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Human Resource and Skill Requirements in the

Auto & Auto Components Sector (2022)

– A Report



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Human Resource and Skill Requirements in the Auto and Auto Component Industry*

Study on mapping of human resource skill gaps in
India till 2022

*Interim

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1. Environment Scanning and Competitiveness of the Auto and Auto Components sector

1.1. Overview of the Automobile and Auto Components Sector

The liberalisation of the Indian industry saw significant growth in the Indian Automotive Industry. Today, the Indian Automotive Industry is a significant contributor to the Indian economy, contributing nearly 5% to the country's GDP and about 17-18% to the kitty of indirect taxes to the Government, while investment outlay stood over Rs. 83,500 crore in 2008-09. With its wide penetration and strong influence on the country's economic and industrial development, the auto sector is indeed one of the major drivers of our economy. Moreover, economic liberalization coupled with its technological, cost and manpower advantage have made India one of the prime business destination for many global automotive players.

With its strong influence on the country's economic and industrial development it is indeed one of the major drivers of our economy. Moreover, economic liberalization coupled with its technological, cost and manpower advantage have made India one of the prime business destination for many global automotive players.

The sector has moderate direct employment and significant indirect employment; it is estimated that the sector provides direct and indirect employment to over 13 million people¹.

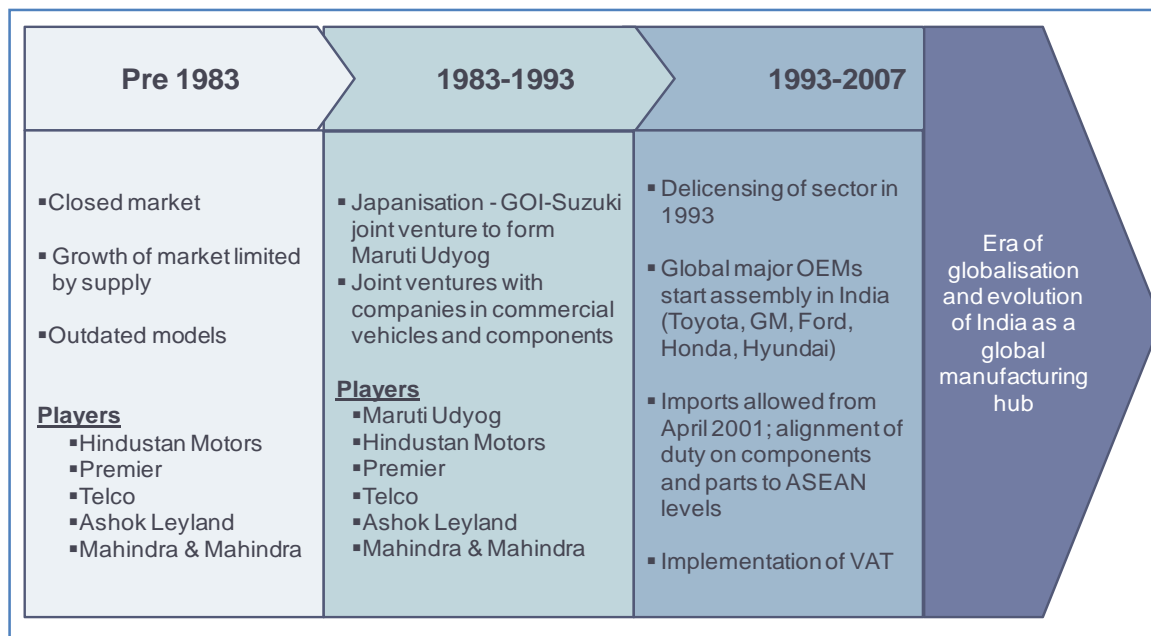
1.1.1. Evolution of the Indian Automotive Industry

The Pre-1980s era was defined by a closed market, availability of outdated models and limited supply of vehicles leading to limited growth of the market. The industry was in its nascent stages without any significant players in the market and neither were there a significant base of customers. Automobiles were largely unaffordable and objects of desire for most people. This changed in the next few years of 1983 to 1993 wherein Maruti Udyog Limited entered the Indian Automotive Sector. The era saw the formation of several joint ventures in the space of commercial vehicles and auto components. With the de-licensing of the automotive sector in 1993, several global players entered the market as a consequence of which the market grew, leading to stiffer competition and a large variety of products for the customers to choose from - currently, the Indian customer has over 30 Auto Original Equipment Manufacturers (OEM's) to choose two wheelers, three wheelers, passenger vehicles and

¹ SIAM – Automotive Mission Plan 2006-2016

commercial vehicles from; and this is only expected to grow further, with the recent advent of foreign players such as Volkswagen, BMW and Renault-Nissan.

Figure 1: Evolution of the Indian Automotive Industry



Source: IMaCS analysis

1.1.2. Geographic Distribution

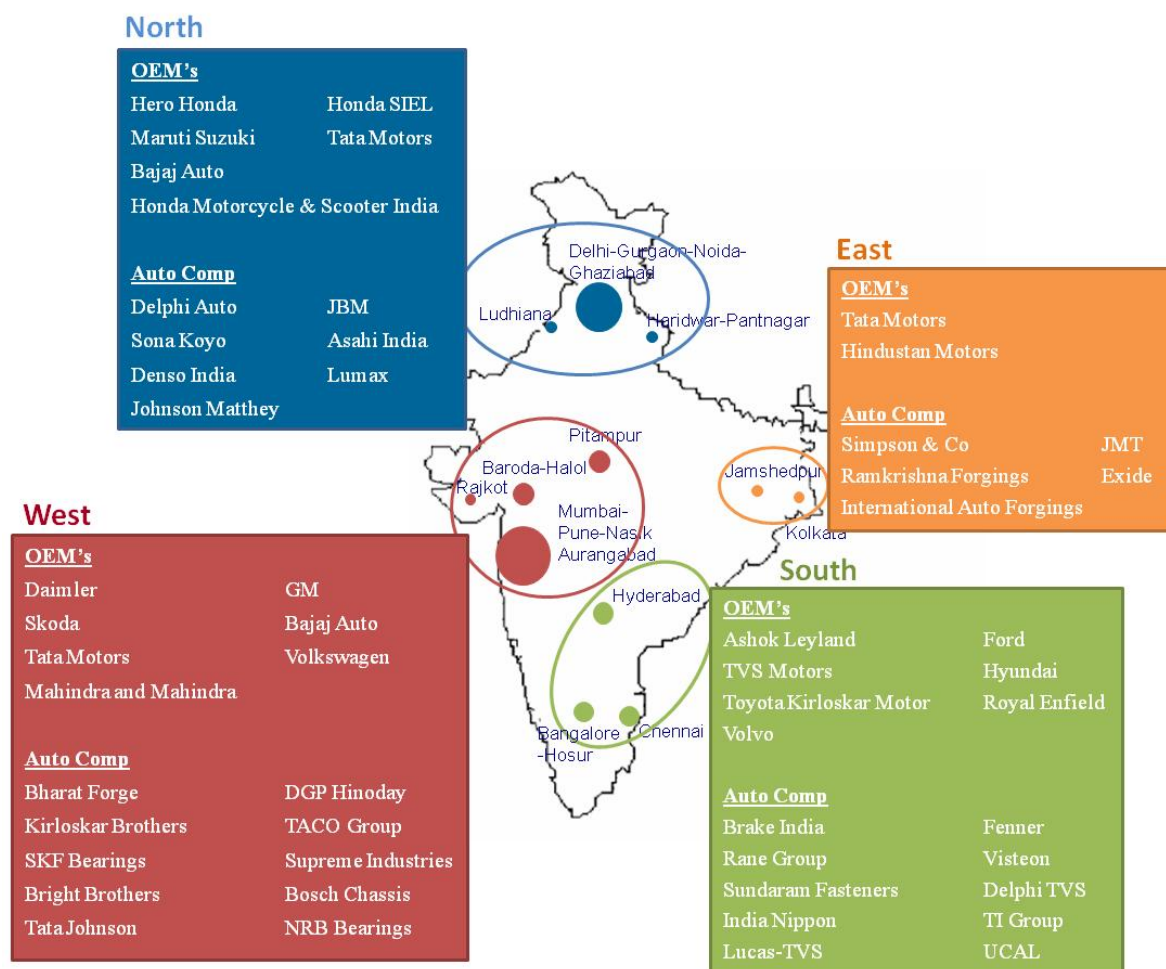
The Automobile Industry, due to its very nature, has grown in clusters. The clusters have OEMs as hubs or centers of growth while the suppliers have formed their bases around the OEMs. There are 3 major automobile and auto component production clusters across the country, namely,

- Western Region (Mumbai – Pune – Nasik – Aurangabad),
- Southern Region (Chennai – Bangalore – Hosur) and
- Northern Region (Delhi – Gurgaon – Faridabad).

In the Eastern region, activity in the automotive sector is seen in Jamshedpur and Kolkata, but the development in this region has been to a lesser extent than in the others.

The following map shows the automotive clusters in India:

Figure 2: Geographical Map of the Automotive Clusters in India



Source: IMaCS analysis

1.1.3. Industry size and Growth of the Automobile and Auto Components Sector

The Indian Automotive Industry today is being seen as one of the most competitive amongst the automotive industries of the world. The growth has largely come in the last 7-8 years where the industry has grown at a CAGR of over 14%. The size of the Automotive sector in 2008-09 was estimated to be around Rs. 1,910 billion, of which the Automobile segment was estimated to be Rs. 1,230 billion² (i.e. about 64%) while the Auto Components segment contributed to around Rs. 680 billion³ (i.e. about 36%).

The trend in the growth of the Industry and its sub-segments is shown below:

² Estimated based on data from SIAM

³ Estimated based on data from ACMA

Figure 3: Industry size (Rs. Billion) of the Automobile and Auto Components sector

Year	Automobiles Segment Size	Auto Components Segment Size	Total Industry Size
2000	423	169	592
2001	492	181	673
2002	499	213	712
2003	595	263	858
2004	662	309	971
2005	836	391	1227
2006	974	531	1505
2007	1,135	679	1,814
2008	1,204	724	1,928
2009	1,230	680	1,910
CAGR between 2000 to 2009	13%	17%	14%

Source: SIAM, ACMA, ImaCS analysis

1.2. Automobiles Segment

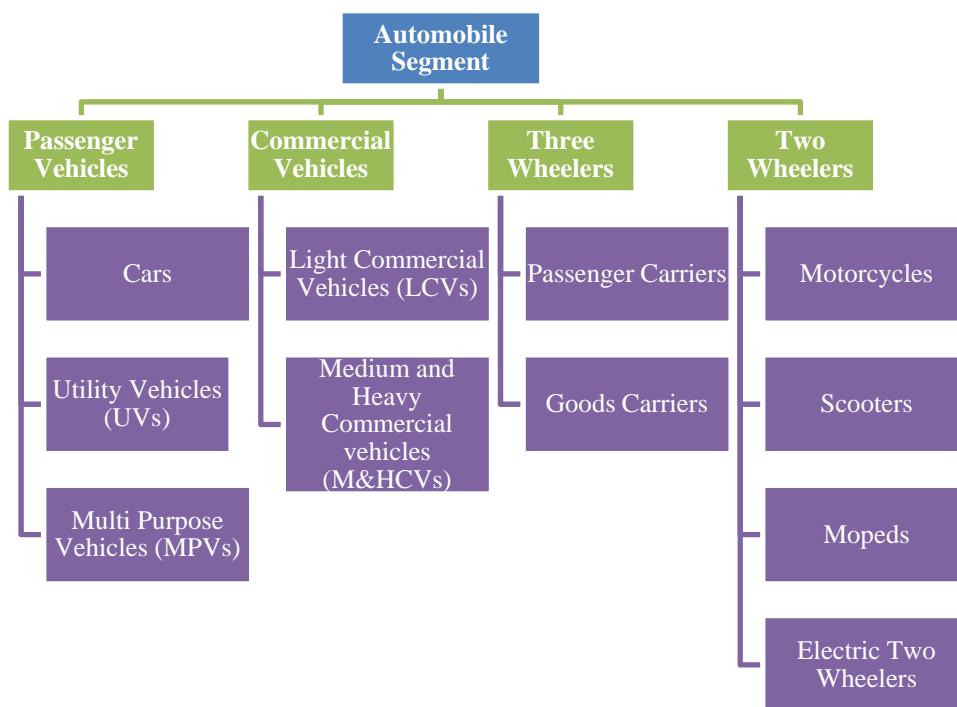
1.2.1. Product categories of the Automobiles Segment

The Automobile segment comprises of the following four broad categories of vehicles

- Passenger Vehicles
- Commercial Vehicles
- Three-wheelers
- Two-wheelers

Two-wheelers, being the most popular means of personal transport, alone account for about 75% of the total automobile production in India, while passenger vehicles account for nearly 16% of the production. However, owing to their lower sales realisations, two wheelers account for only around 32% of the sales in terms of value while passenger vehicles account for around 62% of the same.

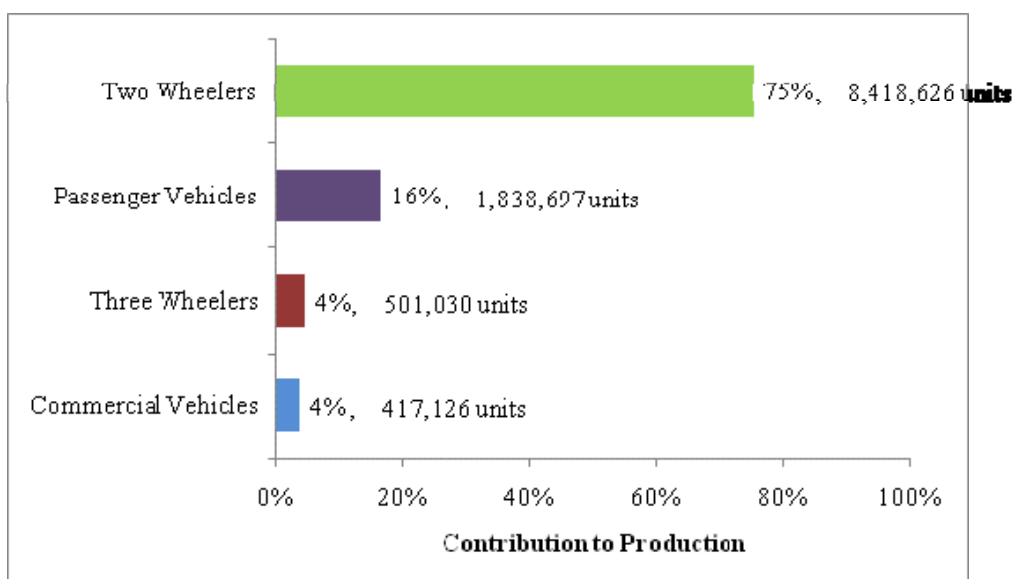
Figure 4: Automobile Segment Product Categories



Source: SIAM, IMAcS analysis

In terms of actual production, a total of around 11.2 million automobiles were produced in 2008-09, leading to sales of over Rs. 1,200 billion⁴ in the year. The production and sales trends for each category are as shown below:

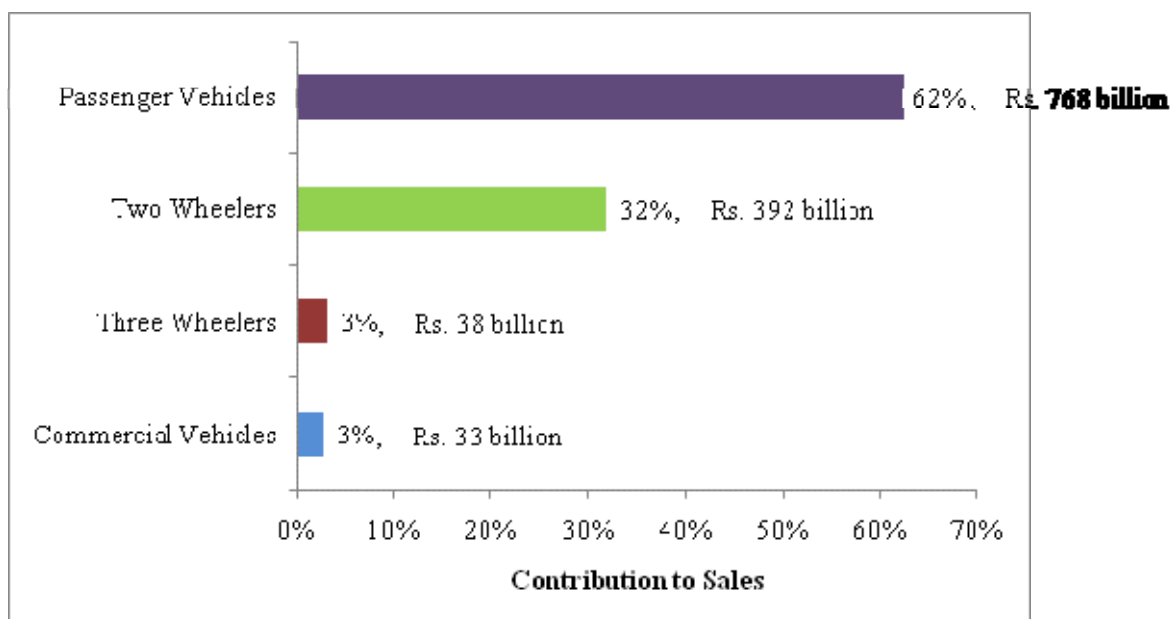
Figure 5: Production of Automobiles in no. of units (2008-09)



Source: SIAM, IMAcS analysis

⁴ IMAcS analysis

Figure 6: Sales of Automobiles in Rs. billion (2008-09)



Source: SIAM, IMAcS analysis

1.2.2. Value Chain of the Automobiles Segment

The Automobile segment, comprising of the OEMs, is at the topmost Tier of the Automotive Industry with a wide network of Tier I, II, III level suppliers supporting the OEMs for end product production. In terms of activity, Manufacturing is the most key function in the Automobile segment, owing to nearly 60-70% of the manpower engaged in this activity at the manufacturer's end (direct employment). Indirect employment generated by this sector is considerable as personnel are employed in functions such as sales, finance, insurance, etc. In terms of criticality, capturing the customers' requirements and translating them into products that would sell in the market is the most challenging part of the value chain. In fact, players who are able to develop expertise in this area command a significant edge in the market and this is one of the key reasons why foreign players have been able to make place in the Indian market. Increasing consumer discerns and growing cost competitiveness has forced OEMs to manage the brand and outsource the rest. This has also resulted in increased tierisation of the automotive industry.

The key aspects of the value chain are captured in the figure below:

Figure 7: Value chain of the Automobile segment

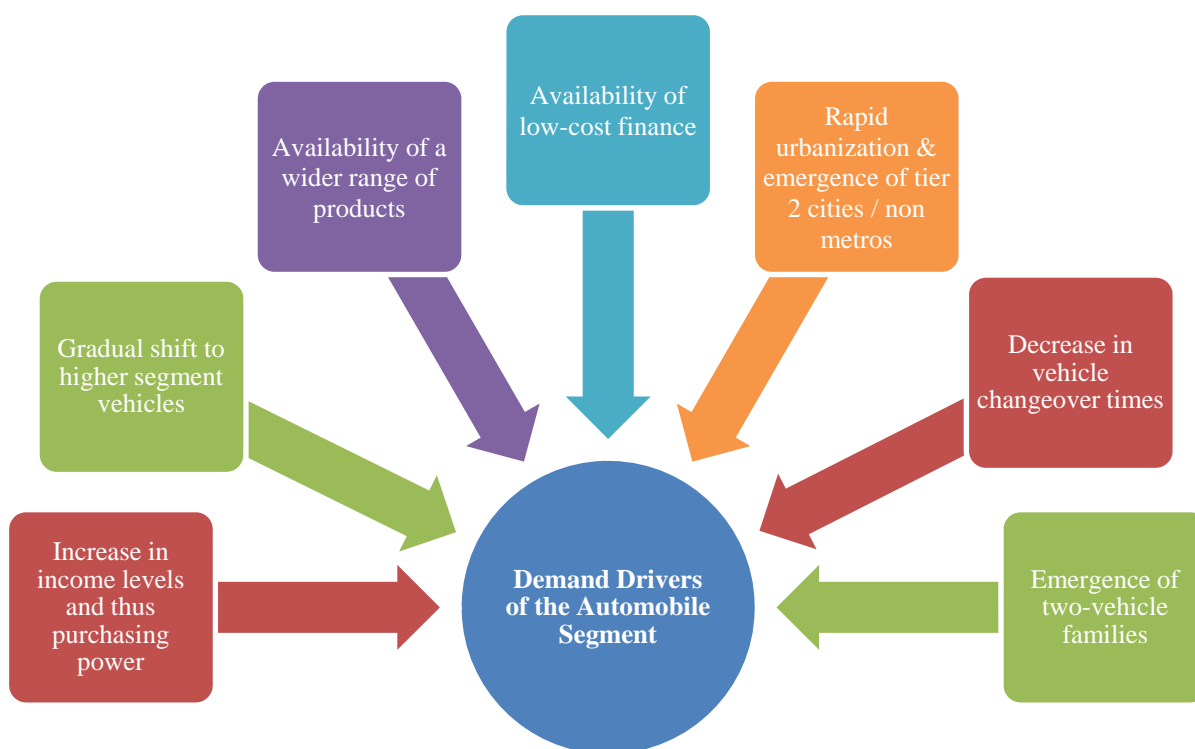
Source: IMaCS analysis

1.2.3. Demand drivers for Automobile Segment

One of the key reasons for the rapid growth in the Automobile segment has been the strong influence of several favourable drivers of demand. While some of the demand drivers are off-shoots of favourable growth in the Indian economy, others have come by due to the comprehensive development of the Automobile segment.

The key demand drivers for the automobile segment are shown below:

Figure 8: Demand drivers for the Automobile segment



Source: Automotive Mission Plan, IMAcS analysis

- **Increase in income levels and thus purchasing power:** Increase in disposable incomes have made cars affordable to a larger section of the population. While the ratio of car prices to average monthly salaries was around 36 - 48 months in the past, it has dropped significantly to less than 24 months currently. This is also a result of decreasing automobile prices with increasing efficiency in production and stiff competition in the market.
- **Gradual shift to higher segment passenger vehicles:** B and C segments have emerged as high growth segments over the last few years. In 2001-02, the A segment accounted for around 28% of sales while in 2004-05 it accounted for only 14%. At the same time, the demand for premium vehicles has also grown significantly, though the volumes are still low compared with other segments. The trend in segmental sales is poised to undergo a sea change with the launch of high volume selling Tata Nano and other players eyeing to get into the ultra low-cost segment.
- **Availability of a wider range of products:** The number of players as well as the number of products in the auto OEM space has increased, thus making more number of product options available to the end customer. While even till late 80's there were 8-10 major OEMs, today there are more than 30 OEMs with a wide variety of offerings in the market. The current

market offers more than 75 options in two-wheelers, more than 30 in hatchbacks, close to 50 in sedans and luxury cars, more than 50 in SUVs, and close to 10 options in sports cars.

- **Availability of low-cost finance:** Decline in interest rates and easy finance options have also enabled rapid increase in vehicle sales. It is seen that more than 90% of the vehicles (passenger vehicles) are currently sold under the financing route.
- **Emergence of tier 2 cities and non metros:** There has been a gradual shift in vehicle sales to smaller cities; markets other than the top 20 cities account for almost half the share of vehicles sold.
- **Decrease in product life cycles:** The product life cycle had decreased from an average of 61 months to about 51 months between 2002 and 2005 and continues to decrease further. Also, purchases for replacement of existing vehicles have been increasing. Coping with the changing market requirements, OEMs have also been forced to reduce their new product introduction timelines in order to maintain their market shares.
- **Emergence of two-vehicle families:** With rising disposable income levels and changing life styles, especially in the key urban centres in India, the trend of two-vehicle families has been increasing and purchases are being made persons who already own vehicles. This has led to high demand of automobiles. Also, it is observed that consumers have a tendency to upgrade their vehicles during replacement leading to a shift to higher categories.

1.2.4. Key Success Factors of the Automobile Segment⁵

- **Widespread sales and service network:** With a wide variety of options available in the market, meeting the key customer requirements becomes essential to maintaining one's position. With increasing average trip lengths both in the intra-city and the inter-city applications, a widespread sales, distribution and service setup has become one of the topmost preferences in the buying behavior and thus enables higher sales and provides a competitive edge. For e.g. Maruti has used its wide service network as a point of differentiation over competitors.
- **One-stop easy solutions:** With financing emerging as the key route for the customer buying an automobile, automobile companies have started their own financing companies and tied up with banks to provide easy and one stop solutions for vying customers. Companies are also tying up with financial institutions having rural presence to provide additional financing options to customers in such areas.
- **Ability to enhance and vary product mix:** Customer demands for more options in each category of vehicles mandate manufacturers to offer multiple products. Also, it is to be ensured that the changing customer demands continue to be met. Thus, the ability to meet these market requirements enables higher sales volumes and better capacity utilization by using common manufacturing capacity.
- **Balance between outsourcing and in-house production:** The make-or-buy decision for components and aggregates is critical to the costing of the product. In fiercely competitive industry, such decisions have a significant impact on the margins. However, the quality of the product should not be overlooked while deciding on outsourcing.
- **Efficient operations:** Intense competition requires existing players to initiate steps to reduce the cost of production. Effective and successful operation methods such as platform commonality, reduction in vendor base and workforce rationalization, if developed and maintain can even be one's competitive edge.
- **Human resources:** With more advanced manufacturing technology being adopted by auto OEM's, the requirement of skilled personnel, especially at the operator level is key to higher productivity and quality of output. Similarly with sophisticated products being launched in the market, there is an acute need for skilled service personnel at the field level.

⁵ Sector Report on "Four-Wheeler Industry" by DBS Cholamandalam Securities Limited

1.2.5. Key Risk Factors of the Automobile Segment

- **Correlation with the economy:** A slowdown in the economy is a serious concern for the automobile segment as the sales are hugely correlated with the economic activity in the country and purchasing capacity of the customers. For example, the recent economic downturn severely affected the sales of auto OEM's and sales between September 2008 to December 2008 dropped by about 13%. Though sales have picked up, such a slowdown may lead to lower investments in infrastructure, which in turn will affect the industry demand.
- **Increase in input material prices:** In the recent past, cost of most of the key raw materials (especially metals) for the Automotive Industry has gone up significantly. Higher steel prices have especially been a key concern (metal prices dropped in early 2009, though now it is improving). The Automotive Industry has tackled rising raw material prices both by passing part of the costs through price hikes and also by optimizing their selling & advertising costs.
- **Higher inflation and increase in fuel prices:** Higher inflation and the constantly increasing fuel prices considerably affect the demand for automobiles in the near term, since these directly increase the running cost of vehicles for the customer and thus also have a negative impact on the demand for vehicles.
- **Rise in interest rates:** Easy availability of low cost finance is one key demand driver for the automobile segment, but the increasing interest rates have a dampening effect on the demand.
- **Low availability of skilled human resources:** One of the key areas in the automobile segment where significant gaps exist is the availability of skilled manpower. The problem is not so much in terms of quantity, but more in terms of quality of manpower available. More so, the problem is destined to aggravate going forward considering the kind of growth and development that is foreseen for the Indian automobile segment.

1.2.6. Market Shares of Players

In the Automotive Sector, the Auto OEM's are all in the organized sector. Key players include Maruti Suzuki India Limited, Tata Motors Limited, Mahindra & Mahindra Limited, Ashok Leyland Limited, Hyundai Motor India Limited, Bajaj Auto Limited, Piaggio Vehicles Pvt Limited, Hero Honda Motors Limited, TVS Motor Company Limited and Honda Motorcycle & Scooter.

The market share of players in passenger vehicles, commercial vehicles, three wheelers and two wheelers in 2008-09 is as below:

Table 1: Market Shares of players in passenger vehicles, commercial vehicles, three wheelers and two wheelers (2008-09)

Passenger Vehicles		Commercial Vehicles ⁶	
Maruti Suzuki India Ltd	45.9%	Tata Motors Ltd	61.2%
Tata Motors Ltd	14.7%	Ashok Leyland Ltd	15.5%
Hyundai Motor India Ltd	14.0%	Mahindra & Mahindra Ltd	11.3%
Mahindra & Mahindra Ltd	6.7%	Eicher Motors Ltd	5.6%
General Motors India Ltd	4.3%	Force Motors Ltd	2.2%
Honda Sael Cars India Ltd	4.1%	Swaraj Mazda Ltd	2.2%
Toyota Kirloskar Motor Pvt Ltd	3.6%	Piaggio Vehicles Ltd	1.0%
Ford India Pvt Ltd	2.2%	Asia Motor Works Ltd	0.7%
Mahindra Renault Pvt Ltd	1.7%	Volvo India Pvt Ltd	0.2%
Skoda Auto India Pvt Ltd	0.9%		
Hindustan Motors Ltd	0.8%		
Force Motors Ltd	0.5%		
Fiat India Automobiles Pvt Ltd	0.2%		
Mercedes-Benz India Pvt Ltd	0.2%		
BMW India Pvt Ltd	0.1%		
International Cars & Motors Ltd	0.1%		

Three Wheelers ⁷		Two Wheelers	
Bajaj Auto Ltd	42.2%	Hero Honda Motors Ltd	44.8%
Piaggio Vehicles Pvt Ltd	41.0%	Bajaj Auto Ltd	23.2%
Mahindra & Mahindra Ltd	9.3%	TVS Motor Company Ltd	15.9%
Scooters India Ltd	3.3%	Honda Motorcycle & Scooter	12.0%
Atul Auto Ltd	2.4%	India Yamaha Motor Pvt Ltd	1.5%
Force Motors Ltd	1.7%	Suzuki Motorcycle India Pvt Ltd	1.2%
TVS Motor Company Ltd	0.0%	Kinetic Motor Company Ltd	0.7%
		Royal Enfield	0.5%
		Electrotherm (India) Ltd	0.2%
		Majestic Auto Ltd	0.1%

Source: SIAM, IMAcS analysis

⁶ Other players with < 0.05 % share include Mercedes-Benz India Ltd, Tatra Vectra Motors Ltd, Hindustan Motors Ltd

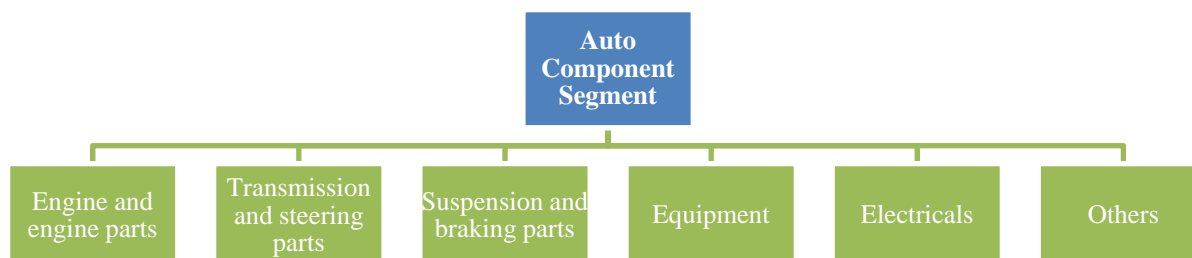
⁷ Other players with < 0.05 % share includes TVS Motor Company Ltd

1.3.Auto Components Segment

1.3.1. Product categories of the Auto Components Segment

The Auto Components segment comprises of a host of products demanded by the Automobile segment. These products are classified by major functions as below:

Figure 9: Product categories of the Auto Components Segment

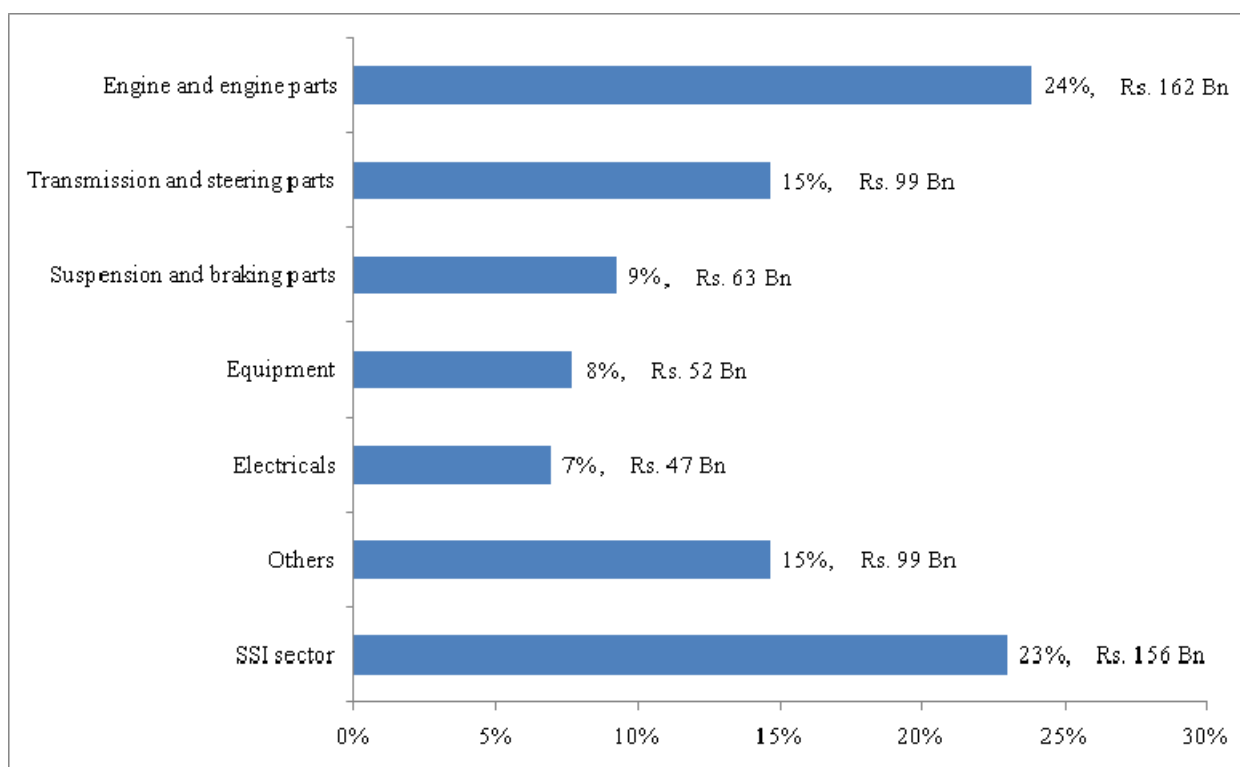


Source: ACMA, IMACS analysis

In terms of production of auto components, Engine & engine parts alone account for 31% of the production value of auto components, while Engine & engine parts and Transmission & steering parts together account for about 50% of the same. The total production value was estimated at about Rs. 680 billion in 2008-09, of which the organized sector accounted for Rs. 523 billion and the SSI sector accounted for Rs. 156 billion⁸. The share of production for each category of auto components in terms of value is shown below:

⁸ Approximation, using the same breakup of organized and unorganized sector as in 2004-05 and applying it to the total production of 7,16,000 units of Auto Components in 2007-08

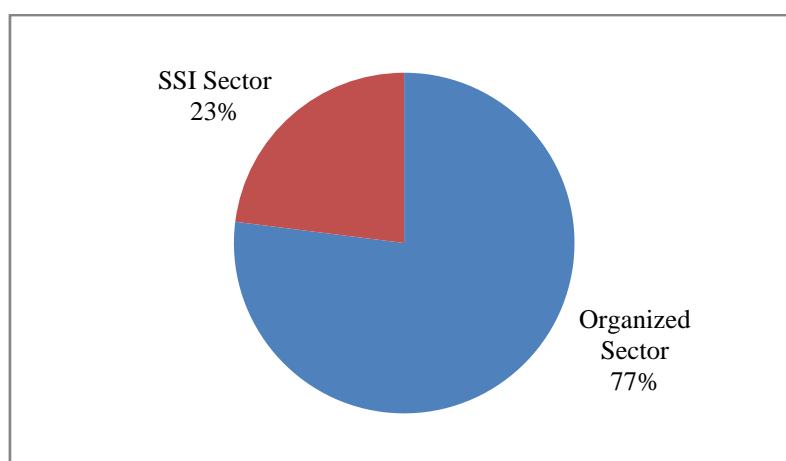
Figure 10: Production of Auto Components (2008-09)



Source: ACMA, IMAcS analysis

Out of the total, about 77% of the production (by value) of Auto Components is by players in the organized sector while the remaining 23% is by the SSI sector.

Figure 11: Share of SSI Sector in the Auto Components Segment (by value of production)



Source: ACMA, IMAcS analysis

In the organised sector, key auto component manufacturers include Brakes India Ltd, Bosch Chassis Systems India Ltd, Sona Koyo Steering Systems Ltd, Spicer India Ltd, Automotive Axles Ltd,

Sundaram Fasteners Ltd, Wheels India Ltd, Jay Bharat Maruti Ltd, Motherson Sumi Systems Ltd, Subros Ltd, Pricol Ltd, Bosch Ltd, Bharat Forge Ltd, Amtek Auto Ltd, Federal-Mogul Goetze (India) Ltd, Ucal Fuel Systems Ltd, Lucas-TVS Ltd and Denso India Ltd.

1.3.2. Value Chain of the Auto Components Segment

The value chain of the Auto Components segment is similar to that of the Automobile segment. However, important activities to focus in this case are Design and Quality. The Design function has to be very closely aligned with the OEM product designs both in terms of design specifications as well as the timeline for development. Quality of the product delivered is again a key parameter being assessed by OEMs. Ability to cope up with the OEMs requirements in these areas are considered critical in the Auto Components segment. The value chain of the Auto components segment is as depicted in the figure below:

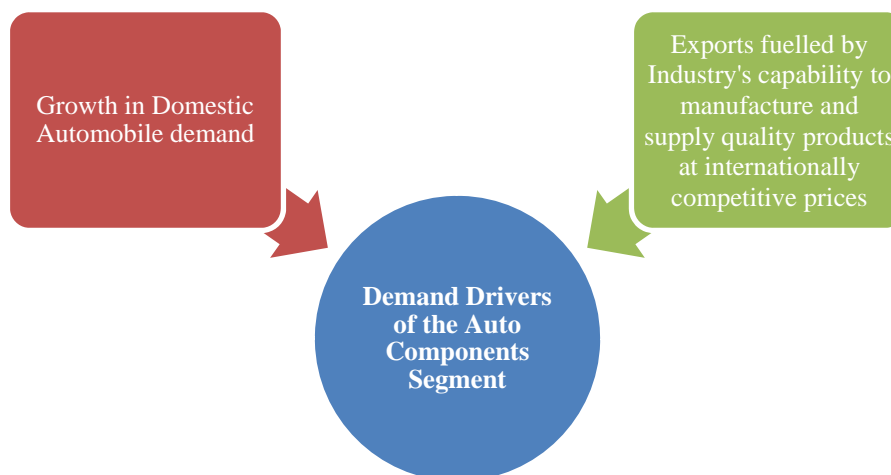
Figure 12: Value chain of the Auto Components segment

Source: IMaCS analysis

1.3.3. Demand drivers for Auto Components Segment

The demand drivers for the auto component segment are as below:

Figure 13: Demand Drivers of the Auto Components Segment



Source: Automotive Mission Plan, IMA CS analysis

- ***Growth in Domestic Automobile demand:*** In 2007-08, about 80% of the sales of auto components were domestic (i.e. to OEM's)⁹. Thus the demand of the Auto Component segment is primarily linked to the growth of the Automobiles segment, i.e. to auto OEM's in India. The demand for Auto Components is, therefore, largely driven by domestic OEM demand and its corresponding demand drivers.
- ***Exports fuelled by Industry's capability to manufacture and supply quality products at internationally competitive prices:*** Development of the Automotive Industry in India with the rise of competition has forced the component industry to shed all fat and become most cost competitive. Moreover, availability of good technical manpower (at a similar cost in comparison with other competing countries) and promotion of use of advanced technology by the Government have helped the industry improve the quality of output. Combination of being cost competitive and a producer of quality products have drawn the attention of other countries to the extent that India is being made the global sourcing hub by many multinational companies. In 2007-08 about 20% components and aggregates were exported¹⁰. Component and aggregate exports have been increasing at a 5 year CAGR (year 2002-03 to 2007-08) of about 32%. Thus, the industry's unique capability has become one of the key drivers of Auto Component exports from India. However, it also needs to be noted that global recession has seriously impacted the auto component industry as exports have been hit.

⁹ Data from ACMA

¹⁰ Data from ACMA

1.3.4. Key Success Factors of the Auto Components segment

- ***Ability to provide system solutions rather than only components:*** Auto OEM's are nowadays increasingly looking for auto component providers who can provide complete system solutions than only components. Hence the ability to be able to provide the same is critical to the success of auto component manufacturers.
- ***Locational advantages:*** Logistics costs can be drastically reduced if the auto component manufacturer is located within the vicinity of the auto OEM. In the currently competitive Automotive Industry any bit of savings in costs provided by the suppliers is greatly appreciated by the OEMs, as it directly adds to the overall margins. Auto component manufacturers also need to give annual price cuts to OEM's, and they thus need to address all avenues by which to reduce costs.
- ***Ability to supply at lower costs:*** Auto OEM's have greater options in terms of auto component manufacturer's they can procure from and hence the ability of auto component manufacturers to supply at lower costs is important. Factors such as higher capacity utilization, low cost of manpower, higher productivity of manpower, ability to procure at lower prices from Tier II suppliers etc., are therefore critical to being cost competitive and thus to being in business.

1.3.5. Key Risk Factors of the Auto Components segment

- ***State of the Global economy:*** Export of auto components one of the key sources of demand for the auto component segment. Thus the slowdown in the overall global economy, which in turn leads to a reduction in the number of vehicles sold world-wide, and which in turn affects the global demand for auto components, is a key concern for the auto component segment.
- ***Spurious Parts:*** The present size of the replacement market is Rs. 16,500 crore of which the genuine replacement parts account for Rs. 11,200 crore and spurious parts account for the around Rs. 5,300 crore, i.e. over 32% of the total replacement market. This in turn eats into the share of business of auto component manufacturers.
- ***Increase in input material prices:*** Raw material cost accounts for about 60% of the sales by OEM's. Auto Component manufacturers are extremely sensitive to input material prices since they are correspondingly always under immense pressure from the OEMs on the pricing front

and are under threat of losing business to competitors and work with very low margins. In such a situation, any increase in input prices eats up into their margins.

- **Low availability of skilled human resources:** As in the automobile segment, the low availability of skilled human resources is a cause of concern for the auto component segment too. Lack of skilled human resource affects the quality of products, which enhances the risk of losing business.

1.4. Enabler Segments

The automotive landscape in India has several underlying support systems which, though not directly linked to the industry, are support areas or “enablers” of growth. Key enabler segments for the core segments of the Automotive Industry include Auto insurance, Financiers, Mechanics, and Auto Dealers etc. The enablers may be categorised as (1) Industry-related support areas or “Industry-enablers” and (2) Market-related support areas or “Market-enablers”. The key enablers, supporting the overall growth of the industry, are enlisted below:

Table 2: Industry and Market Enablers

Industry Enablers (Supply-side support)	Market Enablers (Demand-side support)
Infrastructure supporting Industry	Road infrastructure for key markets
Logistics service providers	Finance support to customers – NBFCs and Banks
Infrastructure and institution for manpower skill development for manufacturing	Fuel distribution system – petrol pumps or gas stations or delivery systems
Design support	Parking infrastructure in key markets
Finance for sustenance and capital investments	Adequate and trained drivers availability
Export-Import facilitation	Traffic management
Research and development support	Upgradation of RTOs
Dealers and Sales	Air pollution monitoring and control
Service centres and After-sales support	
Inspection and maintenance infrastructure	
End-of-life vehicle handling	

Source: IMaCS analysis

The enabler segments are associated with providing indirect employment to personnel in the Auto Industry. At an industry level, the employment in these industries constitutes about 60% to 70% of the

total employment in the Automotive Industry in India¹¹. It is estimated that about 80 lakh to 90 lakh persons are currently employed in these enabler industries.

1.5. Drivers of competitiveness of the Automobile and Auto Components Sector

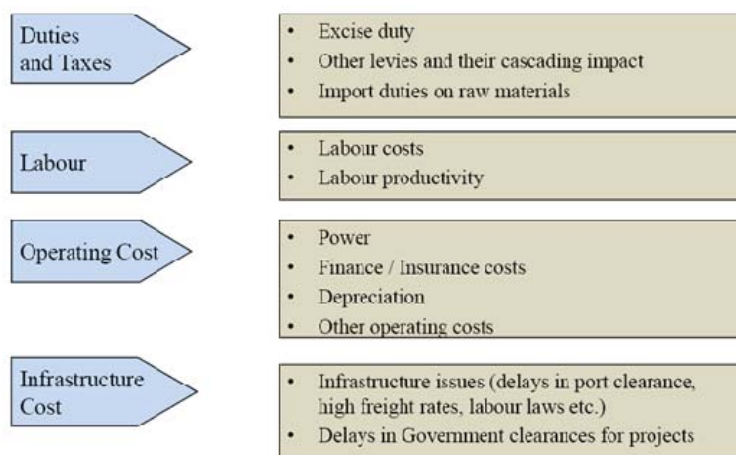
Following are the key drivers of competitiveness of the Automobile and Auto Components Sector¹²:

- **Access to new technologies:** In addition to matching competitor's new products and upgraded machinery, technology is also critical, especially with stricter emission norms going forward. The requirement of updated technologies has driven domestic players into acquisition or collaborations or JVs with global majors. Moreover, at a time when a substantial portion of Indian customers is looking to upgrade to higher segments, be it passenger cars or two wheelers, companies with latest technologies and latest models are bound to attract more attention.
- **Investments in Research and Development:** Investments in R&D are critical for retaining and enhancing the competitiveness of the Indian automobile and auto components sector. This competitiveness depends on the capacity as well as the speed of players in the industry to innovate and upgrade.
- **Availability of trained human resources:** The availability of trained manpower at competitive costs is one of the contributors to India emerging as one of the favourite investment destinations for foreign manufacturers. This is one of the major contributors to players such as Volkswagen, Nissan, BMW and Renault-Nissan, having set up manufacturing operations in India in the recent past and in making India a favourable destination for investment by global majors.
- **Cost competitiveness:** As both the Automobile and the Auto Components Sectors are very sensitive to costs, there are several underlying drivers of cost competitiveness which are vital to the performance of the Industry domestically as well as when compared with other competing countries. The key drivers of competitiveness in the Indian context can be grouped as below:

¹¹ IMaCS Analysis

¹² SIAM – Automotive Mission Plan 2006-2016

Figure 14: Drivers of Cost Competitiveness



Source: IMaCS analysis

The applicability of the drivers of competitiveness to the Auto and Auto Components sector is as below:

Figure 15: Drivers of competitiveness of the Automobile and Auto Components Sector

Sources of competitive advantage	Segments	
	Automobiles Segment	Auto Component Segment
Access to new technologies	C	C
Investments in Research and Development	C	C
Availability of trained human resources	C	C
Cost competitiveness	C	C

C - Critical

Source: IMaCS analysis

1.6.Future Outlook for the Automobile and Auto Components sector

The Indian Automotive Industry has recently been significantly affected by the high interest rates and tight credit, overall slowdown in the economic activity, lower consumer confidence and prevailing uncertainty in the job market. Sales dropped by about 13% between September 2008 and December 2008 and exports were also affected during this period. But the industry has again picked up momentum considerably.

The long-term outlook of the industry still remains optimistic due the strong underlying industry and economy fundamentals. The Indian Economy, even on a conservative estimate, is likely to grow at 6-6.5% (various economic estimates) over the next few years. At the same time, India's focus on infrastructure, rising disposable incomes, lowering age of first time car and two wheeler users, shorter replacement cycles, lower car penetration all point towards the fact that the long-term growth of the industry in a steadily growing economy can be expected to be nearly 10%. It is also expected that input costs pressures could moderate and there will thus be a downward trend in commodities' prices - another boost for the Automotive Industry.

Moreover, in recent years several global brands have established their base in India. India is not only being seen as a huge potential market but also as a favourable destination capable of developing into a global manufacturing hub. Developments of such an order will mandate conscious monitoring and development in several support areas on the market as well as the industry side.

Using the expected growth rates for passenger vehicles, M&HCV's, LCV's, three wheelers and two wheelers and the average prices of these vehicles, it is estimated that the Indian Automotive Industry which has seen significant growth in the past, is expected to grow at the rate of about 13% per annum over the next decade to reach a size of around USD 165 - 175 billion by 2022. Also, since the auto sector has deep linkages the growth of the auto sector will tremendously boost the share of manufacturing in GDP, exports and employment.

1.7. Trends in the Automobile and Auto Components sector

The Automotive Industry being one of the key industries in India has received due attention and concerted efforts are being made for the rapid development of the Industry. These are well supported by various Government initiatives towards the development of the Indian Automotive Industry. Key initiatives include the formulation of the Automotive Mission Plan, Project NATRIP, reduction of excise duty on small motor vehicles, Inspection and Maintenance Policy, Scrapping regulations, etc.

- **Product Trends:** The Automobiles have been undergoing transformation in many ways and development of today's products highlight the following key trends even going ahead:
 - **Increasing Electronic Content:** With more and more stringent norms for safety and emission, and with more features being demanded by the customer, the designers have been forced to increase the electronic content in the car in the form of Electronic Control Units (ECUs), various sensors such as lambda sensors and wheel speed sensor etc. This is likely to go up further with future customer and regulatory requirements.

- **Complicated Engine Designs:** In a race to improve efficiency without compensating power coupled with escalating emission requirements have been making engine design, development and testing the most challenging task in the development of a vehicle. This has led to more stringent design specifications of engine components – which now require high precision, high technology manufacturing processes, to an extent that some of the parts cannot be made in India and necessarily have to be imported. This also led to significant increase in the import content of the cars as well.
- **Plastics emerging as a replacement to Metals:** Plastics over the period of time have found more and more applications in Automobiles. With a content of nearly 2% by weight in the pre-1990 times to a current content of nearly 11-12%, plastics have emerged as a substitute to metals in many applications. The application of plastics till now had been in areas where the function was not load-bearing such as replacement of metallic fuel tubes, metallic fuel tank to plastic tank. However, going forward plastics are poised to replace even load-bearing functional or structure parts such as frames for Front End Modules, Plastic clutch systems, Brake pedals etc.
- **Hybrid Vehicles:** Hybrid vehicles are an attempt towards reducing the dependence on fossil fuels. Most vehicle manufacturers are working for the development of several types of hybrids namely,
 - Hybrid of conventional fuels + electric power
 - Hydrogen + CNG, referred as Hythane Vehicles
 - Hydrogen + Electric

These vehicles are also expected to be cleaner than conventional vehicles

- **Regulatory Trends:**

- **Emission:** Since the adoption of emission norms in 1991, the Indian Automobile industry has been made to keep pace with the changing emission norms in line with those being adopted in the European countries. Continuing the trend, the adoption of Euro IV norms for 11 mega cities are to be implemented from 2010 onwards, with the other cities having to comply with Euro-III norms. This is further likely to be upgraded in a similar manner to Euro V in major cities and Euro IV in other cities by 2014-15. In addition to the above, two-wheelers which were out of the scope of these emission norms are soon likely to be covered with the introduction of emission norms for two-wheelers.

- **Safety in Passenger Cars:** With India recording a large number of accidents, safety of both occupants as well as pedestrians is gaining importance and several regulations are being drafted for enhanced safety in passenger cars in several ways-
 - *Crash Worthiness Testing:* Systematic crash testing for establishing the crash worthiness of vehicles ensuring passenger safety are being worked upon and are likely to come into place by 2012. These regulations will mandate that cars are designed to clear the specified profile of crash tests meant for a particular category of passenger cars. In an attempt to meet crash regulations it is likely that passenger car manufacturers will have to use one or more airbags for meet passenger safety requirements.
 - *Pedestrian Safety:* For the safety of pedestrians, changes in front components of cars such as front bumper and engine hood are expected to be made mandatory so as to ensure minimum injury to pedestrians in case of accidents with passenger cars. These changes are likely to happen in the design of front components such as front bumper and engine hood. Pedestrian safety norms are likely to be implemented by 2014.
 - *Child Restraint Systems:* Currently, there are no provisions in passenger cars for ensuring the safety of small children. For protecting the children in cases of accidents Child Restraint Systems are being made mandatory and the first version of such system is likely to come by 2011.
 - *Stability Control System:* Stability Control System is a system which enhances the stability of passenger cars by preventing the vehicle to lose control in lateral direction and avoid rolling over. These systems are also likely to become mandatory in the near future.
 - *Driver Assist Systems:* These systems are features basically meant to assist the driver in maintaining safety on road such as Lane Warning System and Brake Assist Systems

- **Fuel Economy:** Significant work is happening towards bringing fuel economy under the regulatory perspective. Implementation of this regulation will need the vehicles to provide a particular target fuel economy. This would in turn mandate several other changes in design such as introduction of a tyre pressure monitoring system, tyres with low rolling resistance and so on.

- **Safety in Commercial Vehicles:** Body Codes for Buses and Trucks have been drafted and approved. Safety finds a significant emphasis in each of these codes. In the Bus Body Code, rules have been laid out to prevent rollover of buses. This may

have significant impact on the design of buses. Bus manufacturers have, in fact, started working towards it and have already designed buses with features specified in the Code (e.g. low floor buses with rear mounted engines from Tata Motors). Similarly, the regulation is being drafted for strengthening the super-structure of trucks to ensure safety of cabin occupants in case of rollover.

- **Electromagnetic Compatibility (EMC):** With increasing sophistication, safety, comfort and various other features in passenger cars, the electronic content in a vehicle has gone up and still continues to increase. This has raised concerns of electromagnetic interference both for the cars as well as for other electronic equipment in close vicinity. Regulations are thus being drafted for keeping electromagnetic generation from a car under control and to ensure that the car systems are not being affected by electromagnetic interference. These regulations are likely to be in place by 2013.
- **Policy Initiatives:**
 - **National Automotive Testing and R&D Infrastructure Project (NATRIP):** NATRIP, an autonomous body under the Ministry of Heavy Industries & Public Enterprises, Government of India is the largest and one of the most significant initiatives of the Government of India in Automotive sector so far, represents a unique joining of hands between the Government of India, a number of State Governments and Indian Automotive Industry to create state-of-the-art Testing, Validation and R&D infrastructure in the country. The project involves Rs.1718 crore of investment in two phases of three years' each across seven locations in the country at Manesar, Chennai, Pune, Ahmednagar, Indore, Silchar and Rae Bareilly. The complete execution of the project will provide immense capability to India in the field of Automotive Testing and R&D.
 - **Vehicle Inspection and Maintenance System:** While the regulations governing the sales of vehicles in India ensure that new vehicles meet the stringent norms in areas such as emissions, safety and other areas of vehicle operations, the regulations governing the in-use vehicles is lax. Absence of a proper system and infrastructure required for the vehicle fitness certificate testing aggravates the issue. The Government recognises the issue and is thus working towards the development of a comprehensive Vehicle Inspection and Maintenance System, which may replace the current system of Pollution Under Control (PUC) inspections in future.

- **Production Trends:**

- **Shift towards supplier-integrated production facilities:** Increasing pressure on the costs of production, need to move closer to Just-in-time and to reduce issues with mis-synchronisation between the OEMs and the suppliers, the concept of Supplier-Integrated Parks has developed and has served useful to both OEMs as well as suppliers in better production planning, better time-to-market and reducing the costs of production.
- **Tier I component supplier developing into system suppliers:** As the vehicle design has started getting complicate a more involved, design at the system level has started to shift to the supplier. This has made the suppliers evolve from the past role of component supplier to the developers and suppliers of complete systems which are integral with the OEM designs. Going forward, the trend is likely to continue and with more and more experience these system suppliers are bound to develop into experts of these systems.
- **Modular Manufacturing:** As more and more options are being asked for in the market the amount of complexity being handled at the manufacturing level goes on increasing. This has forced the manufacturing to shift to modular manufacturing. The assembly is process has therefore shifted from component assemblies to assemblies of modules. The vehicles are also designed to suit such manufacturing processes.
- **Use of IT in manufacturing:** Of late, IT has started playing a significant role in some of the key areas in the auto manufacturing. One of the key areas has been new product introduction where the use of IT to streamline and control processes has help in reducing time-to-markets. Also, increasing use of simulation and validation tools not only for design but also for process design has reduced iterations in design and has resulted in significant savings in time and effort. Another, key area where IT has helped the Auto Industry is in supplier and customer integration resulting in more closely knit partners and customers.

- **Market Trends:**

- **Introduction of Low Cost Vehicles:** Introduction of vehicles such as Tata Ace in the commercial category and Tata Nano in the passenger car category, have created a unique space for low cost vehicles in the market and has set the tone and market expectations for value products. This has further heightened competition and increased pressure on the margins for several players and auto component

manufacturers. Introduction of Tata Nano is also seen as a threat to the two-wheeler as well as the used car market space.

- **Entry of foreign players into the market:** With players such as Volkswagen, BMW, Renault, Nissan entering the Indian market and with other existing players planning for expansion, the Indian Automobile Industry is poised to witness tough competition. Foreign players are introducing internationally test new vehicles models at a rapid rate which is gradually raising the bar of customer expectations in terms of features and quality. Indian players will need to bring in a paradigm shift in order to compete with the large foreign players both in terms of cost and quality.

- **Shift towards high-end cars:** Although small and medium car market has remained dominant consistently, recent trends have been seen in terms of shift towards high end cars at a faster rate

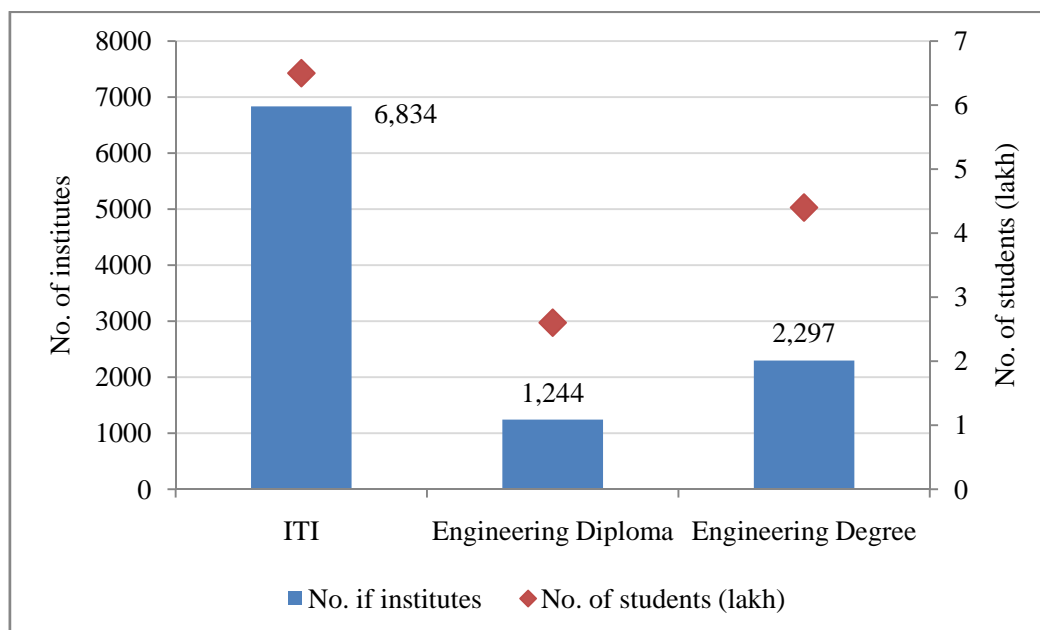
2. Human Resource and Skill Requirements in the Auto and Auto Components Sector

2.1. Current Employment in the Auto and Auto Components Sector in India

The Automotive Industry, by its very nature, has considerable forward and backward linkages and thus employs a significant number of personnel. The Society of Indian Automobile Manufacturers (SIAM) has estimated that the Indian Automotive Industry provides direct and indirect employment to over 13 million people. Direct employment includes personnel working with automobile OEM's and auto component manufacturers (about 30% to 40%). Indirect employment includes personnel working in the enabling industries, such as vehicle finance and insurance industry, vehicle repair, vehicle service stations, vehicle maintenance, vehicle and component dealers, drivers, cleaners etc (about 60% to 70%).

Though the availability of personnel in this industry in terms of numbers is not such an at a broad level, it is the quality of the personnel employed, both in terms of knowledge & skills which is not appropriately matched to the requirements of the automobile industry in India.

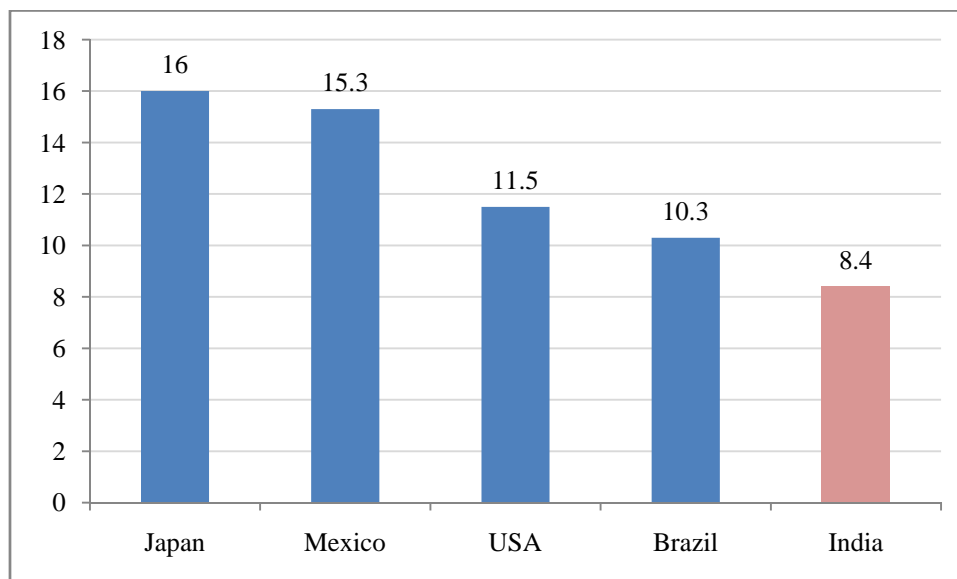
Figure 16: Number of ITI, Diploma and Degree engineering institutes and number of students passing out



Source: Various Sources, IMaCS analysis

Hence one of the key areas at the industry level where significant gaps exist today is the availability of skilled manpower and the problem is not so much in terms of quantity, but more in terms of quality of manpower available. This also leads to lower productivity of the automobile sector in India as compared to other nations producing automobiles as seen in the figure below.

Figure 17: Comparison of productivity (vehicles produced per person employed) among India, Japan, Mexico, USA and Brazil



Source: Various Sources, IMaCS analysis

More so, the problem is destined to aggravate going forward considering the kind of growth and development that is foreseen for the Indian Automotive Industry. As the industry progresses along its growth path, in order to provide for comprehensive growth, it will become imperative to track the enablers of market and industry and at the same time capture and react to the changing skill requirements in each of these areas along with the skill requirements of the mainstream industry.

2.2.Functional Distribution of Human Resources in Core Segments and Enabler Segments of the Auto and Auto Components Sector

During our interaction with the industry as part of our Primary Research, we analysed the proportion of workforce at various functional levels across the core segments (auto OEMs and auto components) and the enabler segments (dealerships – sales, used car market, dealerships – service and service centres, auto finance and auto insurance). The inputs received from the industry, supplemented by analysis by IMaCS, are as presented in the following sections.

2.2.1. Functional Distribution of Human Resources in Core Segments

Auto OEMs and Auto Component manufacturers constitute the core segments in the Auto and Auto Components sector. As seen in the table below, though the proportions may be slightly varied across Auto OEMs and Tier I/II/III suppliers, a significant proportion of the workforce in these segments is involved in the manufacturing or operations activity.

The details are covered in the following table:

Table 3: Functional distribution of human resources at Auto OEM's and Auto Component suppliers

Function	Distribution at Auto OEM's	Distribution at Large Tier I suppliers	Distribution at Small Tier I suppliers, Tier II, Tier III and lower suppliers
Manufacturing / Operations	55-60%	70-75%	80-85%
Design and Development, Production Engineering	7-8%	5-6%	1-2%
Vendor Development / Purchase	4-5%	2-3%	Minimal
Projects	1-2%	Minimal	-
Tool Room	2-3%	2-3%	1-2%
Industrial Engineering / Technical Services	4-5%	2-3%	Minimal
Sales and Marketing	5-6%	3-4%	3-4%
Service / Spares	7-8%	1-2%	1-2%
Support functions (HR, Admin, Finance, Accounts)	7-8%	4-5%	2-3%

Source: Primary Research and IMAcS analysis

2.2.2. Functional Distribution of Human Resources in Enabler Segments

Auto dealerships (sales and service), services centres, used car dealerships, auto finance companies and auto insurance companies constitute the enabler segments in the Auto and Auto Components sector. The functional distribution of personnel employed in these enabler segments is as below.

At dealerships (new car or used car) the maximum proportion of personnel are engaged in the sales function followed by managing accessories and purchase facilitation, while at service dealerships and service centers, over 90% personnel are engaged in activities related to providing service support to the customer. At auto finance companies and in the auto finance sections of NBFCs providing auto finance, most personnel are engaged in the sales and customer support functions while in auto

insurance companies most personnel are engaged in sales, followed by operations and customer support to an equal extent.

The details are covered in the following tables:

Table 4: Functional distribution of human resources at New Car Dealerships (Sales function)

Function / Role	Distribution
Sales	55-60%
Purchase facilitation (RTO and insurance interfacing)	10-15%
Managing accessories	15-20%
Driving	8-10%
Support services (receptionist / accounts)	13-15%

Source: Primary Research and IMaCS analysis

Table 5: Functional distribution of human resources at Used Car Dealerships

Function / Role	Distribution
Purchase and Sales	35-40%
Testing, inspection and valuation	30-35%
Driving	13-15%
Purchase facilitation (RTO and insurance interfacing)	5-8%
Support services (receptionist / accounts)	13-15%

Source: Primary Research and IMaCS analysis

Table 6: Functional distribution of human resources at Dealerships (Service function) and Service Centres

Function / Role	Distribution
Service related functions	90-95%
Works Manager / Service Managers / Service Advisors	16-20%
Service supervisors / spares management	20-25%
Mechanics	60-65%
Support functions (receptionist, accounts)	5-8%

Source: Primary Research and IMaCS analysis

Table 7: Functional distribution of human resources at Auto Finance companies

Function / Role	Distribution
Sales and customer support	70-75%
Credit appraisal and evaluation	10-12%
Collections and recovery	10-12%
Product design	5-8%
Support functions (receptionist, accounts)	3-5%

Source: Primary Research and IMaCS analysis

Table 8: Functional distribution of human resources at Auto Insurance companies

Function / Role	Distribution
Sales	60-65%
Operations	15-20%
Customer Support	15-20%
Underwriting	4-5%
Support functions (HR, Admin, Finance, Accounts)	4-5%

Source: Primary Research and IMaCS analysis

2.3. Distribution of Human Resources by Education Levels in Core Segments and Enabler Segments of the Auto and Auto Components Sector

As a part of our Primary Research, we also analysed the education-wise composition of personnel employed in the core and enabler segments of the Auto and Auto Components sector in India. The inputs received from the industry, supplemented by analysis by IMaCS, are as presented in the following sections.

2.3.1. Distribution of human resources by education levels in Core Segments

The distribution of human resources by education levels at Auto OEMs and large Tier I suppliers and Tier II/III and lower suppliers are covered in this section.

As seen in the following tables, at Auto OEMs, ITI pass outs account for the maximum proportion of employment, followed by graduate engineers and then ITI pass-outs. A slightly different proportion is seen at Large Tier I suppliers - ITI pass outs still account for the maximum proportion of the employment (though the proportion is lower than that at Auto OEMs), followed by diploma personnel, personnel who have studied till standard 12 or below and then by graduate engineers. Employment at small Tier I suppliers and Tier II/III/lower suppliers is mainly constituted by personnel with minimal education.

The details are covered in the following table:

Table 9: Distribution of human resources by education level - at Auto OEM's and Auto Component suppliers

Educational Qualification	Distribution at Auto OEM's	Distribution at Large Tier I companies	Distribution at Small Tier I suppliers, Tier II / Tier III and lower companies
Ph. D / CA / MBA / MTech etc.	3-4%	1-2%	-
Graduate Engineers	15-20%	8-10%	1-2%
Diploma Engineers	8-10%	15-20%	4-5%
ITI and other vocational courses	50-55%	40-45%	10-12%
Graduates (BA/BSc/BCom/others)	7-8%	1-2%	3-4%
12th Standard or below	1-2%	18-20% ¹³	70-75%

Source: Primary Research and ImaCS analysis

2.3.2. Distribution of human resources by education levels in Enabler Segments

The distribution of human resources by education levels at dealerships (sales), used car dealers, dealerships (service) and service centers, auto finance and auto insurance companies is covered in this section.

As seen in the following tables, the maximum proportion of personnel employed at dealerships engaged in sales are graduates, followed by diploma engineers and ITIs, whereas ITIs make up the maximum proportion of the workforce at dealerships engaged in the service function as well as at service centers. The used car dealerships employ a lesser proportion of graduates as compared to that employed by sales dealerships, and a correspondingly higher proportion of ITI pass outs and diploma

¹³ Mainly contractual employees

engineers. Most personnel working auto finance companies and in the auto finance sections of NBFC's providing auto finance, most personnel are graduates. Auto insurance companies, especially in the private sector, employ a large proportion of MBAs and CAs, followed by graduates. The details are covered in the following tables:

Table 10: Distribution of human resources by education level - at Dealerships (Sales) and Dealerships (Service) and Service Centres

Educational Qualification	Distribution at Dealerships (Sales)	Distribution at Dealerships (Service) / Service Centres
Ph. D / CA / MBA / MTech etc.	-	-
Graduate Engineers	Minimal	8-10%
Diploma Engineers	10-15%	10-15%
ITI and other vocational courses	10-15%	65-70%
Graduates (BA/BSc/BCom/others)	70-75%	5-10%
12th Standard or below	7-10%	5-10%

Source: Primary Research and IMAcS analysis

Table 11: Distribution of human resources by education level – at Used Car dealerships

Educational Qualification	Distribution
Ph. D / CA / MBA / MTech etc.	-
Graduate Engineers	3-5%
Diploma Engineers	13-15%
ITI and other vocational courses	30-35%
Graduates (BA/BSc/BCom/others)	45-50%
12th Standard or below	7-10%

Source: Primary Research and IMAcS analysis

Table 12: Distribution of human resources by education level - at Auto Finance companies and Auto Insurance companies

Educational Qualification	Distribution at Auto Finance companies	Distribution at Auto Insurance companies
Ph. D / CA / MBA / MTech etc.	15-20%	55-60%
Graduate Engineers	-	7-10%
Diploma Engineers / ITI and other vocational courses	-	7-10%
Graduates (BA/BSc/BCom/others)	75-80%	25-30%
12th Standard or below	8-10%	-

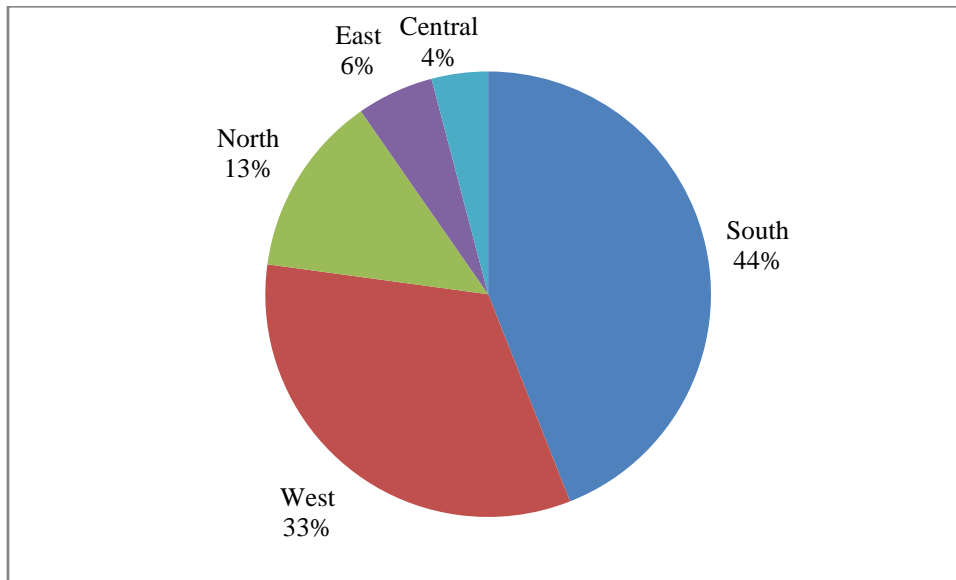
Source: Primary Research and IMAcS analysis

2.4. Major Regions of Employment Concentration

As indicated earlier, the clusters for the core segments of the Automotive Industry in India are concentrated primarily in the South, West and North zones, and these zones correspondingly account for about 90% of the employment in the Auto and Auto Components Sector in India. The South zone itself accounts for about 44% of the total employment in the Auto and Auto Components Sector in India and the employment is mainly seen in Tamil Nadu¹⁴ (about 29% contribution to total employment) and Karnataka (about 11% contribution to total employment). The West zone accounts for the next highest percentage of personnel employed in the Auto and Auto Components Sector in India, i.e. about 33% of the employment); in the West zone, the employment is mainly seen in Maharashtra (about 29% contribution to total employment).

¹⁴ Large number of auto component manufacturers, especially metal working like castings, forgings, etc.

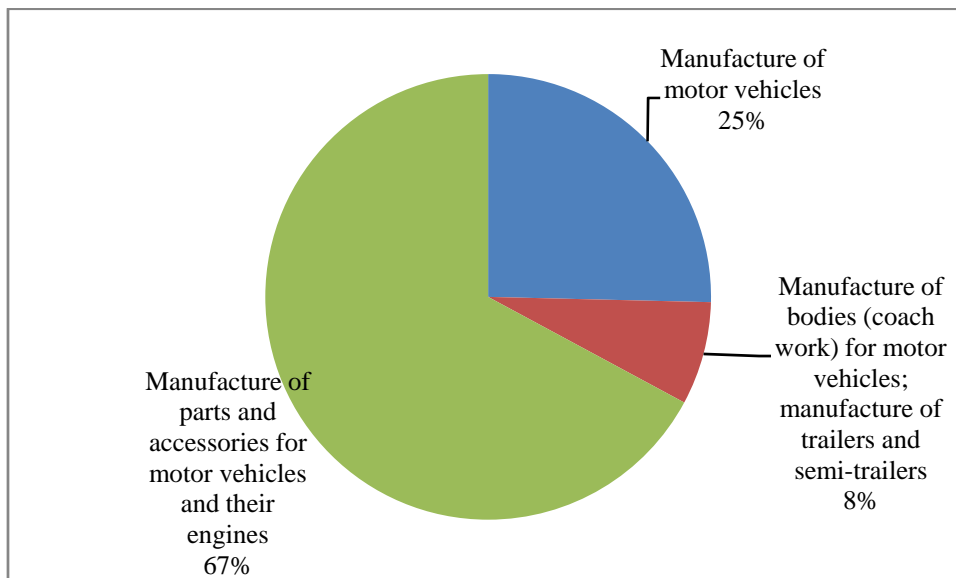
Figure 18: Major regions currently contributing to employment in the Auto and Auto Components Sector



Source: Annual Survey of Industries 04-05 and IMaCS analysis

Further, the employment across (i) Manufacture of motor vehicles, (ii) Manufacture of bodies (coach work) for motor vehicles; manufacture of trailers and semi-trailers and (iii) Manufacture of parts and accessories for motor vehicles and their engines is as below:

Figure 19: Employment distribution across manufacture of motor vehicles, bodies and auto components



Source: Annual Survey of Industries 04-05 and IMaCS analysis

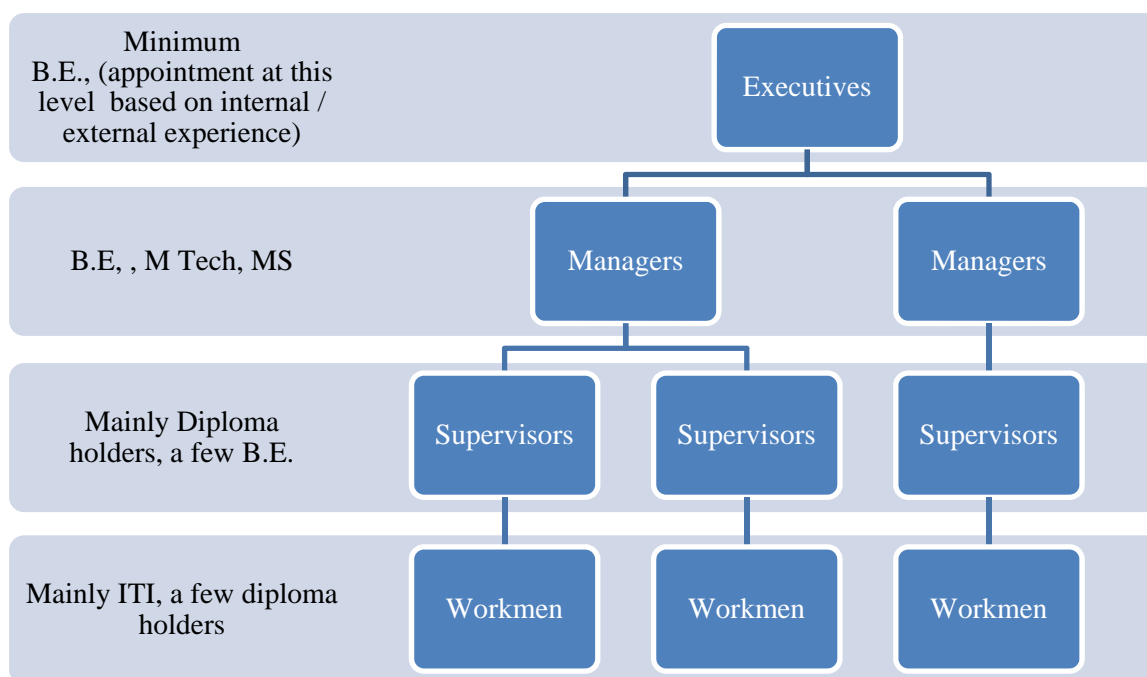
Certain regional differences are also seen in the profile of personnel employed across the Auto and Auto Components Sector in India. For example, due to the proliferation of engineering institutes in the South, and thus the increased availability of diploma and graduate engineering pass-outs, companies are finding it possible to recruit diploma engineers even at the operator or workman level, while in the North, the cost of such personnel is much higher and companies mainly employ ITI pass-outs at this level.

2.5.Skill Requirements and Skill Gaps at Auto OEMs and Large Tier I Suppliers

2.5.1. Profile of people employed

The profiles of people employed at Auto OEMs and Large Tier I Suppliers is similar. The following figure illustrates the profile of people employed in these organizations.

Figure 20: Profile of people employed at Auto OEM's and Large Tier I Suppliers



Source: Primary Research and IMACS analysis

2.5.2. Skill requirements and skill gaps at Auto OEMs and Large Tier I Suppliers

The following table presents the skill requirements and gaps across various functions and hierarchical/reporting 'levels' at Auto OEM's and large Tier I suppliers.

Table 13: Skill requirements and skill gaps common to Auto OEMs and large Tier I suppliers

Function	Level	Skills required	Skill gaps
Manufacturing / Operations	Shop head	<ul style="list-style-type: none"> ▪ Ability to clearly communicate with and ensure coordination between various production lines (e.g. engine shop, weld shop etc) and departments (e.g. vendor development, production planning, etc.) ▪ In-depth knowledge of automobiles, their sub-systems and functions of important parts such as suspension, exhaust, fuel system, coolant circuit, etc. ▪ In-depth knowledge of manufacturing processes in engine assembly, press line, weld line, paint line, final assembly, etc. ▪ Ability to map business requirements into production specifications such as daily volumes in conjunction with production planning personnel ▪ Ability to ensure minimum shop downtime ▪ Ability to clearly communicate and give instructions related to production requirements to supervisors ▪ Ability to supervise and 	<ul style="list-style-type: none"> ▪ Tendency to be inflexible and not accept that vehicle production defects may be due to errors committed in the particular shop that the shop head heads ▪ Insufficient understanding of automobiles, their sub-systems and functions of important parts such as suspension, exhaust, fuel system, coolant circuit, etc. ▪ Tendency to be narrow minded and resist changes required in the particular shop, say, to accommodate a new vehicle version ▪ Inadequate ability to liaison with various production lines and departments ▪ Inadequate knowledge across all facets of the company’s business – for example, the shop head of the transmission shop of Product A typically does not have knowledge of the engine manufacturing processes being used in Product B ▪ Inadequate understanding of financial/commercial

Function	Level	Skills required	Skill gaps
		<p>manage personnel and ensure that production levels are met</p> <ul style="list-style-type: none"> ▪ The ability to guide supervisors / workmen on product / process related queries ▪ Ability to adhere to and schedule work across shifts as per the production plan ▪ Ability to supervise optimum allocation of resources on any given task ▪ Ability to understand the training needs of workmen and supervisors and help design training programs accordingly ▪ Ability to effectively communicate with vendors for component / system related issues ▪ Basic clarity of financial/commercial effect of production methods 	<p>impact of their decisions related with the particular shop</p>
	Supervisor	<ul style="list-style-type: none"> ▪ Understanding of latest production techniques such as lean manufacturing ▪ Ability to ensure that daily production line targets are met ▪ Good knowledge of automobiles, their sub-systems and functions of important parts such as suspension, exhaust, fuel 	<ul style="list-style-type: none"> ▪ Inadequate interpersonal skills, leading to inadequate ability to resolve conflicts that may arise between workmen – this causes disruption in smooth production and leads to loss of time, increased cost and inadequate quality ▪ Tendency to be hand-in-

Function	Level	Skills required	Skill gaps
		<p>system, coolant circuit, etc.</p> <ul style="list-style-type: none"> ▪ Ability to understand differences in product lines and platforms and the corresponding ability to direct workmen accordingly ▪ Ability to manage the available resources – workmen, raw materials, consumables, etc. ▪ Knowledge of electrical and electronics systems, which are finding increased application in machineries and equipments ▪ Knowledge of concepts such as Six Sigma, JIT, TQM, Kaizen, 5-S is important ▪ Ability to allocate suitable work to workmen based on the skill levels of workmen working with them ▪ Ability to resolve conflicts that may arise among workmen / operators ▪ Ability to ensure productivity by employing efficient processes and maintaining coordination on line ▪ Ability to ensure quality by following inspection procedures, use of proper inspection gauges, etc. ▪ Ability to understand concerns expressed by 	<p>hand with workmen and thus the inability to enforce discipline</p> <ul style="list-style-type: none"> ▪ Inadequate understanding of end-to-end processes – supervisors generally tend to know the details only of the production line they are handling ▪ Inadequate business knowledge / understanding of the commercial implication of wastage ▪ Availability of experienced personnel in this cadre is a concern ▪ Inadequate understanding of quality concepts such as Six Sigma, JIT, TQM, Kaizen, 5-S ▪ Inadequate ability to work with and give instructions to workmen who are older / have more number of years of experience ▪ Inadequate knowledge of product and processes

Function	Level	Skills required	Skill gaps
		<p>workmen, if any, and the ability to help resolve the issues without escalation, and escalate issues if getting out of hand</p> <ul style="list-style-type: none"> ▪ Orientation towards wastage minimization, cost reduction and quality workmanship ▪ Ability to ensure minimum shop downtime ▪ Strong problem solving, logical and analytical skills ▪ Ability to plan and schedule activities ▪ Ability to ensure safety and environmental compliance ▪ Man management skills, conflict management, scheduling ability 	
	Operator / Workman	<ul style="list-style-type: none"> ▪ Should have basic literacy, analytical ability and the ability to understand and follow shop floor instructions ▪ Should have relevant knowledge of working of car systems, such as working of a fuel circuit, functioning of the cooling circuit, etc. ▪ Ability to operate and / or maintain both general and special machines such as wheel nut tightening machine, fuel and coolant filling machines, flexible manufacturing systems, 	<ul style="list-style-type: none"> ▪ Tendency to consider only the current activity (say, tightening a bolt) being performed, no understanding of where the activity fits into the big picture ▪ Inadequate trade knowledge and poor application of the available trade knowledge – this can be attributed to the fact that institutions such as ITIs do not teach skills specific to the Automotive Industry (for example, the ‘fitter’

Function	Level	Skills required	Skill gaps
		<p>AGVs, etc.</p> <ul style="list-style-type: none"> ▪ Ability to adhere to Standard Operating Procedures (SOP) for all variants / versions on a single platform / across platforms ▪ Ability to carry out basic trouble shooting of machines in case of breakdown ▪ Ability to perform operations requiring multiple skills - for example, a fitter should be able to perform the job of an auto electrician ▪ Ability to minimize wastage of raw materials and consumables, maximize production and understand the corresponding impact on cost, quality and time ▪ Ability to highlight aberrations in daily production processes ▪ Adherence to required quality levels of production ▪ Ability to understand and follow instructions from supervisors, shop heads, plant head etc. ▪ Ability to understand and conform to basic shop floor safety practices such as wearing gloves when handling cast parts, being aware of dangers of 	<p>trade is generic)</p> <ul style="list-style-type: none"> ▪ Inadequate desire for learning new skills / working on new machines – this also stems from the weak understanding and lack of comfort with latest machines ▪ Availability of drivers, painters and operators for high-tech machines (such as super-finishing grinding machines and other CNC controlled machines) is a concern ▪ Insufficient ability to communicate problems faced during the daily routine – this in turn affects quality and can lead to time and cost overruns ▪ Tendency to form unions and disrupt regular working – this is especially true for the permanent (on-rolls) unionized employees ▪ Insufficient understanding of discipline, industrial rules, work related procedures ▪ Absenteeism is a concern in this cadre ▪ Lack of skill standardization across educational institutes,

Function	Level	Skills required	Skill gaps
		<p>interfering with machine / equipment, etc.</p> <ul style="list-style-type: none"> ▪ Knowledge of assembly line operations, quality management techniques, fabrication techniques, welding techniques, cutting, machining, etc ▪ Understanding of drawings, knowledge of usage of instruments, measurement techniques and maintaining tolerances ▪ Knowledge of principles of manufacturing such as lean manufacturing, managing safety at work, Kiazening, Overall Equipment Efficiency (OEE), etc ▪ Have complete knowledge of / be adept in a particular trade (e.g. painting, fitting, welding, etc.) ▪ Ability to conform to work schedules and complete the assigned work on time ▪ Ability to maintain discipline at the shop floor, punctuality and regular attendance at workplace 	<p>leading to lack of standardization in the people available in this cadre is a concern</p>
Design and Development / Product Development	Project leader	<ul style="list-style-type: none"> ▪ Ability to track policy and regulatory changes such as Motor Vehicles Act, CMVR regulations, homologation, etc. expected in India (for 	<ul style="list-style-type: none"> ▪ Inadequate ability to multitask and coordinate with multiple agencies at once ▪ Tendency to be 'protect'

Function	Level	Skills required	Skill gaps
		<p>domestic market) and abroad (for export market) so as to guide module heads and junior design personnel in designing components / systems / vehicles that will meet the policy / regulatory requirements over the vehicle life</p> <ul style="list-style-type: none"> ▪ Ability to be in constant interaction with module heads / module designers as well as manufacturing personnel, vendor development personnel, projects personnel, suppliers etc. so as to ensure that the overall vehicle design is as per specifications ▪ Ability to coordinate with prototype manufacturing and ensure receipt of feedback on modules fitted into prototypes ▪ Ability to coordinate with module heads / module designers and ensure timely design changes so that modules with modified designs can be fitted on subsequent prototypes and tested accordingly ▪ Ability to understand technical details and integration details of 'black box' items and have meaningful discussions with 	<p>module heads / module designers working with him / her by not being very receptive to feedback received from other agencies on design changes required in systems / modules / components</p> <ul style="list-style-type: none"> ▪ Inadequate ability to understand technical details of 'black box' items and have meaningful discussions with suppliers of such items

Function	Level	Skills required	Skill gaps
	Module heads / module designers	<p>suppliers of such items</p> <ul style="list-style-type: none"> ▪ Ability to design ‘systems’ / ‘modules’ as against only individual components – for example, a good designer will be able to design the entire exhaust system, as against designing only the muffler, or only the catalytic converter, or only the manifold, etc ▪ Ability to use design software such as AutoCAD, CATIA, Pro-E, Ansys, IDEAS, DELMIA, etc. ▪ Ability to work in cross functional teams comprising of personnel from production, suppliers, marketing etc. ▪ Ability to track all design changes in a component / system and knowledge of older changes made and why they were made ▪ Ability to be flexible and open to ideas suggested by non-design personnel ▪ Ability to understand cost implications of designed products so as to minimize product cost ▪ Ability to integrate designs by Tier I suppliers into the vehicle design ▪ Ability to understand the whole gamut of design and 	<ul style="list-style-type: none"> ▪ Availability of personnel in the design and development function is an issue – this is especially the case for personnel in the styling function ▪ Tendency to be inflexible on changes required in design ▪ Inadequate ability to understand production constraints and design components / systems accordingly ▪ Availability of personnel for using design software such as Pro-E, CATIA and DELMIA is limited ▪ Limited exposure to latest manufacturing processes ▪ Availability of personnel for tool design is a concern

Function	Level	Skills required	Skill gaps
		<p>development – for example, personnel working in vehicle underbody design should be able to understand homologation, crash testing, BIW design, etc.</p> <ul style="list-style-type: none"> ▪ Ability to meet multiple customer requirements keeping functional needs in mind ▪ Ability to understand manufacturing processes and design ‘manufacture-able’ / ‘assemble-able’ components / systems ▪ Ability to design new components and systems / modify existing components and systems based on changing customer preferences ▪ Ability to understand quality parameters (such as ---) and build the same into the product design ▪ Ability to update designs based on inputs from prototype manufacturing, prototype testing, production line testing, etc. ▪ Knowledge of design practices such as FMEA, Design of Experiments (DoE), etc. 	
	Junior design	<ul style="list-style-type: none"> ▪ Knowledge of geometric 	<ul style="list-style-type: none"> ▪ Inadequate understanding

Function	Level	Skills required	Skill gaps
	personnel / entry level design personnel	dimensioning and tolerancing (GD&T), such as principles of location, dimensioning, tolerancing, etc. <ul style="list-style-type: none"> ▪ Knowledge of process of product development – for example, conceptualization, modelling, analysis, prototype development, testing and validation ▪ Basic understanding of 2-3 design software such as AutoCAD, CATIA, Pro-E, Ansys, IDEAS, DELMIA, Hypermesh, Nastran, etc. ▪ Ability to read and interpret engineering drawings ▪ Basic understanding of automobiles and sub-systems ▪ Knowledge of techniques such as Finite Element Analysis 	of automobiles and sub-systems <ul style="list-style-type: none"> ▪ Inadequate practical knowledge of concepts of design ▪ Inadequate knowledge of manufacturing processes ▪ Inadequate knowledge of alternate materials used for component design ▪ Insufficient knowledge of design and validation techniques ▪ Insufficient knowledge of software such as Hypermesh, Ansys, IDEAS, CATIA, Pro-E, Multibody Dynamics, etc.
Vendor Development / Materials / Purchase	Senior vendor development personnel	<ul style="list-style-type: none"> ▪ Ability to clearly communicate design requirements / product specifications to vendors and ensure that these are met ▪ Ability to build good working relationships with vendors ▪ Ability to maintain 2 or more vendors for components so as to ensure continuous supply in case there is production breakdown at the suppliers' end 	<ul style="list-style-type: none"> ▪ Inadequate commercial sense in terms of taxations, material prices, sourcing methods, etc. ▪ Inadequate knowledge of optimum manufacturing processes for producing given components ▪ Inadequate negotiation skills, thus leading to the suppliers dominating negotiation discussions at times

Function	Level	Skills required	Skill gaps
		<ul style="list-style-type: none"> ▪ Ability to effectively contribute to make / buy decisions ▪ Ability to play an increasing role in cost reduction actions through liaisoning with suppliers for use of alternate materials such as plastics ▪ Ability to optimize logistics costs while maintaining the same level of component quality and ensuring that components are received on time ▪ Ability to procure an increasing number of systems than only components ▪ Ability to ensure coordination between suppliers and the internal design and development department ▪ Ability to ensure that information needed by the next level supplier in terms of product specifications is provided to the supplier without revealing excess product information ▪ Strong understanding of cost structures, local and international tax structures and financial implications of decisions ▪ Effective negotiation skills so as to get the best price from 	<ul style="list-style-type: none"> ▪ Inadequate technical knowledge of products being supplied by the suppliers

Function	Level	Skills required	Skill gaps
		<p>suppliers</p> <ul style="list-style-type: none"> ▪ Need to handhold suppliers and ensure they meet delivery standards – quality, cost and time ▪ Ability to undertake global sourcing / strategic sourcing ▪ Technical knowledge of products being supplied by the suppliers and how these integrate into the overall vehicle design 	
	Junior vendor development personnel	<ul style="list-style-type: none"> ▪ Technical knowledge of materials and processes ▪ Basic understanding of costing and how to apply the same in the automobile sector ▪ Knowledge of the automobile industry and material sources ▪ Ability to deal with globalized purchase possibilities ▪ Ability to read and understand drawings for purchase of engineering goods / components ▪ Knowledge of concepts of vendor development and management 	<ul style="list-style-type: none"> ▪ Inadequate knowledge of PPAP (methodology for specification of vendor’s production process) ▪ Inadequate understanding of drawings and procurement needs ▪ Insufficient knowledge of materials and production processes ▪ Inadequate knowledge of industry and material sources ▪ Insufficient orientation towards finding alternate sources of raw material ▪ Insufficient orientation towards costs
Projects	Senior projects personnel	<ul style="list-style-type: none"> ▪ Ability to coordinate between various stakeholders, so as to ensure that requirements of all stakeholders are met – for 	<ul style="list-style-type: none"> ▪ Inadequate understanding of technical aspects of vehicle design and manufacturing

Function	Level	Skills required	Skill gaps
		<p>example, the designs are manufacture-able, the costs are under control, safety norms are met, etc.</p> <ul style="list-style-type: none"> ▪ Defining timelines and ensuring that defined timelines of system design are met – for example, ensuring that the brake system gets designed on time so that the final design can be fitted in the physical prototype ▪ Ability to ensure that products costs are under control and the ability to prevent cost-overruns ▪ Ability to understand vehicle specifications and corresponding vehicle design requirements – e.g. the ability to know that a petrol vehicle will need to have a vapour separating circuit which a diesel vehicle will not have ▪ Ability to understand the linkages and dependencies between various activities of the project and the ability to execute the project accordingly – for example, the ability to know that the Class A surface of the plastic bumper needs to be completed before the packaging of the fog lamps 	<ul style="list-style-type: none"> ▪ Inadequate ability to coordinate between departments and ensure that new product issues are resolved on a timely basis ▪ Inadequate ability to liaison with senior projects personnel from other projects to emulate best practices across projects

Function	Level	Skills required	Skill gaps
		may be decided	
	Junior projects personnel	<ul style="list-style-type: none"> ▪ Ability to understand basic vehicle functioning and the use of vehicle sub-systems ▪ Ability to coordinate between various stakeholders and ensure that dialogue happens as and when issues arise and that a solution is reached ▪ Ability to track module specific issues (e.g. issues related to fuel tank system design) and ensure their closure in the stipulated time ▪ Ability to track module specific timelines and ensure that these timelines are met so that vehicle timelines do not get disturbed 	<ul style="list-style-type: none"> ▪ Inadequate understanding of technical aspects of vehicle design and manufacturing, leading to inadequate ability to take decisions related to issues between design and manufacturing ▪ Inadequate orientation towards cost and time aspects of project management
Tool Room	Senior tool room personnel	<ul style="list-style-type: none"> ▪ Ability to perform job scheduling – i.e. to decide which job will be done on which machine at what time by which junior tool room person based on the priority for manufacturing ▪ Excellent knowledge of quality manufacturing processes – e.g. need to know which machines are to be used for achieving what tolerance levels ▪ Excellent knowledge of precision machining ▪ Ability to manufacture parts 	<ul style="list-style-type: none"> ▪ Inadequate ability to perform job scheduling, leading to time delays in receipt of tools ▪ Inadequate orientation towards productivity by considering it as a non-line function ▪ Inadequate experience in working on different kinds of machines – such as jig boring machines, grinding machines, etc.

Function	Level	Skills required	Skill gaps
		<p>in the most efficient way and in the least possible time</p> <ul style="list-style-type: none"> ▪ Knowledge of alternate materials so as to choose the best possible material for manufacturing specific parts – for example, the ability to use fibre glass in place of metal, where appropriate 	
	Junior tool room personnel	<ul style="list-style-type: none"> ▪ Knowledge of tool designing and tool machining ▪ Understanding of intended use of the tools ▪ Knowledge of fabrication techniques ▪ Ability to understand CAD drawings 	<ul style="list-style-type: none"> ▪ Insufficient knowledge of tool designing and machining ▪ Incomplete knowledge of techniques of fabrication, machining
Industrial Engineering / Technical Services	Senior industrial engineering personnel	<ul style="list-style-type: none"> ▪ Ability to plan as per budgets, timelines for project implementation, resources required, etc. ▪ Ability to identify essential requirements of facility implementation – for example, for a new conveyor to be installed, implications on the existing setup need to be evaluated ▪ Ability to undertake line balancing and process optimization so as to ensure shorter throughput times and optimum utilization of human resources ▪ Ability to minimize capital 	<ul style="list-style-type: none"> ▪ Inadequate knowledge of financial / business implications of capital investments ▪ Inadequate ability to budget for investments ▪ Inadequate understanding of design and manufacturing requirements ▪ Inadequate knowledge of process best practices such as Process FMEA (PFMEA), six sigma tools, etc. ▪ Limited knowledge of foreign suppliers of capital

Function	Level	Skills required	Skill gaps
		<p>investments – for example, the ability to use floor chain conveyors as against automated guided vehicles (AGVs) as required</p> <ul style="list-style-type: none"> ▪ Ability to superimpose multiple product designs onto the process design ▪ Knowledge of foreign suppliers of capital equipment 	<p>equipment</p>
	<p>Junior industrial engineering personnel</p>	<ul style="list-style-type: none"> ▪ Ability to understand basic production processes such as vehicle assembly, engine assembly, etc. ▪ Knowledge of different kinds of equipment in the market and their underlying technology – for example, vertical stacking systems, overhead conveyors, etc. ▪ Basic understanding of civil and structural design so as to be able to identify civil/structural support required for equipment installation and commissioning ▪ Ability to read and understand product drawings ▪ Ability to understand the implication of product designs on process designs – e.g. tightening torque accuracy determining the kind of tightening tool (electric / 	<ul style="list-style-type: none"> ▪ Inadequate understanding of production processes ▪ Inadequate understanding of civil and structural design ▪ Inadequate ability to understand the implication of product designs on process designs

Function	Level	Skills required	Skill gaps
		pneumatic) to be selected	
Sales and Marketing	Senior sales and marketing personnel	<ul style="list-style-type: none"> ▪ Ability to foresee changes in customer preferences and the need for new products / versions of existing products ▪ Ability to ensure that customer needs and preferences are taken care of by product design ▪ Ability to ensure timely expansion of dealership network before the launch of a new product ▪ Ability to handle customers from various parts of the world ▪ Ability to maintain relations with channel partners ▪ Ability to manage product launches ▪ Need to understand technical aspects of the product ▪ Ability to meet customer expectations in terms of on-time delivery, product specifications ▪ Ability to understand regional requirements 	<ul style="list-style-type: none"> ▪ Inadequate understanding of customer profiles while designing marketing strategies ▪ Inadequate market intelligence ▪ Ineffective utilization of advertising budgets ▪ Ineffective forecasting of expected sales, leading to inventory built-up / stock-outs at the manufacturing units
	Junior sales and marketing personnel	<ul style="list-style-type: none"> ▪ Ability to maintain good interpersonal skills in interaction with plant personnel, dealers, etc. ▪ Good verbal and non-verbal communication skills to be able to effectively 	<ul style="list-style-type: none"> ▪ Knowledge of competition (product features, prices, services offered) and industry trends is limited ▪ Inadequate selling skills, and the understanding of customer requirements and

Function	Level	Skills required	Skill gaps
		<p>communicate with diverse agencies</p> <ul style="list-style-type: none"> ▪ Ability to understand overall customer requirements and how these are being addressed by product specifications 	<p>customer behaviour is inadequate</p>
Service / Spares	Senior service / spares personnel	<ul style="list-style-type: none"> ▪ Since service personnel from the OEM will need to step in when service personnel at dealerships are unable to diagnose the problem / when an important customer or fleet owner has a service complaint, these personnel need to have (i) high level of technical skills so as to be able to diagnose the right problem and provide solutions accordingly, and, (ii) the ability to handle and appease extremely upset customers ▪ Ability to liaison with suppliers and ensure availability of parts at the dealers and authorized service centers ▪ Ability to provide high quality service so as to ensure customer loyalty ▪ Ability to understand technical aspects of new technologies as and when they are part of the vehicle design ▪ Ability to coordinate between 	<ul style="list-style-type: none"> ▪ Inadequate ability to handle and manage operations of service centres spread across multiple locations ▪ Inadequate ability to maintain and ensure that standard operating procedures are followed at the service centre level ▪ Insufficient skills for maintaining the required service levels and customer satisfaction levels

Function	Level	Skills required	Skill gaps
		two or more service dealerships / centers	
	Junior service / spares personnel	<ul style="list-style-type: none"> ▪ Ability to coordinate with dealerships / service centres / suppliers ▪ Ability to handle different kinds of customers ▪ Ability to understand and talk the local language ▪ Humbleness and humility so as to be able to calmly listen to irate customers and understand their problem(s) ▪ Overall understanding of automobiles and their sub-systems 	<ul style="list-style-type: none"> ▪ Inadequate inter-personal skills hindering proper handling of irate customers ▪ Inadequate knowledge of products deterring them to resolve even minor issues ▪ Insufficient attitude to deal with tough situations such as a customer yelling

Source: Primary research and IMaCS analysis

Skill requirements and gaps specific to individual segments, if any, over and above what is common across passenger car manufacturers, commercial vehicle car manufacturers, and two/three wheeler manufacturers are detailed below:

Table 14: Skill requirements and skill gaps specific to Passenger Car Manufacturers

Function	Level	Skills required	Skill gaps
Manufacturing / Operations	Shop heads	<ul style="list-style-type: none"> ▪ Ability to work in an environment with shorter cycle times while maintaining the same quality of products and shop uptime 	<ul style="list-style-type: none"> ▪ Inadequate ability to appreciate how shop downtime can lead to loss in terms of number of vehicles produced and the corresponding loss in revenues for the business – loss in terms of business

Function	Level	Skills required	Skill gaps
			is more critical for passenger vehicles ¹⁵ because of the shorter cycle times as compared to commercial vehicles
	Supervisor	<ul style="list-style-type: none"> ▪ Ability to ensure greater level of fits and finish in the final vehicle and guide workmen / operator accordingly ▪ Ability to run more number of vehicle tests and more advanced vehicle tests on the final rolled out vehicle 	<ul style="list-style-type: none"> ▪ Inadequate ability to understand and appreciate the need for stringent tests in passenger car units
	Operator / Workman	<ul style="list-style-type: none"> ▪ Ability to work on more sophisticated machines as compared to commercial vehicles / two wheelers / three wheeler manufacturing setups 	<ul style="list-style-type: none"> ▪ ITI educational institutes are currently not in a position to teach on / about sophisticated machines and thus workmen joining this cadre are not familiar with such sophisticated machines which are more prevalent at passenger car manufacturing units
Design and Development / Product Development	Project Leader	<ul style="list-style-type: none"> ▪ Ability to identify the best car design configurations and apply them to manufacture-able product designs (e.g. optimum number of components to be included in the front end module) ▪ Ability to match the overall 	<ul style="list-style-type: none"> ▪ Inadequate knowledge of new concepts in systems design (e.g. use of front end module) ▪ Inadequate ability to package systems / components so as to meet styling and safety

¹⁵ Also for two wheelers

Function	Level	Skills required	Skill gaps
		<p>styling requirements with vehicle design requirements and undertake product design accordingly (e.g. packaging of the engine and related components in the engine house keeping in mind the styling and safety requirements such as optimum space to be kept the top of the engine and the bottom of the bonnet inside)</p> <ul style="list-style-type: none"> ▪ Greater orientation towards optimizing design for vehicle weight reduction which is critical to passenger vehicles ▪ Expertise in design of vehicle safety systems such as airbags, ABS, stability control, etc. 	<p>requirements</p>
<p>Vendor Development / Materials / Purchase</p>	<p>Senior / junior vendor development personnel</p>	<ul style="list-style-type: none"> ▪ Ability to understand modular designs such as front end module which are more prevalent in passenger vehicles ▪ Ability to ensure that higher quality of parts is made available by suppliers as against that required for commercial vehicles ▪ Ability to develop more robust processes at the suppliers' end ▪ Ability to interact with a greater number of global 	<ul style="list-style-type: none"> ▪ Inadequate ability to understand the technicalities of product designs made by vendors and the corresponding reduced ability to negotiate price with vendors

Function	Level	Skills required	Skill gaps
		suppliers as compared to commercial vehicles / 2 wheelers	
Industrial Engineering / Technical Services	Senior / junior industrial engineering personnel	<ul style="list-style-type: none"> ▪ Ability to accommodate a greater number of product lines on the same manufacturing facility, considering that there are a large number of variants in passenger cars ▪ Ability to plan facilities and processes for more sophisticated vehicle systems in comparison with commercial vehicles / 2 wheelers / 3 wheelers ▪ Ability to plan for highly automated manufacturing systems such as multiple axis robots, flexible manufacturing systems (FMS) etc. 	<ul style="list-style-type: none"> ▪ Limited exposure to sophisticated vehicle systems and inadequate ability to decide between the use of sophisticated equipment at higher costs or simple equipment at lower costs w.r.t. the benefits of either option ▪ Limited expertise in line balancing – this is critical due to shorter cycle times in passenger car manufacturing units
Sales and Marketing	Senior / junior sales and marketing personnel	<ul style="list-style-type: none"> ▪ Ability to deal with passenger car customers who are more informed as well as with corporate clients – greater technical knowledge is required as compared to commercial vehicle/2 wheeler / 3 wheeler sales personnel ▪ Given the wide range of products available in the passenger car segment in the same price range, the ability to be able to compare own OEM's product with 	<ul style="list-style-type: none"> ▪ Inadequate technical product knowledge to be able to answer customers who have specific technical questions related to the OEM's products / want a technical comparison w.r.t. competition

Function	Level	Skills required	Skill gaps
		competitors product is critical	
Service / Spares	Senior / junior service / spares personnel	<ul style="list-style-type: none"> ▪ Ability to handle sophisticated customers who are sensitive to even comparatively small issues with the product they purchase and which calls for a higher level of service delivery in the passenger car segment – for example, customers in this segment may be sensitive to small rattles / squeaks which may go unnoticed in commercial vehicles ▪ Ability to handle the inherent higher complexity of car parts as compared to commercial vehicle parts / 2 wheeler parts / 3 wheeler parts 	<ul style="list-style-type: none"> ▪ Inadequate ability to understand and appreciate that customers may be sensitive to comparatively small issues

Source: Primary research and IMaCS analysis

Table 15: Skill requirements and skill gaps specific to Commercial Vehicle Manufacturers

Function	Level	Skills required	Skill gaps
Manufacturing / Operations	Operator / Workman	<ul style="list-style-type: none"> ▪ Ability to handle large parts in operation while ensuring safety at the same time 	<ul style="list-style-type: none"> ▪ Inadequate orientation towards safety measures and features of handling equipment used in operations
Design and Development / Product	Module heads / module	<ul style="list-style-type: none"> ▪ Greater orientation towards structural design of parts – for example, design of long 	<ul style="list-style-type: none"> ▪ Inadequate ability to keep track of latest developments in the

Function	Level	Skills required	Skill gaps
Development	designers	<p>members, chassis etc.</p> <ul style="list-style-type: none"> ▪ Ability to keep track of latest developments in the international commercial vehicle market so that appropriate developments can be incorporated in Indian designs 	international commercial vehicle market
Vendor Development / Materials / Purchase	Senior / junior vendor development personnel	<ul style="list-style-type: none"> ▪ Greater orientation towards machined parts as against electronic / plastic / sheet metal components ▪ Ability to understand the supplier's capability to supply parts requiring higher capacity equipment for manufacture 	
Industrial Engineering / Technical Services	Senior / junior industrial engineering personnel	<ul style="list-style-type: none"> ▪ Ability to design ergonomic processes keeping in mind the need for handling large and heavy parts for fitment ▪ Ability to optimize space requirements in the shop so as to be able to accommodate minimum required inventory considering the bulky parts involved 	<ul style="list-style-type: none"> ▪ Inadequate knowledge of ergonomic principles of shopfloor / workplace design
Sales and Marketing	Senior sales and marketing personnel	<ul style="list-style-type: none"> ▪ Ability to maintain good working relations with large fleet owners so as to ensure customer loyalty and thus continuous business from such persons / entities 	<ul style="list-style-type: none"> ▪ Inadequate understanding of the business of the customer and the reasons/timing for the customer to make purchase decisions

Function	Level	Skills required	Skill gaps
		<ul style="list-style-type: none"> Ability to track customers of own / competitor vehicles in the region / zone and capture them at the right opportunity when they are about to make purchasing decisions – this is critical since commercial vehicle customers are less in number, their purchase requires higher capital investment and is closely linked to the performance of their individual business(es) 	
Service / Spares	Senior service / spares personnel	<ul style="list-style-type: none"> Ability to understand the replacement market and the penetration of spurious components and the impact on their own business 	

Source: Primary research and IMACS analysis

Table 16: Skill requirements and skill gaps specific to Two Wheeler and Three Wheeler Manufacturers

Function	Level	Skills required	Skill gaps
Design and Development / Product Development	Project leader and Module heads / module designers	<ul style="list-style-type: none"> Orientation towards fuel efficiency since this is the main driver behind two wheeler sales in urban as well as rural markets Ability to innovate to a greater extent due to the low availability of international benchmarks in two wheelers – e.g. ability to introduce concepts such as dual spark plug technology for 	<ul style="list-style-type: none"> Inadequate ability to understand unique requirements of the Indian two wheeler market and fulfill them with new & innovative concepts of design

Function	Level	Skills required	Skill gaps
		enhanced fuel efficiency	
Vendor Development / Materials / Purchase	Senior vendor development personnel	<ul style="list-style-type: none"> Ability to assess risks in dealing with small suppliers (typically two wheeler OEM's will have small suppliers) and the ability to have risk mitigation plans in place 	<ul style="list-style-type: none"> Inadequate ability to assess the actual financial strength and technical capability of a small supplier
Sales and Marketing	Senior sales & marketing personnel	<ul style="list-style-type: none"> Ability to understand peculiar requirements of the Indian market – for example, the ability to assess the need for a sari-guard / right side grab handle which is applicable only in the Indian context 	
Service / Spares	Senior service / spares personnel	<ul style="list-style-type: none"> Understanding of the replacement market w.r.t. price of spurious parts available as well as price of spares being supplied by local vendors so as to be able to price spares at the service centre accordingly 	

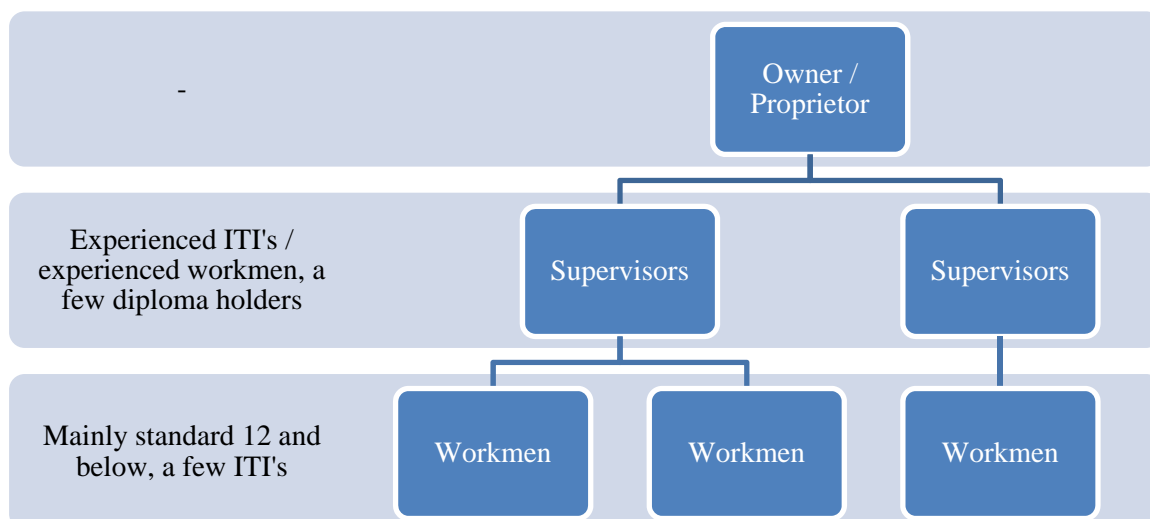
Source: Primary research and IMACS analysis

2.6.Skill Requirements and Skill Gaps at Small Tier I suppliers, Tier II, Tier III and lower suppliers

2.6.1. Profile of people employed

The following figure illustrates the profile of people employed at Tier II, Tier III and lower suppliers.

Figure 21: Profile of people employed at small Tier I, Tier II, Tier III and lower suppliers



Source: Primary Research and IMaCS analysis

2.6.2. Skill requirements and skill gaps at Small Tier I, Tier II, Tier III and lower suppliers

The following table presents the skill requirements and gaps across various functions and hierarchical/reporting 'levels' at Small Tier I suppliers, Tier II, Tier III and lower suppliers.

Table 17: Skill requirements and skill gaps at Tier II, Tier III and lower suppliers

Function	Skills required	Skill gaps
Manufacturing / Operations	<ul style="list-style-type: none"> Ability to understand the implications of defective parts/assemblies and how these link to increased warranty costs for the OEM Ability to meet quality requirements of the OEM / Tier I 	<ul style="list-style-type: none"> Personnel at smaller companies are unable to maintain quality of output and hence customer companies have to depute their own personnel to so as to ensure that the right quality of product is made available

Function	Skills required	Skill gaps
	supplier	
Design and Development / Product Development and Industrial Engineering / Technical Services	<ul style="list-style-type: none"> ▪ Minimal design abilities to be able to convert OEM designs into manufacture-able in-house designs ▪ Ability to understand testing specifications and conduct the basic tests needed accordingly ▪ Ability to design processes given an OEM design, keeping the required quality specifications in mind and reducing rejections to the minimum level possible 	<ul style="list-style-type: none"> ▪ Inadequate ability to understand OEM design specifications ▪ Inadequate knowledge of materials used in auto components
Tool Room	<ul style="list-style-type: none"> ▪ Ability to manufacture on-off parts using multiple basic machines – for example, for manufacturing a failed machine part ▪ Knowledge of gauges and the ability to manufacture and calibrate basic gauges 	<ul style="list-style-type: none"> ▪ Inadequate understanding of advanced engineering drawings for critical gauges etc.
Sales and Marketing	<ul style="list-style-type: none"> ▪ Ability to maintain good working relations with large Tier I suppliers / OEM's (Tier I suppliers / OEM's) ▪ Ability to understand exact technical requirements of customers ▪ Ability to ensure that customer expectations (Tier I suppliers / OEM's) in terms of timely delivery are met 	<ul style="list-style-type: none"> ▪ Inadequate ability to understand exact technical requirements of customers ▪ Inadequate ability to ensure timely delivery
Service	<ul style="list-style-type: none"> • Ability to interact with Tier I suppliers / OEM's to understand the performance of their particular component w.r.t. quality, rejection rate, etc. 	<ul style="list-style-type: none"> • Inadequate ability to understand the criticality of the role played by their component in the overall system design

Function	Skills required	Skill gaps
	<ul style="list-style-type: none"> Ability to effectively provide genuine feedback to the design and manufacturing personnel about their components' performance and the changes required in design / production processes 	<ul style="list-style-type: none"> Inadequate ability to identify the exact problem in the component and understand why it was rejected

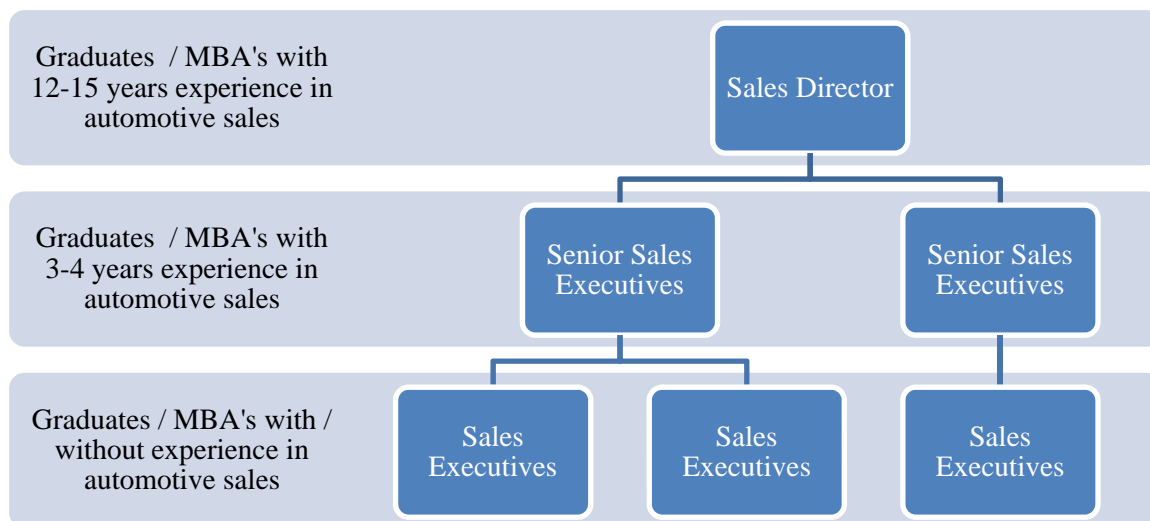
Source: Primary Research and IMaCS analysis

2.7.Skill Requirements and Skill Gaps at Dealerships (Sales function) and Used Car Dealerships

2.7.1. Profile of people employed

The following figure illustrates the profile of people employed at dealerships in the sales function and at used car dealerships.

Figure 22: Profile of people employed at Dealerships in the Sales function and at Used Car Dealerships



Source: Primary Research and IMaCS analysis

2.7.2. Skill requirements and skill gaps at dealerships in the sales function / at used car dealerships

The following table presents the skill requirements and gaps common to across various functions and hierarchical/reporting ‘levels’ at dealerships in the sales function / at used car dealerships.

Table 18: Skill requirements and skill gaps at dealerships (sales function)

Function	Level	Skills required	Skill gaps
Sales	Sales Director	<ul style="list-style-type: none"> ▪ Ability to keep track of the market in terms of which segments are growing – e.g. whether buses / trucks / trailers are being sold to a greater extent etc. ▪ Ability to be in regular contact with large customers – e.g. with buyers of cars in the corporate space, truck fleet owners, etc. ▪ Ability to be in regular contact with the OEM and maintain good working relations with the OEM contact person ▪ Ability to understand what to buy, when to buy, etc, communicate this effectively to the OEM and ensure timely delivery of products ordered ▪ Ability to maintain a good aesthetic façade and interior appearance of the dealership 	<ul style="list-style-type: none"> ▪ Limited ability to keep track of the market, especially in the case of smaller dealerships
	Senior Sales Executive	<ul style="list-style-type: none"> ▪ Ability to keep track of competitors’ products so as to be able to answer customer queries related to comparisons between two or more products – the ability to highlight why the 	<ul style="list-style-type: none"> ▪ Inadequate product knowledge to be able to effectively answer customer queries, especially w.r.t. competition comparison ▪ Inadequate ability to be able

Function	Level	Skills required	Skill gaps
		<p>OEMs product(s) is better than that of competitors</p> <ul style="list-style-type: none"> ▪ Ability to interact with customers and maintain a pleasing countenance ▪ Ability to ensure that customers are approached within a few seconds of them entering the dealership ▪ Ability to coordinate and answer queries raised by sales executives w.r.t. the product(s) 	<p>to deal with multiple kinds of customers</p>
	Sales Executive	<ul style="list-style-type: none"> ▪ Knowledge of the local language to be able to interact with customers who are not well conversant with English ▪ Adequate product knowledge so as to be able to answer various kinds of questions posed by customers ▪ Ability to maintain good interpersonal skills and verbal and non-verbal communication skills in dealing with customers ▪ Knowledge of effective selling techniques ▪ Ability to quickly understand customer requirements and 	<ul style="list-style-type: none"> ▪ Knowledge of competition (product features, prices, services offered) and industry trends is limited ▪ Inadequate Selling skills, understanding customer requirements and customer behaviour are inadequate
Purchase facilitation	-	<ul style="list-style-type: none"> ▪ Ability to coordinate with the local RTO and ensure timely processing of customer's registration papers ▪ Ability to maintain good working relations with the RTO personnel 	<ul style="list-style-type: none"> ▪ Inability to assess completeness of documents submitted by customers, leading to delays in processing

Function	Level	Skills required	Skill gaps
		<ul style="list-style-type: none"> ▪ Ability to coordinate with insurance companies / insurance brokers and ensure timely pricing of customer's insurance papers ▪ Ability to check papers submitted by customers and highlight gaps if any so as to facilitate quicker processing 	
Driving	-	<ul style="list-style-type: none"> ▪ Ability to drive brand new vehicles / used vehicles carefully within the premises of the dealership so as to prevent physical damage to the vehicles 	<ul style="list-style-type: none"> ▪ Inadequate discipline and tendency to drive rashly within the dealer's premises ▪ Inadequate appreciation of the damage that can be caused by careless maneuvering of vehicles within the dealership premises
Managing accessories	-	<ul style="list-style-type: none"> ▪ Ability to keep wide range of accessories on display ▪ Ability to track fast-moving accessories ▪ Ability to cross-sell and up-sell accessories 	<ul style="list-style-type: none"> ▪ Inadequate ability to price accessories optimally and get maximum profit from customers in comparison with competitors ▪ Ability to sell accessories to customers when they purchase the two wheeler / car / commercial vehicle itself, since customers may not come back to the dealership only for purchasing accessories

Source: Primary Research and IMAcS analysis

Skill requirements and gaps specific to dealerships in the sales function / used car dealerships, over and above what is common across these are detailed below:

Figure 23: Skill requirements and skill gaps specific to Used Car Dealerships

Function	Level	Skills required	Skill gaps
Purchase / Sales	Senior Sales Executive / Sales Executive	<ul style="list-style-type: none"> ▪ Ability to portray the product above its actual value or below its actual value in selling / purchase transactions respectively ▪ Ability to judge the customers' expectation in terms of price when the customer has come to sell the car to the used car dealer 	<ul style="list-style-type: none"> ▪ Since the market is highly scattered, personnel have limited ability to determine the expectation of the customer who wishes to sell a vehicle
Driving	-	<ul style="list-style-type: none"> ▪ Ability to conduct test drives on vehicles when they are being purchased by the used car dealership ▪ Ability to identify defects that are not obvious and cannot be detected by normal inspection ▪ Ability to “have a ear” for determining defects in used cars being purchased 	<ul style="list-style-type: none"> ▪ Low availability of skilled drivers for testing
Testing, inspection and valuation	-	<ul style="list-style-type: none"> ▪ Ability to follow standard set of tests that need to be performed when buying a vehicle ▪ Ability to give a judgment on the condition of individual systems and take decisions related to replacement / repair of parts ▪ Ability to judge the actual value of the vehicle – component by component and system by system ▪ Ability to determine the up-side potential while buying a vehicle across various vehicles 	<ul style="list-style-type: none"> ▪ Inadequate understanding of the re-manufactured components market and the value that a replaced component from a used car will fetch

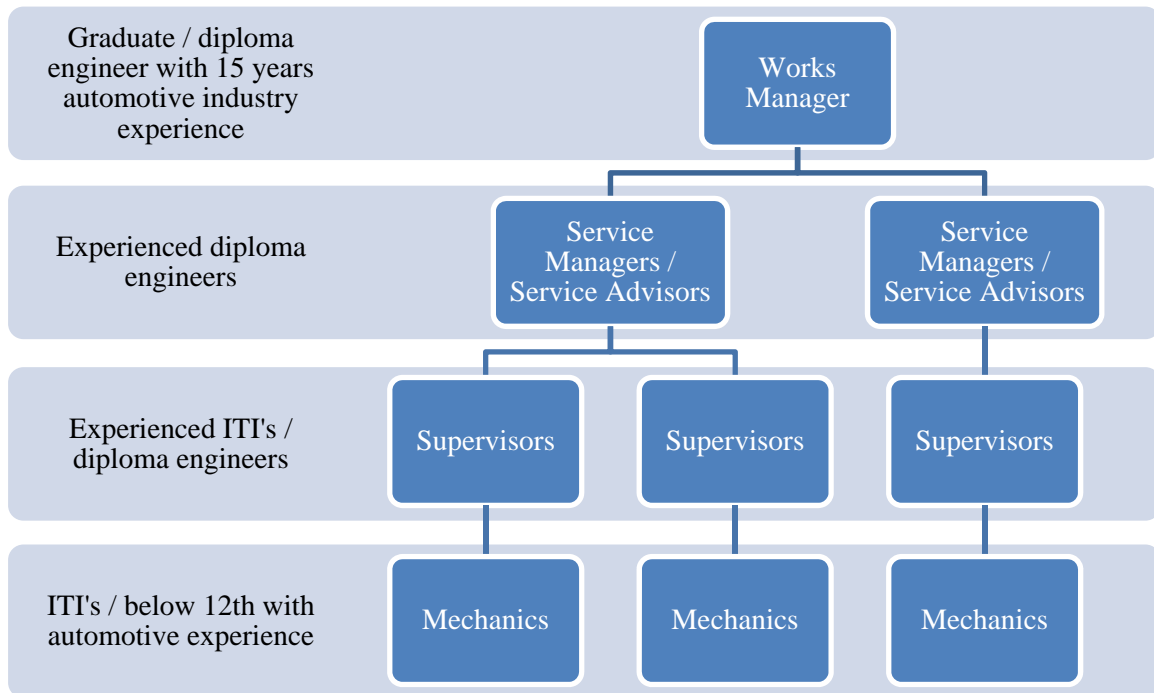
Source: Primary Research and IMAcS analysis

2.8.Skill Requirements and Skill Gaps at Dealerships (Service function) and Service Centres

2.8.1. Profile of people employed

The following figure illustrates the profile of people employed at dealerships (service function) and service centres.

Figure 24: Profile of people employed at dealerships (service function) and service centres



Source: Primary Research and IMaCS analysis

2.8.2. Skill requirements and skill gaps at dealerships (service function) and service centres

The following table presents the skill requirements and gaps across various functions and hierarchical/reporting 'levels' at dealerships (service function) and service centres.

Table 19: Skill requirements and skill gaps at dealerships (service function) and service centres

Level	Skills required	Skill gaps
Works Manager	<ul style="list-style-type: none"> ▪ Ability to liaison with the OEM ▪ Ability to run the service centre so as to achieve profitability targets ▪ Ability to coordinate with the OEM and ensure that spare parts are made available as required ▪ Ability to send mechanics and/or supervisors for carrying out servicing activities at the customers' end, if required 	<ul style="list-style-type: none"> ▪ Inadequate understanding of commercial aspects of running the service centre ▪ Inadequate understanding of key drivers of profitability for the service centre
Service Managers / Service Advisors	<ul style="list-style-type: none"> ▪ Ability to diagnose the overall problem and make job cards to guide supervisors and mechanics accordingly ▪ Ability to clearly identify and give directions w.r.t. which components / systems need overhauling and which components / systems need to be replaced so as to minimize warranty costs ▪ Ability to understand technical aspects of new technologies as and when they are part of the vehicle design ▪ Ability to be reduce turnaround time and be quick in responding to customer complaints ▪ Ability to provide high quality service so as to ensure customer loyalty 	<ul style="list-style-type: none"> ▪ Inadequate ability to diagnose and trouble shoot and decide on what is to be done – for example, these personnel may find it difficult to take a decision on whether to open or not open the gearbox ▪ Inadequate ability to differentiate between components that require overhauling and components that need to be replaced – this leads to increased warranty costs ▪ Inadequate knowledge of modern vehicle technology ▪ The attrition rate of personnel employed in this function is high at about 30-40% ▪ Though the skill required for diagnosing problems is typically

Level	Skills required	Skill gaps
	<ul style="list-style-type: none"> ▪ Ability to provide cost-effective service so as to prevent customers from going to local garages as against authorized service centers ▪ Ability to handle and appease upset customers ▪ Ability to take complaints and following systems and procedures of service 	<p>higher than that required on the manufacturing shop floor, the salary of personnel employed in the service function is much lower, thus leading to lower motivation levels</p>
Supervisors	<ul style="list-style-type: none"> ▪ Allocate work to mechanics ▪ Ensure timely completion of repair / service work ▪ Ability to maximise the number of vehicles serviced by his team 	<ul style="list-style-type: none"> ▪ Inadequate ability to get work done on a timely basis from mechanics
Mechanics	<ul style="list-style-type: none"> ▪ In-depth understanding of vehicle assemblies ▪ In-depth understanding of criticality of parts – e.g. ability to carefully remove the piston without damaging the cylinder which is one of the most expensive components in the engine ▪ Understanding of critical assembly specifications – e.g. what torque needs to be applied to tighten the wheel nut ▪ Ability to follow instructions in the job card 	<ul style="list-style-type: none"> ▪ Inadequate ability to discern minute distinctions in components leading to erroneous assembly – mixing of ordinary nuts with lock nuts ▪ Inadequate orientation towards final safety of the vehicle after servicing – e.g. being careless about fixing the split pin on the castle nut on the wheel of a two wheeler ▪ Tendency to rely on judgements than on specific instruments / tools – e.g. tendency to avoid usage of pressure gauge while filling air in tyres

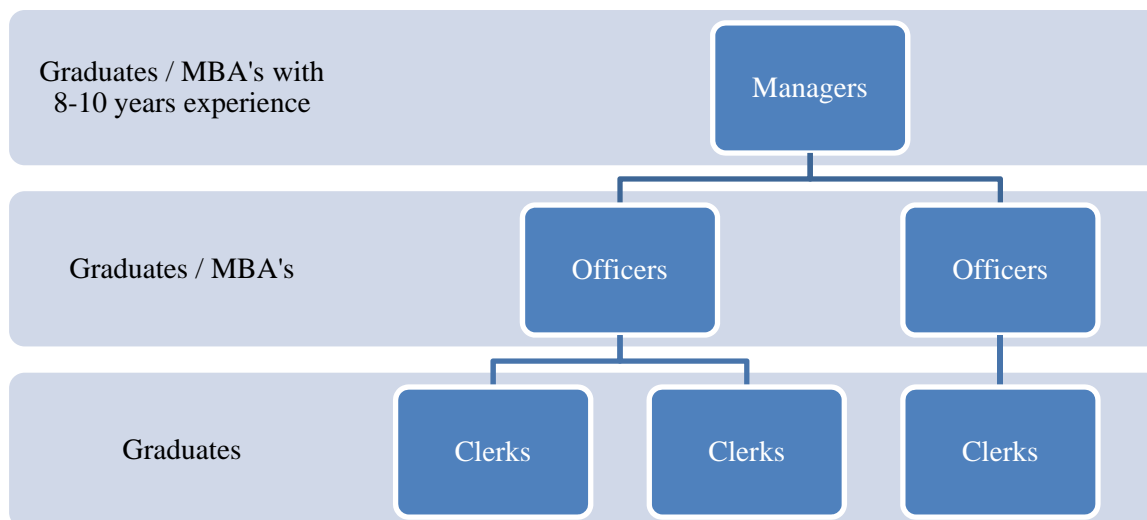
Source: Primary Research and IMaCS analysis

2.9.Skill Requirements and Skill Gaps in Auto Finance

2.9.1. Profile of people employed

The following figure illustrates the profile of people employed in the auto finance domain.

Figure 25: Profile of people employed at auto finance companies



Source: Primary Research and IMaCS analysis

2.9.2. Skill requirements and skill gaps at auto finance companies

The following table presents the skill requirements and gaps across various functions and hierarchical/reporting 'levels' at auto finance companies.

Table 20: Skill requirements and skill gaps at auto finance companies

Function	Level	Skills required	Skill gaps
Sales and customer support	Senior sales executive	<ul style="list-style-type: none"> ▪ Understanding of loan products offered by the bank / NBFC ▪ Knowledge of RBI rules and guidelines applicable to auto finance operations ▪ Ability to guide junior sales executives and drive them towards getting more business ▪ Ability to design optimum sales workforce ▪ Ability to prepare a regional sales 	<ul style="list-style-type: none"> ▪ Inadequate knowledge of the auto finance industry

Function	Level	Skills required	Skill gaps
		strategy which will include tie-ups with auto dealers etc.	
	Junior sales executive	<ul style="list-style-type: none"> ▪ Ability to efficiently check that all documents required for loan processing have been correctly submitted by the customer ▪ Detailed understanding of banks loan products so as to be able to explain the same to the customer ▪ Understanding of the bank procedures related with each product ▪ Knowledge of documentation related with loan products ▪ Ability to follow the standard checklist when checking documents submitted ▪ Ability to alter selling methods when dealing with salaried personnel / business personnel 	<ul style="list-style-type: none"> ▪ Knowledge of the auto finance industry is limited ▪ Limited knowledge of the local language tends to be a hindrance ▪ Insufficient knowledge of competitors' products and hence limited ability to highlight the benefits of the own products as against customer's products
Credit appraisal and evaluation	-	<ul style="list-style-type: none"> ▪ Ability to decide what percentage loan to offer to the customer based on the customer's ability to repay the loan ▪ Ability to check the standing of guarantors provided by the customer ▪ Ability to interview customers who have applied for the auto loan and determine their capacity to repay the loan ▪ Knowledge of RBI rules and guidelines applicable to auto finance operations ▪ Ability to decide the loan term ▪ Ability to determine the percentage interest to be charged to customers based on various parameters 	<ul style="list-style-type: none"> ▪ Inadequate ability to take swift decisions as regards loan term and percentage loan to be offered ▪ Tendency to take a long time in credit appraisal
Collections	-	<ul style="list-style-type: none"> ▪ Ability to keep track of collections being received form customers 	<ul style="list-style-type: none"> ▪ Limited knowledge of laws and their

Function	Level	Skills required	Skill gaps
and recovery		<ul style="list-style-type: none"> ▪ Ability to determine which customers are defaulting ▪ Ability to identify which customers are expected to default based on past history of payment ▪ Ability to pursue recovery in the right bucket ▪ Ability to segregate customers into various categories based on their level of default and take appropriate actions for collections – e.g. Reminder calls to customers who delay payments, legal warning to customers who successively default on payment 	<p>application on a case-basis</p> <ul style="list-style-type: none"> ▪ Inadequate relations with local police
Product design	-	<ul style="list-style-type: none"> ▪ Ability to track the market and study what auto loan products are being offered by competitors ▪ Ability to design loan products addressing needs of customers according to their profile and the product being purchased ▪ Ability to build in maximum profitability in designed loan products 	<ul style="list-style-type: none"> ▪ Limited ability to track the market and understand customers products

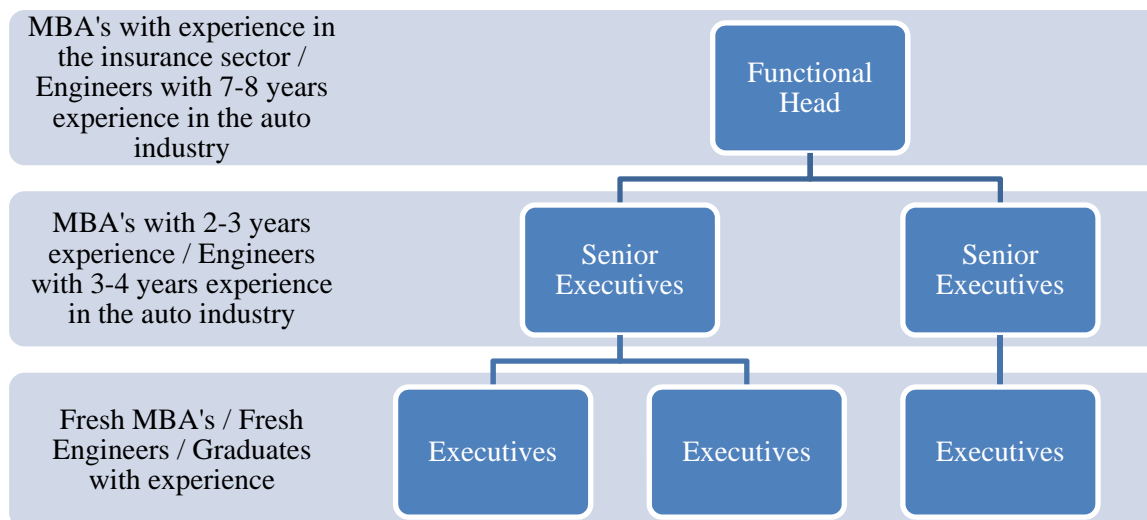
Source: Primary Research and IMaCS analysis

2.10. Skill Requirements and Skill Gaps in Auto Insurance

2.10.1. Profile of people employed

The following figure illustrates the profile of people employed at auto insurance companies.

Figure 26: Profile of people employed at auto insurance companies



Source: Primary Research and IMaCS analysis

2.10.2. Skill requirements and skill gaps at auto insurance companies

The following table presents the skill requirements and gaps across various functions and hierarchical/reporting 'levels' at auto insurance companies.

Table 21: Skill requirements and skill gaps at auto insurance companies

Function	Level	Skills required	Skill gaps
Sales	Senior sales executive	<ul style="list-style-type: none"> ▪ Ability to handle multiple sales channels and interact with senior personnel at these channels ▪ Ability to effectively guide junior sales executives ▪ Basic understanding of automobiles 	<ul style="list-style-type: none"> ▪ Difficulty faced in working in different work environments – e.g. in the case of persons working in PSUs (which dominated the insurance space at one time) / private insurance companies
	Junior	<ul style="list-style-type: none"> ▪ Ability to maintain good 	<ul style="list-style-type: none"> ▪ Tendency to overestimate their

Function	Level	Skills required	Skill gaps
	sales executive	<p>working relationships with multiple sales channels – e.g. dealerships, agents, bank partners, referrals, brokers and other intermediaries</p> <ul style="list-style-type: none"> ▪ Aggressiveness and the ability to convince, so as to be able to effectively sell auto insurance products ▪ Basic understanding of automobiles 	<p>knowledge of the industry</p> <ul style="list-style-type: none"> ▪ Tendency to have a “know-it-all” attitude, which is a deterrent to meaningful knowledge gaining ▪ Inadequate commitment levels, especially towards understanding the dynamics of the insurance industry
Customer Support	-	<ul style="list-style-type: none"> ▪ Knowledge of automobiles and automotive systems ▪ Ability to distinguish genuine insurance claims from counterfeit claims ▪ Ability to determine the liability of the insurance company, i.e. what is payable to the customer, once a claim is submitted and an evaluation has been carried out ▪ Ability to handle irate customers ▪ Empathy to understand that typically customers’ knowledge of insurance products is limited and that they may expect greater coverage as compared to what can actually get covered under the policy – this is especially critical in rural areas ▪ Ability to ensure that standardized service quality 	<ul style="list-style-type: none"> ▪ Inadequate understanding of automobiles and automotive systems ▪ Inadequate ability to effectively handle irate customers

Function	Level	Skills required	Skill gaps
		parameters are enforced	
Underwriting	-	<ul style="list-style-type: none"> ▪ Ability to be able to work in an environment in which data is minimally available and yet policies need to be defined ▪ Thorough knowledge of risk modeling and the ability to access risks to the insurance company and design policies so as to minimize the risk ▪ Need to be experts in statistics / actuarial science / insurance science ▪ Detailed knowledge of the dynamics of the insurance sector 	<ul style="list-style-type: none"> ▪ Shortage of personnel with an actuarial / statistics / insurance science background
Operations	-	<ul style="list-style-type: none"> ▪ Ability to design processes and process flows (for example, the set of steps that a customer will need to follow when raising a claim) ▪ Ability to execute all back-office operations (e.g. processing of claims made by customers, making insurance policy documents available to customers, etc.) 	<ul style="list-style-type: none"> ▪ Difficult to attract personnel for the operations function as most people wish to be part of the front-end sales function instead and operations is seen as a less attractive career prospect ▪ Quality of personnel employed tends to be lower, though the qualifications may be the same as that of personnel employed in the sales function

Source: Primary Research and IMACS analysis

2.11. Emerging Trends in Human Resource and Skill Requirements

Some of the emerging trends in human resource and skill requirements in the Auto and Auto Components Industry in India are as below¹⁶:

- **Human resource and skill requirements related to the emerging trends in the industry:** As stated earlier, several emerging trends are seen in the Automotive Industry in India. These trends will in turn give rise to the corresponding human resource and skill requirements. For example, more number of electronics engineers will be needed to work on the increasing electronic content of vehicles, design engineers will need to work on complicated engine designs, and design as well as manufacturing personnel will be needed for hybrid vehicles. Similarly, personnel to work on the emerging regulatory trends will be needed – for example, design engineers will need to have advanced knowledge of emission and safety regulations. This will also lead to increasing human resource and skill requirements at the supplier's end.
- **Increasing cost of human resources due to the advent of foreign players:** With the advent of foreign players in the OEM space and with the demand-supply situation w.r.t. skilled human resources in the Automotive Industry in India being as it currently is, personnel currently employed at OEM's / Tier I suppliers are found to be "industry-ready" and they are thus being attracted by the foreign players into their fold. Thus a major challenge currently being faced by OEM's / Tier I suppliers, is retaining their skilled employees, thus leading to increasing cost of human resources.
- **Increasing recruitment of BSc graduates:** A recent trend seen in the Automotive Industry in India is the recruitment of BSc graduates at the same level as ITIs or diploma engineers. It is observed that BSc graduates are able to adapt to the manufacturing environment and learn quickly – they need to be given the same amount of training (6 months to one year) that is generally provided to fresh ITI's or diploma engineers. Also, the attrition of diploma engineers for higher studies is not found in BSc graduates. Going ahead, as the Auto Industry further focuses on the design and development function, science graduates may also be required in the design and development field (e.g. chemists / physicists may be required in companies that produce castings / forgings). The industry perceives this trend to increase going ahead, and BSc graduates are expected to account for an increasing proportion of the workforce employed in the Automotive Industry in India.

¹⁶ Documented based on inputs received in the Primary Research

- ***Shortfall of human resources in vehicle design and styling functions:*** Styling of vehicles is a key competitive advantage for OEM's, but at the same time styling and design capabilities are significantly lacking in India – this is why most auto OEM's in India depend upon design houses abroad for styling of the vehicles being developed by them. With the increase in product development activity in India, the need for developing design capabilities in the country is increasing dramatically. This is also being driven by the need for developing vehicles as per the tastes of fast growing local and Asian markets. The Indian OEMs over the years have set up in-house design centres for enhancing their capabilities to develop products to suit customer choices which are fast changing. The global OEMs have also felt the growing need for developing vehicles as per local requirements and have started setting up design houses in India. The focus on developing vehicle design capabilities in India is driving the need qualified manpower with the requisite capabilities. Availability of qualified and talented vehicle designers is being considered as one of the biggest bottlenecks in designing vehicles in India. The supply side is also currently limited, with the Master in Design course being offered by some IIT's and NID Ahmedabad. However, in order to build competencies of global levels, continuous availability of a large pool of qualified and talented designers will be necessary.
- ***Increase in human resource requirements for vehicle financing and vehicle insurance:*** Vehicle financing and vehicle insurance are underlying support systems for the Automotive Industry in India and these may be considered as the enablers of growth of the Automotive Industry. The enabler segments are associated with providing indirect employment to personnel in the Auto Industry.
- ***Increasing proportion of women in the workforce:*** The Automotive Industry in India is characterized by maximum proportion of the workforce being male. Women employed in the Auto Industry in India, are mainly employed in functions such as design, HR, finance and in support office functions. This has primarily been the case due to the low availability of women who take up courses such as mechanical engineering in college. Companies, especially auto OEM's and Tier I suppliers, are making a conscious effort to increase the participation of women in the workforce, including in the core operations function. Whether or not women will participate in the operations workforce though, remains to be seen.
- ***Skills that will be required due to the upcoming Inspection and Maintenance regime (including vehicle scrapping):*** Mandatory inspection and maintenance regulations, including vehicle scrapping norms for old vehicles since they contribute to a larger portion of carbon

dioxide emissions are expected to come into being in the near future. These norms will help implement stricter safety and emission regulations and will in turn lead to employment in certain new areas covering the vehicle scrapping chain. For example, the role of car dealers will diversify as they will additionally serve as intermediaries between the customer and the scrapping industry. There will be an increased need for dismantlers, scrap dealers and vehicle cutters and the absolute number of these units as well as the employment at existing units will correspondingly increase. Other agencies involved will include OEM's, insurance agencies, RTO's etc. and these agencies will need separate personnel for vehicle scrapping related work or will need to train their existing personnel specifically for this purpose.

- ***Multi-product integrated dealerships and the corresponding need for multi-skilled sales and service personnel:*** Currently in India, OEM's have their own dealerships that sell cars of only of one particular OEM - thus a Tata passenger car dealer is an exclusive Tata dealer and will not sell passenger cars of, say, Hyundai. This situation is expected to undergo a change in the near future, with multi-brand car sales dealerships setting up base. A recent example is Mr. Jagdish Khattar's "Carnation Auto", which is 'in the process of setting up a state-of-the-art network of integrated multi-brand auto sales, services and related solutions across the country'. Carnation Auto plans to retail new as well as used cars of different brands under the same roof. Such an initiative is expected to bring about a sea-change in the way cars are sold currently by making available one-stop solutions to customers and also allowing them to compare new cars at a single location. Such an initiative is expected to lead to the need for multi-skilled sales and service personnel who are able to sell as well as service multiple car models and brands with the same efficiency.
- ***The Tata Nano and auto hubs in Gujarat and Uttarakhand:*** There are 3 major automobile and auto component production clusters across the country and these are located in the Western, Southern and Northern regions. Also, the clusters have OEMs as hubs or centers of growth while the suppliers have formed their bases around the OEMs. The Western and the Northern regions are expected to grow further, with Gujarat and Uttarakhand emerging as auto hubs; the Tata Nano manufacturing facility being set up in Gujarat will not only provide employment to people working in the manufacturing plant, but will also give a boost to auto ancillary players in the State in places like Rajkot, thus leading to further employment in the State. In Uttarakhand, the Tata Ace plant is already in existence, and production of the Tata Nano unit is also expected in the State – this, combined with the need for auto ancillaries to be available at close quarters, is expected to further increase the employment potential in the State. Gujarat is also poised to become an auto export hub with vehicle manufacturers investing in its ports to create car export terminals.

- **Organized used car industry:** The used car industry in India has traditionally been unorganized, and has been characterized by small players buying and selling vehicles and direct seller-to-buyer interaction. This scenario is already changing, with the advent of players such as Maruti True Value and Mahindra First Choice. The organized used car market provides several advantages to the end-customer - since vehicles purchased by used car dealers are thoroughly tested and valued accordingly, customers can be more sure of the quality of the product bought from used car dealers as against from unorganized players. The further proliferation of used car dealerships is also expected to expand the need for certain skill sets in the industry – for example, a greater number of personnel are in demand for testing, inspecting and valuing used cars, sales personnel are expected to not only sell used cars but also to aid in purchasing used cars, drivers are required for test-driving used cars, etc.

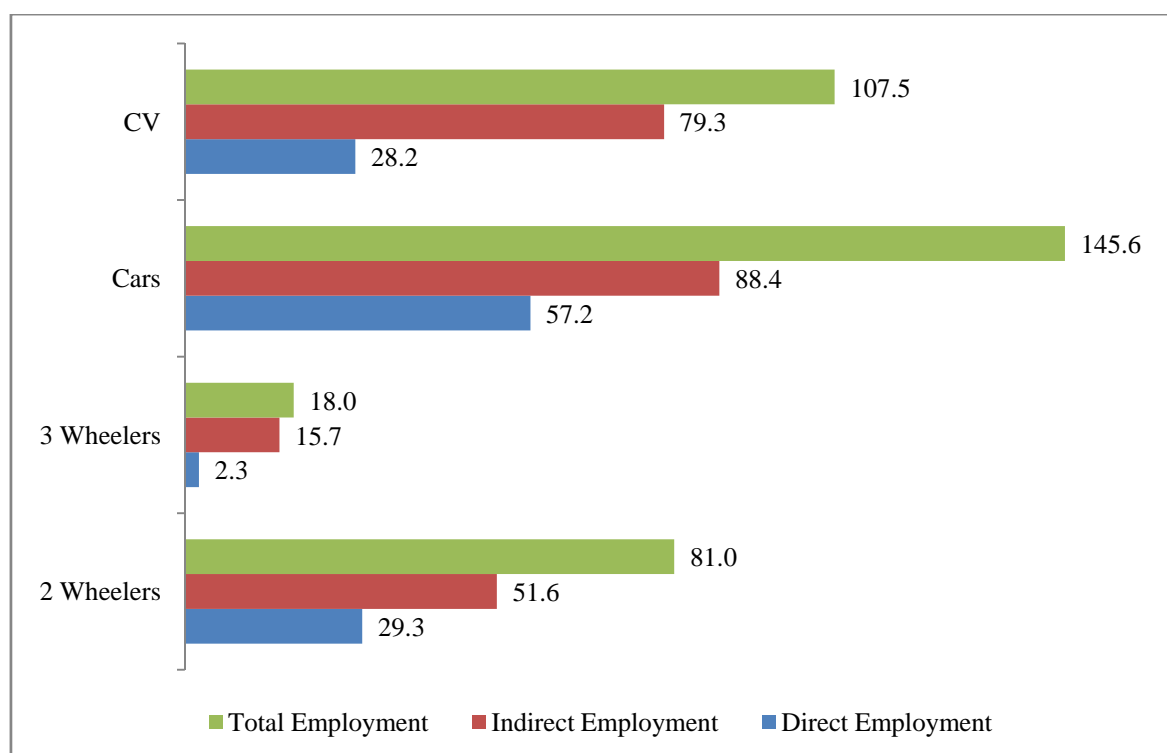
2.12. Projected Human Resource Requirements

India’s Automotive Mission Plan envisages size of the Indian Automotive Industry to grow at 11.5% p.a. over the next decade to reach a minimum size of USD 165 to 175 billion by 2022. The Indian Automotive Industry faces a challenge in terms of developing human resource skills to achieve the said growth targets. The problems are twofold –

- India needs to train manpower to cater to the higher employment demand from the Indian Auto Industry; further,
- As India embraces global technology, skill enhancement becomes mandatory to improve technology and productivity.

The Automotive Industry has also been recognized as an industry with a very high potential to increase employment and additional employment of 25 million people is envisaged by the year 2016¹⁷. It is also estimated that by 2022, the Automotive Industry will employ an incremental **35 million** people¹⁸. The category-wise human resources requirement is expected to be as follows:

Figure 27: Category-wise incremental human resources requirement (in lakh) expected in 2022¹⁹



Source: IMaCS analysis

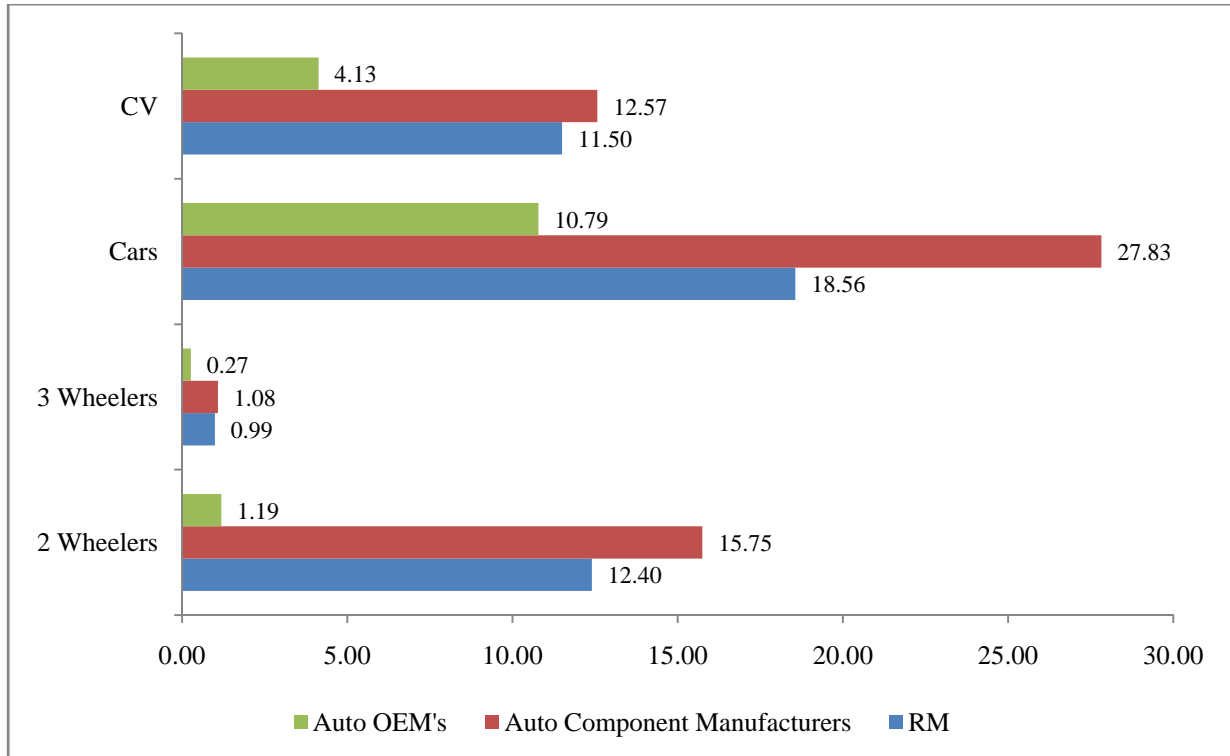
¹⁷ SIAM – Automotive Mission Plan 2006-2016

¹⁸ IMaCS analysis

¹⁹ Initial estimate

Direct employment will consist of employment at OEMs, component suppliers and raw material suppliers, and is expected to be distributed as below:

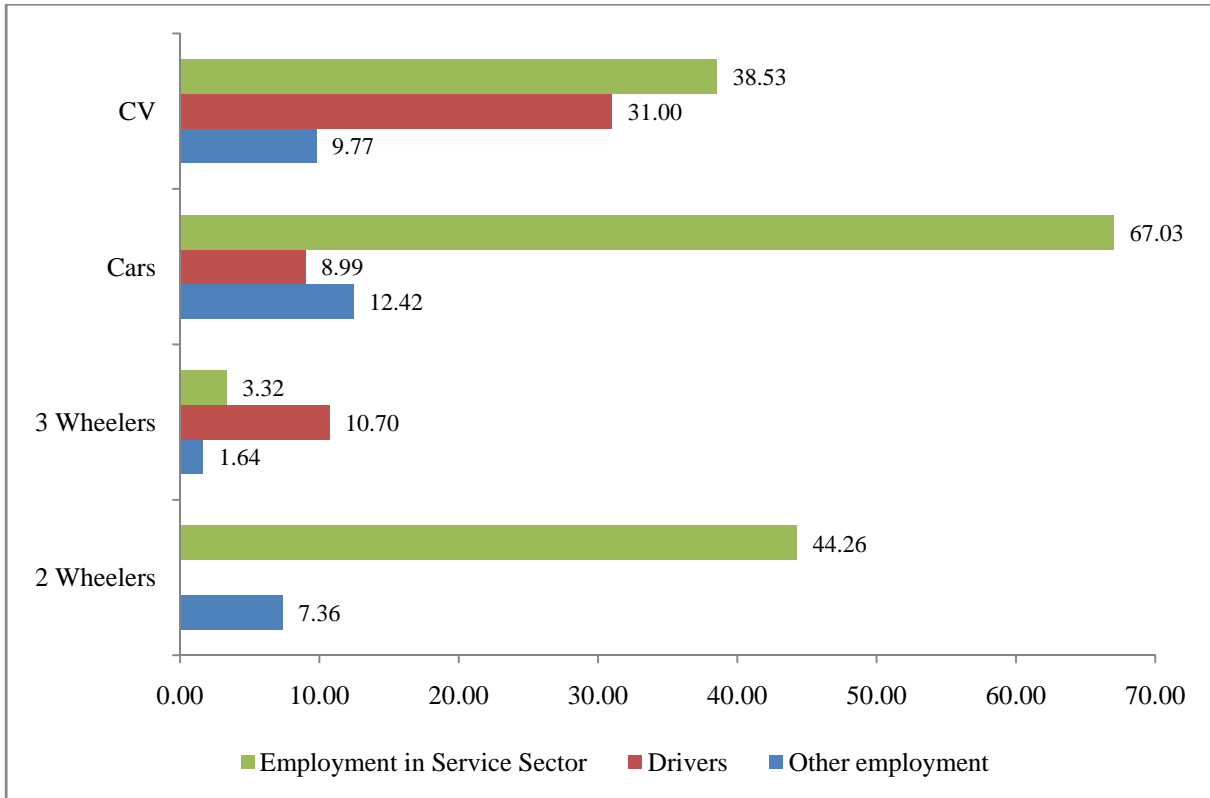
Figure 28: Direct employment - Incremental human resources requirement (in lakh) expected in 2022



Source: IMaCS analysis

Indirect employment will primarily consist of employment in the service sector (auto finance, auto insurance etc.) and employment generated for drivers. The indirect employment is expected to be distributed as below:

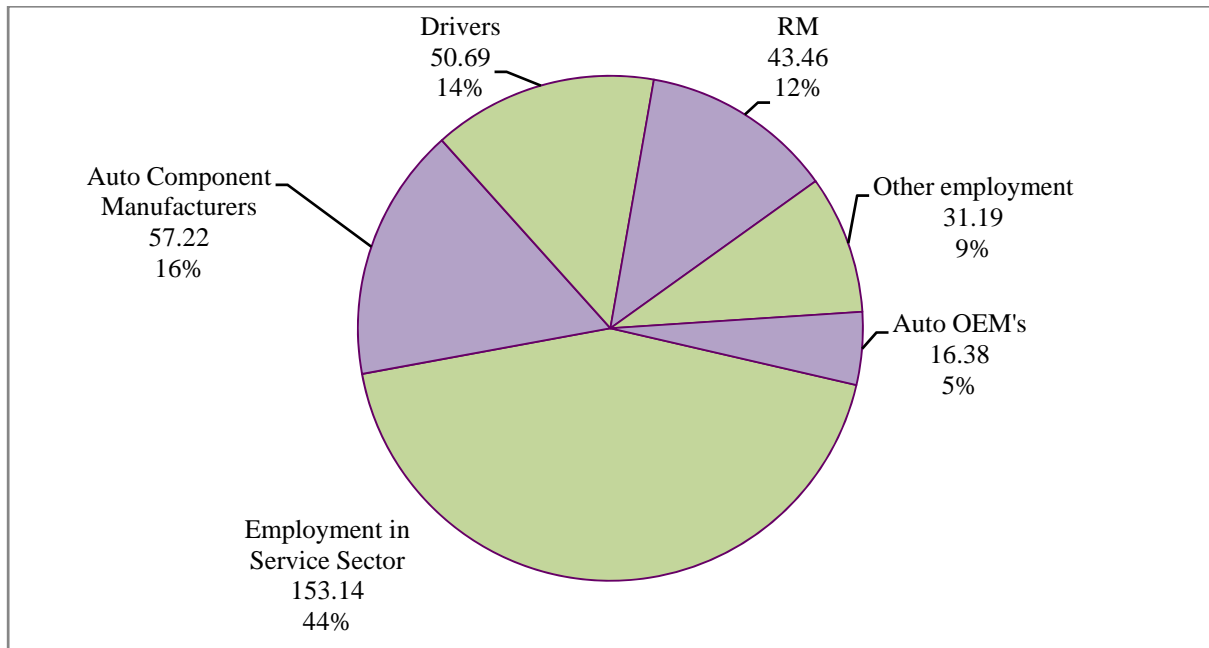
Figure 29: Indirect employment - Incremental human resources requirement (in lakh) expected in 2022



Source: ImaCS analysis

Thus at an overall level, the total incremental employment in the Auto and Auto Components Sector is expected to be distributed as follows:

Figure 30: Distribution of overall incremental human resources requirement (in lakh and percent) expected in 2022



Source: IMaCS analysis

This report has been prepared by **ICRA Management Consulting Services Limited (IMaCS)**.

IMaCS is a multi-line management and development consulting firm headquartered in India. It has an established track record of over 15 years in consulting across various sectors and countries. IMaCS has completed over 950 consulting assignments and has worked in over 30 countries across the globe. Through the process of carrying out several assignments over the last decade and half, IMaCS has accumulated considerable analytical and consulting expertise, backed by the following capabilities:

- Deep understanding of policy formulation.
- Extensive and organised database on several sectors.
- Knowledge of key factors of success in different projects and programmes.
- Ability to research emerging trends in the economy, as well as in specific sectors.
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- Ability to identify the various types of risks and suggest appropriate strategies to mitigate the same.

The Education and Skills practice at IMaCS focusses on identifying skill gaps, mapping future skill requirements, and formulating strategies to address them. Our service offerings encompass diagnosis, design and implementation of education and skill development interventions for government and private sector.



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