usage analysis, etc. So at the end of the trip the OBD (On board Diagnostics) would give a report on the conduct of the driver - Good, average or a rouge driver!

6. AUTOMOTIVE INDUSTRY ISSUES AND TRENDS:

The automotive industry is characterized by intense competition, a sharp focus on cost and regulatory oversight with an ongoing trend towards global sourcing and distributed manufacturing and assembly operations. As the automotive industry in North America continues to emerge from the recession, automotive suppliers and manufacturers need a professional services firm with a wide range of automotive industry knowledge, someone who understands the latest trends and challenges automotive manufacturers face each day. We are thoroughly familiar with the challenges our automotive industry clients face and the climate in which they operate, including not only accounting and tax issues, but also the business and technical factors that drive the industry. Our automotive practice helps clients tackle some of the most challenging and complex issues facing the industry, including.

Mobile connectivity - this technology is the latest trend to have an impact not only on consumers' mobility choices and transportation choices but seriously affects the decisions made in the board room regarding model refresh cycles.

Corporate Average Fuel Economy (CAFE) standards – the ever-changing requirements regarding vehicle weight impacts your product development cycle, manufacturing processes and your material choices.

Import and export activity – understanding the impact of increases or decreases in your automotive import and export operations and what advantages you may have.

Research & development life cycles – the automotive industry is transforming how people use their vehicles by adding increased functionality, complexity and dependences to the model designs. Adding to the challenge is the ever growing integrations of systems, models and data application information as well as mobile connectivity.

We have a comprehensive team of tax, audit and automotive manufacturing specialists ready to help you tackle these challenges and many others facing the automotive industry. If international matters are important to you, our international services practice professionals have a deep knowledge base of the global marketplace and accounting standards.

7. FOCUSING ON CHALLENGES:

It was in 2000 that the Indian automobile industry rolled automobiles complying with BSI emission norms. Much has changed since. The industry has moved past BSII emission norms in 2002, and past BSIII emission norms in 2005. The BSIV emission norms were introduced in 2010. Their pan-India implementation is however slated for mid-2017. Unavailability of fuel proved to be a deterrent for pan-India implementation. It took Europe 13 years to move from Euro1 to Euro4. In India, this journey was completed in 11 years. Work is on to meet the BSVI emission norms deadline by mid-2020. This was reflected at the 56th SIAM Annual Convention held at Delhi recently. Said a SIAM source that the industry is ready. He drew attention to the additional expenditure of Rs. one-lakh crore that may be necessary to get to a new level. The theme of the convention was, 'Building the nation, responsibly

7.1 The future:

In his inaugural speech, Anant Geete, the minister for heavy industries and public enterprises, expressed that the government's move to subsidise electric vehicles, implement GST and encourage a transition to greener vehicles will ensure good growth. Hinting at the future, Geete mentioned that environment is one of the biggest concerns for the sector. "We have therefore allocated Rs.14,000 crore for the FAME scheme to promote hybrid and electric mobility. This will save Rs.60,000 crore worth of fuel, thereby benefitting the environment," he added. Announcing that hybrid and electric vehicles are expected to dominate mobility by 2025, Geete stressed upon the key role the Indian auto industry has played in the 'Make in India' programme. Reiterating government support, he averred that jobs need to be created for the youth of this country. SIAM president Vinod K. Dasari, called upon the central government to support the auto industry concerning laws governing diesel vehicles, and regulate GST to ensure the

auto industry is able to focus on innovation. Dasari said that the auto industry lost Rs.4000 crore in the last nine months post the ban on sale of diesel vehicles in the National Capital Region. "Such losses could be avoided if the industry gets a clear long term policy perspective," he added.

7.2 Global benchmarks

"The Indian automobile industry contributes 40 per cent to the nation's manufacturing GDP, and is surrounded by a cloud of opportunities," he expressed. Drawing attention to challenges like safety, pollution, unemployment and lack of adequate resources, Butschek explained that it is imperative for leading automobile manufacturers to focus on developing 'sustainable mobility solutions' and nurture skilled engineers and people managers rather than technocrats and theory masters. "New developments like safety norms, GST and scrappage policy will be an opportunity to counter such challenges," he added.

7.3 In the interest of safety

Participating in a discussion under the theme, 'Technology Trends', Nitin Gadkari, Minister of Road Transport, Highways and Shipping, praised the auto industry's performance and assured of his government's support to avail new technologies. Speaking via video recorded message, he appreciated industry's support to solve pollution problems and agree to move to BSVI from BSIV emission norms. "The automotive sector is on the road to growth and success with a turnover of Rs.450,000 crore. It is generating employment, and the government is seeking ways to ensure that a large part of the global supply can be exported from India," averred Gadkari. He drew attention to safety, and stated that five lakh accidents take place annually, causing 2.5 lakh deaths. Calling upon the auto industry to help address the issue of accident spots across the country, Gadkari mentioned, "In 10 years, we believe India's automotive sector will be number one in the world. To realise this goal, the industry will have to play a key role."

8. CONCLUSION:

Today's tough challenges in the automotive industry require to find new ways to create value if they are to prosper. To successfully adapt these levers companies will be able to respond to changes with focus, responsiveness, variability and resilience.

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