Sector Skills Study – Auto Parts Sector

Submitted to: **Punjab Skills Development Fund - PSDF**

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List of Abbreviations and Acronyms

-Acronym	Description
AASR	Anjum Asim Shahid Rahman
AIDP	Auto Industry Development Plan
APMA	Association of Pakistan Motorcycles Assemblers
CAD	Computer Aided Design
САМ	Computer Aided Manufacturing
CEO	Chief Executive Officer
CNC	Computerized and Numeric Control
DAE	Diploma of Associate Engineering
DFID	Department for International Development
EDB	Engineering Development Board
EFI	Electronic Fuel Injection
EU	European Union
FGDs	Focus Group Discussions
GDP	Gross Domestic Product
GoPb	Government of Punjab
GPB	Great Britain Pound
GSP	Generalized System of Preferences
HR	Human Resource
IAG	Industry Advisory Groups
IT	Information Technology
KTDMC	Karachi Tools, Dies & Moulds Centre
LCV	Light Commercial Vehicle
LED	Light Emitting Diode
MOU	Memorandum of Understanding
MPFI	Multi-Port Fuel Injection
NAVTTC	National Vocational & Technical Training Commission
NED	Nadirshaw Eduljee Dinshaw
NIDA	National Institute of Design & Analysis
NUST	National University of Science & Technology
NVQF	National Vocational Qualification Framework
OEM	Original Equipment Manufacturer
PAAPAM	Pakistan Association of Automotive Parts and Accessories
	Manufacturers
PAMA	Pakistan Automotive Manufacturers Association
PBTE	Punjab Board of Technical Education
PCSIR	Pakistan Council of Scientific & Industrial Research
PITAC	Pakistan Industrial Technical Assistance Centre
PKR	Pakistan Rupee





PPP	Public Private Partnership
PSDF	Punjab Skills Development Fund
PVTC	Punjab Vocational Training Council
QC	Quality Control
R&D	Research and Development
SBTE	Sindh Board of Technical Education
SKD	Semi knocked down
SME	Small and Medium Enterprise
SMEDA	Small and Medium Enterprises Development Authority
TBS	Tariff Based Systems
TEVT	Technical Educational and Vocational Training
TEVTA	Technical Education & Vocational Training Authority
TORs	Terms of Reference
ТоТ	Training of Trainers
TQM	Total Quality Management
TSPs	Training Service Providers
TUSDEC	Technology Up-gradation and Skill Development Company
VTI	Vocational Training Institute
UET	University of Engineering and Technology
USD	United States Dollar





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1.0 EXECUTIVE SUMMARY

Punjab Skills Development Fund (PSDF) is a not-for-profit organization, set up by the Government of the Punjab (GoPb) in collaboration with the Department for International Development (DFID), United Kingdom (UK). In view of the importance of automobile sector for Pakistan's economy, PSDF, through its Accountable Grant programme, commissioned a sector skills study on Auto Parts Sector of Punjab to identify quantitative and qualitative skills deficiencies. The study aimed to highlight the skill deficiencies in auto parts sector and identify the needed skills and their supplies; so as to enable PSDF develop/implement demand-driven training programmes. The objectives of the study were achieved by conducting a structured survey of sector stakeholders; including Auto Parts sector enterprises, Training Service Providers (TSPs) and Auto Parts sector experts. The data collected from the three stakeholder groups was correlated and analyzed to arrive at recommendations for effectively meeting the technical skills requirements of Auto Parts sector of Punjab.

Automobiles sector is a large industrial sector of Pakistan; manufacturing all types of vehicles; including passenger cars, vans, jeeps, light commercial vehicles, buses, trucks, tractors, motorcycles and three wheelers. Auto parts manufacturing sector is the vendor industry for automobiles assembly units. The automobile sector was born in early 1950sand the growth kept rolling at modest pace till 1980swhen the sector experienced a high growth rate, fueled by the entry of Japanese manufacturers into Pakistani market. It was during this period that rapid growth was also seen in the automotive parts vending industry. The government supported this infant industry through Deletion Programs that made it mandatory for the local automobile assemblers to use locally manufactured parts. Supported by this policy, the auto parts industry experienced growth and local manufacturers of automotive parts flourished.

As per previous studies, the total number of units in automotive sector is 2283 of which about 90% are small and medium enterprises.¹ Largest concentration of automotive units is in Karachi, followed by Lahore. Total number of auto sector enterprises surveyed during this study was 204 while the numbers of surveyed TSPs and sector experts respectively were 21 and 40. 58% of the selected enterprises were from Lahore, 36% from Karachi and 6% from other cities. Enterprises are generally dealing in more than one subsector which has resulted in the following representation in the sample; 69% enterprises were in the business of manufacturing metal parts; 31% rubber/plastic parts, 6% electronic/electrical parts; and 10% in Assembly/Sub Assembly subsector.

As per the findings from the survey, Auto parts sector was found to comprise 54% medium, 28% small and 18% large enterprises. The sector was structured with 46% private limited companies, 9% public limited companies and 38% sole proprietorships. 78% enterprises were registered/affiliated with a government department or regulatory body. 46% enterprises were established during the last two decades while 70% had an age of up to 30 years. Owing to serve both type of markets, 65% enterprises were selling to replacement market and 51% to OEMs. Major share of sales came from local market with exports only having 4% share in total sales. According to the findings of the survey, major export markets are Asia and Europe. Revenue growth trends and the growth expectations were reported to be positive. For local market sales, 37% reported an increasing trend while 45% reported stability. In export

¹Working Paper -An Overview of Trends in the Automotive Sector and the Policy Framework, Hafiz Pasha, Zafar Ismail, International Growth Centre, January 2012





market, 62% reported an increasing trend.85% sector experts expected the sector growth trend to be increasing in the coming years. Average capacity utilization was 65% which is an indicator of average to good health of the sector. Capacity utilization of small enterprises was relatively low compared to those for medium and large. With respect to subsectors, Electronic/Electrical parts sector was a better performer with 74% capacity utilization. Limited demand and electricity shortage were quoted as the two main reasons for suboptimal capacity utilization. Looking into the emerging trends, the most commonly flagged technological change, quoted by 81% metal parts enterprises and enterprises from other subsectors, was industrial automation.

The study revealed that newspaper was the most common channel, used by 81% enterprises, for hiring on managerial positions and 49% for hiring on technical positions. Personal references were also used very commonly. Recruitment through channels like contractors, job postings, and universities/training centers was not very common. 34% enterprises did not follow any formal recruitment process and 42% hired only through informal interviews. Prior work experience was required by 78% enterprises for managers and by 76% for workers. Longer experience was required for managers than that for workers. Hiring trained workforce from certified institutes was preferred by 65% enterprises for managers and by 46% for workers. TEVTA had a high recall in 62% enterprises as the key certification body.

Share of females in the total workforce of auto parts sector was only 6%; with most of them accommodated in office jobs such as administration, HR, IT and accounts. 73% of the total workforce was permanent. Employee turnover rate was not found to be a major issue in auto parts sector. Only 32% considered it an issue and only 8% rated the turnover as high. Quitting jobs for better paying opportunities and improper worker attitude were quoted as the two most important reasons for employee turnover. 88% enterprises worked on single shift of 8 hours. The enterprises working for two or three shifts were mostly the large enterprises. 95% of the enterprises paid their employees on monthly basis which is an indicator of a more formal business approach. Average monthly salaries for helper and machine operator levels respectively were PKR 11,082 and PKR 18,447 while for supervisors and middle management; they were PKR 25,290 and 34,583 respectively. Average salaries increased with the size of the enterprise. Employment trend for the past one year was increasing for 40% enterprises while 48% reported stability and 12% reported a declining trend.

A quantitative analysis of the skilled workforce revealed that the total number of technical employees in the surveyed enterprises were 31,885 which translated into an average of 156 employees per enterprise. Total employee capacity also included 292 vacant positions which was 0.9% of the total; showing that availability of workforce was not a major issue in auto parts sector. 46% of the total workforce was employed in metal related trades; sheet metal being the largest with 26% share, followed by 16% for metal casting and 4% for metal forging. Assembly/Sub Assembly accounted for 31%, Rubber/Plastic parts 14% and Electronic/Electrical parts accounted for 4% share of the total workforce. Share of vacant positions was the highest in Design/Tool &Dies section where 8.3% positions were vacant. 1.4% positions in sheet metal and 1.1% in metal forging were vacant. There were no vacant positions in Assembly/Sub Assembly and Storekeeping. Large enterprises absorbed 57% while medium and small respectively accounted for 40% and 3% shares of the total technical workforce of Auto sector. Average numbers of employees per enterprise were 490 for large, 116 for medium and 18 for small enterprises.





Share of different positions in different subsectors/processes were analyzed. In Design/Tools & Dies section, Tools &Die Maker position had the largest share of 36% of the total positions; followed by Designer/Pattern Maker with 26% share. In Sheet Metal, Pressman accounted for 12% and Assembler 10% of the total positions; followed by Welder and Drillers with 6.5% and 5.5% shares respectively. Assembler and Machinist were the largest job categories in Metal Casting process accounting for 20% and 19% shares respectively. Oven Operator and Painter were the next two largest positions. In Metal Forging, Machinist accounted for 25% positions; followed by Machine Operator with 9% share. In Rubber/Plastic parts subsector, Moulder and Assembler respectively accounted for 18% and 15% job positions. In Electronic/Electrical parts, Assembler was the key position accounting for 37% of total jobs; followed by Packer. In Assembly/Sub Assembly. Assemblers and Assistant Assemblers constituted 84% of the total workforce. 71% positions in Storekeeping were those of Storekeeper.

Helpers represented the unskilled/semiskilled workforce, and were used in all the subsectors/processes except Assembly/Sub Assembly and Storekeeping. Share of Helpers in total workforce was 16%. Sheet Metal had the highest share of helpers where 30% workforce was constituted by this. Rubber/Plastic and Electronic/Electrical parts subsectors each had 29% share of Helpers in their total workforce.

Qualitative Assessment of skills from the perspective of employers was carried out by defining a scale where 70% or above responses as 'Good' or 'Excellent' were considered 'Satisfactory', 60-70% as 'Barely Satisfactory' and below 60% as 'Unsatisfactory'. The skills levels of individuals working in the Design/Tools & Dies section and Assembly/Sub Assembly were rated as satisfactory, while the other subsectors/processes were rated barely satisfactory. Skills rating of Rubber & Plastic parts were 60.4%, the lowest among all subsectors/processes. In Design/Tools & Dies section, the skills rating of Die making & Sequencing was rated satisfactory. In Sheet Metal, Surface Treatment was rated satisfactory, Cutting, Welding & Drilling, Assembly & Finishing and QC/Packing were rated barely satisfactory while Pressing/Stamping and Heat Treatment were rated unsatisfactory. In Metal Casting, Heat Treatment and QC/Packing were rated satisfactory. Machining, Surface Treatment and Assembly/Finishing were rated barely satisfactory and Melting & Casting and Stores/Material Handling were rated unsatisfactory. In Metal Forging, QC/Packing was the only satisfactorily rated job. Machining, Heat Treatment and Surface Treatment were rated barely satisfactory and Heating & Forging as unsatisfactory. In Rubber/Plastic parts, QC/Packing was rated satisfactory, Mixing & Compounding, Assembly and Packing were rated barely satisfactory and Injection & Moulding and Cutting & Trimming were rated unsatisfactory. In Electronic/Electrical parts, no job was rated unsatisfactory. Painting and Inspection/QC were rated satisfactory and Components Intake, Assembly Line and Assembly/Finishing were rated barely satisfactory. In Assembly/Sub Assembly, the skills ratings of Chassis shop, Paint shop, Assembly/Sub Assembly -A and QC/Finishing were satisfactory while the rating of Assembly/Sub Assembly-E was unsatisfactory. All other subprocesses were rated barely satisfactory.

The analysis was further enriched by linking the skills ratings with the criticality level² of each sub-process. Majority of the sub-processes were rated either as 'of 'High' or 'Medium' criticality. Skills with 'High' criticality and 'Low' quality rating were identified. The

²The relative importance of process in the overall business operations, whether it is highly important or less important





respondents suggested having further specialized trainings instead of initiating new programmes to overcome skills deficiencies.

Criticality analysis of soft skills showed that Occupational Health & Safety skills and work ethics were two areas with highest responses for 'High' criticality. Responses for 'Low' criticality were very small indicating that none of the soft skills were rated unimportant by responding enterprises. Inclusion of soft skills as part of programme was the recommended option to improve soft skills.

Relative difficulty in finding the right people for the job was also assessed using the number of vacant positions in total positions and the number of hard-to-fill vacancies in total vacant positions. Relative difficulty was found by getting the product of two shares. Using this indicator, Design/Tools & Dies section was the department with the most difficult situation with 45% relative difficulty to find the right people for the positions within reasonable time. It was followed by Rubber/Plastic parts subsector and Sheet Metal process with 11.6% and 9.5% relative difficulty. Relative difficulty of Assembly/Sub Assembly and Storekeeping was zero since there was no vacant position in these sections. Hardest-to-find positions included Tools & Die Maker and Designer/Pattern Maker in Design/Tools & Dies section, Driller and Sheet Cutter in Sheet Metal process, CNC Operator and Oven Operator in Metal Casting, Machinist and Machine Operator in Electronic/Electrical parts. The study also analysed the reasons for difficulty to find the right person for certain job positions. Lack of required skills was quoted through 73% responses as the most important reason; while lack of educational qualification was quoted by 13% as the second most important reason.

The study also analyzed the satisfaction of auto sector enterprises with the current educational qualification of their workforce. Desire to up-grade to higher level, i.e. from diploma/certificate to degree or from short course to diploma/certificate/degree or from no qualification to some qualification was quantified and used as the degree of satisfaction/dissatisfaction. Overall satisfaction of the whole sector was 50% of the total responses by the enterprises. The other 50% responses went in favour of up-gradation in educational qualification. Electronic/Electrical parts was the most satisfied subsector with 69% satisfaction while Sheet Metal and Metal Forging were the two most dissatisfied processes with satisfaction levels of 42% and 46% respectively. In Design/Tools & Dies section, the two lowest satisfaction levels of 33% and 55% were found for Assembler and Tools & Dies Maker positions respectively. In Sheet Metal, the satisfaction from the current educational qualification for Sheet Cutter, Pressman, Welder, Driller, Oven Operator, Painter and Assembler were below 50%. In Metal Casting, the overall satisfaction with the current educational qualification was 57%. Assistant Assembler and Quality Assistant were the two positions with lowest satisfaction. Overall satisfaction level in Metal Forging was 46%. Metal Polisher, Painter and Heat Technician were the positions with lowest satisfaction levels. Overall satisfaction in Rubber/Plastic parts was 50% with Quality Assistant, Moulder and Cutter/Trimmer as the three positions with the lowest satisfaction. In Electronic/Electrical parts, the desire to up-grade educational qualification was the highest for Assembler and Packer positions. In Assembly/Sub Assembly, the lowest satisfaction levels were for Assistant and Quality Assistant positions. In Storekeeping, the satisfaction level for Assistant was only 26% and that for Storekeeper was 62%.

Future demand of skilled workforce in auto parts manufacturing sector for the next three years was also worked out. Total increase in workforce projected for the surveyed 204 units was





4,985 which meant an overall increase of 15.5% and an increase of 4.9% per annum. Highest increase of 20.5% was projected for Sheet Metal process and the demand was also the highest in terms of number of workers. Second highest growth of 17.1% in workforce demand was in Rubber/Plastic parts; followed by 14.7% for Metal Forging and 13.2% for Assembly/Sub Assembly. However, in terms of number of workers, Assembly/Sub Assembly was the second highest after Sheet Metal. With respect to enterprise size, demand growth projections for the next three yearswere8.2% for small, 5.9% for medium and 4.1% for large; however, the projected increase in numbers was the lowest for small enterprises. Average projected increase per enterprise was 24. With respect to enterprise size, the average increase was 62 for large, 22 for medium and 5 for small enterprises. There was a difference in relative shares of workforce in different subsectors/processes³ in the current and the projected workforce numbers. The relative shares of Sheet Metal, Rubber/Plastic and Storekeeping were higher in the projected workforce than those in the current workforce: which indicates an increased relative workforce demand in these subsectors/processes.

In Design/Tools & Dies section, the highest projected demand was for Tools & Dies Maker; followed by Designer/Pattern Maker. `In Sheet Metal, the highest number of skilled persons was required as Pressman and Supervisor. Machinist and Supervisor had the highest projected demand in Metal Casting; whereas in Metal Forging, Machinist and Painter were the most wanted positions. In Rubber/Plastic parts, the highest projected demand was for Supervisor and Moulder. In Electronic/Electrical parts, the highest demand was projected for Assembler and Painter. Assembler and Assistant were projected in greatest numbers in Assembly/Sub Assembly and Storekeepers were in demand in Storekeeping section.

Three year demand projections of the sample were extrapolated over the whole population (2300 enterprises) to calculate the workforce requirements for the whole auto parts sector; which came out to be 55,898. Its distribution between subsectors/processes included 1,680 persons for Design/Tools & Dies section, 18,862 for Sheet Metal, 6,753 for Metal Casting, 2,334 for Metal Forging, 9,132 for Rubber/Plastic parts, 1,725 for Electronic/Electrical parts, 14,679 for Assembly/Sub Assembly and 733 for Storekeeping.

Looking into the skills supply, the surveyed TSPs included 8 institutes from Lahore, 9 from Karachi and 2 each from Gujranwala and Gujrat. 67% were from public and 33% from private sector. 51% of the TSPs were established within the last two decades.49% were affiliated with TEVTA and 33% with Punjab Board of Technical Education. All the surveyed institutes offered courses for metal, 80% for Electronic/Electrical, 35% for Rubber/Plastic and 25% for Assembly/Sub Assembly.

In degree courses, Electrical Engineering was the most commonly offered course accounting for 33% of total seats. Mechanical Engineering was the second with 27% seats. Automotive Engineering was offered only by NED University of Engineering & Technology Karachi. The share of female enrollment in degree courses was 10%. Under Diploma/Certificate category; DAE Mechanical was the most commonly offered course accounting for 29% of total seats and DAE Electrical was second with 28% seats. Two automotive specific courses were offered; DAE Auto & Diesel accounted for 3% and Auto Mechanic 6% of the total seats. There was no female enrollment in Diploma/Certificate courses. Short courses were offered with the widest variety. The more common short courses offered by the surveyed TSPs included Welder, Turner/Machinist, Auto CAD and CNC machines related courses and courses related to electrical, mechanical and electronic technologies. Courses specifically

³*Relative share of workforce in any subsector/process is the ratio of its workforce and sectors' total workforce*



related to auto sector were not many. Five short courses were found related to Auto Mechanic, Auto Electrician, Automobile and Car Painter. There was a negligible share of female enrollment in short courses.

Regarding the institutes' training capacity, 57% of the surveyed TSPs were not satisfied with the current situation. 83% of the unsatisfied TSPs preferred provision of physical infrastructure while 67% preferred strengthening of intellectual resources to improve the situation. 90% TSPs expressed their intention to expand with the key theme of initiating new courses. For the institutes operating in public sector, government was the most common source of funding. 58% of the public sectors TSPs were funded solely by the government. 17% were partially funded by the government and they generated the balance funds through their own sources. There was one example where government and industry had joined hands to fund a TSP. Total teaching faculty in the surveyed TSPs was 1,063 which came out to be 51 per institute. Average numbers of teachers per institute were 14 for public and 7 for private TSPs. 88% of the teachers were permanent.

For attracting students, newspaper was the most common channel used by 93% public and 100% private TSPs. Use of modern channels like internet was more common in public TSPs. Classroom training was used by all the TSPs; while workshops/labs were used by 100% private and 93% public TSPs. Use of on-job training was limited; only by 43% public and 29% private TSPs. Share of workshop training was around 50% and classroom training was around 40%. Share of on-job training was only 10% for public TSPs. Regarding required support for improvement, 71% public TSPs desired equipment support and 57% infrastructure development support. For private TSPs, the priority was reverse with 57% requiring infrastructure support and 43% requiring equipment support. Support for internships was given the lowest priority both by public and private TSPs.

The most common reason for not getting employment within 60 days was quoted as economic turmoil and energy crisis. Lack of industry support was the second most important reason. TSPs considered improvement of skills important for improving job prospects. For achieving that, improvement in infrastructure and labs and development of modern training material were mentioned as preferred options. 90% TSPs maintained follow up with employers for job placement of their pass-outs. 69% TSPs mentioned using the route of using their linkages with auto sector for getting jobs for their pass-outs.

67% TSPs agreed on the existence of a demand-supply gap in skill sets. This was also endorsed by sector experts where 60% rated the quality of technical training institutes as average or poor. Providing industry exposure to trainees and revamping of curricula were referred to as the two most important steps to bridge this gap. Need to increase practical training for degree courses and reviewing curricula for diploma and short courses was emphasized.

52% TSPs followed traditional approach of using government's provided curricula while 48% used their own experts. Only 19% involved the experts from the industry in curricula development. This lack of interaction forms the basis for skills demand-supply gap. 57% TSPs did not have any mechanism to interact with industry. Outdated curricula were also indicated by the sector experts and only 35% rated it as good.

Industrial automation was ranked as the most important emerging need of auto parts sector by the metal parts enterprises. For Metal sector, the courses planned by TSPs and suggested by





Sector Experts included degree courses in Mechanical, Industrial and Automobile Engineering; CNC machine Operator, Forging, Foundry, Machining and Core Blowing under Diploma/Certificate courses; Moulding, Welding, Turner, Die Casting, Forging, Machinist, Mechanical Draftsman, Auto CAD, Metal Casting, Core Blowing, Surface Treatment and Automation under short courses. For Rubber/Plastics subsector, important courses included Diploma in Polymer Engineering, CAD/CAM (Mould Designing), Injection & Moulding and CAM under short courses. For Electronic/Electrical parts, degree courses in Electrical and Electronics Engineering; while for Assembly/Sub Assembly, short courses in Die & Mould (Fitting) and General Fitter were considered important to meet sector's future needs of technical workforce.

Enterprises also identified courses in demand for training the workforce. For degree courses, 59% enterprises mentioned Mechanical Engineering and 18% mentioned Electrical Engineering. Automotive Engineering was mentioned only by 2% enterprises. Diploma/Certificate courses in demand included CAD/CAM, Welding, CNC Machine Operation, Precision Machining, Injection Moulding, Quality Control, Mechanical, Foundry, Automation and Pressing & Stamping. Short courses in demand included CAD/CAM which was mentioned by 95% enterprises. Other short courses included Simulating Method Engineering, Machinist, Quality Control and Measurement Tools. As per the feedback provided by PAAPAM, Electroplating and Forging were specifically mentioned as the two areas in which the industry finds it difficult to get good quality skilled workforce.

100% of the surveyed TSPs arranged training of trainers' sessions. 71% used existing teacher's training manuals. 48% TSPs endeavoured to use national and international experts to train their teachers. All the TSPs realized the need to get certification from national or international bodies.

The provision of facilities for on-job training was also assessed during the study. 76% of the surveyed enterprises provided training to their employees. The total number of employees trained during one year was 2,895 which averaged 14 employees per enterprise. Lack of resources was quoted by 50% enterprises as the biggest reason for not providing training. 25% enterprises quoted the fear of trained employee leaving for better opportunity as another reason for not training. 46% enterprises allocated formal budget for training. 33% enterprises had dedicated training centres at their locations. Average duration of training for 41% enterprises was less than one month. 95% of the training comprised on-job training. 76% TSPs did not have any formal arrangement with the enterprises for apprenticeships for their students.

Current awareness about PSDF and its role was not satisfactory. Only 52% TSPs and 14% enterprises were found to be aware of the organization. Most of the TSPs which knew PSDF also knew about its role; however, only 6% enterprises knew about the role of PSDF. 83% enterprises and 71% TSPs expressed interest in knowing more about PSDF.

The findings of the study provide thorough quantitative and qualitative analyses which can be used by PSDF to devise focused initiatives to meet the current and future needs of technical workforce for auto parts manufacturing sector of Punjab.





2.0 INTRODUCTION AND BACKGROUND

2.1 Punjab Skills Development Fund (PSDF)

Punjab Skills Development Fund (PSDF) is a not-for-profit company, set up under the Companies Ordinance 1984 by the Government of the Punjab (GoPb) in collaboration with Department for International Development (DFID) UK. Established in 2010, it is a GBP 50 million training fund, set up with the objective of financing 135,000 individuals by stimulating a market for training services.

PSDF initiated its operations for the residents of four districts of Southern Punjab i.e. Bahawalpur, Bahawalnagar, Muzaffargarh and Lodhran. In 2013, PSDF's geographical coverage was expanded to eleven new districts: Chiniot, Faisalabad, Gujranwala, Khanewal, Lahore, Narowal, Rahim Yar Khan, Sargodha, Sheikhupura and Vehari. In these fourteen districts, PSDF is implementing its skills promotion programs to achieve inclusive growth by focusing on employment intensive productive sectors.

PSDF aims to provide skills and vocational training opportunities to the poor and vulnerable population of Punjab to build/improve their capacity to find work, help them progress in their current employment or start up their own businesses. The Fund aims to up-skill those in 'low-skills-low-returns' jobs and enhance their earning potential. It also provides resources to help private sector enterprises and partnerships develop/offer high quality vocational training courses. Through its multiple interventions, PSDF focuses on establishing a training market which can effectively respond to the training needs of individuals and various industrial sectors of the province. It's funding and incentive structures ensure an active responsiveness from private, public and not-for-profit Training Service Providers (TSPs). PSDF is currently associated with over 120 TSPs which are implementing multiple vocational trainings programmes under different PSDF schemes. Till February 2015, PSDF has successfully trained over 52,000 men and women in more than 150 different trades.

2.1.1 Vision of PSDF

Improve income generation opportunities for the poor and vulnerable population of selected districts of Punjab by enabling skills development through promotion of a competitive skills training market.

2.2 The Consultant - Anjum Asim Shahid Rahman, Chartered Accountants (AASR)

Anjum Asim Shahid Rahman (AASR) is one of the leading firms of Chartered Accountants in Pakistan, employing over five hundred people and having offices in Karachi, Lahore and Islamabad. Internationally, AASR is the member firm of Grant Thornton International, one of the world's leading organizations of independently owned and managed accounting and consulting firms providing advisory, assurance, tax advice to their clients. Being the member firm of Grant Thornton, AASR is able to combine the knowledge and experience of its local market place with those available globally through a network of member firms operating worldwide. Besides auditing and accounting as one of its core services, the management





consulting practice of AASR is one of the most active practices in Pakistan, providing a wide range of services in different areas; including surveys and sector studies, strategy and growth, corporate finance and business risk services.

2.3 Background and Objectives of the Study

GoPb has identified the Auto Parts Sector as a potential growth sector which calls for a coordinated and focused strategy to fully benefit from the emerging opportunities in local and export markets. Pakistan's automotive industry has followed an impressive growth since its inception in early fifties. Increasing disposable incomes, availability of financial options, coupled with government's supportive policies have helped the sector attain a satisfactory performance level during the past years. The industry was supported through Deletion Programmes during the initial phases of its development. The strength of the industry was successfully tested in 2006 when it smoothly underwent a transition from Deletion Programmes to a competitive Tariff Based System (TBS).⁴

With the opening up of cross-border trade, and the world turning into a global village, it is imperative for any sector to keep a close watch on its competitiveness. This requires an ongoing adaptation to the modern technological advances and the new production practices to improve efficiency, produce better quality products and cope with the emerging challenges like producing more fuel efficient and environment friendly vehicles. Effectively meeting these challenges requires having an ample supply of high quality skilled workforce.

It was in this backdrop that PSDF commissioned this sector skills study to identify the existing and potential skills deficiencies and propose a roadmap to overcome the identified issues; so as to enable the sector effectively cope with the emerging needs for skilled workforce. For executing this, PSDF hired the services of AASR to administer a comprehensive Auto Parts sector skills study. The subject study has been based on the opinions of the key stakeholders including the Auto Parts sector enterprises, Training Service Providers and key Business Experts.

⁴Auto Industry Development Programme (AIDP), Ministry of Industries, Production and Special Initiatives, Government of Pakistan (2008)





3.0 STUDY OBJECTIVES AND METHODOLOGY

3.1 Study Objectives

The prime objective of this Study is to review the level of existing skills and training opportunities available in the Auto Parts sector of Punjab and identify gaps. This objective has been achieved through interviewing the Auto Parts sector enterprises, TSPs and sector experts. The study presents a coordinated view of the findings emanating from these three stakeholder groups. The recommendations of the report would enable PSDF to design focused training programmes to address skills deficiencies identified during the study.

This assignment aims at administering three different survey tools designed to obtain information for each of the aforesaid dimensions. The findings have been used to:

- a) Assess current skill levels (both vocational and professional) in the Auto Parts sector of Punjab
- b) Inform PSDF's plan for strengthening the skill potential of workforce for the Auto Parts sector including identification of trades in demand, training courses required and delivery options
- c) Identify sector level skills delivery gaps and the required contribution of other players
- d) Develop a medium to long-term roadmap for human resource development for the Auto Parts Sector focusing on vocational and technical skills

3.2 Study Methodology

In line with the terms of reference and the objectives of the Study, AASR designed a comprehensive execution methodology, a snapshot of which is shown in Figure 1.

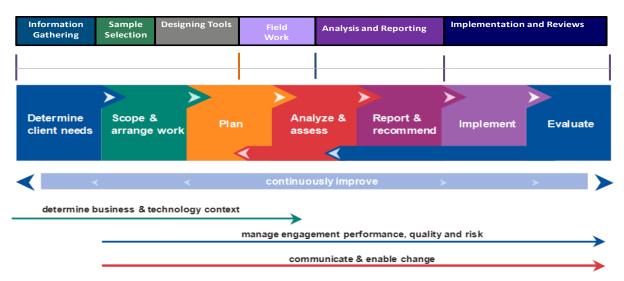


Figure 1 – Study Methodology





The fundamental approach for achieving the study objectives was laid on the following pillars:

- Adopting a rigorous strategy during all of the stages of the study including planning, executing, analysis and report writing stages
- Engaging the stakeholders in a productive and transparent manner and seeking their fair opinion so as to ensure a high quality end product
- Engaging highly motivated team members having adequate knowledge and experience of Auto Parts sector and possessing skills set required for conducting surveys and interviews to obtain high quality data during the field survey
- Ensuring that the objectives of the Study are fully met and that the resulting report includes focused policy recommendations to meet the target development objectives

For achieving the above, the assignment was divided into two phases:

3.3 Phase - 1: The Survey

3.3.1 Inception Meeting and Finalization of Work Plan

The Study commenced with the target of clearly defining, aligning and reiterating a wellstructured work plan for the assignment. It was done with the aim of sharing and confirming our understanding of the overall assignment and obtaining initial feedback from the client. In the first kick off meeting with the Client, key inputs and linkages required for the study were identified. The anticipated role of the three stakeholder groups was discussed at length and agreed with the Client. Point persons for the study from AASR and Client were identified. In addition, methodology and work plan were discussed in detail and finalized.

3.3.2 Review and Analysis of Existing Studies

The project team carried out a comprehensive review of the available reports on Auto Parts Sector and on previously done skills job assessment studies. The review enhanced the level of understanding of the project team about the Auto Parts sector and the technical and vocational training landscape of the province of Punjab. It also contributed towards developing a representative sampling plan and designing focused survey tools. List of the reviewed documents and reports is provided in Annexure A

3.3.3 Business Sectors Identification and Sampling Plan

3.3.3.1 Demand Side Assessment

- Primary and secondary research tools were employed for carrying out the demand side assessment of the sector. Secondary research was carried out by reviewing the selected reports to obtain useful insights. These findings were kept in perspective during the next phases of the study including field survey and information analysis.
- Primary research was carried out by interacting with the key sector stakeholder groups, including:
 - Auto Parts sector enterprises



- Training Service Providers
- Auto Parts sector experts
- Chambers of Commerce and business and trade associations.(Pakistan Association of Automotive Parts and Accessories Manufacturers) (PAAPAM)

The demand side assessment aimed at aligning workforce planning efforts with the current and the future business requirements and forecasting workforce needs based on various assumptions. It involved gathering and analyzing specific information about the departments, workforce employment levels, skills sets and core competencies needed in the workforce.

To define the workforce needs and requirements within the Auto Parts sector, skills mapping was carried out. This map was developed to identify the current status of existing workforce, its need, skill deficiencies and the sector's future workforce requirements by skill type, numbers and gender. Moreover, skills deficiencies were identified in the existing workforce, which helped in identifying employers' requirements. This formed the basis for projecting the overall workforce requirement.

- To conduct field survey, a representative sample of Auto Parts sector enterprises was drawn with the mutual agreement of AASR and PSDF. Judgment-based sampling technique was primarily followed; leading to selection of a balanced mix of large, medium and small scale enterprises. Considerations in the selection of sample mainly included the following:
 - Geographical clusters
 - Enterprise subsectors
 - Enterprise size with respect to revenue and production capacity
 - Enterprise status with respect to formal (member of association) or informal

On the basis of the sampling mix of enterprises, profile of the Auto Parts sector of Pakistan was developed. Reviews of previous reports and discussions with various stakeholder groups (including Sector experts and representatives of relevant trade associations) revealed that majority of auto parts manufacturing enterprises were located in Lahore and Karachi. Consequently, the sampled enterprises were selected primarily from these two cities. A small number was also selected from Gujranwala, Islamabad and Lasbela.

Primarily, the sector comprises of four sub-sectors; Metal Parts, Rubber/Plastic Parts, Electronic/Electrical Parts and Assembly/Sub Assembly. Metal Parts involves three sub-processes; Sheet Metal, Metal Casting and Metal Forging. In addition to these, two other important processes, Design/Tools & Dies/Technical Support and Storekeeping were also identified. With this approach, the study was conducted with reference to eight different subsectors/processes.

The sample included enterprises from both formal and informal sectors. There are three associations relevant to automotive sector. Auto parts manufacturers are represented by Pakistan Association of Automotive Parts and Accessories Manufacturers (PAAPAM); whereas, the assemblers are represented by two associations. Pakistan Automotive Manufacturers Association (PAMA) is the main association having representation of all types of vehicles manufactured in Pakistan. This includes the assemblers of cars, trucks, buses, tractors and 2/3 wheelers. Another smaller association is APMA, the Association of Pakistan Motorcycles Assemblers. This represents only 2/3 wheeler manufacturers. The sample





included mainly the members of PAAPAM; with some representation from the other two associations. In addition, the sample also included enterprises which were not member of these associations. Those enterprises were considered to be from informal sector.

A total of 204 Auto Parts sector enterprises were surveyed during the study. List is presented in Annexure B.

3.3.3.2 Supply Side Assessment

3.3.3.2.1 Assessment of Educational and Training Institutions/Training Service Providers (TSPs)

In parallel with the demand side assessment, an assessment of supply of skills was also carried out, which determined whether the training and education of human resource was market driven and trainees were adequately skilled and employable upon completion of their trainings. The skill side assessment included developing a profile of institutions providing skills development and training for Auto Parts sector. This involved identifying the major Auto Parts sector TSPs operating in private and public sectors. This information was gathered using primary and secondary research tools. Information available with relevant ministries, R&D organizations in public and private sectors, key Chambers of Commerce and Industry and Industry and Trade Associations was gathered by the field team. Previous reports on workforce and skills development were also consulted for obtaining the desired information.

A skill mapping of the provision of skilled workforce for the Auto Parts Sector was also initiated. In this regard, TSPs were inquired about the offered courses and their levels to judge the current competence and skill level of the workforce. Taking into account the future needs of the Auto Parts sector, information about the existing infrastructure and its enhancement/expansion plans was collected. Moreover, the mapping enabled us to determine the skill set of trainees being trained and their acceptability in the Auto Parts sector.

The list of 20 TSPs surveyed during the study is provided in Annexure C.

3.3.3.2.2 <u>Review of Training Models and Existing Curriculum</u>

The survey was designed to look into the strategy adopted by TSPs to impart training to enhance the employment potential of the graduates. The survey also assessed the effectiveness of the support provided for job placement in the Auto Parts Sector. TSPs were contacted in order to assess their curriculum to verify if that was in accordance with current requirements and job opportunities in the formal and informal sectors. This helped to identify gaps where curricula development was needed in line with the skill requirements to cater for the skill gaps and address the issue of unemployment.

3.3.3.3 Assessment of Independent Views of Experts

Sector experts were also interviewed to correlate the responses received from demand and supply sides. The expert opinions obtained through this exercise added further depth to the analysis and provided useful insights to come up with demand driven, focused recommendations for the sector. Sector experts were carefully identified and selected based on their knowledge, experience, competence and the positions held in Auto Parts sector.

The list of 40 sector experts interviewed during the survey is shown in Annexure D.





3.3.4 Designing of Survey Tool and Data Collection

3.3.4.1 Questionnaires and Databases

Three sets of questionnaires and databases were designed. Each set of survey instruments contained both open-ended and close-ended questions to obtain and analyses understanding of Auto Parts sector enterprises, TSPs and sector experts on different aspects of the study. These tools were discussed at length with PSDF team and were finalized through a series of discussions and interactive sessions.

The structured questionnaires were used for getting quantitative data. In addition, wherever required, qualitative insights were obtained by interacting with the sector experts through interviews. AASR team members obtained the required information by asking targeted questions to satisfactorily meet the objectives of the study. This information helped the team to understand skill related issues acting as constraints to the growth of Auto Parts sector enterprises.

The three sets of questionnaires developed for Auto Parts Sector Entities, TSPs and Sector Experts are provided in Annexure J.

3.3.5 Survey Tools Pretest

The developed tools were tested by AASR in the field to iron out inconsistencies and to note the time taken to fill in the information. Based on the results of the pilot test, appropriate modifications were made in the tools to make them more effective.

3.3.6 Selection and Training of Enumerators

Experienced enumerators were selected on the basis of past experience of conducting similar surveys, their knowledge about the Auto Parts sector and fluency in Punjabi and/or Urdu. Final survey tools were discussed in a central training workshop with the enumerators. Trainings were provided by the Skill Gap Assessment Expert along with Field Survey Manager keeping in view the observations made during pre-test stage. Training sessions also included mock tests with real time data of the field situation for enumerators to undertake the experience and situation on board. Mock tests were also conducted on the field with a visit planned for one district to give better understanding to the enumerators.

3.3.7 Field Surveys and Monitoring

Field teams, comprising of survey coordinator and enumerators, were sent out into the field to collect the required quantitative and qualitative data from the identified sources. To ensure comprehensive control and quality management, rigorous supervision and monitoring of all field activities was carried out on an ongoing basis. AASR Project Managers conducted field back checks of respondents and field editing of the collected data on random basis. A random sample of the filled questionnaires was analyzed at the initial stages of editing and data entry to detect any errors. AASR kept the management of PSDF updated at every stage of the survey and invited them to witness activities carried out in the field.

3.4 Phase - 2: Data Compilation, Analysis and Reporting

3.4.1 Data Entry and Compilation into Unified Databases

As per the system developed at the inception of the project for receipt, compilation and analysis, the data received from the field was concurrently fed into the system. The team





members, upon completion of everyday tasks, entered data onto a pre-specified reporting format and reported back to the Field Survey Manager who assembled the data into three sets of databases specifically designed for the purpose of compilation and tabulation of results.

3.4.2 Data Analysis and Reporting

The entered data was checked for completeness and accuracy. Data analysis was carried out to draw conclusions to meet the set objectives of the study. The findings were analyzed and recommendations were formulated. Results were presented in the final report.

3.4.3 Quality Control/Progress Monitoring of the Study

Quality Control was ensured at all stages of the study. The information gathering process was checked for quality and correctness by the Field Survey Manager. Quality of data collection and its entry into databases was monitored by Field Monitoring Manager and Skill Gaps Assessment Specialist. In addition, sector experts also independently reviewed the results of the study to ensure that these are in line with its objectives. Any identified discrepancies, anomalies or mistakes were rechecked by the survey team and corrected as and when required during the survey.





4.0 AUTO PARTS SECTOR SNAPSHOT

Automobiles sector is a large industrial sector of Pakistan. Pakistan is amongst few countries of the world which manufactures all types of vehicles; including passenger cars, vans, jeeps, light commercial vehicles, buses, trucks, tractors, motorcycles and three wheelers. Country's total demand for vehicles is generally met from the local production. Automobiles are manufactured by the assembly units, the Original Equipment Manufacturers (OEM).

Auto parts manufacturing sector is the vendor industry for automobiles assembly units. An automobile is manufactured by assembling thousands of different mechanical, electrical and electronic parts. All these parts are different for different brands of vehicles. Such a diversity in demand leads to a situation where the types of products manufactured by auto parts sector is very large. Meeting such a diverse demand requires use of different types of manufacturing technologies and diverse types of skills. Ensuring a sustainable supply of quality skilled workforce for auto parts manufacturing thus remains a challenge for the sector.

4.1 Pakistan's Automobile Sector – An Introduction

4.1.1 History of Pakistan's Automobile Sector

The growth of Pakistan's automobile industry can be divided into several distinct phases. The industry was born in 1953 with the establishment of the country's first assembly plant in Karachi by National Motors Limited. The plant initially started the assembly of trucks (Bedford Rocket) and in subsequent years, also assembled light trucks, buses and cars. Following this, four more plants were set up in collaboration with leading American automobile companies. These plants manufactured cars and trucks. The operations of these units were limited to assembly of the parts of semi knocked down (SKD) units. Thus there was no existence of auto parts manufacturing sector at that time. The next turn of Pakistani automobile industry was in 1972 when all the industrial units were nationalized by the government. This was a stagnant phase for the industry without any major growth.

In early 1980s, it was finally realized that it is important to increase the role of private sector to achieve sustainable development in auto sector. The existing manufacturing units were reorganized in collaboration with private sector. Manufacture of tractors was started by Al Ghazi tractors. Suzuki Motor Company started assembly of passenger cars in 1983. Assembly of trucks was started by Nissan. In late eighties, license was granted to Toyota Motor Corporation to assemble passenger cars in the country.

The deregulation policy adopted after nationalization phase was continued during 1990s. Entrance of Japanese manufacturers into the industry led the market experience a competition between players like Suzuki, Toyota, Honda, Hino, Nissan, etc.

It was during this period that a rapid growth was also seen in auto parts vending industry. The initial focus of the industry was only on tractors and trucks and that too was limited to replacement market of spare parts. However, with the entry of large players like Suzuki and Toyota, the local industry received a big boost. New investments were made by the private sector to meet the needs of local automobile manufacturers. The government supported this infant industry through Deletion Programs that made it mandatory for the local automobile assemblers to use locally manufactured parts. Supported by this policy, the auto parts industry managed to localize large number of automotive parts including sheet metal, rubber/plastic and aluminium parts, chassis, tyres, tubes, car seats and lights, etc.





From 2001-02, Pakistan automobile industry entered into another even faster growth phase; characterized by a high growth rate in the overall economy leading to an increase in purchasing power of consumers. This was supported by increased availability of credit and financial options on low interest rates. This change led to a massive increase in demand for automobiles. The phase witnessed a sharp increase in production of all types of vehicles. To meet the growing demand, the government also relaxed its import policies to make it easier to import automobiles.

4.1.2 Overview of Pakistan's Automobiles Sector

The demand for auto parts is derived from the number of automobiles assembled. Therefore, it is important to review the automobiles assembly and the number of vehicles assembled. The number of vehicles manufactured under different categories is presented in Table 1.

116,281 17,477
17,477
1,217
2,674
558
34,521
771,507

Table 1 - Pakistan's Automobiles Production 2013-14

4.1.2.1 Passenger Cars⁵

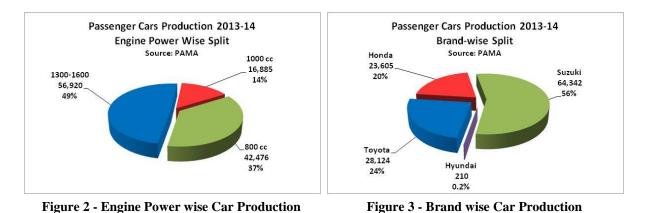
During the year 2013-14, total number of cars produced in the country was 116,281. Of these, 49% was accounted for by cars of engine power 1300-1600 cc. Share of 800 cc cars was 37% and 1000 cc cars accounted for 14% of the total production.

Suzuki manufactured 64,342 cars, the largest number manufactured by any company, and claimed 56% share of the total annual production. Toyota manufactured 28,124 cars, the second largest number, and accounted for 24% share in production. Honda was the third largest producer with 23,605 cars and 20% share. Distribution of cars production with respect to engine power and car makes is shown in Figure 2 and Figure 3.

⁵ Source: PAMA







Looking into production distribution between different models, Toyota only produced its Corolla model. Suzuki produced the maximum number of different models. Production of Suzuki Mehran was 28,485 and claimed the highest 44% share of total passenger car production by Suzuki. Suzuki Cultus was the second largest model with 23% share; by

producing 14,467 cars. Suzuki Bolan had 22% share. Figure 4shows the distribution.

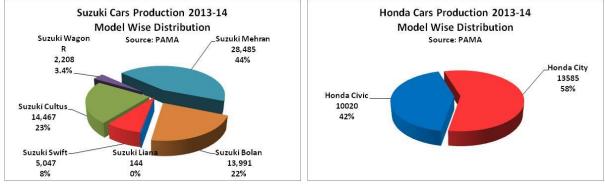


Figure 4 - Model wise Suzuki Cars Production



Honda's production was distributed between two models. Number of Honda City cars produced during 2013-14 was 13,585 claiming 58% share; while that of Honda Civic was 10,020 cars; accounting for 42% share of total production of Honda cars. The distribution is shown in Figure 5.

4.1.2.2 Light Commercial Vehicles⁶

Total production of Light Commercial Vehicles (LCVs) in 2013-14 was 19,694; comprising of 17,477 (93%) pickups and 1,217 (7%) jeeps. Shares of different models in the total production of LCVs are presented in Figure 6.

⁶Source: PAMA





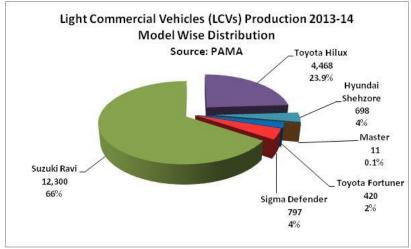


Figure 6 - Model wise LCVs Production

Suzuki Ravi held the highest share in total production of LCVs (66%) by producing 12,300 vehicles. Toyota Hilux had the second largest production of 4468, accounting for 24% share in total production of LCVs. Hyundai Shehzore, Master, Toyota Fortuner and Sigma Defender Together accounted for 10% of the total LCVs produced during 2013-14.

4.1.2.3 Trucks⁷

Total production of trucks in 2013-14 was 2,674. 40% share in this production was held by Hino which produced 1,058 trucks. Master had the second largest share of 24% by producing 641 trucks. Isuzu and Nissan respectively held 22% and 14% shares respectively. Production distribution of trucks is shown in Figure 7.

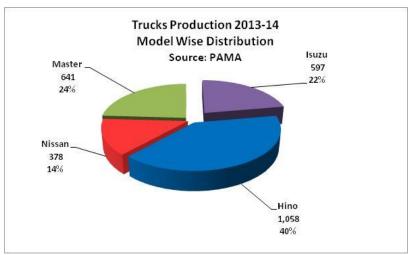


Figure 7 - Model-wise Trucks Production

4.1.2.4 Buses⁸

Total production of buses in 2013-14 was 558; distributed between Hino, Nissan, Master and Isuzu. Hino held a dominating share in production of 85% by producing 477 buses; followed by Master with 14% share. Isuzu produced 61 buses to claim 11% share while Nissan only produced only 6 buses during the year. Figure 8shows the distribution of buses production.



⁷Source: PAMA ⁸Ibid

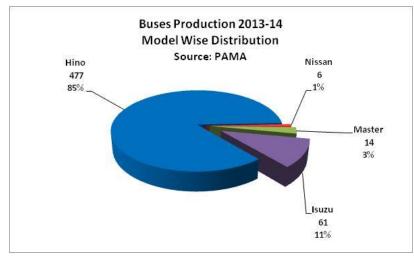


Figure 8 - Model-wise Buses Production

4.1.2.5 Farm Tractors⁹

A total of 34,521 farm tractors were produced during 2013-14. 21,600 of this production were done by Millat claiming 63% share. Fiat was the second major contributor with 11,920 tractors produced; and accounted for 34% share of total production of tractors. The third manufacturer Orient IMT only held 3% share. Distribution of farm tractor production is during 2013-14 is shown in Figure 9.

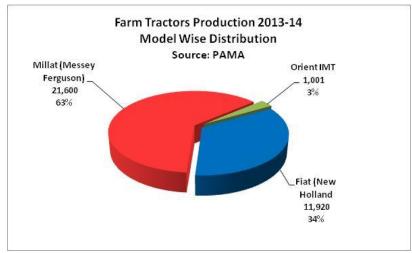


Figure 9 - Model wise Tractors Production

4.1.2.6 2/3 Wheelers¹⁰

Total production of 2/3 wheelers in the country during 2013-14 was 771,507.¹¹Honda held the lion's share of 83% in the total production. The balance 17% was divided between 9 manufacturers. Qing qi was the second largest manufacturer with 26,727 motorcycles/3 wheelers and held 3.5% share. Suzuki held 3.2% and Ravi 2.8% shares. Production split between the ten manufacturers is shown in Figure 10.

¹¹*This does not include the production done by non APMA manufacturers.*





⁹PAMA

¹⁰Ibid

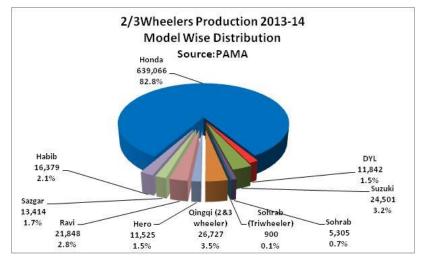


Figure 10 - Model wise 2/3Wheelers Production

4.1.3 Industry Growth

Automobile industry has grown manifold during the past decades. Growth of auto parts sector closely follows the growth of automobile assemblers and thus growth in number of vehicles produced can be taken as a direct indicator of the growth of auto parts sector. Time series charts of the number of vehicles produced during the period from 1995-96 to 2013-14 in different categories are discussed in the following paragraphs:

4.1.3.1 Passenger Cars

Total number of cars produced in the country grew from 33,419 in 1995-96 to 116,281 in 2013-14. This means a total increase of 248% and translates into a compounded annual growth rate of 7.2%. The growth rate has been different for cars of different engine powers. Figure 11shows the trend lines of production of cars of three categories of engine powers.

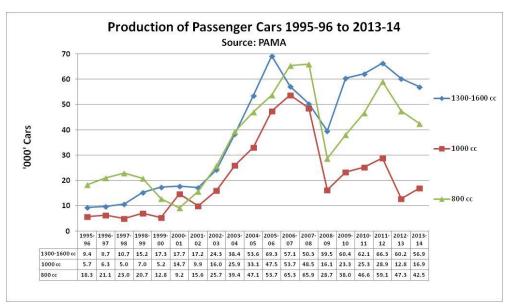


Figure 11 - Passenger Cars Production Trend 2005-06 to 2013-14

1300-1600 cc cars have grown at the highest rate, the number increasing from 9,397 to 56,920, an increase of over 500%. Compounded annual growth rate was 10.2% per annum. Compared to this, the 1000 cc segment grew at 6.2% and the 800 cc segment at 4.8% per





annum. There was a sharp increase in productions of all types of cars during the period from 2001-02 to 2006-07 due to increased credit availability and decreased interest rates.

4.1.3.2 Light Commercial Vehicles (LCVs)

Production of both types of LCVs, jeeps and pickups, peaked during the period from 2000-01 to 2007-08. Figure 12shows the production trend lines of both types of vehicles.

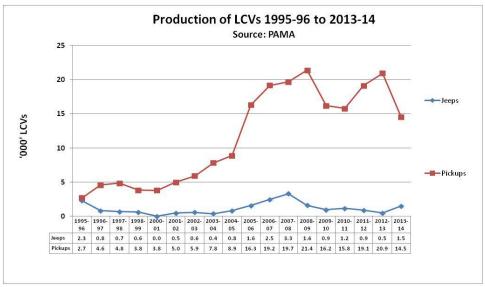


Figure 12 - LCVs Production Trend 1995-96 to 2013-14

Jeeps production was 2274 in 1995-96 which touched its peak of 3,298 in 2008-09 and declined to 1,217 in 2013-14. It shows an overall decline of 46% and a yearly decline of 3.4%. On the other hand, the production of pickups increased from 2682 in 1995-96 to 17477 in 2013-14, an overall increase of 550% and an annual compounded increase of 11%. This is highest annual growth rate for any category of vehicles during this period.

4.1.3.3 Trucks and Buses

Production of trucks and buses followed a mixed trend during the last 18 years. Trucks production in 1995-96 was 2994 in 1995-96 which increased to its highest, 4993 in 2007-08 and declined in the successive years to 2,674, a number even lower than that in 1995-96. This means overall decrease of 11% and an average yearly decrease of 0.6%. A sharp increase of 39% took place during 2013-14. Trucks production trend is shown in Figure 13.





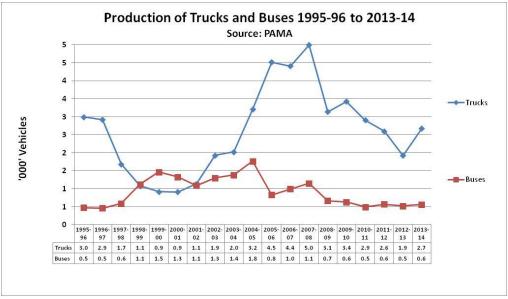


Figure 13 - Trucks and Buses Production Trend 1995-96 to 2013-14

The trend for buses was also similar, starting with 474 in 1995-96, reaching to a maximum of 1,762 in 2004-05 and declining to a minimum of 558 buses in 2013-14. This represents an overall increase of 18% and a compounded annual increase of 0.9%. Thus, the growth in trucks and buses has been very low compared to those in other types of vehicles.

4.1.3.4 Farm Tractors

Production trend of farm tractors is shown in Figure 14. The production grew from 16,093 tractors in 1995-96 to 71,607 in 2009-10 and during the next four years, declined to 34,521. Despite this sharp fall, there was an increase of 114% over the 18 year period which translated into an average yearly growth rate of 4.3%.

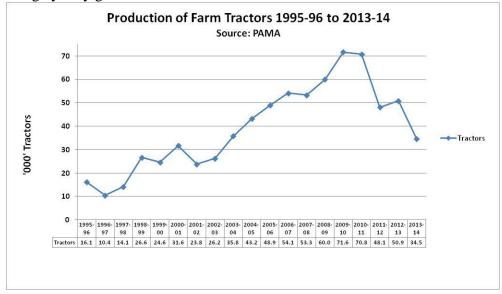


Figure 14 - Farm Tractors Production Trend 1995-96 to 2013-14

4.1.3.5 2/3 Wheelers

The production of 2/3 Wheelers has grown at the highest rate among all types of vehicles. Total production in 1996-97 was 106,797 vehicles which grew to 838,665 in 2010-11 and then continuously declined for the next three years to reach 771,507 in 2013-14. This means





an overall increase of 622% over 17 years and a yearly compounded growth rate of 12.3%. Figure 15shows the results.

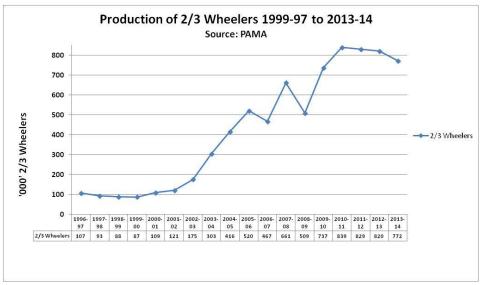


Figure 15 - 2/3 Wheelers Production Trend 1996-97 to 2013-14

Increase in disposable incomes has been key reason of growth. The other reason specific to this particular segment has been the replacement of traditional the animal driven Tonga with the three wheeler passenger carriers.

4.1.3.6 Comparison of Growth Rates of All Vehicles' Categories

Growth rates of different categories of vehicles produced in Pakistan during the period from 1995-96 to 2013-14 is presented in Table 2.

	Producti	on (No.)	Overall Growth	Yearly
Vehicle type	1995-96	2013-14	in 18 years	Growth
Cars 1300-1600 cc	9,397	56,920	506%	10.5%
Cars 1000 cc	5,720	16,885	195%	6.2%
Cars 800 cc	18,302	42,476	132%	4.8%
Cars Total	33,419	116,281	248%	7.2%
LCVs Jeeps	2,274	1,217	-46%	-3.4%
LCVs Pickups	2,682	17,477	552%	11.0%
LCVs Total	4,956	18,694	277%	7.7%
Trucks	2,994	2,674	-11%	-0.6%
Buses	474	558	18%	0.9%
Tractors	16,093	34,521	115%	4.3%
2/3 Wheelers	106,797	771,507	622%	12.3%
Source: PAMA				

4.1.4 Importance of Automobile Sector for Pakistan's Economy

Pakistan's automobile and auto parts industries are a major contributor to country's economy. In 2009-10, the share of Automobile sector in manufacturing was 5.3% which places it as the





sixth largest manufacturing industry.¹²As per another study in 2012, automotive sector was 4.8% of manufacturing and 0.7% of GDP with PKR 108 billion value added. Total turnover was PKR 402 billion, comprising of PKR 234 billion from the assemblers and PKR 168 billion from auto parts manufacturers.¹³

Auto parts sector has been a major generator of investment during the past years. To cater to the growing demand from assemblers, the auto parts sector has enhanced their production capacities by making large investments. Value of cumulative investment in the sector has been estimated as USD 2.8-3.0 billion.¹⁴The economic indicators related to the automotive parts manufacturing industry show the tune of investment during 2004-05, when the sector contributed PKR 25 billion (ca. US\$420 million) to the country's GDP and invested a total of PKR 103 billion (ca. US\$1.7 billion).¹⁵

Auto industry's contribution to other sectors of the economy has always been very significant due to its deep forward linkages. The industry contributes towards the development of the engineering sector as a whole since it keeps introducing new systems, technologies and skills. Along with that, it also provides strong impetus to sector supplying raw materials like steel, aluminium, copper, plastics, chemicals, rubber, glass, etc. It generates a strong economic activity in forward linkages including retail/wholesale dealerships, logistic, auto workshops, filling stations, finance and insurance etc.

Automotive sector is a significant generator of employment. Varying numbers regarding total employment in the sector can be seen in different reports done in the past. Auto Industry Development Plan (AIDP) mentions the direct employment in 2005-06 as 192,000 and the project employment for 2011-12 as 250,000. According to a report done by SMEDA, total employment in the sector is around 500,000. Yet another estimate is obtained in the working Paper for Automotive sector by International Growth Centre. According to this report, the total employment in sector is 209,324 of which 187,070 is in auto parts sector.

The job multiplier in the automotive industry has been very high, a total of over 201,000 direct jobs were created by the sector in 2005 compared to about 100,000 in 2002.

4.1.5 Industry Structure

In Pakistan, a significant portion of economy is informal and consequently, accurate data about any sector is not available easily. Different estimates for the total number of enterprises in automotive sector have been quoted by different sources. As per a European commission report,¹⁶ there are around 1,250 units in the auto vendor industry in Pakistan of which about 500 are registered vendors with OEMs.

¹⁶The Automotive Parts Sector in Pakistan, Export Performance and Potential — Implications of the WTO Agreements, European Commission Trade Related Technical Assistance for Pakistan, September 2007





¹²Project for Automobile Industry Development Policy in The Islamic Republic of Pakistan, Japan International Cooperation Agency, January 2011

¹³Working Paper -An Overview of Trends in the Automotive Sector and the Policy Framework, Hafiz Pasha, Zafar Ismail, International Growth Centre, January 2012 ¹⁴Ibid

¹⁵The Automotive Parts Sector in Pakistan, Export Performance and Potential — Implications of the WTO Agreements, European Commission Trade Related Technical Assistance for Pakistan, September 2007

As per the working paper on automotive sector by International Growth Center on Automotive sector of Pakistan,¹⁷ total number of units in the sector in 2012 was 2283, consisting of 83 assemblers and 2200 auto parts manufacturers. According to PAAPAM, 450 parts manufacturers are the Tier 1 units, 425 Tier 2 units and 1325 replacement markets suppliers.

4.1.5.1 Size Classification

The auto vendor industry constitutes 90% of small to medium enterprises (SMEs) most of which are family owned.¹⁸These units produce a wide range of parts for OEMS as well as for the replacement market. Industry has developed good technical linkages with many global companies and thus has by and large developed into a well-organized sector.

4.1.5.2 Major Clusters

The automotive assembling in Pakistan started in Karachi. Being a sea port and the largest market for vehicles, Karachi became the hub of automobile assembling plants which laid the foundation of Auto Parts Manufacturing Industry in Pakistan. Since its inception, Karachi has been the major hub of automotive industry. However, with the passage of time, the industry also laid its foothold in Lahore. Currently, Lahore auto parts cluster is the second largest hub for auto parts manufacturing after Karachi and caters to almost fifty percent of auto parts demands of assemblers and after markets. Table 3shows the major clusters.

Karachi	Hub Chowki			
	Port Qasim			
	Laandi			
	Korangi Industrial Area			
Lahore	Badami Bagh			
	McLeod Road			
	Bilal Ganj			
	Kot Lakhpat			
	Thokar Niaz Baig			
	Multan Road			
Gujranwala	Eminabad			
Source: IFC Advisory Services in Middle East and North Africa - Motor				
Vehicles and Trailers - Auto Parts	Manufacturing, IFC and SBP			

Table 3 - Major Auto Parts Clusters in Lahore and Karachi

4.1.6 Major Products

Auto parts manufactured in Pakistan can be categorized into three major product groups/subsectors which are Metal parts, Rubber and Plastic parts, and Electrical/Electronic parts. The fourth subsector is Assembly/Sub Assembly. Major products are shown in Table 4, Table 5 and Table 6.

1	Adapter Plate	41	Engine Valve Guides	81	Pitman Arms
2	Alex /Ball	42	Exhaust Manifolds	82	Pulley

¹⁷Working Paper -An Overview of Trends in the Automotive Sector and the Policy Framework, Hafiz Pasha, Zafar Ismail, International Growth Centre, January 2012
 ¹⁸Diagnostic Study - Auto Parts Cluster Lahore, SMEDA





3	Aluminium Radiators	43	Exhaust Muffler	83	Race End	
4	Armrest	44	Fenders	84	Radiator Cores	
5	Ash Tray	45	Floor Member	85	Rocker Levers	
6	Automobile Horns	46	Fly Wheels 86		Rod Connecting	
7	Axle Arm	47	Front & Middle Cowl 87		Rod Shifter	
8	Backstay	48	Front & Rear Hub	88	Screw Jack Assy	
9	Ball Joints	49	Front Fork	89	Service Valves Meter Body	
10	Battery Retainer	50	Front Frames	90	Shackle Plates	
11	Bearing Cup	51	Fuel Filters	91	Shaft Rear Axle	
12	Bolts	52	Fuel Gauges	92	Shafts	
13	Bracket Tail Light Case	53	Fuel Tank Assy	93	Shock Absorbers & Strut	
14	Bracket Transmissions MTG	54	Fuel Tank	94	Side gate panels	
15	Brake Cam Lever Front & Rear	55	Fuel Tanks	95	Splined Shaft and Helical	
16	Brake Drums	56	Gaskets	96	split pins	
17	Brake Shoe	57	Gear Shifter Drum	97	Springs	
18	Cam Chain	58	Gears	98	Steel Wire Springs	
19	Cam Shafts	59	Hanger Spare	99	Steering Box	
20	Carburetor	60	Helping Rod Bush 100		Steering Gear Box for Tractors	
21	Cargo Bodies	61	Hub Crank	101	Steering Knuckle	
22	Centrifugally Cast Cylinder Liner	62	Hub Idler Gear	102	Steering Rocker Shafts	
23	Chain Case	63	HVAC Parts	103	Stem Nuts	
24	Clevis Hydraulic	64	Hydraulic Lift Arms	104	Step Bar	
25	Clutch facing	65	Kick Spindle	105	Straight Bevel Gear	
26	Clutch Pedals	66	Leaf Springs Assy	106	Tappet Covers	
27	Clutch/ Brake Pedals	67	Lever Parking Brakes	107	Thrust Washers	
28	CNG Kits	68	Limiter Pipe	108	Tie Rod Ends	
29	Crankcase Covers	69	LPG Regulators	109	Timing Gears	
30	Cross Members	70	Member Fronts	110	Tool Kit	
31	Crown Wheel & Pinion	71	Motor Cycle Handles	111	Tractor Wheels	
32	Cylinder Body	72	Motor Cycle Rims	112	Transmission Kits	
33	Disc Front Brake	73	Muffler	113	Tube Assy Exhaust	
34	Dish Drums	74	Nipple & Spoke	114	Turn Signal Assy	
35	Door Hinges	75	Oil Filters	115	U-Bolts	
36	Drum Rear Brake	76	Oil Pump	116	Washer Assy	
37	Engine Bearings	77	Oil Pump Gear	117	Wheel Chain	





ſ	38	Engine Blocks	78	Oil Sump	118	Wheel Hub
	39	Engine Bushes	79	Pillar	119	Wheel Rims
ſ	40	Engine Mounts	80	Pistons	120	Yoke Assy

Table 5 - Major Products - Rubber/Plastic Auto Parts

1	Axle Boot	24	Head Light Case
2	Bumpers	25	High Pressure Fuel Injection Pipes
3	Oil Seals	26	Indicator Case
4	Starting Ring Gears	27	Insert & Sleeves
5	Air Filter	28	Mirror case
6	Battery Covers	29	Mounting Exhaust Pipe
7	bonnet seals	30	Mudguard
8	Brake & Fuel Pipes	31	O Bush
9	Brake Linings	32	O-Rings
10	Dash Board Insulators	33	Penal Cowl Top
11	Door Stopper	34	Radiant Hose
12	Door Trim	35	Roof Lining
13	Fan Shrouds	36	Rubber Hoses
14	Flaps for passenger cars	37	Shock Boot
15	Flexible Coupling	38	Speedometer Case
16	Floor Carpets	39	Spring Shackle Bush
17	Floor Mat	40	Strut Bar Bush
18	Footrest	41	Strut Bar Rubber
19	Fuel Injection Pipes	42	Suspension Bush
20	Fuel Sending End Units	43	Tool Box
21	Grill Assy	44	Tyres & Tubes
22	Grip Assist	45	Weather Strips
23	Handle Grip	46	Wheel Cap

Table 6 - Major Products - Electronic/Electrical Parts

1	ACG (Magneto)	20	Ignition Coil
2	Adaptor	21	Instrument Panel
3	Android based car security	22	Key Sets (Locks)
4	Anti - Theft System	23	Lamps
5	Auto Wire	24	LEDs
6	Automotive Batteries	25	Light switch
7	Automotive Radios	26	MIB
8	Automotive Speedometers	27	Plug Cap
9	Bluetooth car door locking	28	Potentiometer
10	Cable & Channels	29	Regulator Rectifier
11	Capacitor Discharge Ignition (CDI)	30	RFID based car alarm system
12	Car Audio System	31	Side Turn Lights
13	Control Cable	32	Starter Motor & Alternators
14	Control Wirers	33	Switch Assembly Winker
15	GPS Self-Monitoring System	34	Tachometers





16	Head Light Holders	35	Winker Flasher
17	Head Lights	36	Wire Harness
18	Heat Light Assy		
19	Heater Blowers Wiring Harness		



4.1.7 Production Processes

Auto parts manufacturing sector is diverse with respect to production processes. A wide variety of processes are used to produce multiple types of auto parts in different subsectors. Basic description of the key processes, showing all the important steps are presented in Annexure E.





4.1.8 Auto Sector International Trade

International trade of Automotive sector is reported under HS codes from 8701 to 8716. Imports and exports for the entire automotive sector (all HS codes) over the period from 2006-07 to 2012-13 are presented in Figure 16.

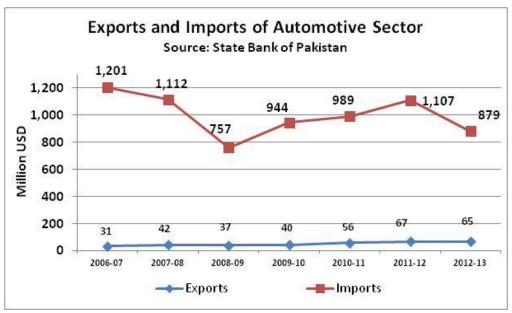


Figure 16 - Pakistan's International Trade of Automotive Sector

During the seven year period, imports followed a downward while exports followed an upward trend. Trade balance has been negative; however it has decreased from USD 1170 million to USD 814 million during the presented seven year period. Imports have decreased by 27% while exports have increased by 110%. However, since the export base is small, the increase in value terms has not been very significant (only USD 34 million).

Looking into the breakup of exports between different HS codes, it is seen that tractor exports have been the major contributor to increase in exports. It increased from USD 10.1 million in 2006-07 to USD 33.9 million in 2012-13; accounting for 52% of the total auto sector exports. The other major contributor to exports was the auto parts sector which accounted for 29% of the total auto sector exports. Motorcycle was the third largest contributor with 10% share in total exports. These three product categories accounted for 91% of the total exports of the sector. Total automotive sector exports from 2006-07 to 2012-13 are presented in Table 7.

		Value in '000' USD						
HS Code	Description	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012- 13
'8701	Tractors (other than tractors of heading no 87.09)	10,041	11,829	15,009	16,452	16,904	24,396	33,925
'8702	Public-transport type passenger motor vehicles	24	115	158	485	2,849	2,417	377
'8703	Cars (incl. station wagon)	1,337	447	702	1,309	1,079	457	654
'8704	Trucks, motor vehicles for the transport of goods	662	1,272	1,989	2,096	2,503	2,049	562

Table 7 - Pakistan's Automotive Sector Exports 2006-07 to 2012-13





	e: State Bank of Pakistan	01,020	.2,100	0.,017	0,720	,12	01,077	0.,700
Total	· · · · · · · · · · · · · · · · · · ·	31,326	42,158	37,317	39,725	55,912	67,399	64,785
'8716	Trailers & semi-trailers; other vehicles not mechanically propelled	1,043	1,644	604	334	11	1,433	35
'8715	Baby carriages and parts thereof	-	-	-	-	21	-	-
'8714	Parts and accessories of motorcycles & cycles	4,681	2,094	2,658	2,572	4,415	1,454	958
'8713	Invalid carriages (wheelchairs), w/n motorized	-	-	124	-	-	-	185
'8712	Bicycles & other cycles, not motorized	68	153	134	-	153	-	491
'8711	Motorcycles, side-cars	3,348	9,936	4,923	7,940	12,652	12,017	6,276
'8710	Tanks and other armoured fighting vehicle, motorised, and parts	-	146	13	36	35	-	73
'8709	Work truck, self-propelled, for factories/airport & parts	139	51	17	16	22	307	112
'8708	Parts & access of motor vehicles	9,783	14,061	10,478	7,699	13,369	22,551	18,644
'8706 '8707	for motor vehicles Bodies for motor vehicles	- 24	242	25 470	343 86	977 289	84 143	1,435 1,009
19706	Chassis fitted with engine	_	6	25	2.42	077		1 425
'8705	Special purpose motor vehicles (fire fight vehicle, crane lorry)	176	162	13	357	633	91	49

Total automotive sector imports in 2012-13 were USD 879 million. 54% of this was accounted for by the imports of cars. Trucks and motorcycles segments, each accounted for 11% of the total imports. The share of auto parts in total imports was only 6.8%. The auto sector imports from 2006-07 to 2012-13 are shown in Table 8.

HS		Value in USD '000'						
Code	Product Label	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
'8701	Tractors (other than tractors of heading no 87.09)	163,685	135,409	111,759	153,804	71,867	62,834	52,487
'8702	Public-transport type passenger motor vehicles	49,408	28,000	23,518	58,727	34,342	87,013	55,945
'8703	Cars (incl. station wagon)	595,508	513,084	381,737	403,489	476,745	636,088	473,545
'8704	Trucks, motor vehicles for the transport of goods	136,070	149,877	101,718	117,101	141,664	93,852	95,131
'8705	Special purpose motor vehicles (fire fight vehicle, crane lorry)	7,314	13,184	10,981	3,050	17,422	2,715	4,491
'8706	Chassis fitted with engine for motor vehicles	431	639	315	309	3	171	10
'8707	Bodies for motor vehicles	705	351	-	282	386	37	90
'8708	Parts & access of motor vehicles	48,920	60,338	60,338	96,942	119,612	94,375	60,127





'8709	Work truck ,self-propelled, for factories/airport & parts	2,865	38,003	1,358	109	1,543	300	967
	Tanks and other armoured fighting vehicle, motorized,			,				1 170
'8710	and parts	78,569	71,547	2,678	321	429	2,351	1,179
'8711	Motorcycles, side-cars	92,417	78,335	49,442	83,052	96,308	93,000	97,375
'8712	Bicycles & other cycles, not motorized	483	739	63	200	63	909	2,284
'8713	Invalid carriages (wheelchairs), w/n motorized	251	53	144	173	124	348	1,599
'8714	Parts and accessories of motorcycles & cycles	20,319	17,524	10,635	23,309	26,530	31,687	32,070
'8715	Baby carriages and parts thereof	44	98	362	18	-	26	-
'8716	Trailers & semi-trailers; other vehicles not mechanically propelled	3,955	5,219	2,333	2,620	2,438	1,287	1,836
Total		1,200,944	1,112,400	757,381	943,506	989,476	1,106,993	879,136
Source:	Source: State Bank of Pakistan							

4.1.8.1 Pakistan's International Trade in Auto Parts

Analyzing trade statistics for auto parts, it is seen that Pakistan's auto parts imports are higher than the exports. Total imports during 2012-13 were USD 60 million whereas the total exports were USD 18.6 million; with a negative trade balance of USD 41.5 million. However, total increase in imports during these seven years was 3% compared to 10% increase in exports. A sharp decline in imports can be seen after 2010-11. During two years, the imports declined by 50% and exports increased by 39% during the same period. Import and export trends are shown in Figure 17.

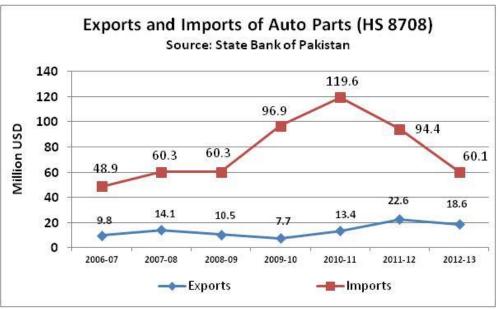


Figure 17 - Pakistan's International Trade of Auto Parts

4.1.8.1.1 Trading Partners in Auto Parts

Total exports of USD 18.6 million during the year 2012-13 was distributed between 77 countries from all around the world. Shares of top ten export destinations are shown in Figure





18. Italy was the biggest importer of auto parts from Pakistan; accounting for 29% of the total exports during that year. USA and Dubai respectively accounted for 19% and 6% shares. Top ten trading partners accounted for 80% of the total exports.

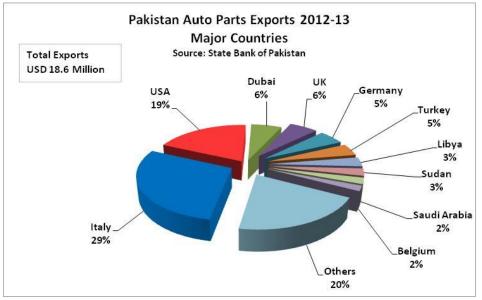


Figure 18 - Pakistan's Auto Parts Exports Trading Partners

For imports of auto parts into Pakistan, Japan was the largest trading partner; accounting for 43% of the total imports during 2012-13. Singapore and Thailand were the second and third largest trading partners accounting for 22% and 10% shares respectively. China and Turkey held 6% shares each. Figure 19shows the distribution.

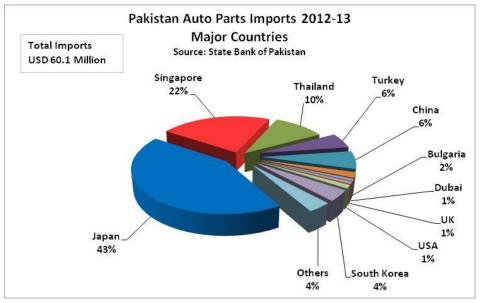


Figure 19 - Pakistan's Auto Parts Imports Trading Partners

4.1.9 Study Samples

As per the requirements specified in the TOR, information was collected by conducting surveys in three stakeholder groups, the auto parts manufacturers, Training Service Providers (TSPs) and the auto parts sector experts to analyze the sector dynamics in specific context of skilled workforce requirements. Three samples were selected from the target populations in





coordination with PSDF. Profiles of the samples used for data collection are discussed in the following chapters.





5.0 AUTO PARTS SECTOR – CURRENT SCENARIO

Demand side analysis was carried out by administering a structured questionnaire from selected 204 auto parts sector enterprises. The enterprises were selected with the consideration of having a representative sample so as to capture all the important aspects of the study. In addition, demand side information was also obtained from the selected sample of 40 sector experts. It is important to look into sample profiles so as to be able to understand the findings in the right perspective. Profiles of auto sector enterprises and sector experts are presented in the following paragraphs:

5.1 Sample Profiles

5.1.1 Auto Parts Sector Enterprises Sample Profile

204 auto parts sector enterprises were selected for the survey from the total population of auto parts manufacturers in the country. Since the focus of PSDF is Punjab, the major share of the sample was taken from Lahore which is the largest cluster of auto parts in Punjab. Some units were also selected from Gujranwala. The largest auto parts cluster of the country is in Karachi. In order to enrich the analysis and be able to get the complete picture, the sample also included enterprises from Karachi. Including Karachi was also important since the auto parts manufacturers in Karachi offer a large market for the skilled workforce passing out of the institutes in Punjab. Therefore, it was deemed important to understand the requirements of that cluster also.

Geographical distribution of the sample of auto parts enterprises is shown in Figure 20.

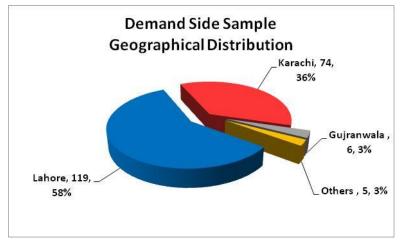


Figure 20 - Demand Side Sample - Geographical Distribution

119 auto parts manufacturers, representing 58% of the total respondents, were selected from Lahore, 36% from Karachi and the balance from Gujranwala and other cities including Islamabad, Sadiqabad and Lasbela (Baluchistan).

The auto parts sector has four main subsectors. The selected sample had representation from all the four subsectors. 69% of the selected enterprises manufactured Metal parts, 31% Rubber/Plastic parts while 6% manufactured Electronics/Electrical parts. 10% of the selected enterprises were selected from Assembly/Sub Assembly subsector. Sub-sector wise distribution of the demand side sample is shown in Figure 21. The shares add up to more than 100% since many of the selected enterprises manufactured auto parts from more than one subsector.





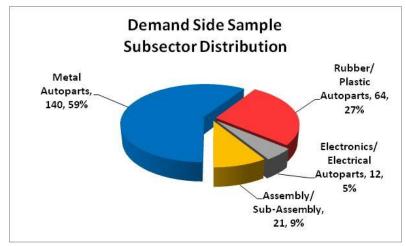


Figure 21 - Demand Side Sample - Subsector Distribution

It was also important to incorporate the views of both the formal and informal sector. So the sample included both types of enterprises. Pakistan Association of Automotive Parts and Accessories Manufacturers (PAAPAM) is the representative body of the auto parts sector. Thus the membership of PAAPAM was used as the criterion and the enterprises associated with PAAPAM were considered 'Formal' and the ones not associated with it were considered 'Informal'.

The sample profile had 127 (62%) formal and 38% informal enterprises. Distribution is shown in Figure 22.

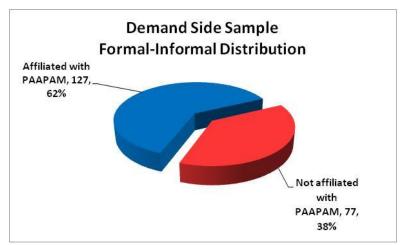


Figure 22 - Demand Side Sample - Formal-Informal Distribution

5.1.2 Sector Experts Profile

As per the requirements of the TOR, 40 Sector Experts were included in the sample. The selected experts worked in the sector in different capacities in auto parts sector; and included CEOs, Directors, General Managers and Managers. All the experts possessed excellent knowledge of auto parts sector and the related issues.

Educational profiles of the selected experts show that 42% of them were business graduates and thus were fully conversant with the business dynamics of the sector. 30% were engineers including graduate and diploma engineers in mechanical engineering. The selected group also





included two PhDs and experts with Master's/Bachelor's degrees in different science and accounting subjects. Profile of the 40 sector experts with respect to their educational qualification is shown in Table 9.

Educational Qualification	No.	Percentage
Business Graduates	17	42.5%
Graduate Engineers	9	22.5%
Diploma Engineers	3	7.5%
Science Masters/Graduates	6	15.0%
Accountants	3	7.5%
PhD	2	5.0%
Total	40	100.0%

Table 9 - Sector Experts Educational	l Qualification
--------------------------------------	-----------------

65% of the sector experts had 11-20 years' experience of working in auto parts sector while 23% had more than 20 years of experience. Thus, the group was experienced enough to provide all the required insights on all skill-related issues of the sector. Figure 23shows the distribution of sector experts with respect to their total professional experience.



Figure 23 - Sector Experts Profile - Total Sector Experience

Selection of sector experts was made with the approach of getting expert opinion on all the four subsectors of auto parts included in the survey. Distribution of sector experts with respect to subsectors is shown in Figure 24.



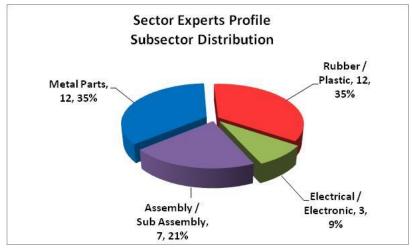


Figure 24 - Sector Experts Profile - Subsector Distribution

12 experts each were selected from Metal and Rubber/Plastic subsectors. Together they accounted for 70% of the total sample. 21% were from Assembly/Sub-Assembly and 9% from Electrical/Electronic subsectors.

5.2 Auto Parts Sector Profile- Key Findings

5.2.1 Enterprise Size

For defining the sizes of small, medium and large enterprises in auto parts sector, industry experts were consulted and the definitions were decided in consensus with them. Annual revenue was used as the indicator to define the enterprise size. Enterprises having up to PKR 25 million revenues were called 'Small', those having revenues from PKR 25 million to PKR 250 million were termed as 'Medium' while the ones having more than PKR 250 million as annual revenues were termed 'Large'. Table 10 shows the definitions.

Table 10 - Auto I	Parts Enterprises'	Size Definitions	

Small	Annual sales up to PKR 25 Million
Medium	Annual sales more than PKR 25 Million up to PKR 250 Million
Large	Annual sales more than PKR 250 Million

The auto parts sample was found to comprise of 54% medium enterprises with 110 enterprises falling in this range. Small enterprises accounted for 28% and large 18% of the total sample. Distribution with respect to enterprise size is shown in Figure 25.





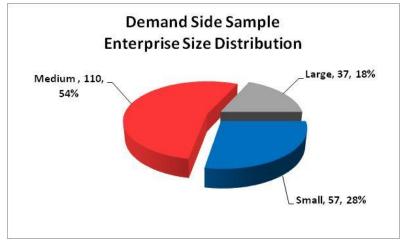


Figure 25 - Auto Parts Enterprises Size Distribution

This finding confirms the existing perception that majority of enterprises in auto parts subsector are SMEs. The study revealed that 82% enterprises fell under this category. This finding is close to the figure reported by SMEDA in its study where 90% of the auto parts enterprises were classified as SMEs.¹⁹

5.2.2 Legal Status

Legal status of the sampled enterprises was inquired during the survey. The profile indicated that auto parts sector is a structured sector to a reasonable level. 55% of the surveyed enterprises were limited companies; 46% were private limited and 9% were public limited. Sole Proprietorship was the other more commonly found legal status. 38% of the enterprises were running as sole proprietorships. Partnership was found to be not a very popular legal form of business in the sector. Only 12 (6%) enterprises were found to be operating under this form of business. Karachi Tools Dies and Moulds Center (KTDMC) was the one enterprise which was running as a public sector enterprise. The center operates as a manufacturer of tools, dies and moulds as well as a training resource center to provide skilled manpower for the industry. Distribution of the surveyed enterprises with respect to legal statuses is shown in Figure 26.

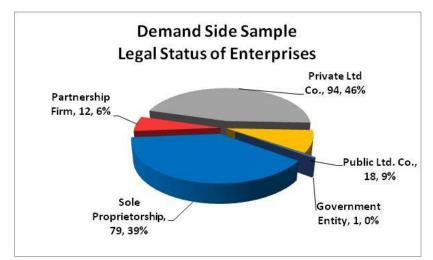


Figure 26 - Legal Status of Auto Parts Enterprises

¹⁹Diagnostic Study – Auto Parts Cluster Lahore, Pakistan – UNIDO-SMEDA Cluster Development Programme





Operating as formal legal entity helps the auto parts enterprises deal with their customers; the assemblers which are large setups of multinational companies. These assemblers operate as public limited companies and naturally are more comfortable working with formally structured vendors. This acts as a driver for auto parts vendors to structure their businesses as limited companies. This fact is also confirmed by looking at the distribution of public/private companies in the sample with respect to their sale to OEMs or otherwise. 65% of the limited companies were found to be selling their products to OEMs, whereas, for the whole sample, the share of enterprises selling to OEMs was only 51%. 49% were selling to replacement market.

5.2.3 Registration/Affiliation

A similar trend is seen when the sector is viewed in terms of the registration/affiliation of enterprises. 78% of the enterprises had some form of affiliation; 51% with any government department and 27% with some other regulatory body. Only 22% were found to be operating without any such arrangement. Figure 27shows the distribution.

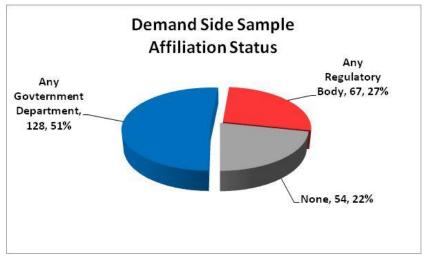


Figure 27 - Auto Parts Enterprises Affiliation Status

5.2.4 Age of Enterprises

Demand side sample profile shows auto parts sector has grown at fast pace during the last two decades. 46% of the surveyed enterprises were established after 1994 having an age of not more than twenty years. Extending this analysis further back by ten years, 70% of the enterprises had an age of thirty years. Correlating this with the history of development of the auto sector in Pakistan, this is the same period during which the auto sector experienced a high growth rate; owing to the entry of international brands like Toyota, Honda and Suzuki. The growth pattern appears to be continuing since 28% of the total enterprises were established only during the last decade. That investment pattern is an indicator of optimism about industry's growth in the coming years. Age distribution of the surveyed enterprises is shown in Figure 28.





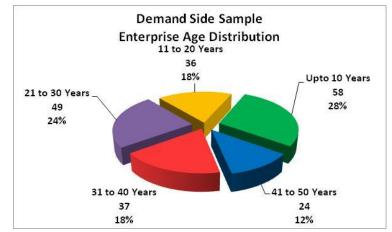


Figure 28 - Auto Parts Enterprises Age Distribution

5.2.5 Market Distribution

Major share of the auto parts sector sales is in the local market. However, a small share of production is also exported. Thus the sector is connected with the global markets. This connection is not only in terms of exporting the manufactured products but also for importing raw materials. The surveyed enterprises were found to be using local as well as imported raw materials. Some of them directly imported their raw materials.

The survey analyzed the nature of business of the auto parts manufacturing enterprises. It was revealed that 67% of the total surveyed enterprises were only the manufacturers while the rest were also involved in international trade. 26% of the total surveyed enterprises were importers and 19% were exporters. 12% manufacturers were those which were acting as both importer and exporter. That means that 14% enterprises were importing but not exporting and 7% were the ones which were exporting but not importing. The distribution is shown in Figure 29.

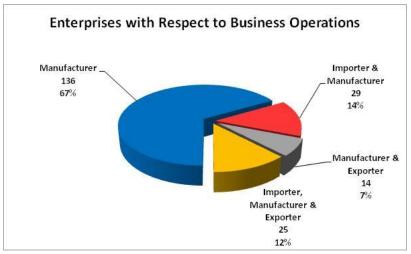


Figure 29 - Auto Parts Enterprises as Manufacturer, Exporter, Importer

Of the 54 (26%) enterprises which were importers, 76% imported raw materials for their selfconsumption while 4% imported for selling that in the local market. 20% (11) enterprises were those which were using their imports for self-consumption as well as selling those in the local market. Distribution of importers is shown in Figure 30.





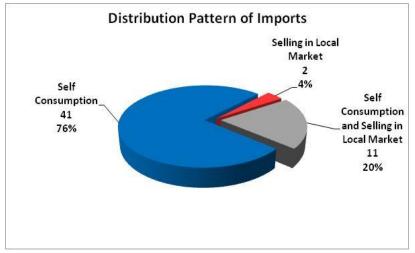


Figure 30 - Enterprises Distribution of Imports

Thus the demand of imported raw material by non-importing enterprises is met by the manufacturer cum importer enterprises.

Auto parts sale in local market is done either to OEMs for manufacture of new vehicles or to the replacement market to be sold as spare parts. 35% of the surveyed enterprises were found to be selling only to OEMs while 49% only to replacement market. 16% enterprises were selling their products in both the markets. Figure 31shows the results.

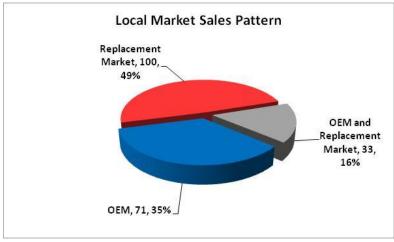


Figure 31 - Enterprises Local Market Sales Pattern

On an overall basis, 65% enterprises were selling to replacement market and 51% to OEMs. Replacement market is a larger market compared to OEM market. It also grows at a higher rate compared to OEM market since the number of vehicles requiring spare parts is continuously increasing with the addition of new vehicles being manufactured each year. Every new vehicle which comes on road creates a new replacement market for parts. In contrast, the growth rate of vehicles assembled by the OEM is actually determined by market demand for vehicles; which in turn depends on multiple factors like disposable incomes, government policies, etc. This is one of the reasons that even when the production and sale of automobiles by the assemblers has declined during the past three years, the auto parts sector is still able to follow an increasing trend of sales and is able to view the future growth prospects optimistically. It is the sizable auto parts replacement market that keeps it rolling.





5.2.5.1 Export Market

Major share of the revenues of auto parts sector is derived from the local market. As per the survey, share of exports in the total revues was only 4%. Major export market for auto parts is Asia and Europe. There were 35 exporting enterprises found in the sample which were exporting to 61 different destinations around the world. 54% (21) enterprises were exporting to Asia; mainly to Turkey, China, Bangladesh, Sri Lanka and Afghanistan. Same numbers of enterprises were exporting to Europe mainly to Italy, Germany and UK. Middle East was the other important export destination where 37% enterprises were selling their products. Shares of different export markets are shown in Figure 32.

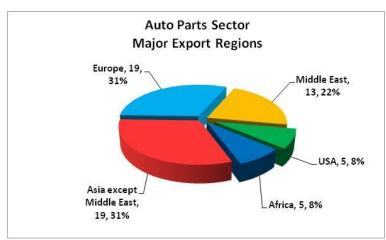


Figure 32 - Auto Parts Enterprises-Major Export Regions

5.2.6 Revenue Growth Trends

Auto parts manufacturing sector has grown at a fast rate during the last decade. The survey inquired about the growth trend in enterprises revenues during the last three years. The results are summarized in Table 11.

	Local Market		Export Market		
Growth Trend	No. of Enterprises	Percent	No. of Enterprises	Percent	
Upward	75	37%	24	62%	
Downward	38	19%	4	10%	
Varied	91	44%	11	28%	
Total	204	100%	39	100%	

 Table 11 - Auto Parts Sector Revenue Trends in Local and Export Markets

On an overall basis, the revenue growth trend was positive since the number of enterprises with positive growth rate were higher; for both local and export markets. In the local market, revenues of 37% enterprises increased while those of 19% decreased. While this shows an optimistic view of growth rate of local auto parts market, the 45% enterprises that experienced a fluctuating sales trend rate during that period cannot be neglected since they were not able to see attractive growth prospects.

Growth trend in export market was found to be more positive than that in local market. Export revenues of 62% of the 39 exporters increased while those of 10% decreased.





Sector experts were inquired about the expected future growth of the sector. They were found to hold an optimistic view in that regard. 85% expected an increasing growth trend in the sector and 15% expected it to remain constant in the next five years scenario. None of the experts thought that the sector's growth will be negative.

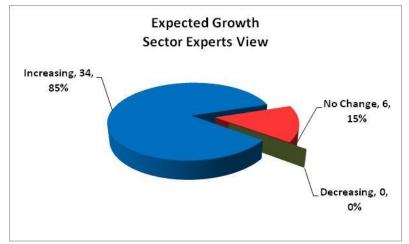


Figure 33 - Auto Parts Sector Expected Growth - Sector Experts View

Sector experts also provided their estimated growth rates for the next five years. Average growth rate expressed by the sector experts was 19%. Experts from different sectors viewed the sector's future growth differently. Metal Parts subsector experts estimated the growth rate as 19%. Experts from Rubber/Plastic parts and Assembly/Sub Assembly held a more cautious view and expected the future growth rate to be 14% while electronic/electrical parts experts held a more optimistic view and projected that the industry will grow at 21% during the next five years.

5.2.7 Capacity Utilization

Average capacity utilization of the surveyed enterprises was found to be 65% which indicates an average to good health of the auto parts sector. There were only 5 enterprises (2%) which were operating at 30% or below capacity utilization. 15% enterprises were operating at 80% or higher capacity utilization. Only two enterprises were found to be operating at 100%.

Capacity utilization differed with respect to enterprise sizes and was 57% for small, 67% for medium and 70% for large enterprises. Some small differences were also observed for different geographical clusters. Average capacity utilization for the enterprises from Karachi was 71% whereas, for Lahore, it was only 61%.

Capacity utilization was also seen for different subsectors. Some enterprises in the sample operated in single subsector while others operated in two or more subsectors. Comparing the enterprises operating in single subsector, the average capacity utilization for Metal parts, Rubber/Plastic parts and Assembly/Sub Assembly subsectors were close to average; however, the capacity utilization of Electronic/Electrical parts was 74%, more than the average of 65%. Table 12shows subsector-wise capacity utilizations.





Table 12 - Capacity Utilization of Enterprises Operating in Single Sector

Single Subsector	%
Metal Parts	64%
Rubber / Plastic Parts	64%
Electronics/Electrical Parts	74%
Assembly / Sub-Assembly	63%

Table 13 - Capacity Utilization of Enterprises operating in Multiple Sectors

Combination of Subsectors	%
Metal and Rubber/Plastic	70%
Metal and Assembly	62%
Rubber/Plastic & Electronic/Electrical	68%
Metal, Rubber/Plastic & Electrical/Electronic	75%

For enterprises operating in more than one subsector, the capacity was more for those enterprises which had Electronic/Electrical as one of the subsectors. For example, the enterprises operating in three subsectors of Metal, Rubber/Plastic and Electronic/Electrical parts had an average capacity utilization of 75%. Table 13 shows the results.

5.2.7.1 Reasons for Sub-Optimal Capacity Utilization

Investigating the reasons for suboptimal capacity utilization, it was found that limited market demand is the biggest reason in that regard; quoted by 72% enterprises. Demand for auto parts in the local market is derived from the manufacture of vehicles (OEMs) and the usage of vehicles (replacement parts market). Thus the demand for auto parts depends on the demand of new vehicles in the market as well as the affordability of people to drive those vehicles. It is important to highlight that the share of exports in the overall revenues of the sector is only 4%. Focusing more on export market can be a viable option for increasing this capacity utilization. Appropriate measures may be initiated by the government to move the industry in that direction.

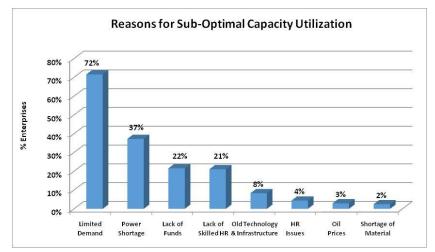


Figure 34 - Reasons for Suboptimal Capacity Utilization²⁰

²⁰ The total of mentioned percentages exceed 100% due to multiple responses by the respondents





The second most important constraint towards optimally utilizing installed capacity; quoted by 37% enterprises, was energy shortage. Long load shedding hours and unreliable power supply makes it difficult for the industry to meet orders on time and produce to capacity. Reverting to alternate sources of power like generators increases the product cost and erodes competitiveness; thereby pushing the enterprises into the vicious circle of lesser number of orders and further reduced capacity utilization.

Third biggest reason was directly related with the objectives of this study. 21% enterprises mentioned lack of skilled manpower as an important factor for low capacity utilization. The finding raises the red flag indicating that even if the market demand increases and the power issue is resolved, it will still be difficult to improve the capacity utilization of auto parts sector due to lack of skilled workforce.

Lack of funds and old technology/infrastructure were also mentioned as factors for low capacity utilization; however, such reasons are related more to an enterprise's management approach rather than the external factors like market demand, power shortage and supply of skilled manpower.

5.2.8 Emerging Changes in Automotive Industry

The survey identified emerging trends in auto parts sector of Pakistan in technological, organizational and market areas.

5.2.8.1 Emerging Technological Trends

Technological changes identified during the survey were different for different subsectors. Maximum responses in this regard were obtained from metal parts subsector. There were 140 enterprises in the sample that were dealing with metal parts; however, the number of responses obtained was 279 since one enterprise gave multiple responses. The most commonly flagged emerging technological change, quoted by 81% of the metal parts enterprises, was industrial automation. The second most important technological change was the usage of CNC machines which is also part of industrial automation. This was mentioned by 60% of the metal parts manufacturers. Other emerging technologies were grey iron casting, pressure die casting, CO2 & spot welding and use of power hydraulic press which were mentioned respectively by 14%, 11%, 10% and 9% metal parts enterprises.

The enterprises involved in manufacture of rubber/plastic auto parts did not show much interest in mentioning new emerging technologies. There were 64 enterprises in the sample; however, only 21 responses were obtained. This shows that rubber/plastic industry is currently not undergoing any major technological changes. Compression moulding and injection moulding machines were mentioned respectively by 14% and 9% rubber/plastic auto parts enterprises. 6% also mentioned increasing use of CNC machines.

Importance of automation was also emphasized by the manufacturers of electrical/electronic auto parts. 33% enterprises mentioned sensor system and auto ignition as the two main emerging technologies. Other new technological trends highlighted by the respondents included digital technology, dry batteries and LED technology.

Similarly, the enterprises involved in assembly/sub assembly subsector also mentioned some emerging technological changes. 48% of the subsector enterprises mentioned the hybrid





technology. Other trends including EFI (electronic fuel injection) system, use of push start technology and ensuring compliance to Euro II standards.

Emerging technological changes highlighted by the surveyed enterprises are provided in Annexure E.

5.2.8.2 Emerging Organizational Trends

Along with the technological changes, the auto parts sector also faces the challenge of coping with emerging changes at organizational level. These changes have to be triggered due to some technological changes or to increase effectiveness and efficiency at different levels of the organization. The responses received in this regard from the surveyed enterprises are listed in Table 14. The total is more than the number of enterprises due to multiple responses by many enterprises.

Response	No. of Enterprises	%
Industrial Automation	62	27%
HR Management Challenges	49	22%
Performance Appraisal and Management	38	17%
Strategic Alliances	30	13%
Business Process Reengineering	25	11%
Flat Structure	23	10%
Total	227	

Table 14 - Emerging Organizational Trends in Auto Parts Sector

Industrial automation was mentioned as an important organizational change by 27% enterprises. This change is occurring due to technological changes. More automation means employing lesser number of people; but with better qualification and skills. That means incorporating this change in hiring and training of employees as well as in their work environment and compensation packages. Thus the HR policy needs to align itself with such technological changes. This was also highlighted during the survey when 22% enterprises said that efficient HR management to meet the changing trends is the real challenge for the industry. A related challenge quoted by 17% enterprises was having an efficient performance appraisal and management system.

Some of the mentioned changes relate to changes in the overall industry structure. 13% mentioned the trend of formation of strategic alliances between different companies. Need for Business Process Reengineering to achieve organizational efficiency and use of flat structure were also quoted by 10% enterprises.

5.2.8.3 Emerging Market Related Trends

Market related trends mentioned by the surveyed auto sector enterprises were quite standard market factors. The most common factor mentioned by 28% enterprises was the market requirement to reduce the prices of the products. Strict quality management was quoted as one of market demand by 25% enterprises.





6.0 WORKFORCE CHARACTERISTICS

The chapter presents an analysis of the current situation of skilled workforce in auto parts sector. It documents the current employment profile and HR related practices of the surveyed enterprises. Detailed quantitative and qualitative analysis of the current technical workforce is also included in the chapter.

6.1 Hiring of Workforce

The quality of workforce depends on numerous factors including a rigorous hiring process. Hiring good quality human resource lays the foundation of developing a good team that possesses the capacity of delivering as per the expectation of the management. The survey therefore mapped the process followed by auto parts manufacturers for hiring their workforce.

6.1.1 Hiring Process

Hiring is a matchmaking process between the organization's needs and a person who can adequately fulfill those needs. Initiating this matchmaking process starts when an organization announces its needs and the desire to engage human resource to meet those needs. The information can be communicated to interested candidates through different channels. The survey analyzed the practices used by the auto parts enterprises for this communication. The results are shown in Figure 35.

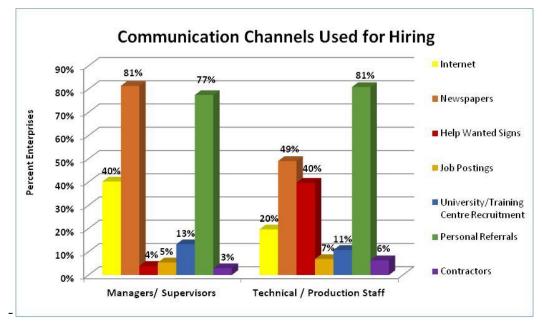


Figure 35 - Communication Channels Used by Enterprises for Hiring²¹

The results revealed that different approaches were adopted for hiring managers/supervisors and technical/production staff. For managers, the most commonly used channel was newspapers; which was used by 81% enterprises whereas for technical staff, only 49% enterprises used newspapers. Similarly, use of internet was 40% for managers and only 20% for workers. Some tools like 'help wanted' signs were used more for hiring workers. 40% enterprises adopted this practice for workers whereas for managers, this was used only by 4% enterprises.

²¹The total of mentioned percentages exceed 100% due to multiple responses by the respondents





However, the hiring practice for managers and workers aligned when it came to personal referrals. The channel was considered useful by the enterprises for both the employee categories. 77% enterprises used it for hiring managers and 81% for hiring workers. This mode of hiring is preferred by the organizations since it reduces the risk which is inherent in hiring of an unknown person. Moreover, it provides the employers the comfort of checking the credentials of the candidate from the quoted reference. It also allows the employer recourse in case the hired person fails to live up to the expectations of the organization.

Recruitment through channels like contractors, job postings, and universities/training centers were not found to be very popular in auto parts sector.

The analysis reveals that auto parts sector is using most of the available means to access human resource available in the market. However, the usage of some of the useful means is not sufficient. One such means is hiring through universities/training centres. Only 13% and 11% enterprises used it for hiring managers and workers respectively. This is also an indicator of the weak interaction between the industry and the educational institutions. It is important to increase this interaction. Hiring directly from educational institutions will not only be cost effective for the organizations but will also increase the probability of hiring good quality human resource.

Probing into the hiring process for workers, it was observed that 34% enterprises did not follow any formal recruitment process and mostly personal references were used. 42% of the enterprises were found to be conducting formal interviews while 40% conducted informal interviews. Distribution of responses obtained from the entire sample regarding the hiring process are shown in Figure 36

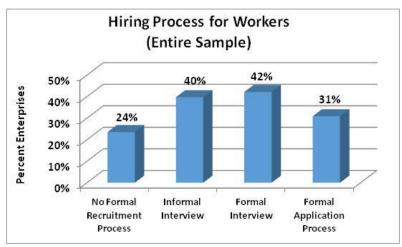


Figure 36 - Hiring Processes Used by Enterprises²²

In order to dig deeper, the responses were analyzed with reference to the size of the enterprise. The results are shown in Figure 37.

²²The total of mentioned percentages exceed 100% due to multiple responses by the respondents





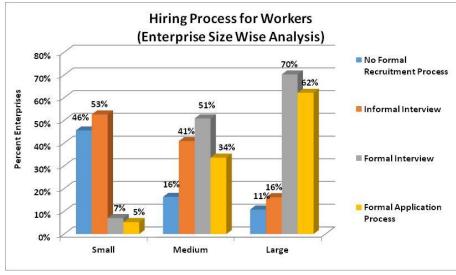


Figure 37 - Hiring Process Used by Enterprises of Different Sizes²³

It is seen that the degree of formality of hiring process has a direct relationship with the size of the enterprise. 46% small enterprises do not follow any formal recruitment process and for medium and large enterprises, this percentage reduces only to 16% and 11% respectively. Similarly, use of formal application process is used by 62% large enterprises whereas only 5% of the small enterprises use this approach. For medium enterprises, this percentage lies inbetween as 34%. Similarly the use of informal interview is highest for small and lowest for large enterprises while the use of formal interview shows an opposite trend.

6.1.2 Hiring Criteria

6.1.2.1 Experience Requirement

The survey results revealed that majority of auto parts sector enterprises consider prior work experience a prerequisite for hiring employees. This applies equally to hiring of managers as well as workers. 78% and 76% enterprises respectively mentioned prior experience a requirement for hiring managers and workers. Figure 38and Figure 39show the results.

²³The total of mentioned percentages exceed 100% due to multiple responses by the respondents





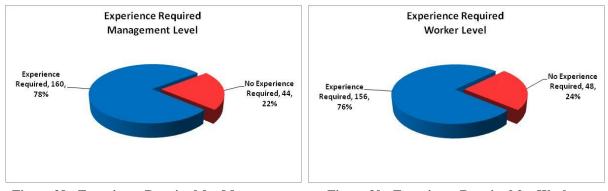




Figure 39 - Experience Required for Workers

The importance assigned to practical experience highlights the importance of putting more emphasis on practical training as part of technical courses taught by the TSPs. The results also indicate that majority of the enterprises do not consider training their employees as their responsibility since they are looking only for experienced people. One of the reasons for such an approach is the apprehension that the employee once trained will leave for other enterprises. However, there is an equally important need to think about a situation where an employee is not trained and he stays with the organization. The loss for the enterprise in the second scenario is definitely larger.

Looking into the requirement for experience in terms of number of years, it is seen to be stricter for managers compared to the workers. For workers, a majority of 74% enterprises require experience of 1-2 years whereas for managers, the similar figure is only 7%. This means that 93% of the surveyed enterprises required an experience of more than 2 years before hiring. The results distribution is presented in Figure 40and Figure 41.

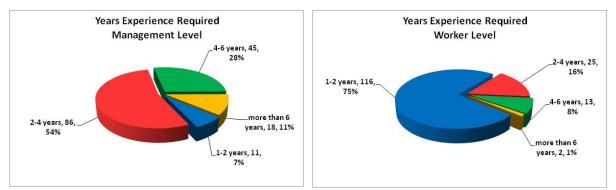


Figure 40 - No. of Years' Experience for Managers Figure 41 - No. of Years' Experience for Workers

The approach of the enterprises is logical since the training cost of a new manager is higher than that of a new worker.

6.1.2.2 Certification Requirement

65% enterprises required some kind of certification before hiring at manager level. For workers, this requirement was mentioned for 46% enterprises. That shows that for managers' hiring, the credibility of the institute matters more than that for the workers; for whom, the practical work experience carries more weight than the name of the institute. Certification requirement for both the manager and worker levels is shown in Figure 42 and Figure 43.





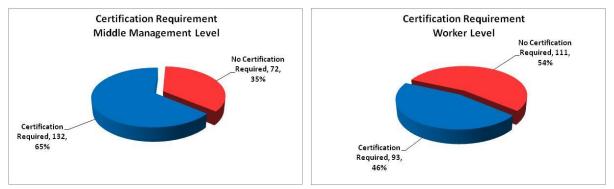


Figure 42 - Certification Requirement for Managers Figure 43 - Certification Requirement for Workers

NED University Karachi and UET Lahore were the two universities that were respectively mentioned by 33% and 23% of the enterprises requiring certification. In addition, 29% also mentioned government technical training institutes. Other institutes mentioned included Punjab University, NUST, PCSIR and TEVTA.

For technical workforce, there was a very strong recall for TEVTA which was mentioned by 62% of the enterprises that required certification for workers. This result can be seen as an indicator of the trust that TEVTA has established in the eyes of the industry over the past years. Among other institutes, Pak Swiss Training Center Karachi was mentioned by 15% and PITAC and Aman Tech by 8% and 9% enterprises respectively. Figure 44 shows the results.

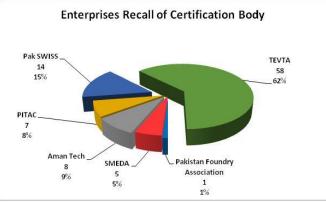


Figure 44 - Enterprises Recall of Certification Bodies

6.2 Mapping of Existing Workforce

6.2.1 Employment Profile

6.2.1.1 Gender Split

Auto parts sector has small share of female employees. Average share of female employees in the surveyed enterprises was found to be 6%. It is because majority of sector's workforce is absorbed in production department where the work environment is relatively tougher for female staff. Most of the female staff working in the sector is involved in office jobs such as Administration, HR, IT and Accounts.





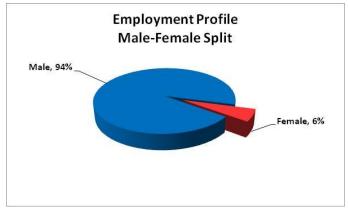


Figure 45 - Employment Profile-Male-Female Split

Looking at permanent-temporary split, it was found that permanent employees accounted for 73% of the total workforce which is a reasonable high figure when compared to many other sectors. It is because, automotive manufacturing is not a seasonal business and the manufacturing units operate throughout the year at the same rate. The organizations thus prefer to retain the employees on long term basis. Most of the technically skilled workers are permanent while the temporary staff comprises of daily wagers; majority of whom work as helpers in different departments.

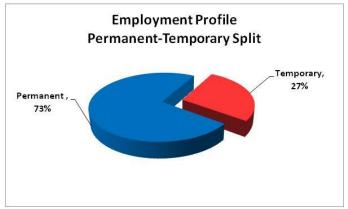
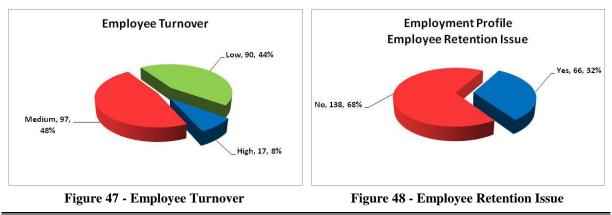


Figure 46 - Employment Profile-Permanent-Temporary Split

6.2.2 Employee Turnover

Employee turnover was not seen as a major issue by majority of the enterprises. Only 8% of the surveyed enterprises rated the employee turnover as high while 44% rated it as low; the balance rating it as medium. Figure 47shows the results.





The finding is supported by another direct question inquiring about if employee retention was an issue in their enterprises. 68% of the sampled enterprises did not marked high turnover as an issue. 32% enterprises responding affirmatively to this question were further asked about the reasons due to which employee retention becomes a problem. The responses were clustered around two main reasons. 79% enterprises said that employees leave their current employment for better paying opportunities in other organizations. Along with that, workers attitude was the second most common reason quoted by 61% organizations. This meant that workers do not take their work with the required seriousness due to which sometimes they leave their jobs themselves and sometimes they have to be relieved by the management. Excessive workload and lesser benefits were also the quoted reasons for high turnover. Figure 49shows the distribution of enterprises between different reasons for high turnover.

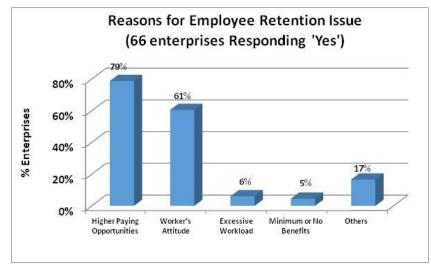


Figure 49 - Reasons for Employee Retention Issue²⁴

17% of the enterprises quoted 'other' reasons for turnover; the most commonly occurring of which was tough working conditions. Factors like high temperatures at job station, work involving lifting heavy weights, etc. were quoted as the reasons for leaving the job. Lack of adequate skills was also quoted by some enterprises as a reason for high turnover.

6.2.3 Working Hours

Majority of the auto parts enterprises were found to be working only for 8 hours. The survey revealed that 88% enterprises only worked in single shift of 8 hours. 7% enterprises follow a 16 hour shift and the remaining 5% work round the clock for 24 hours. Distribution of enterprises with respect to working hours is shown in Figure 50.

²⁴The total of mentioned percentages exceed 100% due to multiple responses by the respondents





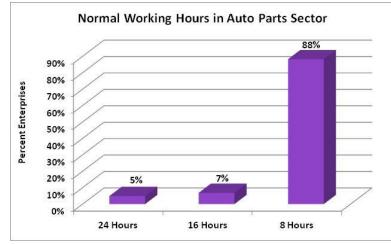


Figure 50 - Working Hours in Auto Parts Enterprises

Exploring further, it was found that the practice of working for more than 8 hours increases with the enterprise size. None of the small enterprises worked 24 hours, only 2% worked for 16 hours while 98% worked 8 hours. For medium enterprises, 94% worked for 8 hours and 4% for 16 hours. The number of medium enterprise working 24 hours was 3%, which was higher than that for small enterprises. Within large enterprises, the share of enterprises working 8 hours was the highest (57%) but much lower than the comparable shares in small and medium enterprises. 24% large enterprises followed 16 hour shift while 19% worked round the clock. Figure 51shows those results.

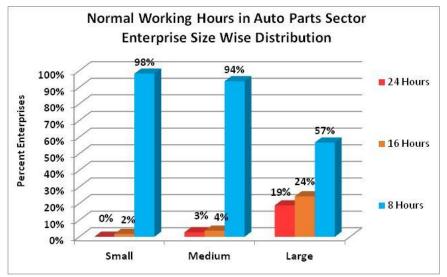


Figure 51 - Enterprise Size wise Working Hours

The normal working hours in manufacturing organizations sometimes also change with the load of orders from the market. Working hours may be increased to more than 8 hours to meet the needs of any required additional production.

6.2.4 Preferred Skill Areas for Female Workforce

Active female participation in economic activities is the key to expedite growth process. Keeping in view the cultural and societal norms, it is important to identify specific areas where the work environment is conducive for female employees. With this perspective, the survey identified such areas in auto parts manufacturing sector. The responses to a direct





question inquiring the respondents about most suitable areas for female employees are shown in Figure 52.

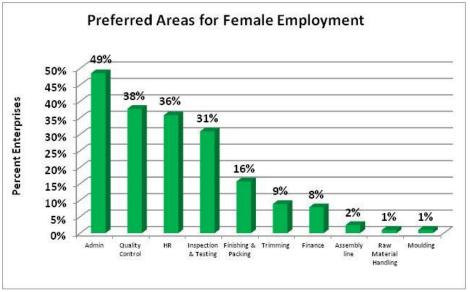


Figure 52 - Preferred Areas for Female Employment²⁵

As a general trend, manufacturing floor was considered not a very friendly work place for females and very small responses were received for jobs like moulding, assembly line, etc. The types of job considered most suitable for women related mainly to office work. 49% enterprises considered Administration and 36% considered Human Resource functions as friendly work places for women. Another 38% considered Quality Control as one of the jobs. Although, Quality Control job is related to production; however, many of its activities are carried out in laboratories. So, this job can also be classified as close to an office job. Another production related job was Finishing & Packing which was considered suitable for females by 16% enterprises.

6.2.5 Workers Compensation

6.2.5.1 Payment Frequency

95% of the enterprises in auto parts sector paid their employees on monthly basis. This is an indicator that the industry is stable and follows a relatively more structured business approach. 23% enterprises paid their employees on weekly basis. 50% of these enterprises were small and 41% were medium. It was surprising to note that 9% enterprises in this group were large. The distribution is shown in Figure 53.

²⁵The total of mentioned percentages exceed 100% due to multiple responses by the respondents





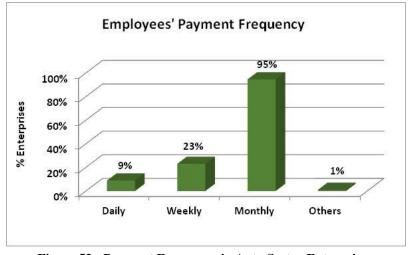


Figure 53 - Payment Frequency in Auto Sector Enterprises

There were 9% enterprises which were found to pay their employees daily. 45% of these enterprises were small. That shows that even medium and large employees pay their employees on daily basis. 1% fell in 'Others' category which included payment on piece rate basis.

The percentages mentioned in the distribution do not add to 100% due to multiple responses which exist due to presence of different types of workforce. Many organizations follow a dual compensation policy as per which the permanent employees are paid on monthly basis and the temporary employees are paid on weekly or daily basis.

6.2.5.2 Average Wages

Average wages were asked from the enterprises for four levels of employment; Helper, Machine Operator, Supervisors/Foremen and Middle Management. Table 15shows the minimum, maximum and average salaries.

Level	Monthly Salary (PKR)			
Level	From	То	Average ²⁶	
Helper Level	8,000	25,000	11,082	
Machine Operator Level	12,000	36,500	18,447	
Supervisory Level	12,000	55,000	25,290	
Middle Management Level	15,000	85,000	34,583	

The salaries were also analyzed with respect to enterprise size. For lower positions, the difference between small, medium and large was not significant. For example, a Helper's salary in large enterprise was only 14% higher than that in small enterprise whereas for machine operator and supervisory levels, the salaries in large enterprises were respectively 47% and 67% higher than those in small enterprise. For the middle management positions, the difference was even more pronounced. Manager's average salary in large enterprise was 77% higher than that in small enterprise. Table 16shows the salaries comparison.

²⁶*Average is obtained by taking the sum of the salaries mentioned by the enterprises for each position level and dividing that by the total number of responses*





	Average Monthly Salary (PKR)				
Level	Small	Medium	Large		
Helper Level	10,368	11,188	11,865		
Machine Operator Level	15,161	18,816	22,324		
Supervisory Level	19,351	25,997	32,338		
Middle Management Level	25,891	35,502	45,750		

Table 16 - Average Salaries in	Auto Parts Sector in Sr	mall, Medium and Large Enterprises
Table 10 - Average Salaries III	Auto I al is sector in Si	man, wieulum and Large Enterprises

Average salaries were also analyzed with respect to formal and informal and were found to be quite comparable; with only small differences; as shown in Table 17.

Table 17 - Average Salaries in Auto Parts Sector in Formal and Informal Enterprises

T and	Average Month	Difference	
Level	Formal	Informal	
Helper Level	11,234	10,831	402
Machine Operator Level	18,758	17,928	830
Supervisory Level	25,923	24,247	1,676
Middle Management Level	34,527	34,671	(144)

6.2.6 Employment Trend

Increase or decrease in number of employees is a direct indicator of the industry's growth trend. Evaluating on this indicator, the auto parts sector turned out to be a positively growing sector. This finding is in line with the revenue growth trend of the industry. Figure 54shows the share of enterprises where the number of employees increased, decreased or remained the same during the last twelve months.

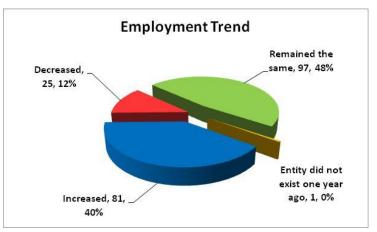


Figure 54 - Employment Trend in Auto Parts Enterprises

Manpower increased in 40% enterprises while it remained the same in another 48%. Only 12% enterprises in the ample indicated a decrease in number of employees. Such a positive growth outlook of the industry can be sustained only by ensuring a matching growth in the supply of skilled workforce.





7.0 SKILLED WORKFORCE ANALYSIS

Auto Parts manufacturing sector requires multiple types of technical skills differentiated by the subsector and the types of processes. The survey analysed the skills with respect to these subsectors/process both quantitatively and qualitatively.

7.1 Quantitative Analysis of Skilled Workforce

The total number of technical employees in eight different subsectors/processes in the surveyed enterprises was found to be 31,885. On the basis of this number, the average number of technical employees per enterprise comes out to be 156.

The total technical workforce included 31,593 persons as employed and 292 vacant positions; which as a share of total workforce accounted only for 0.9% share. Such a small percentage of vacant position indicated that availability of technically skilled manpower was not a major issue in auto parts sector and skilled workers were generally available to meet the industry's needs.

Workforce Distribution with respect to Formal-Informal Enterprises

Looking into the distribution of this workforce between formal and informal sectors, it was found that 62% was in formal sector and 38% in informal which is in line with the distribution of formal and informal enterprises in the sample. Figure 55shows the split.

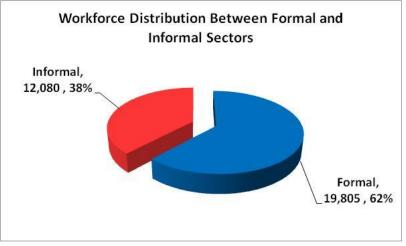


Figure 55 - Workforce Distribution between Formal-Informal Enterprises

Since the share of informal enterprises in the sample and their share in total workforce are same, the average number of workers per enterprise is also almost same (156 for formal and 157 for informal enterprises).

Workforce Distribution with respect to Subsectors/Processes

Workforce distribution was also analysed with respect to subsectors/processes. Looking into the relative shares, it is seen that the biggest share (31%) of technical workforce is absorbed by Assembly/Sub Assembly subsector. It is followed by Sheet Metal and Metal Casting Processes which respectively account for 25.6% and 16% shares respectively. Technical workforce distribution between different subsectors/processes is shown in Figure 56.





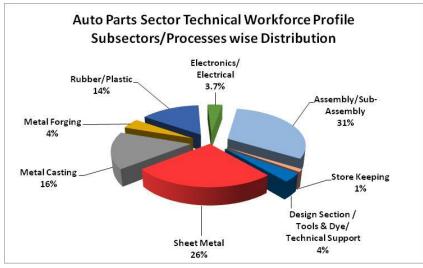


Figure 56 - Workforce Distribution between Subsectors/Processes

46% of the total workforce is absorbed by the three metal related trades, sheet metal, metal casting and metal forging. Rubber/Plastic subsector accounted for 14% and Electrical/Electronic parts only for 4% of the total workforce. This technical workforce distribution highlights the priorities that need to be kept under consideration by the technical training sector in order to effectively meet the skilled workforce needs of auto parts sector.

The number of current technical skilled workforce distribution in different subsectors/processes is summarized in Table 18.

Subsector/Trades	Currently Employed	Current Vacancies	Total Employment Capacity	Vacant Positions Share
Design Section/Tools & Die/Technical Support	1,071	97	1,168	8.3%
Sheet Metal	8,055	116	8,171	1.4%
Metal Casting	5,084	8	5,092	0.2%
Metal Forging	1,391	16	1,407	1.1%
Rubber/Plastic Parts	4,566	44	4,610	1.0%
Electronics/Electrical Parts	1,153	11	1,164	0.9%
Assembly/Sub-Assembly	9,893	-	9,893	0.0%
Store Keeping	380	-	380	0.0%
Total	31,593	292	31,885	0.9%

Table 18 - Current Technical Skilled Workforce Distribution in Subsectors/Processes

Design Section/Tools & Dies/Technical Support section had 8.3% vacant positions which the highest. For all other processes the share of vacant positions was less than 2%. Skills requirement for Design Section are superior in nature and thus it is relatively more difficult to find properly trained people for doing the job.

Workforce Distribution with respect to Enterprise Size

Workforce distribution was also analysed with respect to enterprise size. On an overall basis, large enterprises absorbed 56.9% workforce while medium and small enterprises respectively





absorbed 39.9% and 3.2%. The distribution highlights the fact that in automotive sector, the large enterprises have the biggest contribution in generating employment. Workforce distribution with respect to enterprise size is shown in Figure 57.

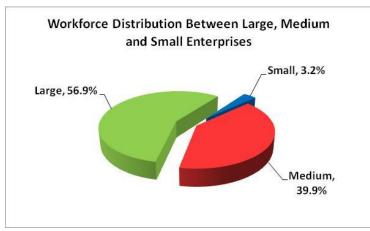


Figure 57 - Workforce Distribution between Large, Medium and Small Enterprises

Correlating the number of workforce in small, medium and large enterprises with the number of enterprises in each category in the sample, the average numbers of technical workforce in the each of the three categories was worked out and is shown in Table 19.

	Small	Medium	Large	Total
No. of Enterprises	57	110	37	204
No. of Workforce	1,012	12,731	18,142	31,885
Workforce per Enterprise	18	116	490	156

Workforce distribution between Large, Medium and Small enterprises was also analysed with respect to different subsectors/processes. Although, the maximum share of workforce is absorbed by the large sector, this was not always the case when seen with respect to different subsectors/processes. The relative shares of workforce in all the subsectors/process are shown in Figure 58.





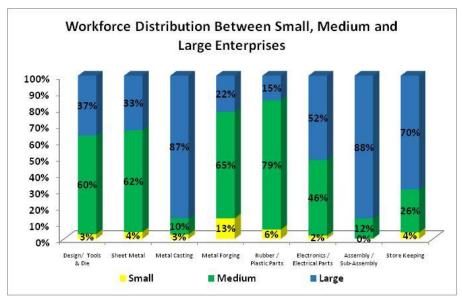


Figure 58 - Workforce Distribution w.r.t. Enterprise Size in Subsectors/Processes

It shows that in line with the trend for overall sample, the shares of Large sector were the highest in Metal Casting, Assembly/Sub Assembly, Electronic/Electrical parts and Storekeeping; meaning thereby that respectively, 87%, 88%, 52% and 70% shares of the total workforce in these subsectors/processes were absorbed by the Large sector. However, in four other subsectors/processes, highest shares of workforce were absorbed by Medium and not Large sector. These were Design/Tools & Dies, Sheet Metal, Metal Forging and Rubber/Plastic Parts. For Small segment, no deviation from the overall trend was observed and the shares of Small in total workforce distribution were the lowest for all the subsectors/processes. Metal Forging was the process where Small enterprises accounted for 13% of the total workforce which was the highest among all subsectors/processes.

7.2 Workforce Distribution with Respect to Job Positions

Total number of employees in different subsectors/processes was calculated by summing up the workers working in different job positions. Following tables provide a break-up of workforce with respect to job positions. The top row in each table provides information about the Supervisor/Incharge/Foreman and the rest the positions are arranged in descending order with respect to number of workers. For each subsector/process, the category of 'Helper' has been listed in the last row since this is a semiskilled or unskilled worker. The tables also provide the relative share of each job in each particular subsector/process.

7.2.1.1 Workforce Distribution in Design Section/Tools & Dies/Technical Support

Table 20shows the current distribution of workers in Design Section/Tools & Dies/Technical Support.

Job Positions	Currently Employed	Current Vacancies	Total Capacity	Relative Share
Tools & Die Shop Supervisor/In-charge	119	20	139	11.9%
Tools & Die Maker	393	30	423	36.2%

Table 20 - Workforce Distribution in Design Section/Tools & Die/Technical Support





Designer/ Pattern Maker	281	25	306	26.2%
Assistant	264	22	286	24.5%
Helper	14	-	14	1.2%
Total	1,071	97	1,168	100.0%

Key findings are listed below:

- Tools and Die makers accounted for 36% of total jobs in this category; followed by Designer/Pattern Maker with 26% share.
- Supervisory positions accounted for 12% of the total jobs which is highest share for supervisory positions when compared with other subsectors/processes.
- Helpers only accounted for 1.2% share of the total workers which is the lowest when compared with other subsectors/processes. It shows that Helpers are commonly not required in this process. There were no vacant positions for Helper.

7.2.1.2 Workforce Distribution in Sheet Metal

Table 21shows the current distribution of workers in Sheet Metal process.

Job Positions	Currently Employed	Current Vacancies	Total Capacity	Relative Share
Supervisor/In-charge			629	
/Foreman	625	4	022	7.7%
Pressman	975	16	991	12.1%
Assembler	779	12	791	9.7%
Welder	526	9	535	6.5%
Driller	441	11	452	5.5%
Painter	391	7	398	4.9%
Oven Operator	392	4	396	4.8%
Electroplater	350	9	359	4.4%
Quality Assurance	353	1	354	4.3%
Inspector			221	
Sheet Cutter	324	7	331	4.1%
Quality Assistant	297	-	297	3.6%
Quality Assurance			116	
Incharge	114	2	116	1.4%
Packer	37	-	37	0.5%
Helper	2,451	34	2,485	30.4%
Total	8,055	116	8,171	100.0%

Table 21 - Workforce Distribution in Sheet Metal

Key findings are listed below:

- Share of supervisory jobs is 7.7% of the total jobs in Sheet Metal process which is well within the overall range of 7-10% found for all the technical processes.
- Pressman is the most common job in Sheet Metal processing. 12% of the total jobs in this process fell under this job description.





- Assemblers, Welders and Drillers were the other large contributors to workforce strength; respectively accounting for 9.7%, 6.5% and 5.5% shares of the total jobs in this process.
- Helpers play a key role in Sheet Metal process. 30% of the total workforce in this process was found to be comprising of Helpers. It shows that Sheet Metal is a relatively more labour intensive process compared to other sub-processes.
- Share of vacant positions was 1.4% of total positions which was second only to Design Section.

7.2.1.3 Workforce Distribution in Metal Casting

The current distribution of workforce in Metal Casting process is shown in Table 22.

Job Positions	Currently Employed	Current Vacancies	Total Capacity	Relative Share
Melting & Casting Supervisor/In-charge	442	-	442	8.7%
Assembler	1,009	-	1,009	19.8%
Machinist	988	1	989	19.4%
Oven Operator	442	5	447	8.8%
Painter	430	-	430	8.4%
CNC Operator	314	2	316	6.2%
Assistant Assembler	216	-	216	4.2%
Electroplater	177	-	177	3.5%
Quality Inspector	164	-	164	3.2%
Metal Polisher	159	-	159	3.1%
Quality Assistant	56	-	56	1.1%
Quality Supervisor	30	-	30	0.6%
Packer	3	-	3	0.1%
Helper	654	-	654	12.8%
Total	5,084	8	5,092	100.0%

 Table 22 - Workforce Distribution in Metal Casting Process

Key findings follow:

- Supervisory positions are 8.7% of the total positions under this process which is within the average range of 7-10%.
- Assembler is the most commonly found position in this process. Assemblers accounted for 19.8% of the total jobs under this process.
- Machinist is second most common job and the share of machinist positions was 19.4% of the total.
- Oven Operator, Painter and CNC Operator were other important positions in this process.
- Helpers accounted for 12.8% of the total which shows their importance for this process. However, their need in Metal Casting was lesser than that in Sheet Metal.
- Maximum number of vacancies existed against Oven Operator position.





7.2.1.4 Workforce Distribution in Metal Forging

The current distribution of workforce in Metal Forging process is shown in Table 23.

Job Positions	Currently Employed	Current Vacancies	Total Capacity	Relative Share
Forging Supervisor / In- charge / Foreman	117	1	118	8.4%
Machinist	340	12	352	25.0%
Machine Operator	128	3	131	9.3%
Heat Technician	79	-	79	5.6%
Quality Inspector	75	-	75	5.3%
Quality Assistant	69	-	69	4.9%
CNC Operator	53	-	53	3.8%
Packer	51	-	51	3.6%
Painter	50	-	50	3.6%
Electroplater	47	-	47	3.3%
Metal Polisher	42	-	42	3.0%
Quality Supervisor	20	-	20	1.4%
Helper	320	-	320	22.7%
Total	1,391	16	1,407	100.0%

 Table 23 - Workforce Distribution in Metal Forging Process

Key findings are listed below:

- Share of supervisory positions is 8.4% which is within the normal range.
- Machinist is the most important job in Metal Forging; accounting for 25% of the total jobs under this process.
- Machine Operator and Heat Technician were the other common jobs accounting for 9.3% and 5.6% of the total positions.
- Helpers accounted for a large share of 22.7% which shows the labour intensive nature of the process.

7.2.1.5 Workforce Distribution in Rubber/Plastic Parts

Table 24shows the current distribution of workforce in Rubber/Plastic parts.

 Table 24 - Workforce Distribution in Rubber/Plastic Parts

Job Positions	Currently Employed	Current Vacancies	Total Capacity	Relative Share
Supervisor/In-charge/ Foreman	387	4	391	8.5%
Moulder	808	11	819	17.8%
Assembler	671	2	673	14.6%
Cutter/Trimmer	462	2	464	10.1%
Machine Operator	278	9	287	6.2%
Quality Inspector	274	4	278	6.0%





Quality Assistant	274	4	278	6.0%
Helper	1,351	6	1,357	29.4%
Quality Supervisor	61	2	63	1.4%
Total	4,566	44	4,610	100.0%

Key findings are summarized below:

- Supervisory positions accounted for 8.5% of the total which fell within the usual range of 7-10% for such positions.
- Moulder was the most common position. It accounted for 17.8% of the total positions in Rubber/Plastic parts sector.
- Assembler was the next most important job; accounting for 14.6% of the total.
- Cutters/Trimmers were the third most commonly found skilled workers in Rubber/Plastic parts sector. They accounted for 10% of the total workforce in this subsector.
- Share of Helpers in this subsector was 29.4% which is high; showing high degree of labour intensiveness.

7.2.1.6 Workforce Distribution in Electronic/Electrical Parts

The current distribution of workforce in Electronic/Electrical parts is shown in Table 25.

Job Positions	Currently Employed	Current Vacancies	Total Capacity	Relative Share
Supervisor/ In-charge/ Foreman	114	-	114	9.8%
Assembler	426	2	428	36.8%
Packing Worker	149	-	149	12.8%
Painter	138	-	138	11.9%
Helper	326	9	335	28.8%
Total	1,153	11	1,164	100.0%

 Table 25 - Workforce Distribution in Electronic/Electrical Parts

Key findings are summarized below:

- Supervisors/Incharges/Foremen represented 9.8% of the total workforce in Electronics/Electrical subsector.
- Assembler was the most commonly found job in the subsector. Assemblers accounted for 36.8% of the total workforce in the subsector.
- Other important positions were Packing worker and Painter; accounting respectively for 12.8% and 11.9% shares.
- Share of Helpers is 28.8% which was high.

7.2.1.7 Workforce Distribution in Assembly/Sub Assembly

The current distribution of workforce in Assembly/Sub Assembly is shown in Table 26.

 Table 26 - Workforce Distribution in Assembly/Sub Assembly





Job Positions	Currently Employed	Current Vacancies	Total Capacity	Relative Share
Supervisor/ In-charge / Foreman	818	-	818	8.3%
Assembler	5,345	-	5,345	54.0%
Assistant	2,936	-	2,936	29.7%
Painter	356	-	356	3.6%
Quality Inspector	306	-	306	3.1%
Quality Assistant	82	-	82	0.8%
Quality Assurance Incharge	50	-	50	0.5%
Total	9,893	-	9,893	100.0%

Key findings follow:

- Supervisory positions were 8.3% of the total positions in Assembly/Sub Assembly subsector.
- Assembler was the key position. 54% of the jobs in this subsector were those of Assemblers. Assistants of these Assemblers accounted for another 29.7% share.
- 3.6% jobs were those of Painters and the rest of different types of Quality personnel.
- There were no jobs of Helpers in Assembly/Sub Assembly subsector due to the fact that the subsector is more automated compared to other subsectors/processes.

7.2.1.8 Workforce Distribution in Storekeeping

The current distribution of workforce in Storekeeping is shown in Table 27.

Table 27 - Workforce Distribution in Storekeeping	

Job Positions	Currently Employed	Current Vacancies	Total Capacity	Relative Share
Store In-charge	57	-	57	15.0%
Storekeeper	269	-	269	70.8%
Assistant	54	-	54	14.2%
Total	380	-	380	

Key findings follow:

- Store Incharge accounted for 15% of the total jobs.
- Storekeeper was the main position which accounted for 71% total positions under this process. The balance was accounted by their Assistants.

7.2.2 Unskilled/Semiskilled Workforce

Except the Assembly/Sub Assembly subsector and Storekeeping sections, all other subsectors/processes employed Helpers to provide assistance to the skilled workforce. The persons employed as Helpers were mostly unskilled. Some of them may also be classified as semiskilled. Some of these helpers, during their stay on job, may be able to learn and improve their technical skills and get upgraded as skilled workers.





The number of Helpers identified during the survey of 204 auto parts enterprises, has been used as an indicator to estimate the share of unskilled/semiskilled workforce in the sector. Total number of Helpers positions in all the subsectors/processes was 5,165 which were16% of the total technical workforce of auto parts sector. Split between unskilled/semiskilled and skilled workforce is shown in Figure 59.

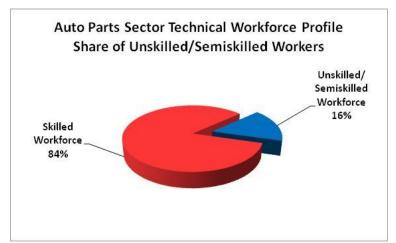


Figure 59 - Share of Unskilled/Semiskilled Workers

Comparison of share of unskilled workforce in different subsectors/processes is shown in Figure 60. Sheet Metal is the most dependent process on Helpers where 30% of the total workforce comprised of Helpers.

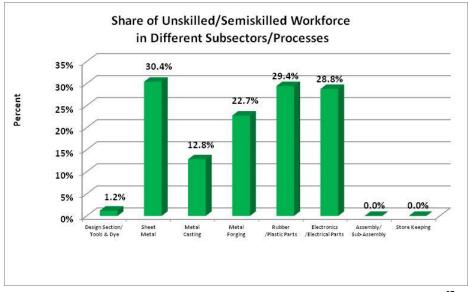


Figure 60 - Share of Unskilled/Semiskilled Workers in Subsectors/Processes²⁷

Design section/Tools & Dies employed only 1.2% Helpers, while Assembly/Sub Assembly and Storekeeping did not have any Helper.

²⁷The total of mentioned percentages exceed 100% due to multiple responses by the respondents





7.3 Qualitative Assessment of Skills

The survey endeavoured to conduct a qualitative analysis of skills in auto parts sector. Direct questions were asked from the enterprises to rate different skills required in their different processes. The scale used for rating used four options of 'Excellent', 'Good', 'Average' and 'Poor'. Data analysis revealed that there were small numbers of responses in the two extreme categories of 'Excellent' and 'Good'. To make the analysis simpler, the responses the 'Excellent' and 'Good' were merged and called as 'Good' and those of 'Average' and "Poor' were also merged and were called 'Not Good'.

Qualitative skills analysis has been carried out in three stages. In the first stage, quality ratings have been analysed from the overall sector's perspective for all the subsectors/processes. In the second stage, ratings for the key sub-processes in each subsector/process have been analysed. The third stage analysis discusses the quality ratings for different skills required for carrying out those sub-processes.

7.3.1.1 Criterion for Individual Skill Assessment

Ratings of individual skills for each sub-process of all the subsectors/processes have been listed in tabular form. The tables provide the number of responses obtained for each skill and the percent split of those responses between 'Good' and 'Not Good'. The last column provides an overall assessment of each skill, using colour coded flags. Flags of three colours, green, yellow and red have been used to mark the skills with respect to the satisfaction levels of the responding enterprises. The criterion used for assessment is shown in Table 28.

Legend	Symbol	Response Percent of 'Good'	Explanation
Two Green Flags		80% and Above	Very satisfactory
One Green Flag		70-80%	Satisfactory
One Yellow Flag		60-70%	Barely satisfactory
One Red Flag		50-60%	Unsatisfactory, needs improvement
Two Red Flags		Below 50%	Very unsatisfactory, needs immediate action to improve

Table 28 - Criteria Used for Individual Skills Assessment

7.3.2 Skills Quality Ratings in Subsectors/Processes

This analysis combines the ratings given by the enterprises in different subsectors/processes for all types of skills used in different sub-processes. Thus it provides an overall assessment of the quality of skills in those subsectors/processes. The results have been shown in Figure 61.It shows the percent responses in 'Good' category.





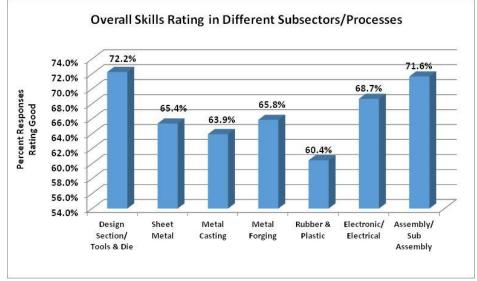


Figure 61 - Overall Skill Rating in Subsectors/Processes²⁸

It shows that the highest quality rating was obtained in Design section/Tools & Dies where 72% of the respondents rated the skills as Good. An almost matching rating of 71.8% was found in Assembly/Sub Assembly subsector. One of the reasons for this trend is that these are two subsectors/processes where majority of the workforce is skilled and qualified. The shares of Helpers in Assembly/Sub Assembly and Design section were 0% and 1.2% respectively. The other subsector with better rating was Electronic/Electrical parts where the quality rating was 68.7%.

The quality ratings of all the seven subsectors/processes were more than 60% which can be considered average and indicates towards the large room for improvement. The lowest quality rating was obtained for Rubber & Plastic parts subsector where only 60.4% of the responses were rated as 'Good'.

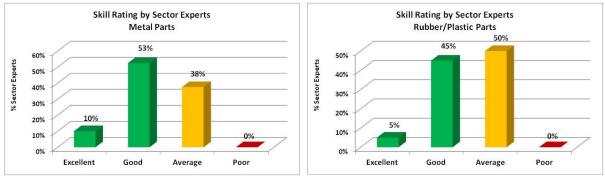
7.3.2.1 Sector Experts Rating of Skills Quality

Skill rating in metal parts subsector was rated high with 63% experts assigning Good and Excellent rating. 38% of the responses were rated average. For Rubber/Plastic parts subsector, the rating was relatively lower with 50% experts giving average rating to skills quality. Quality ratings for the four subsectors are presented in Figure 62-Figure 63.

²⁸The total of mentioned percentages exceed 100% due to multiple responses by the respondents









Skill rating for Electronic/Electrical parts and Assembly/Sub Assembly subsectors was even lower where only 35% and 40% experts rated the skills quality as Good or Excellent, the balance falling for average rating. Skills quality was not rated poor by any expert for any of the subsectors.

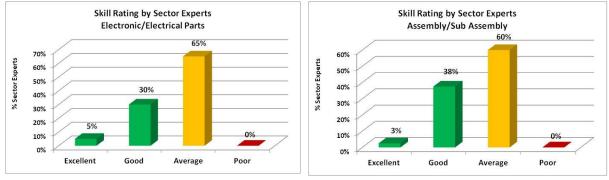


Figure 64 - Sector Experts Rating - Electronic Parts Figure 65 - Sector Experts Rating - Assembly

The sector experts' ratings were found to be somewhat different from the ratings of enterprises. Unlike sector experts' ratings, the relative ratings by enterprises were better for Electronics/Electrical parts and Assembly/Sub Assembly subsectors compared to Metal and Rubber/Plastic parts subsectors.

7.3.3 Skill Quality Ratings for Sub-Processes and Skills

Skills quality rating has been carried out for sub-processes in all the subsectors/processes.

7.3.3.1 Quality Ratings in Design Section/Tools & Dies/Technical Support

Main job carried out under this process is Die Making and Sequencing for which four main types of skills were identified by the responding enterprises. Table 29 shows the qualitative rating of the identified skills.

Table 29 -Skills Quality Rating in Die Making & Sequencing in Design/Tools & Dies Se	ction
There are starting in 2 to maning to sequencing in 2 to get to be	

Required Skills	No. of Responses	Good	Not Good	Assessment
Die Making & Sequencing	73	75.3%	24.7%	
Die Designing Sequence	62	69.4%	30.6%	
CAD/CAM Professional skills	59	74.6%	25.4%	





Die gauge selection	51	68.6%	31.4%	
Die Making & Sequencing Overall	245	72.2%	27.8%	

- Overall rating of Die making and Sequencing was satisfactory with 72.2% responses falling under 'Good' rating.
- Die making and sequencing skill was rated satisfactory with 75.3% score.
- Other skill obtaining a high rating of 74.6% was the CAD/CAM Professional skills.
- Die designing sequence and die gauge selection skills were rated yellow in barely satisfactory range.
- Die making and sequencing is a process that requires manpower with relatively higher level of educational qualification. This trend is identified in the survey that skills requiring higher educational qualification have generally obtained a higher quality rating.

7.3.3.2 Skill Quality Ratings in Sheet Metal Process

Seven sub-processes were analysed in Sheet Metal process. Percent responses rated 'Good' for all the sub-processes have been depicted in Figure 66.

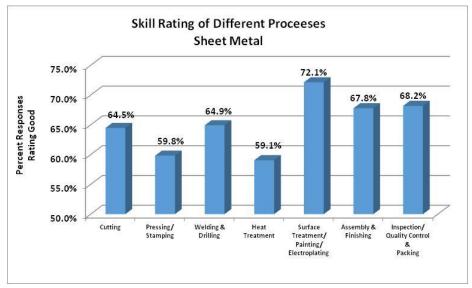


Figure 66 - Skill Ratings in Sheet Metal

Highest satisfaction was observed for Surface Treatment/Painting sub-process where 72% of the responses were rated Good. Cutting, Welding & Drilling, Assembly & Finishing and Quality Control fell in the average range and were rated in the range 60-70%. Pressing/Stamping and Heat Treatment were the lowest rated sub-processes indicating the relative dissatisfaction by less than 60% Good responses.

The issue was explored in more depth to exactly identify the skills required to perform jobs in these sub-processes and the rating of those skills by the surveyed enterprises. The objective of this detailed analysis is to identify the skills where the quality is satisfactory as well the ones where more focus is required to improve the skills quality.





7.3.3.3 Sheet Metal – Individual Skills Assessment

Required Skills	No. of Responses	Good	Not Good	Assessment
Instrument Usage Precision	53	64.2%	35.8%	
Blade Handling	50	72.0%	28.0%	
Dimensions Marking	42	61.9%	38.1%	
Cutting Size Adjustment	38	57.9%	42.1%	
Cutting Overall	183	64.5%	35.5%	

Table 30 - Skills Quality Rating in Cutting in Sheet Metal

- Overall assessment of cutting sub-process 64.5% in the yellow range, which means close to unsatisfactory.
- Only the Blade handling skill was rated satisfactory while other required skills of instrument usage precision, dimensions marking were barely satisfactory.
- Cutting size adjustment was the weakest skill getting only 58% responses in Good category.
- Most of the skills required for cutting were measuring and precision related which appeared to be a weak area. The skill of blade handling which is not directly related with precision was rated satisfactory.

7.3.3.3.1 Pressing/Stamping

Table 31 - Skills Quality Rating in Pressing/Stamping in Sheet Metal

Required Skills	No. of Responses	Good	Not Good	Assessment
Pressing and Stamping Skills	65	58.5%	41.5%	
Die Fitting	52	59.6%	40.4%	
Die Handling	54	66.7%	33.3%	
Die Aligning	48	54.2%	45.8%	
Pressing Stamping Overall	219	59.8%	40.2%	

- Current skill level of pressing and stamping was rated unsatisfactory and thus required improvement.
- Four types of skills were required for Pressing/stamping three of which were rated unsatisfactory as per the defined assessment scale. Pressing, stamping, die fitting and die aligning skills were rated unsatisfactory.
- Only die handling skill was rated yellow which was also close to unsatisfactory.
- Analyzing the skill types, it was seen that the skills of fitting and aligning the die are related to precision which appears to be an issue with the skilled workforce.





7.3.3.3.2 Welding & Drilling

Descripted Chills	No. of	Card	Not Cood	
Required Skills	Responses	Good	Not Good	Assessment
Angle Setting Skills	70	60.0%	40.0%	
Object Placement	68	60.3%	39.7%	
Nozzle Adjustment Skills	68	67.6%	32.4%	
Advance Drilling Techniques	62	72.6%	27.4%	
Welding & Drilling Overall	268	64.9%	35.1%	

Table 32 - Skills Quality Rating in Welding & Drilling in Sheet Metal

- Welding and drilling, though being a common skill, was still not rated satisfactory. Only 64.9% responses were Good which means that about one third of the responses did not rate it okay.
- Angle setting, object placement and nozzle adjustment skills were rated as barely satisfactory respectively through 60% 60.3% and 67.6% responses in Good category.
- For advanced drilling techniques, the rating was satisfactory.

7.3.3.3.3 <u>Heat Treatment</u>

Required Skills	No. of Responses	Good	Not Good	Assessment
Oven operating techniques	32	43.8%	56.3%	
Temperature Control	34	67.6%	32.4%	
Heat Specification conformance	34	67.6%	32.4%	
Cleaning Oxides Techniques	27	55.6%	44.4%	
Heat Treatment Overall	127	59.1%	40.9%	

Table 33 - Skills Quality Rating in Heat Treatment in Sheet Metal

- None of the required skills in this job was rated satisfactory. Overall rating was also in the red zone with only 59% 'Good' responses.
- Heat Treatment is the weakest area in terms of required skills in Sheet Metal process. The rating was 59.1%, entering into the red zone and indicating an unsatisfactory quality of skills.
- Oven operating technique was rated very unsatisfactory and obtained two red flags with a very low rating of 43.8%.
- Temperature control and heat specification performance were rated relatively better but remained barely satisfactory in yellow range.

7.3.3.3.4 <u>Surface Treatment/Painting/Electroplating</u>





Required Skills	No. of Responses	Good	Not Good	Assessment
Electroplating Techniques	54	66.7%	33.3%	
Formula Deriving	52	69.2%	30.8%	
Humidity Level Determination	48	75.0%	25.0%	
Paint Mixing	47	78.7%	21.3%	
Surface Treatment/ Painting/ Electroplating Overall	201	72.1%	27.9%	

Table 34 - Skills Quality Rating in Surface Treatment in Sheet Metal

- Overall skills level of Surface treatment was rated satisfactory with 72.1% rating, the highest among all the sub-processes in Sheep Metal process.
- Humidity level determination and paint mixing were satisfactorily rated skills while formula deriving skill was in the yellow range of almost satisfactory.
- Electroplating techniques rating was also barely satisfactory with 66.7% responses in Good category.

7.3.3.3.5 Assembly & Finishing

Required Skills	No. of Responses	Good	Not Good	Assessment
Nut Fitting	53	64.2%	35.8%	
Process determination and adjustments	46	65.2%	34.8%	
Determining Assembly Sequence	40	70.0%	30.0%	
Ensure Standardized Assembly	38	73.7%	26.3%	
Assembly & Finishing Overall	177	67.8%	32.2%	

Table 35 - Skills Quality Rating in Assembly & Finishing in Sheet Metal

- Four main types of skills were required for assembly and finishing in Sheet Metal process. Of these, two were rated satisfactory and two barely satisfactory.
- Nut fitting skill was rated lowest among all obtaining 64.2% responses for 'Good'.
- Ensuring standardized assembly was the skill with best rating of 73.7%.
- Overall rating of Assembly and Finishing was in yellow range with 67.8% responses for 'Good'.

7.3.3.3.6 Inspection/Quality Control & Packing

Table 36 - Skills Quality Rating in Inspection/Quality Control & Packing in Sheet Metal

	No. of			
Required Skills	Responses	Good	Not Good	Assessment





Defect identification	48	68.8%	31.3%	
Quality compliance	45	62.2%	37.8%	
Quality inspection	41	63.4%	36.6%	
TQM application	42	78.6%	21.4%	
Inspection/Quality control and Packing Overall	176	68.2%	31.8%	

- Overall skill rating of this inspection/quality control & packing was rated almost satisfactory with 68.2% score.
- Routine quality control skills of defect identification, quality inspection and compliance were rated in yellow range whereas TQM skills were rated in green range as satisfactory. This is in line with the general trend found during the survey as per which the skills requiring a relatively higher educational qualification received a higher satisfaction level and vice versa.

7.3.3.4 Skill Quality Ratings in Metal Casting Process

There are seven sub-processes to manufacture auto parts using Metal Casting process. Skill quality ratings for each of those processes have been compared in Figure 67.

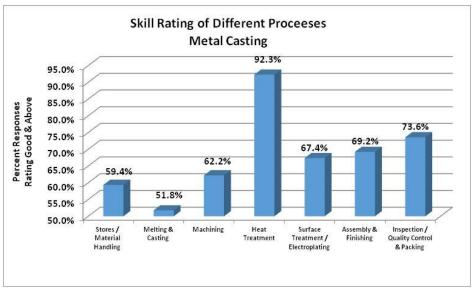


Figure 67 - Skill Ratings in Metal Casting²⁹

Skill rating of the two sub-processes of Heat Treatment and Inspection/Quality Control were rated satisfactory obtaining scores of 92.3%³⁰ and 73.6% respectively. Skill quality in three sub-processes, Assembly & Finishing, Surface Treatment and Machining fell in yellow range. Melting and Casting, the most important sub-process in Metal Casting process obtained the lowest skill rating. Only 51.8% responses in this sub-process were of 'Good' rating.

³⁰*The result should be interpreted with care as it is based only on 13 responses.*





²⁹The total of mentioned percentages exceed 100% due to multiple responses as each sub-process is rated separately

All the sub-processes were further analysed to identify quality ratings of individual skills identified by the surveyed enterprises. The results are tabulated in Tables 37 to 43.

7.3.3.5 Individual Skill Rating in Metal Casting Process

7.3.3.5.1 Melting & Casting

Table 37 - Skills Quality Rating in Melting & Casting in Metal Casting

Required Skills	No. of Responses	Good	Not Good	Assessment
Sand Casting Techniques	26	42.3%	57.7%	
Casting design consideration	24	54.2%	45.8%	
Casting Defects removal	19	47.4%	52.6%	
Solidification Time adjustment	16	68.8%	31.3%	
Melting & Casting Overall	85	51.8%	48.2%	

- Melting and Casting obtained the lowest rating among all the required skills for Metal Casting process. Only 51.8% 'Good' responses made the sub-process to fall in red zone.
- The rating was very unsatisfactory for Sand Casting and Casting Defect Removal skills. The scores for these two skills were 42.3% and 47.4% respectively that led these two skills to fall in very unsatisfactory, double red flag range.
- Rating for Casting Design skill was also unsatisfactory with only 54.2% responses for 'Good'.
- Only the Solidification Time Adjustment skill was not in the unsatisfactory range and received a barely satisfactory rating by getting 68.8% 'Good' responses.

7.3.3.6 Machining

Required Skills	No. of Responses	Good	Not Good	Assessment
Positioning system handling	28	57.1%	42.9%	
Casting design consideration	22	77.3%	22.7%	
Pressure die casting machine handling	23	65.2%	34.8%	
Machining components with repeatable accuracy	17	47.1%	52.9%	
Machining Overall	90	62.2%	37.8%	

Table 38 - Skills Quality Rating in Machining in Metal Casting

- Overall skill rating of Machining in Metal Casting process was in the yellow range with 62.2% score; indicating that there is room for improvement in skill quality.
- Casting design was the only skill which was rated satisfactory in this sub-process.





- Machining components with repeatable accuracy was the skill with the lowest quality. 53% responses fell in 'Not Good' category due to which a double red rating was assigned to it.
- The rating of Positioning System Handling was also unsatisfactory with only 57% score.
- Rating of Pressure die casting machine handling skill also indicated the need for improvement.

7.3.3.7 Heat Treatment

Table 39 - Skills Quality Rating in Heat Treatment in Metal Casting

Required Skills	No. of Responses	Good	Not Good	Assessment
Cleaning oxides techniques	7	85.7%	14.3%	
Oven operating techniques	3	100.0%	0.0%	
Troubleshooting	3	100.0%	0.0%	
Heat Treatment Overall	13	92.3%	7.7%	

- Heat Treatment in Metal Casting was the only sub-process in which the ratings of all the three required skills of cleaning oxides techniques, oven operating techniques and troubleshooting were very satisfactory.
- The Overall rating of Heat Treatment was also very satisfactory.
- The result however should be interpreted with care as the numbers of responses used to arrive at these ratings were small.

7.3.3.8 Surface Treatment/Electroplating

Required Skills	No. of Responses	Good	Not Good	Assessment
Paint Mixing	27	70.4%	29.6%	
Humidity level determination	23	78.3%	21.7%	
Electroplating techniques	24	58.3%	41.7%	
Polishing Techniques	21	61.9%	38.1%	
Surface Treatment/ Electroplating Overall	95	67.4%	32.6%	

Table 40 - Skills Quality Rating in Surface Treatment in Metal Casting

- Four skills were required for Surface Treatment/Electroplating process.
- Overall quality rating was 67.4%; meaning thereby that improvement was required in the skill quality.
- Skills of paint mixing and humidity level determination were rated satisfactory with 70.4% and 78.3% 'Good' responses.





• The key skill of Electroplating Techniques was rated Unsatisfactory with only 58% responses of 'Good'.

7.3.3.9 Metal Casting-Assembly & Finishing

Table 41 - Skills Quality Rating in Assembly & Finishing in Metal Casting

Required Skills	No. of Responses	Good	Not Good	Assessment
Nut Fitting	19	63.2%	36.8%	
Process Determination and				
Adjustments	14	71.4%	28.6%	
Ensure Standardized Assembly	12	66.7%	33.3%	
Determining Assembly				
Sequence	7	85.7%	14.3%	
Metal Casting-Assembly &				
Finishing	52	69.2%	30.8%	

- Quality rating of Assembly & Finishing sub-process in Metal Casting process marginally fell in the yellow range by obtaining 69.2% score for 'Good'.
- Skills of Process Determination and Adjustments and Determining Assembly Sequence were rated satisfactory with 71.4% and 85.7% score respectively.
- Skills of Nut Fitting and Ensuring Standardization required improvements as they scored 63% and 66.7% scores respectively and fell in yellow range.

7.3.3.10 Metal Casting-Inspection / Quality Control & Packing

Table 42 - Skills Quality Rating in Inspection/QC & Packing in Metal Casting

Required Skills	No. of Responses	Good	Not Good	Assessment
Quality Compliance	15	73.3%	26.7%	
Quality Inspection	14	78.6%	21.4%	
TQM Application	13	84.6%	15.4%	
Defect Identification	11	54.5%	45.5%	
Overall Inspection/Quality Control & Packaging	53	73.6%	26.4%	

- Overall quality rating was satisfactory with 73.6% score.
- TQM application was the skill with highest quality rating of 84.6%.
- All the skills were rated satisfactory except Defect Identification which was rated unsatisfactory with only 54.5% responses as Good.

7.3.3.10.1 Stores/Material Handling

Table 43 - Skills Quality Rating in Stores/Material Handling in Metal Casting





Required Skills	No. of Responses	Good	Not Good	Assessment
Reasonable Inventory				
Knowledge	31	64.5%	35.5%	\sim
Inventory Management	33	54.5%	45.5%	
Overall Stores/Material Handling	64	59.4%	40.6%	

- None of the two skills were rated satisfactory.
- Inventory management rating was unsatisfactory with 54.5% score and overall rating was marginally unsatisfactory with 59.4% score.

7.3.3.11 Skill Quality Ratings in Metal Forging Process

The surveyed enterprises identified five main sub-processes in Metal Forging process. Each of these sub-processes were analysed with respect to required skills and quality rating was obtained on the defined scale of 'Good' and 'Not Good'. Inspection and Quality was the highest rated sub-process obtaining 78.6% score; while Heating & Forging was the sub-process with the lowest skill rating of 59.3%. Figure 68shows the comparison of five sub-processes of Metal Forging process.

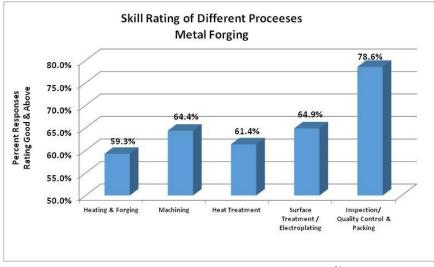


Figure 68 - Skill Ratings in Metal Forging³¹

All the sub-processes were further analysed to identify quality ratings of individual skills required to carry out these sub-processes. The results are tabulated in Tables 44 to 48.

7.3.3.11.1 Heating & Forging

Table 44 - Skills Quality	Rating in Heating	& Forging in Metal Forgi	ing
	8 8	0 0 0	0

Required Skills	No. of Responses	Good	Not Good	Assessment
Tube Swaging	20	40.0%	60.0%	

³¹The total of mentioned percentages exceed 100% due to multiple responses as each sub-process is rated separately





EDM Machine operation	15	66.7%	33.3%	
Open and closed die functions	11	81.8%	18.2%	
Ultrasonic cleaning	8	62.5%	37.5%	
Overall Heating & Forging	54	59.3%	40.7%	

- Four types of skills were identified by the responding enterprises required for carrying out Metal Forging process. Overall skill quality rating was unsatisfactory with 59.3% score.
- Tube Swaging was the lowest rated skill. Only 40% of the responses were rated as 'Good' taking the skill to very unsatisfactory range, shown by two red flags.
- EDM Machine Operation and Ultrasonic Cleaning were rated as barely satisfactory with 66.7% and 62.5% 'Good' responses respectively.
- Open and Closed Die functions was rated as very satisfactory while obtaining 81.8% 'Good' responses.

7.3.3.11.2 Metal Forging-Machining

	No. of			
Required Skills	Responses	Good	Not Good	Assessment
Barreling and Cogging				
Techniques	23	60.9%	39.1%	\sim
Precision Forging Techniques	20	55.0%	45.0%	
Tool Paths, Cutting and Plotting				
Motions Operations	16	75.0%	25.0%	
Application of Specific				
Lubricants	14	71.4%	28.6%	
Metal Forging-Machining	73	64.4%	35.6%	

Table 45 - Skills Quality Rating in Machining in Metal Forging

- Four types of main skills were identified for this sub-process. Two were rated satisfactory, one barely satisfactory and one unsatisfactory.
- Tool Paths-Cutting and Plotting Motion Operations and Lubrication related skills were rated satisfactory.
- Quality of Precision Forging Techniques was rated unsatisfactory. Only 55% responses were classified as 'Good'.
- Rating of Barreling and Cogging skills fell in yellow range with 60.9% score.

7.3.3.11.3 Metal Forging-Heat Treatment

Table 46 - Skills Quality Rating in Heat Treatment in Metal Forging

Required Skills	No. of Responses	Good	Not Good	Assessment
Cleaning Oxides Techniques	12	41.7%	58.3%	





Temperature Control	12	75.0%	25.0%	
Oven Operating Techniques	10	60.0%	40.0%	
Heat Specification				
Conformance	10	70.0%	30.0%	\sim
Metal Forging - Heat				
Treatment Overall	44	61.4%	38.6%	

- Two of the four skills were rated satisfactory, one barely satisfactory and one very unsatisfactory.
- Cleaning Oxides Techniques was rated as the lowest quality skill with only 41.7% responses as 'Good', and was consequently marked with two red flags.
- Temperature control and Heat Specification Conformance were the two related skills and both were rated satisfactory with 75% and 70% scores respectively.
- Oven Operating Techniques was identified as the skill requiring an improvement to move to satisfactory range. It was close to unsatisfactory red range with 60% score.

7.3.3.11.4 Metal Forging-Surface Treatment/Electroplating

Required Skills	No. of Responses	Good	Not Good	Assessment
Anodizing Techniques	19	42.1%	57.9%	
Application of Required Design	15	73.3%	26.7%	
Buffing and Polishing Techniques	13	76.9%	23.1%	
Polishing Techniques	10	80.0%	20.0%	
MetalForging-SurfaceTreatment/Electroplating	57	64.9%	35.1%	

Table 47 - Skills Quality Rating in Surface Treatment in Metal Forging

- Overall skill quality rating of Surface Treatment/Electroplating sub-process in Metal Forging was rated as barely satisfactory with 65% 'Good' responses.
- Quality rating of three skills of Design Application, Buffing and Polishing were rated satisfactory.
- Overall skill rating of the sub-process fell in yellow range due to very low score of 42% in Anodizing Techniques. The skill was rated very unsatisfactory with two red flags.

7.3.3.11.5 Metal Forging-Inspection/Quality Control & Packing

Table 48 - Skills Quality Rating in Inspection/QC & Packing in Metal Forging

Required Skills	No. of Responses	Good	Not Good	Assessment
Quality Compliance	24	70.8%	29.2%	





Quality Inspection	16	87.5%	12.5%	
Defect Identification	3	66.7%	33.3%	
TQM Application	13	84.6%	15.4%	
MetalForging-Inspection/Quality Control & Packing	56	78.6%	21.4%	

- Overall skill rating of Inspection/Quality Control & Packing was satisfactory with 78.6% responses as 'Good'.
- Three of the four required skills were rated very satisfactory or satisfactory.
- Just like in other processes, Defect Identification skill was rated relatively low with 66.7% score; thereby obtaining a yellow rating.

7.3.3.12 Skill Quality Rating Rubber & Plastic Parts Subsector

Five types of sub-processes were identified in Rubber & Plastic parts subsector. Skill quality ratings for each of those sub-processes are presented in Figure 69.

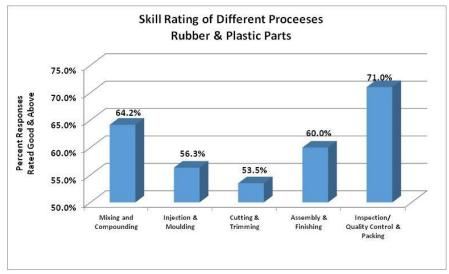


Figure 69 - Skill Ratings in Rubber/Plastic Parts³²

Only one sub-process, Inspection/Quality Control & Packing was rated as satisfactory with 71% responses found to be 'Good'. The sub-processes of Mixing & Compounding and Assembly & Finishing were rated as barely satisfactory with 64.2% and 60% score respectively. Injection & Moulding and Cutting & Trimming sub-processes were rated as unsatisfactory with respect to skill quality; with only 56.3% and 53.5% responses falling under 'Good' category.

The sub-processes were further analysed with respect to individual skills to clearly identify the skills where the quality was rated satisfactory and those where improvement was required. The analysis is presented in Table 49to Table 53.

³²The total of mentioned percentages exceed 100% due to multiple responses as each sub-process is rated separately





7.3.3.12.1 Mixing and Compounding

	No. of			
Required Skills	Responses	Good	Not Good	Assessment
Fire & Explosion Safety				
Measures	31	74.2%	25.8%	
Sequential Mixing	28	57.1%	42.9%	
Shrinkage, Weight and Volume				
Handling	25	64.0%	36.0%	\sim
Rubber Sheet Gauge				
Adjustment	22	59.1%	40.9%	
Mixing & Compounding				
Overall	106	64.2%	35.8%	

Table 49 - Skills Quality Rating in Mixing & Compounding in Rub	ber/Plastics Parts
-----------------------------------------------------------------	--------------------

- Overall skill rating of Mixing & Compounding sub-process was barely satisfactory, marked with a yellow flag.
- Only one of the four required skills, Fire &Explosion Safety Measures was rated satisfactory with 74.2% responses in 'Good' category.
- The skill quality of Sequential Mixing and Rubber Sheet Gauge Adjustment was rated unsatisfactory with 57% and 59% scores respectively.
- Shrinkage, Weight & Volume Handling was barely satisfactory with a score of 64.2% and a yellow rating.

7.3.3.12.2 Rubber and Plastic - Injection & Moulding

Required Skills	No. of Responses	Good	Not Good	Assessment
Transfer Moulding Skills	46	60.9%	39.1%	
Compression Moulding Skills	41	48.8%	51.2%	
Shrinkage adjustments	31	58.1%	41.9%	
Process & machine schematics	24	58.3%	41.7%	
Rubber and Plastic - Injection & Moulding	142	56.3%	43.7%	

- Injection and Moulding was rated as unsatisfactory with respect to overall skill quality. Good rating was only 56.3%.
- Three of the four required skills were rated unsatisfactory. Compression Moulding Skills was rated as very unsatisfactory with 48.8% score while Shrinkage Adjustment and Process & Machine Schematics was rated as unsatisfactory with only 58.1% and 58.3% responses in 'Good' category.
- Transfer Moulding skills were rated relatively better; however, this was also barely satisfactory with 60.9% score.





7.3.3.12.3 Rubber and Plastic - Cutting & Trimming

Required Skills	No. of Responses	Good	Not Good	Assessment
Cutting Size Adjustment	39	53.8%	46.2%	
Efficiency & Effectiveness	37	43.2%	56.8%	
Task Accomplishment	28	60.7%	39.3%	\sim
Wastage Control	25	60.0%	40.0%	\sim
Rubber and Plastic - Cutting				
& Trimming	129	53.5%	46.5%	

Table 51 - Skills Quality Rating in Cutting & Trimming in Rubber/Plastics Parts

- Cutting & Trimming was the lowest rated skill in Rubber/Plastic parts subsector with only 53.5% responses in 'Good' category.
- Efficiency & Effectiveness skills were rated very unsatisfactory with a score of 43.2% and two red flags.
- Cutting size adjustment was also rated unsatisfactory with 53.8% responses as 'Good'.
- Skills quality ratings of Task Accomplishment and Wastage Control were barely satisfactory and were marked with yellow flags.

7.3.3.12.4 Rubber and Plastic -Assembly & Finishing

Table 52 - Skills Quality Rating in Assembly & Finishing in Rubber/Plastics Parts

	•	8		
Required Skills	No. of Responses	Good	Not Good	Assessment
Determining Assembly				
Sequence	34	58.8%	41.2%	
Nut Fitting	26	69.2%	30.8%	
Process Determination &				
Adjustments	25	52.0%	48.0%	
Ensure Standardized Assembly	20	60.0%	40.0%	
Rubber and Plastic -Assembly				
& Finishing	105	60.0%	40.0%	\sim

- Assembly & Finishing sub-process obtained an overall skill rating of 60% which marginally classified it in yellow category, showing that it is barely satisfactory.
- Two skills, Determining Assembly Sequence and Process Determination & Adjustments were rated as unsatisfactory and the other two, Nut Fitting and Ensuring Standardized Assembly were rated as barely satisfactory.
- The sub-process deserved special attention since none of the skills in Assembly & Finishing sub-process was rated satisfactory.

7.3.3.12.5 Rubber and Plastic -Inspection/Quality Control & Packing





Required Skills	No. of Responses	Good	Not Good	Assessment
TQM Application	33	75.8%	24.2%	
Defect Identification	29	65.5%	34.5%	
Quality Compliance	25	64.0%	36.0%	
Quality Inspection	20	80.0%	20.0%	
Inspection/Quality Control &				
Packing	107	71.0%	29.0%	

Table 53 - Skills Quality Rating in Inspection/QC & Packing in Rubber/Plastics Parts

- Like in other subsectors/processes, the sub-process of Inspection/Quality Control & Packing was rated as satisfactory with respect to skill quality. 71% responses were obtained for 'Good' category.
- Quality Inspection was rated as very satisfactory and TQM application as satisfactory.
- Defect identification and Quality compliance were rated as barely satisfactory in yellow range. This trend is seen throughout auto parts sector that defect identification is identified as an area that requires special attention.

7.3.4 Skill Quality Rating Electronic/Electrical Parts Subsector

Skill quality rating of Electronic/Electrical parts subsector is the third best among all the subsectors/processes. Only Design/tools & Dies and Assembly/Sub Assembly subsectors have skills quality ratings higher than Electronic/Electrical parts.

The two sub-processes of Painting & Finishing and Inspection/Quality Control obtained high skill quality ratings of 81% and 80% respectively. The other three sub-processes of components Intake, Assembly Line and Packing were classified as barely satisfactory with 64.3%, 62.5% and 60% responses rated as 'Good'. Comparison of sub-processes in terms of skill ratings is shown in Figure 70.

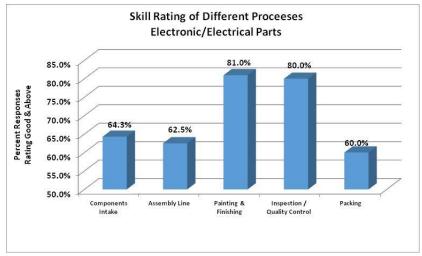


Figure 70 - Skill Ratings in electronic/Electrical Parts³³

³³The total of mentioned percentages exceed 100% due to multiple responses as each sub-process is rated separately





Analysis of sub-processes with respect to individual skills to segregate the skills with respect to industry's satisfaction is presented in Table 54 to Table 58.

7.3.4.1 Electronic/Electrical Parts-Individual Skills Analysis

7.3.4.1.1 Components Intake

Table 54 - Skills Quality Rating in Components Intake in Electronic/Electrical Parts

Deguined Skills	No. of	Cood	Not Cood	Aggggmgnt
Required Skills	Responses	Good	Not Good	Assessment
Reasonable Inventory				
Knowledge	21	66.7%	33.3%	\sim
Inventory Management	7	57.1%	42.9%	
Components Intake Overall	28	64.3%	35.7%	

- Overall skill rating was 64.3%, classifying the sub-process as barely satisfactory.
- Inventory knowledge was rated barely satisfactory while inventory management skill was rated as unsatisfactory with only 57.1% responses as 'Good'.

7.3.4.1.2 Assembly Line

Table 55 - Skills Quality Rating in Assembly Line in Electronic/Electrical Parts

Required Skills	No. of Responses	Good	Not Good	Assessment
Circuit Resistance Test				
Operations	12	66.7%	33.3%	
Starter Drive Operations	9	33.3%	66.7%	
Fuel Gauge Operations	11	72.7%	27.3%	
Ignition Coil Operations	8	75.0%	25.0%	
Assembly Line Overall	40	62.5%	37.5%	

- Overall skill quality rating for Assembly Line of Electronic/Electrical Parts subsector was barely satisfactory with 62.5% responses in 'Good' category.
- Fuel Gauge Operations and Ignition Coil Operations were rated satisfactory.
- Skill quality of Starter Driver Operations was rated very unsatisfactory with a score of only 33%, and was thus, marked with two red flags.
- Skills quality of circuit resistance test operations was barely satisfactory.

7.3.4.1.3 Painting & Finishing

Table 56 - Skills Quality Rating in Paining & Finishing in Electronic/Electrical Parts

	No. of			
Required Skills	Responses	Good	Not Good	Assessment
00				





Paint mixing	8	87.5%	12.5%	
Humidity level determination	8	62.5%	37.5%	
Nozzle Adjustment	2	100.0%	0.0%	
Formula deriving	3	100.0%	0.0%	
Painting & Finishing	21	81.0%	19.0%	

- The sub-process was rated very satisfactory with respect to the quality of the required skills. 81% responses were rated as Good.
- Skills quality in Paint Mixing, Nozzle Level Determination and Formula Deriving were rated very satisfactory.
- Humidity Level Determination was relatively rated lower and fell in yellow, barely satisfactory range.
- The results however be interpreted with care as the numbers of responses obtained for different skills are small.

7.3.4.1.4 Inspection/Quality Control

Required Skills	No. of Responses	Good	Not Good	Assessment
TQM application	5	80.0%	20.0%	
Quality compliance	7	85.7%	14.3%	
Defect identification	7	71.4%	28.6%	
Quality inspection	6	83.3%	16.7%	
Inspection / Quality Control	25	80.0%	20.0%	

- Inspection/Quality Control sub-process is rated very satisfactory with respect to skills quality.
- Three required skills were rated very satisfactory while Defect Identification was rated satisfactory. This was the only sub-process in which the Defect Identification Rating was classified as satisfactory.

7.3.4.1.5 Packing

Required Skills	No. of Responses	Good	Not Good	Assessment
Ceramic Packaging techniques	7	71.4%	28.6%	
System Level Packaging techniques	4	50.0%	50.0%	





Material handling	5	40.0%	60.0%	
Metal Packaging techniques	4	75.0%	25.0%	
Packing Overall	20	60.0%	40.0%	

- The two types of packaging techniques, ceramic and metal were rated satisfactory with 71.4% and 75% responses as 'Good'.
- System level packaging techniques was rated unsatisfactory, while material handling was rated very unsatisfactory with only 40% responses as 'Good'.
- Overall rating of the packing sub-process was barely satisfactory.
- Number of responses obtained for these skills rating was small.

7.3.5 Assembly/Sub Assembly Operations

On an overall basis, Assembly/Sub Assembly operations received obtained 71.6% responses in 'Good' category which gives it a satisfactory rating. However, many sub-processes in this subsector fell below the satisfaction level. Skills in Chassis shop and Paint shop received 75.6% and 72.1% ratings respectively while skills in Assembly line were close to satisfactory range with 69.85 'Good' responses. Figure 71 shows the skill rating comparison.

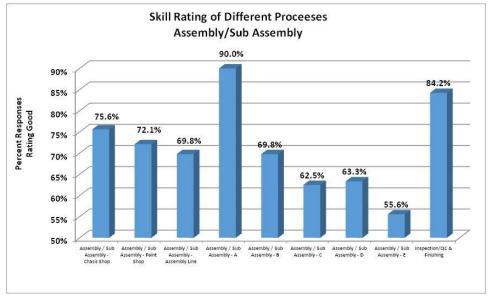


Figure 71 - Skill Ratings in Assembly/Sub Assembly³⁴

Five different Assembly/Sub Assembly processes were identified as A, B, C, D and E. Of these, the skill rating of 'A' process was very high with 90% responses in Good category. The lowest skill rating of 55.6% was obtained for 'E' process, assigning it unsatisfactory rating. Skill ratings of the remaining three processes fell in the barely satisfactory range. Just like in other subsectors/processes, Inspection/Quality Control received a satisfactory skill rating.

All the sub-processes of Assembly/Sub Assembly were analysed individually for assessment of skills required for these sub-processes. The results are discussed from Table 59 to Table 67.

³⁴The total of mentioned percentages exceed 100% due to multiple responses as each sub-process is rated separately





7.3.5.1 Assembly / Sub Assembly - Chassis Shop

Required Skills	No. of Responses	Good	Not Good	Assessment
Assembly Line Balancing	12	83.3%	16.7%	
Appropriate Object Placement	11	81.8%	18.2%	
Monitoring Assembly Process	10	70.0%	30.0%	
Assembly Process Pattern	8	62.5%	37.5%	
OverallAssemblySubAssembly - Chassis Shop	41	75.6%	24.4%	

Table 59 - Skills Quality Rating in Chassis Shop in Assembly/Sub Assembly

- Overall rating of Chassis shop was satisfactory with 75.6% score.
- Only the skill related to Assembly Process Pattern was rated in almost satisfactory range with a yellow flag indicating the need for improvement.
- Assembly Line Balancing and Appropriate Object Placement were rated very satisfactory while Monitoring Assembly Process was rated satisfactory with 70% 'Good' responses.

7.3.5.2 Assembly / Sub Assembly - Paint Shop

Required Skills	No. of Responses	Good	Not Good	Assessment
Recommended Spray Nozzle	12	41.7%	58.3%	
Surface preparation	13	84.6%	15.4%	
Formula Deriving	10	70.0%	30.0%	
Humidity level Adjustment	8	100.0%	0.0%	
Overall Assembly/Sub Assembly - Paint Shop	43	72.1%	27.9%	

Table 60 - Skills Quality Rating in Paint Shop in Assembly/Sub Assembly

- Overall rating of Paint shop skills was satisfactory with 72% score.
- Surface preparation was rated very satisfactory.
- Skill required for recommendations of spray nozzles was rated very unsatisfactory. Only 41.7% responses fell in 'Good' category.
- Formula Deriving skill was marginally satisfactory whereas Humidity Level Adjustment was declared 'Good' in all the responses.

7.3.5.3 Assembly / Sub Assembly - Assembly Line

Table 61 - Skills Quality Rating in Assembly Line in	Assembly/Sub Assembly
------------------------------------------------------	-----------------------

Required Skills	No. of	Good	Not Good	Assessment
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	Responses			
Efficient performance of				
assembly tasks	12	66.7%	33.3%	
Construction of prototype	13	76.9%	23.1%	
Sequencing of tasks	10	60.0%	40.0%	
Removal of production				
constraints	8	75.0%	25.0%	\sim
Overall Assembly/Sub				\sim
Assembly –Assembly Line	43	69.8%	30.2%	2

- Overall, Assembly Line sub-process received 69.8% 'Good' responses; putting it in barely satisfactory range.
- Efficient performance of assembly tasks and sequencing of tasks were the two skills in yellow range showing the need for improvement. These are the two skills which require some planning expertise.
- Skills for construction of prototype were rated satisfactory with 77% score and those required for removing production constraints were also satisfactory with 75% score.

7.3.5.4 Assembly/Sub Assembly - A

	No. of			
Required Skills	Responses	Good	Not Good	
Efficient performance of				\sim
assembly tasks	7	100.0%	0.0%	
Construction of prototype	4	50.0%	50.0%	
Sequencing of tasks	9	88.9%	11.1%	
Removal of production				\sim
constraints	10	100.0%	0.0%	
Overall Assembly/Sub				
Assembly - A	30	90.0%	10.0%	

Table 62 - Skills Quality Rating in Assembly-A in Assembly/Sub Assembly

- Overall rating of this sub-process was very satisfactory with 90% responses falling in 'Good' category.
- Quality of three of the four required skills was rated very satisfactory.
- Construction of prototype was rated unsatisfactory and was marked with a red flag by receiving 50% 'Good' responses (total responses were only 4). This is in contrast to Assembly Line sub-process where construction of prototype was rated satisfactory with 77% score.

7.3.5.5 Assembly / Sub Assembly - B

 Table 63 - Skills Quality Rating in Assembly-B in Assembly/Sub Assembly

Required Skills	No. of Responses	Good	Not Good	
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OverallAssembly/SubAssembly - B	43	69.8%	30.2%	
Removal of production constraints	15	80.0%	20.0%	
Sequencing of tasks	7	71.4%	28.6%	
Construction of prototype	9	66.7%	33.3%	
Efficient performance of assembly tasks	12	58.3%	41.7%	

- Overall rating of this sub-process was barely satisfactory with 69.8% 'Good' responses.
- Efficient performance of assembly tasks was rated unsatisfactory and marked with red flag with 58% rating.
- Removal of production constraints was rated very satisfactory.

7.3.5.6 Assembly / Sub Assembly - C

Table 64 - Skills Quality Rating in Assembly-C in Assembly/Sub Assembly

Required Skills	No. of Responses	Good	Not Good	
Efficient performance of	<u> </u>			~
assembly tasks	11	54.5%	45.5%	
Construction of prototype	11	63.6%	36.4%	
Sequencing of tasks	9	66.7%	33.3%	
Removal of production				
constraints	9	66.7%	33.3%	2
Overall Assembly/Sub				
Assembly - C	40	62.5%	37.5%	~

- Overall rating of 'C' Assembly/Sub Assembly sub-process was barely satisfactory with 62.5% responses in 'Good' category.
- Three of the four required skills were rated yellow indicating the need for improvement.
- Efficient performance of assembly tasks received only 54.5% score putting it in unsatisfactory rating.

7.3.5.7 Assembly/Sub Assembly - D

Table 65 - Skills Quality Rating in Assembly-D in Assembly/Sub Assembly

Required Skills	No. of Responses	Good	Not Good	
Efficient performance of assembly tasks	10	60.0%	40.0%	
Construction of prototype	11	54.5%	45.5%	





Sequencing of tasks	4	50.0%	50.0%	
Removal of production constraints	5	100.0%	0.0%	
Overall Assembly/Sub Assembly - D	30	63.3%	36.7%	

- Overall rating of the 'D' sub-process was barely satisfactory with 63.3% score.
- Construction of prototype and sequencing of skills were rated as weak skills in this sub-process and received red unsatisfactory rating.
- Efficient performance of assembly tasks was barely satisfactory.

7.3.5.8 Assembly / Sub Assembly - E

Required Skills	No. of Responses	Good	Not Good	
Efficient performance of assembly tasks	6	33.3%	66.7%	
Construction of prototype	9	44.4%	55.6%	
Sequencing of tasks	6	66.7%	33.3%	
Removal of production constraints	6	83.3%	16.7%	
Overall Assembly/Sub Assembly - E	27	55.6%	44.4%	

Table 66 - Skills Quality Rating in Assembly-E in Assembly/Sub Assembly

- Assembly/Sub Assembly E was the sub-process receiving the lowest skill rating among all sub-processes of Assembly/Sub Assembly subsector. Only 55.6% responses were rated as 'Good', assigning a red flag to it.
- Efficient performance of assembly tasks was the weakest skill with a score of only 33% and an unsatisfactory rating.
- Construction of prototype was also rated unsatisfactory with only 44.4% 'Good' responses.
- Removal of production constraints was not a problematic skill in this sub-process.

7.3.5.9 Inspection, Testing, QC & Finishing

Table 67 - Skills Quality Rating in Inspection/QC & Finishing in Assembly/Sub Assembly

Required Skills	No. of Responses	Good	Not Good	
TQM application	7	100.0%	0.0%	
Quality inspection	4	75.0%	25.0%	
Defect identification	15	93.3%	6.7%	
Quality compliance	12	66.7%	33.3%	





Overall Inspection, Testing, QC				
& Finishing	38	84.2%	15.8%	

- Inspection/Quality Control & Finishing skills were rated very satisfactory with 84% responses falling in 'Good' category.
- Except for Quality compliance skill, the other three skills were rated very satisfactory.
- TQM was the skill where 100% of the responses fell in 'Good' category.

7.4 Skills Criticality Analysis³⁵

7.4.1 Criticality Analysis of Technical Skills

The survey analysed the sub-processes under all the subsectors/processes with respect to their criticality for the overall process, production and the product quality. Criticality of majority of the sub-processes was rated high with some classified as medium. There were very few responses in the 'Low' rating.

The following analysis also relates the criticality level of the jobs to the skill ratings; shown in colour codes explained in the previous section. This helps to identify the jobs in which there is need for immediate improvement. For example the skills rated with high criticality and low quality (red or yellow rating) is the ones that need immediate attention for improvement.

7.4.1.1 Design Section / Tools & Dye/ Technical Support

	No. of Enterprises				Skills
Sub-Process	High	Medium	Low	Criticality Rating	Quality Rating
Design Section / Tools &					2
Dye/ Technical Support	73	11	0	High	

The process was rated as highly critical by 73 responding enterprises, 87% of the total responses. The skill quality rating was satisfactory.

7.4.1.2 Sheet Metal

Table 69 - Skills Criticality-Quality Analysis in Sheet Metal

	No. o	f Enterprise		Skills	
Sub-Process	High	Medium	Low	Criticality Rating	Quality Rating
Cutting	60	26	4	High	
Pressing / Stamping	69	16	4	High	
Welding & Drilling	54	31	4	High	
Heat Treatment	25	33	1	Medium	

³⁵Criticality refers to the relative importance of Process in the overall business operations, whether it is highly important or less important





Surface Treatment/ Painting/ Electroplating	36	18	2	High	
Assembly & Finishing	40	44	0	Medium	
Inspection / Quality Control & Packing	54	32	0	High	

In Sheet Metal process, the criticality rating of the jobs of Heat Treatment and Assembly & Finishing was rated Medium and that of all others High. Even for the two jobs rated Medium, the number of responses for Medium were only marginally higher than those for High. None of the jobs was rated as of Low criticality.

Comparing the ratings of criticality and quality, it was seen that Pressing/Stamping was the job for which criticality was High but quality rating was unsatisfactory. Similarly, Heat Treatment was the other area where criticality was Medium but quality was unsatisfactory. Surface Treatment/Electroplating was the only job where the criticality-quality match was satisfactory.

7.4.1.3 Metal Casting

	No	o. of Enterpri	~	Skills	
Sub-Process	High	Medium	Low	Criticality Rating	Quality Rating
Metal Casting - Stores /					
Material Handling	1	21	6	Medium	
Metal Casting - Melting &					
Casting	26	0	2	High	
Metal Casting - Machining	12	16	0	Medium	
Metal Casting - Heat					
Treatment	22	6	0	High	
Metal Casting - Surface					
Treatment / Electroplating	11	17	0	Medium	\sim
Metal Casting - Assembly &					\sim
Finishing	23	5	0	High	\sim
Metal Casting - Inspection /					
Quality Control & Packing	25	3	0	High	

 Table 70 - Skills Criticality-Quality Analysis in Metal Casting

In Metal Casting, four of the seven sub-processes were rated as of High criticality and three as of Medium. The difference between the number of responses for High and Medium was however small (57% responses for Medium and 43% for High for Machining, and 61% for Medium and 39% for High for Surface Treatment). However, in case of stores and material handling, the response was predominantly in favour of Medium criticality.

Melting & Casting and Inspection & Quality control were the two jobs where the criticality level was High but skills level was unsatisfactory; indicating the need to deal with these two skill areas on priority.





7.4.1.4 Metal Forging

	N	o. of Enterpri	~	Skill	
Sub-Process	High	Medium	Low	Criticality Rating	Quality Rating
Heating & Forging	12	7	0	High	
Machining	10	9	0	High	
Heat Treatment	3	16	0	Medium	
Surface					\sim
Treatment/Electroplating	3	14	2	Medium	
Inspection/ Quality Control &					
Packing	17	2	0	High	

Table 71 - Skills Criticality-Quality Analysis in Metal Forging

Three of the four sub/processes were rated as of High criticality and two as Medium. Heat Treatment and Surface Treatment were rated as of Medium criticality and the number of responses for Medium was more than High by a wide margin. Whereas Machining was rated High by 10 responses compared to 9 responses for Medium.

Heating and Forging was the job which was rated highly critical for Metal Forging but the quality of skills for this job was unsatisfactory; thus requiring attention. Similarly, machining was another job requiring improvement since the criticality was High but the skill quality rating is barely satisfactory.

7.4.1.5 Rubber and Plastic

	No	of Enterpris	ses	~	Skill
Sub-Process	High	Medium	Low	Criticality Rating	Quality Rating
Rubber and Plastic - Mixing &					\sim
Compounding	35	15	0	High	\sim
Rubber and Plastic - Injection &					
Moulding	49	1	0	High	~
Rubber and Plastic - Cutting &					
Trimming	17	25	8	Medium	
Assembly & Finishing	7	26	17	Medium	
Inspection/ Quality Control &					
Packing	37	13	0	High	

Mixing & Compounding, Injection & Moulding and Quality Control were the skills with high criticality. For Injection & Moulding 98% responses were for High which indicated a consensus. Cutting & Trimming and Assembly & Finishing were the ones with Medium Criticality. Assembly & Finishing appeared as a unique job since it was the only job where the numbers of responses for 'Low' were higher than those for 'High'. Similarly, the number





of responses for Cutting & Trimming were 8 (16%) which is the higher figure compared to the overall trend for criticality analysis.

Injection & Moulding was the job with High criticality but unsatisfactory skills. So it should be dealt at priority. Mixing and Compounding was the other job where improvement is desirable due to its high criticality and barely satisfactory skill quality.

7.4.1.6 Electronic/Electrical Parts

Table 73 - Skills Criticality-Quality Analysis in Electronic/electrical Parts

	No	. of Enterpri	ses		Skill
Sub-Process	High	Medium	Low	Criticality Rating	Quality Rating
Components Intake	1	8	0	Medium	
Assembly Line	5	4	0	High	
Painting & Finishing	8	0	0	High	
Inspection / Quality Control	6	3	0	High	
Packing	0	4	4	Low	

Three of the jobs were rated as of High criticality, one of Medium and one of Low criticality. Packing obtained a low criticality rating. Electronic/Electrical part was the only subsector in which any skill was given 'Low' criticality rating.

This was only subsector in which none of the jobs received an unsatisfactory rating. All the quality ratings match with the criticality rating. Assembly line can be partially classified as a skill which should be considered for improvement as this has a High criticality and a barely satisfactory quality rating.

7.4.1.7 Assembly / Sub Assembly

	No	. of Enterpris		Skill	
Sub-Process	High	Medium	Low	Criticality Rating	Quality Rating
Assembly / Sub Assembly - Chassis					
Shop	11	3	0	High	~
Assembly / Sub Assembly - Paint					
Shop	14	0	0	High	
Assembly / Sub Assembly -					\sim
Assembly Line	14	0	0	High	~
Assembly / Sub Assembly - A	10	0	0	High	
Assembly / Sub Assembly - B	10	0	0	High	
Assembly / Sub Assembly - C	10	0	0	High	

Table 74 - Skills Criticality-Quality Analysis in Assembly/Sub Assembly





Assembly / Sub Assembly - D	10	0	0	High	
Assembly / Sub Assembly - E	10	0	0	High	
Inspection, Testing, QC & Finishing	14	0	0	High	

Assembly/Sub Assembly was found to be the only subsector in which all the jobs were rated as having 'High' criticality. One of the reasons in this regard was that most of the enterprises in this subsector were large where strict adherence to the standard procedures and overall quality consciousness was more compared to medium or small enterprises.

There was only one job, Assembly/Sub Assembly - E, in which the quality of skills is rated unsatisfactory and the criticality is High. This should be considered for improvement.

7.4.2 Remedial Measures Suggested to Overcome Skill Deficiencies

The surveyed enterprises were asked to identify their priority to overcome skill deficiencies. They were asked to mention their priority whether there is a need for specialized trainings or a need to launch a new program or revise an existing program. Responses were obtained for all the sub-processes under each subsector/process. Total number of responses and the share of responses against the two options are summarized in Table 75.

Subsector/Process	Total Responses	Need for Further Specialized Trainings	New Program/ Program Revision
Design Section / Tools & Dye/			
Technical Support	86	45%	55%
Sheet Metal	663	68%	32%
Metal Casting	619	68%	32%
Metal Forging	82	82%	18%
Rubber and Plastic	174	78%	22%
Electronic/Electrical Parts	24	96%	4%
Assembly / Sub Assembly	64	84%	16%

Table 75 - Remedial Measures Suggested to Overcome Technical Skill Deficiencies

For Design Section/Tools & Dies process, 55% responses went in favour of New Program/Program Revision. For all other subsectors/processes, the responses emphasized the need for specialized trainings by wide margins.

While the overall response was in favour of Need for Specialized Trainings, within some subsectors/processes, there were some sub-processes against which the other option of New Program/Revision was suggested. Those sub-processes are identified below:

- Inspection/ Quality Control & Packing in Rubber & Plastic Parts subsector
- Chassis Shop in Assembly/Sub Assembly subsector

7.4.3 Criticality Analysis of Soft Skills

Criticality levels of soft skills required in a skilled worker were also assessed. It was important to assess this since real benefit of a good technically skilled worker can only be





realized if he also possesses the basic skills which are expected of any good human being. Lack of these soft skills can make a skilled worker a liability instead of an asset for the organization.

Nine soft skills were included in the analysis. The respondents rated the criticality of each soft skill as 'High', 'Medium' or 'Low'. The results are illustrated in Figure 72.

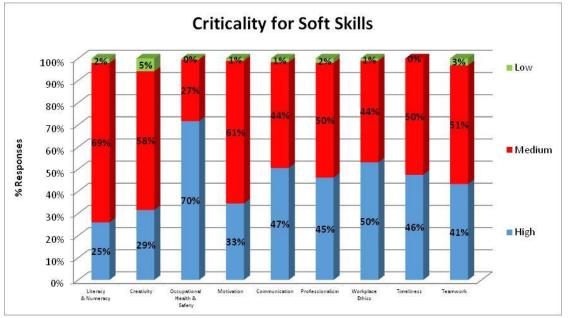


Figure 72 - Criticality for Soft Skills

The trend exhibited for soft skills is the same for soft skills as was found for technical skills. Majority of the responses were distributed between High and Medium; with very small number of responses quoted as 'Low' criticality. The highest share of 'High' responses (70%) was obtained for Occupational Health and Safety skills. This is a positive sign that the enterprises assign a high priority to safety in their organizations and consider this as an important skill that should be possessed by their employees.

The other skill in which the share of responses was 'High' as 50% was Workplace Ethics. This was considered to be an important attribute of the employees by the organizations; so as to be able to get the maximum from their technical skills. Other soft skills where the share of 'High' was more than 40% included Timeliness, Professionalism and Communication.

Shares of 'Low' responses were very small which meant that none of the soft skills were considered uncritical. However, the shares of 'Low' do provide an idea of the relative 'unimportance'. For example, for Creativity 5% responses fell in 'Low' category which showed that on a relative scale, this skill was considered to be less critical.

7.4.4 Remedial Measures for Soft Skills

The enterprises were asked to choose their preferred remedial measure from two options of 'Need for Specialized Training' or 'Including Soft Skills as Part of Existing Programmes'.

Majority of the responses were in favour of including the soft skills as part of existing programmes. Table 76shows the number of responses and their shares obtained for each of the two options.





Soft Skill	Total Responses	Need for Training	%	Include as Part of Programme	%	Overall Remedial Measure
Literacy & Numeracy	178	97	54%	81	46%	Need for Specialized Training
Creativity	170	59	35%	111	65%	Include as Part of Program
Occupational Health & Safety	156	38	24%	118	76%	Include as Part of Program
Motivation	176	71	40%	105	60%	Include as Part of Program
Communication	204	107	52%	97	48%	Need for Specialized Training
Professionalism	207	44	21%	163	79%	Include as Part of Program
Workplace Ethics	191	54	28%	137	72%	Include as Part of Program
Timeliness	196	61	31%	135	69%	Include as Part of Program
Teamwork	194	62	32%	132	68%	Include as Part of Program
Total	1673	593	35%	1080	65%	Include as Part of Program

Table 76 - Remedial Measures Suggested to Overcome Technical Skill Deficiencies

Literacy & Numeracy and Communication were the two soft skills for which the need for a specialised training was emphasize. For all other soft skills, the recommended option was to include these soft skills as part of the existing training programmes.

7.4.5 Hard-to-Fill Vacancies

The surveyed enterprises were asked about the vacancies for which they find it difficult to find the required human resource. The enterprises mentioned those positions and the number against those positions as 'hard-to-fill' vacancies.

Total number of hard-to-fill vacancies identified in 204 surveyed enterprises was 210 which came out to be 0.7% of the total workforce of auto parts sector (31,911). This is not a very significant number which indicates that on an overall basis, the issue of finding a right person (person with at least average skills level) is not very severe. However, there is a need to look within the subsectors/processes to identify the relative degree of severity of this issue. Table 77 shows the distribution of total hard-to-fill vacancies in different subsectors/processes. It also shows the share of hard-to-fill to total vacancies for each category. In order to have a combined view of both the shares, a product of the two has also been calculated and is termed as 'Relative Difficulty'. To avoid small values, this number has been reported after multiplying it with 100.

	Total	Hard-to-	Share in	Hard-to-Fill	Relative
Subsector/Sub-process	Vacancies	Fill	Total Hard-	as Total	Difficulty





		Vacancies	to-Fill	Vacancies in	A*B
			Vacancies(A)	Subsector/	
				Process (B)	
Design Section/Tools					
&Die/Technical Support	98	96	46%	98.0%	44.8
Sheet Metal	116	48	23%	41.4%	9.5
Metal Casting	8	8	4%	100.0%	3.8
Metal Forging	16	15	7%	93.8%	6.7
Rubber / Plastic Parts	69	41	20%	59.4%	11.6
Electronics / Electrical					
Parts	11	2	1%	18.2%	0.2
Assembly/Sub-					
Assembly	0	0	0%	0.0%	0.0
Store Keeping	0	0	0%	0.0%	0.0
Total	318	210	100%	66.0%	66.0

The table shows that Design section/Tools & Dies/Technical Support is the main process with the highest issue of getting good quality skilled workforce. 46% of the total hard-to-fill vacancies were found to exist in this particular process. The issue looks very serious when this share is compared with the share of jobs in this process as percent of total jobs which is only 3.7%. Severity of the issue was also confirmed by observing that 98% of the total vacancies in this process were rated as hard-to-fill by the responding enterprises. The relative difficulty for Design section/Tools & Dies/Technical Support is 44.8 which are the highest among all the subsectors/processes.

Sheet Metal process and Rubber/Plastic parts subsector were the two other main contributors to hard-to-fill vacancies; respectively accounting for 23% and 20% of the total. The issue of not being able to find the right person for the jobs was more severe for Rubber/Plastic where 59% of the total vacancies were rated hard-to-fill while the corresponding figure for Sheet Metal was 41%. This is also indicated for the relative difficulty values of 11.6 and 9.5 for Rubber/plastic and Sheet Metal.

Metal Forging was small in terms of its share in hard-to-fill vacancies (only 7%). However, when seen in terms of relative availability, the issue looked very serious. 15 out of the total 16 vacancies (93%) were categorized as hard-to-fill by the responding enterprises.

The issue of finding the right person for the job was not very severe in Electronic/Electrical parts subsector and did not exist at all in Assembly/Sub Assembly and Storekeeping where no vacancy was mentioned as hard-to-fill by any enterprise.

7.4.5.1 Sector Experts View on Availability of Skilled Workforce

As per the surveyed sector experts, the issue of availability of skilled workforce is most serious in Electronic/Electrical parts subsector. 45% of the experts thought that it is difficult to find suitably qualified trained workers in this sector. Assembly/Sub Assembly was the other sector where 35% sector experts said that good quality workforce is difficult to find. Figure 73shows the distribution of responses.





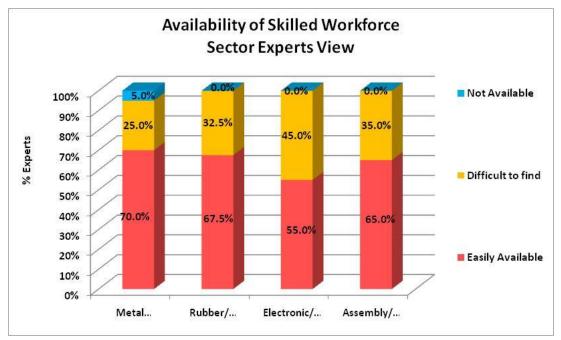


Figure 73– Availability of Skilled Workforce-Sector Experts' view

Relating this finding to the analysis of hard-to-fill vacancies of the surveyed enterprises, some differences can be observed. Electronic/Electrical parts and Assembly/Sub Assembly subsector were the two subsectors in which the hard-to-fill vacancies as percent of total vacancies were the lowest. In fact, for Assembly/Sub Assembly, no vacancies were declared as hard-to-fill. This can be attributed to be a difference in perception and reality. Although, the sector experts were fully aware of the workforce availability situation of the sector, still, their response was mainly derived from their overall perception of the sector. Whereas, the data obtained from enterprises was the ground data of actual number of total vacancies and the number of vacancies which the enterprise was finding it difficult to fill.

In Metal Parts sector, only 25% experts thought it to be difficult to find good skilled workers. This was the only subsector for which two experts (5%) said that good quality skilled workforce is not available.

7.4.5.2 Hard to Fill Vacancies in Each Subsector/Process

The following analysis provides details of hard-to-fill vacancies in each subsector/process. For each job position, total number of vacancies and the number of hard-to-fill vacancies have been listed. Share of each position in total hard-to-fill vacancies has been captured. Along with that, hard-to-fill vacancies have also been seen as percent of total vacancies for each position. The tables list only those positions in each subsector/process for which hard-to-fill vacancies have been identified. The positions for which no vacancy existed have not been included in the tables; and mentioned separately at the end.

7.4.5.2.1 Design Section/Tools & Dies/Technical Support

Distribution of hard-to-fill vacancies in Design/Tools & Dies/Technical Support section is presented in Table 78.

	Total	Hard-to-	Share in	Share of Hard-to-	Relative
Job Position	Vacancies	Fill	Subsector's	Fill Vacancies in	Difficulty







		Vacancies	Total Hard- to-Fill Vacancies (A)	Total Vacancies against the Position(B)	A*B
Tools & Dies Shop					
Supervisor/In-charge	21	21	21.9%	100.0%	21.9
Tools & Die maker	30	30	31.3%	100.0%	31.3
Designer/ Pattern maker	25	24	25.0%	96.0%	24.0
Assistant	22	21	21.9%	95.5%	20.9
Total	98	96	100.0%	98.0%	98.0

Total hard-to-fill vacancies identified by the respondents in this process were 98; which were distributed between four positions. The highest share of 31% of these vacancies was accounted by Tools & Die Maker and 100% of the vacant positions under this position were declared as hard-to-fill. Designer/Pattern Maker was the second largest contributor contributing 25% of the total hard-to-fill vacancies. 24 out of 25 vacant positions were considered hard-to-fill for this position. All the 21 vacant positions for Supervisory positions were considered hard-to-fill. No vacancy existed against the position of Helper in this subsector.

7.4.5.2.2 Sheet Metal

Distribution of hard-to-fill vacancies in Sheet Metal process is presented in Table 79.

Job Position	Total Vacancies	Hard-to- Fill Vacancies	Share in Subsector's Total Hard- to-Fill Vacancies (A)	Share of Hard-to- Fill Vacancies in Total Vacancies against the Position (B)	Relative Difficulty A*B
Supervisor / In-charge					
/Foreman	4	3	6%	75.0%	4.5
Sheet Cutter	7	7	15%	100.0%	15.0
Pressman	16	10	21%	62.5%	13.1
Welder	9	5	10%	55.6%	5.6
Driller	11	9	19%	81.8%	15.5
Oven Operator	4	3	6%	75.0%	4.5
Electroplater	9	4	8%	44.4%	3.6
Painter	7	2	4%	28.6%	1.1
Assembler	12	4	8%	33.3%	2.7
Quality Assurance Incharge	2	1	2%	50.0%	1.0
Quality Assurance					
Inspector	1	0	0%	0.0%	0.0
Helper	34	0	0%	0.0%	0.0
Total	116	48	100%	41.4%	41.4%

Table 79 - Hard-to-Fill Vacancies Distribution in Sheet Metal

Total number of hard-to-fill vacancies in Sheet Metal process was 116. Pressman and Driller were the two hardest-to-fill positions respectively accounting for 21% and 19% of the total hard-to-fill vacancies. Of these two positions, Driller was more difficult position to fill





because 82% of the total positions were hard-to-fill compared to 63% for Pressman. Welder and Sheet Cutter were the two next hard-to-fill positions. Sheet Cutter was unique in the sense that all the seven vacant positions were declared hard-to-fill. No hard-to-fill position was mentioned for Helper. 75% of the vacant positions for Supervisor and Oven Operator were declared hard-to-fill.

No vacancies existed for the positions of Quality Assistant and Packers.

7.4.5.2.3 Metal Casting

Table 80provides the distribution of hard-to-fill vacancies in Metal Casting.

Job Position	Total Vacancies	Hard-to- Fill Vacancies	Share in Subsector's Total Hard- to-Fill Vacancies (A)	Share of Hard-to- Fill Vacancies in Total Vacancies against the Position (B)	Relative Difficulty A*B
Machinist	1	1	13%	100.0%	13.0
CNC Operator	2	2	25%	100.0%	25.0
Oven Operator	5	5	63%	100.0%	63.0
Total	8	8	100%	100.0%	100.0%

 Table 80 - Hard-to-Fill Vacancies Distribution in Metal Casting

In Metal Casting sector, the issue of finding right people for technical jobs was not very severe since the number of hard-to-fill vacancies in this process was only 8. However, all of those positions were rated as hard-to-fill. Oven Operator was identified as the most sought after position accounting for 63% of the total hard-to-fill positions in the process. CNC Machine operator and Machinist were the two other hard-to-fill positions.

The job positions against which there were no vacant positions existed in Metal Casting included Melting & Casting Supervisor, Assembler, Assistant Assembler, Painter, Electroplater, Metal Polisher, Quality Supervisor, Quality Inspector, Quality Assistant, Helper and Packer.

7.4.5.2.4 Metal Forging

Distribution of hard-to-fill vacancies in Metal Forging process is presented in Table 81.

	Total	Hard-to- Fill	Share in Subsector's Total Hard- to-Fill	Share of Hard-to- Fill Vacancies in Total Vacancies against the	Relative Difficulty A*B
Job Position	Vacancies	Vacancies	Vacancies (A)	Position (B)	
Forging Supervisor / In-					
charge / Foreman	1	1	7%	100.0%	7.0
Machine Operator	3	2	13%	66.7%	8.7
Machinist	12	12	80%	100.0%	80.0
Total	16	15	100%	93.8%	93.8%

Table 81 - Hard-to-Fill Vacancies Distribution in Metal Forging





Share of Metal Forging process in total hard-to-fill vacancies was only 7% with 15 positions; however, relative difficulty of finding right people was high since 94% of the total vacant positions in Metal Forging were declared as hard-to-fill. 80% (12) of these positions were accounted for by Machinist and all of them were declared hard-to-fill. Machine Operator and Supervisor were the two other hard-to-fill positions.

The job positions against which there were no vacant positions existed in Metal Forging included Heat Technician, CNC Operator, Painter, Electroplater, Metal Polisher, Quality Supervisor, Quality Inspector, Quality Assistant, Helper and Packer.

7.4.5.2.5 <u>Rubber/Plastic Parts</u>

Distribution of hard-to-fill vacancies in Rubber/Plastic parts subsector is presented in Table 82.

		Share in Subsector's Hard-to- Total Hard-		Share of Hard-to- Fill Vacancies in Total Vacancies	Relative Difficulty A*B
Job Position	Total Vacancies	Fill Vacancies	to-Fill Vacancies (A)	against the Position (B)	
Supervisor / In-charge /					
Foreman	4	4	10%	100.0%	10.0%
Machine Operator	9	6	15%	66.7%	10.0
Moulder	11	10	24%	90.9%	21.8
Cutter / Trimmer	2	1	2%	50.0%	1.0
Assembler	2	2	5%	100.0%	5.0
Helper	31	18	44%	58.1%	25.6
Quality Supervisor	2	0	0%	0.0%	0.0
Quality Inspector	4	0	0%	0.0%	0.0
Quality Assistant	4	0	0%	0.0%	0.0
Total	69	41	100%	59.4%	59.4%

Table 82 - Hard-to-Fill Vacancies Distribution in Rubber/Plastic Parts

Rubber/Plastic parts subsector was the only sector in which vacancies existed for all the job positions. The subsector was also found to be unique in this regard since 44% of 41 hard-to-fill vacancies were for the position of Helper. The other important position was Moulder which accounted for 24% of hard-to-fill vacancies. Difficulty in finding good Moulders was also shown by the fact that 91% of its total vacancies were rated hard-to-fill. Machine Operator was also identified as a difficult position to fill. 9 vacancies existed of which 6 (67%) were hard-to-fill. Finding a good Supervisor was also difficult. 100% of the 4 vacant positions of supervisors were declared hard-to-fill.

7.4.5.2.6 <u>Electronic/Electrical Parts</u>

Table 83shows the distribution of hard-to-fill vacancies in Electronic/Electrical parts subsector.

		Hard-to-	Share in	Share of Hard-to-	Relative
	Total	Fill	Subsector's	Fill Vacancies in	Difficult
Job Position	Vacancies	Vacancies	Total Hard-	Total Vacancies	У





			to-Fill Vacancies (A)	against the Position (B)	A*B
Assembler	2	2	100%	100.0%	100
Helper	9	0	0%	0.0%	0
Total	11	2	100%	18.2%	18.2%

Of the total 11 vacant positions in Electronic/Electrical parts, only 2 were rated hard-to-fill and both of them were the Assembler positions. The other 9 positions were those for helpers of which none was hard-to-fill. There were no vacant positions for Supervisor, Painter and Packing worker.

7.4.5.3 Reasons for Hard-to-Fill Vacancies

The respondents were also inquired about the reasons for not being able to find the right person for different positions in different subsectors/processes. A total of 137 responses were obtained the distribution of which is shown in Figure 74.

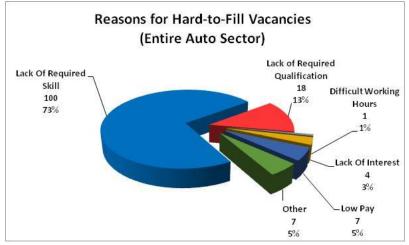


Figure 74 - Reasons for Hard-to-Fill Vacancies

Lack of required skills was quoted in 73% responses as the most important reason for not finding the right person for a position. Lack of educational qualification was quoted by 13% as the second most important reason. Low pay and lack of interest by the employees were respectively the third and fourth important reasons; mentioned in 5% and 3% responses. The 'Other' category included reasons of lack of experience and hard working environment. Although the questionnaire included workers' attitude, competition with other enterprises and poor career progression; however, none of the respondents quoted any of these as the reasons for not being able to find the right person.

The trends in different subsectors/processes with respect to the reasons for difficulties were almost the same. One notable difference however was the reason of low pay was mentioned only for Design Section/Tools & Dies/Technical Support. Similarly, the reason for lack of interest was quoted mostly for Sheet Metal process.

7.4.6 Technical Educational Qualification Analysis

Satisfaction of enterprises with the current educational qualification of auto parts skilled workforce was assessed. Current and preferred qualification for each position in all subsector/processes was inquired. For some enterprises, the current and preferred





qualification was the same while for some others; the desired qualification was higher than the current. The first type of enterprises was classified as 'satisfied' while the other as 'unsatisfied'. Table 84 shows the distribution of satisfied and unsatisfied responses for all the four types of educational qualifications; degree, diploma/certificate, short courses, none and any other.

	Total			
Subsector/Process	Responses	Satisfied	Unsatisfied	% Satisfied
Design Section/Tools & Dies	256	161	95	63%
Sheet Metal	1,419	603	816	42%
Metal Casting	461	265	196	57%
Metal Forging	296	137	159	46%
Rubber / Plastic Parts	617	310	307	50%
Electronics / Electrical Parts	103	71	32	69%
Assembly / Sub-Assembly	381	205	176	54%
Store Keeping	90	54	36	60%
Total	3,623	1,806	1,817	50%

 Table 84 - Satisfaction with Current Educational Qualification in Subsectors/Processes

The last column shows the satisfaction % for each subsector/process. The satisfaction levels have been compared graphically in Figure 75.

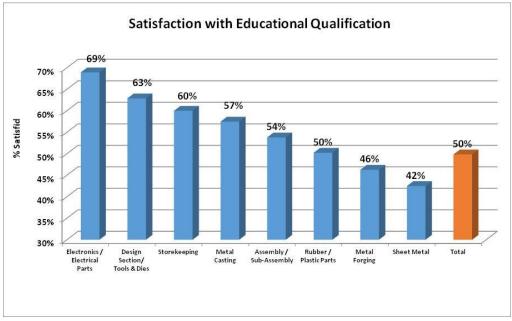


Figure 75 - Satisfaction with Current Educational Qualification in Subsectors/Processes

On an overall basis, only 50% of the total responses were found to be satisfied with the current educational qualification of the technical skilled workforce. This meant that half of the total responses wanted an up-gradation in educational qualification. Electronics/Electrical parts sector was the most satisfied sector with 69% satisfaction responses. Sheet Metal was rated as the lowest satisfied process where 58% of the total responses were in favour of an up-gradation to a higher educational level. Metal Forging was the second most dissatisfied process with 46% responses satisfied with the current educational qualification.





7.4.6.1 Satisfaction with Educational Qualification for Different Job Positions

Analysis was conducted to assess the satisfaction of enterprises with the current educational qualification of their skilled workforce for all job positions in all subsectors/processes. Details are provided in Table 85-Table 92.

Total numbers of responses obtained for each position have been listed, along with the satisfaction level with respect to educational qualification. The percentage represents those responses which were satisfied with the current qualification and did not want to up-grade to higher qualification (including all responses for degree, diploma/certificate, short courses, none or any other³⁶). In addition, the tables also provides distribution of responses for each position with respect to degree, diploma/certificate, short course, none or other; for both current and preferred scenarios, Difference between the two provides an assessment of the desire to up-grade qualification. Tables for each subsector/process and the key findings are discussed in the following paragraphs:

7.4.6.2 Design Section/Tools & Dies/Technical Support

Satisfaction analysis with the current educational qualification of technical workforce in Design/Tools & Dies/Technical section is presented in Table 85

Job Positions	Total Responses	Satisfied %	Current/ Preferred	Degree	Certificate/ Diploma	Short Course	None	Any Other
Tools & Die Shop	66	83%	Current	26%	56%	0%	3%	15%
Supervisor			Preferred	30%	62%	2%	0%	6%
Tools & Die Maker	82	55%	Current Preferred	0% 0%	40% 70%	34% 26%	17% 2%	9% 2%
Designer/ Pattern maker	50	86%	Current Preferred	0% 2%	80% 88%	12% 6%	0% 0%	8% 4%
Assistant	54	33%	Current Preferred	2% 2%	6% 54%	59% 26%	24% 11%	9% 7%
Helper	4	0%	Current Preferred	0% 0%	0% 0%	0% 100%	100% 0%	0% 0%
Total	256	63%	Current Preferred	7% 9%	44% 67%	26% 17%	13% 3%	10% 5%

Table 85 - Satisfaction with Current Educational Qualification in Design/Tools & Dies/Technical Support

Key findings for Design/Tools & Dies/Technical Support section are discussed in the following paragraphs:

• An up-gradation in qualification of supervisory positions was desired. Current share of degree holders was 26% while the preferred was 30%. Likewise, the enterprises showed a preference to have more Certificate/Diploma holders for this position. Currently, 3% supervisors did not have any educational qualification. This figure was

³⁶Any other represents either Matric or Intermediate





0% of preferred which showed that auto sector enterprises did not want to hire a supervisor in design section without an educational qualification. Short course was found to be not a preferred qualification for this position.

- Degree was not a preferred qualification for any position in Design section except for the supervisory position.
- For Tools & Die Maker, Certificate/Diploma was the most desirable qualification; with short course being the second option. The responses indicated a desired shift from short course to diploma/certificate. Share of Diploma for current was 40% while that in preferred was 70%. An opposite trend was observed for short course. 17% responses were for none which reduced to 2% indicating a desire to hire qualified staff.
- For Designer/Pattern Maker. Diploma/Certificate was the desired qualification; mentioned by about 80% enterprises. No major desire to up-grade was observed as the share in preferred responses was close enough (88%).
- A major desire to up-grade qualification was seen for Assistant where currently, only 6% workers held a diploma/certificate whereas the preferred percentage for that was found to be 54%. The enterprises wanted to have more diploma holders in this position instead of short course trained workers. 24% enterprises had unqualified Assistants which reduced to 11% in preferred.
- All the helpers currently were unqualified but the preferred qualification was short course.

7.4.6.3 Sheet Metal

Satisfaction analysis with the current educational qualification of technical workforce in Sheet Metal process is presented in Table 86

Job Positions	Total Responses	Satisfied %	Current/ Preferred	Degree	Certificate/ Diploma	Short Course	None	Any Other
Supervisor /	331 ³⁷	59%	Current	2%	55%	20%	10%	13%
In-charge	551	59%	Preferred	5%	80%	8%	2%	5%
Shoot Cutton	76	41%	Current	1%	20%	29%	29%	21%
Sheet Cutter	70	41%	Preferred	0%	43%	41%	8%	8%
Pressman	83	41%	Current	0%	22%	20%	43%	14%
Flessman	65	41%	Preferred	0%	39%	48%	8%	5%
Welder	78	38%	Current	0%	18%	41%	28%	13%
weider	78	30%	Preferred	0%	50%	38%	9%	3%
Driller	73	37%	Current	0%	16%	33%	38%	12%
	15	51%	Preferred	0%	37%	52%	5%	5%
Oven Operator	58	470/	Current	0%	26%	28%	38%	9%
Oven Operator	58	47%	Preferred	0%	40%	53%	5%	2%

Table 86 - Satisfaction with Current Educational Qualification in Sheet Metal

³⁷The number of responses for supervisory positions is more than the total sample size of 204 since there are different sub-processes in a subsector/process and many of them have separate supervisory positions. The same holds for the position of Helpers also.





Total	1419	4270	Preferred	2%	46%	35%	9%	8%
		42%	Current	1%	27%	23%	37%	13%
Гаскеі	12	42%	Preferred	0%	0%	0%	42%	58%
Packer	12	42%	Current	0%	0%	0%	100%	0%
Helper	303	29%	Preferred	0%	23%	44%	18%	14%
Halman	365	200/	Current	0%	7%	18%	65%	10%
Assistant	54	39%	Preferred	0%	22%	50%	28%	0%
Quality	<i>Γ</i> 4	2004	Current	0%	6%	22%	50%	22%
Assurance Inspector	68	40%	Preferred	1%	72%	18%	3%	6%
Quality			Current	1%	25%	41%	19%	13%
Assurance Incharge	57	68%	Preferred	26%	56%	5%	2%	11%
Quality			Current	11%	65%	12%	5%	7%
Assembler	64	28%	Preferred	0%	30%	59%	5%	6%
A 11	<i>C</i> 1	2004	Current	0%	22%	8%	50%	20%
Painter	57	35%	Preferred	0%	30%	63%	2%	5%
D: /	<i>c</i>	2504	Current	0%	23%	21%	47%	9%
Electroplater	43	53%	Preferred	0%	47%	49%	0%	5%
Ele etne aleten	43	520/	Current	0%	35%	33%	23%	9%

Key findings with respect to educational qualification preferences in Sheet Metal process are discussed below:

- Overall satisfaction level from current educational qualification in Sheet Metal was only 42%.; the lowest among all subsectors/processes.
- Assembler, Driller and Welder were the three positions with lowest satisfaction levels of 28%, 37% and 38% respectively.
- Quality Assurance Incharge was the position with the highest satisfaction level of 68%. An increased preference was however shown for degree; increasing from current 11% to 26%.
- For supervisory positions in Sheet Metal process, increased preference was observed for degree and diploma/certificate courses. Preference for degree moved from 2% to 5% while that for diploma increased from 55% to 80%. The highest gap was seen for Assembler position where currently, 50% workers were unqualified which reduced to 5% in preferred and the Assemblers qualified by short courses were only 8% currently; which increased to 59% in preferred responses. Share of unqualified in preferred reduced to 5%.
- For most of the positions, an up-gradation was desired by the enterprises to Diploma/Certificate and Short courses; since the shares of preferred was higher than the current for all the positions.
- For Quality Assurance Inspector, a preference increase was observed for Diploma/Certificate; increasing from current 25% to 72%.
- For helper position as well, the current satisfaction level was only 29% and an increased preference was observed for diploma and short courses.





• For packer position, currently the entire staff was unqualified. 58% of the enterprises wanted an up-gradation to Matric or Intermediate.

7.4.6.4 Metal Casting

Satisfaction analysis with the current educational qualification of technical workforce in Metal Casting process is presented inTable 87

Job Positions	Total Responses	Satisfied %	Current/ Preferred	Degree	Certificate/ Diploma	Short Course	None	Any Other
Melting &			Current					
Casting Supervisor/	103	78%		2%	72%	10%	7%	10%
In-charge/	105	/ 0 %	Preferred					
Foreman				5%	85%	7%	3%	0%
Machinist	58	64%	Current	0%	43%	19%	22%	16%
Widefillingt	50	0170	Preferred	0%	72%	16%	12%	0%
CNC Operator	19	84%	Current	0%	79%	11%	5%	5%
erte operator	17	0470	Preferred	0%	89%	11%	0%	0%
Assembler	18	78%	Current	0%	61%	6%	28%	6%
Assembler	10	7870	Preferred	0%	61%	28%	11%	0%
Assistant	17	18%	Current	0%	0%	59%	41%	0%
Assembler	17	1070	Preferred	0%	59%	18%	18%	6%
Painter	20	70%	Current	0%	50%	15%	30%	5%
Painter	20	70%	Preferred	0%	50%	45%	5%	0%
Electronlator	21	760/	Current	0%	52%	24%	19%	5%
Electroplater	21	76%	Preferred	0%	62%	33%	5%	0%
Matel Dellahan	17	9.20/	Current	0%	53%	18%	29%	0%
Metal Polisher	17	82%	Preferred	0%	53%	35%	12%	0%
	01	710/	Current	0%	52%	10%	29%	10%
Oven Operator	21	71%	Preferred	0%	62%	29%	10%	0%
Quality	17	0.20/	Current	7%	87%	7%	0%	0%
Supervisor	15	93%	Preferred	13%	80%	7%	0%	0%
Quality	22	720/	Current	0%	59%	18%	5%	18%
Inspector	22	73%	Preferred	0%	82%	18%	0%	0%
Quality	16	200/	Current	0%	13%	56%	25%	6%
Assistant	16	38%	Preferred	0%	69%	6%	25%	0%
Halman	110	170/	Current	0%	2%	44%	47%	7%
Helper	112	17%	Preferred	0%	48%	34%	13%	4%
Deelser	2	500/	Current	0%	0%	0%	100%	0%
Packer	2	50%	Preferred	0%	0%	0%	50%	50%
Total	461	57%	Current	1%	43%	24%	25%	8%

Table 87 - Satisfaction with Current Educational Qualification in Metal Casting





	Preferred	2%	67%	21%	9%	2%

Key highlights of satisfaction with the current educational qualification in Metal Casting follow:

- Overall satisfaction level with the current educational qualification in Metal Casting process was 57%.
- Highest satisfaction levels were found for the positions of Quality Supervisor, CNC operator and Metal Polisher with 93%, 84% and 82% satisfaction respectively.
- For supervisory positions, the preference for degree increased from current 2% to 5% and that for diploma/certificate courses from 72% to 85%. An interesting observation was that for such important position, 3% enterprises still insist to keep using unqualified staff. That indicates that some enterprises will always like to stick to the approach of assigning more weight to experience that to educational qualification.
- Almost for all the positions in Metal Casting, there was an increased preference towards hiring people with Diploma/Certificate and Short courses. Difference between current and preferred was more pronounced for short courses than that for diploma.
- Just like in Sheet Metal, the most intense desire to upgrade qualification was observed for Assembler and Assistant Assembler positions. For Assembler position, currently 61% workers held Certificate/Diploma and it remained the same in preferred. However, a shift in preference was seen for short courses, increasing from 6% to 28%. Overall satisfaction was 78% for Assembler and only 18% for Assistant Assembler. For Assistant Assembler, no worker currently held diploma/certificate; however 61% enterprises preferred to hire Assistant Assembler having a diploma/certificate. 59% enterprises preferred short course for this position compared to 18% currently. A significant share of 18% enterprises wanted to keep using unqualified Assistant Assembler.
- For Quality Supervisor, the preference for degree increased from current 7% to 13%. For quality Inspector, Diploma was the most preferred qualification while for Quality Assistant, it was short course.
- It was surprising that 82% responses preferred to hire helpers with either a Diploma or short course. Only 13% wanted to have helpers with no qualification.

7.4.6.5 Metal Forging

Satisfaction analysis with the current educational qualification of technical workforce in Metal Forging process is presented in Table 88

Job Positions	Total Responses	Satisfied %	Current/ Preferred	Degree	Certificate/ Diploma	Short Course	None	Any Other
Forging Supervisor/ In-charge	64	64%	Current Preferred	3% 6%	61% 83%	19% 9%	3% 0%	14% 2%
Machine Operator	20	45%	Current Preferred	0% 5%	30% 55%	30% 35%	15% 5%	25% 0%
Machinist	22	50%	Current	0%	41%	36%	9%	14%

Table 88 - Satisfaction with Current Educational Qualification in Metal Forging





			Preferred	0%	86%	5%	5%	5%
Heat	19	37%	Current	0%	21%	32%	37%	11%
Technician	19	5770	Preferred	0%	42%	53%	5%	0%
CNC Operator	13	54%	Current	0%	54%	31%	0%	15%
CIVE Operator	15	5470	Preferred	0%	100%	0%	0%	0%
Painter	12	27%	Current	0%	25%	33%	33%	8%
1 annei	12	2170	Preferred	0%	58%	42%	0%	0%
Electroplater	12	55%	Current	0%	33%	33%	17%	17%
Electroplater	12	5570	Preferred	0%	58%	33%	8%	0%
Metal Polisher	11	27%	Current	0%	27%	27%	45%	0%
Wietai Folishei	11	2170	Preferred	0%	55%	45%	0%	0%
Quality	17	88%	Current	29%	53%	12%	6%	0%
Supervisor	17	8870	Preferred	35%	53%	12%	0%	0%
Quality	22	62%	Current	9%	50%	14%	14%	14%
Inspector		0270	Preferred	14%	73%	9%	5%	0%
Quality	14	78%	Current	0%	0%	36%	50%	14%
Assistant	14	7870	Preferred	0%	43%	21%	36%	0%
Helper	63	11%	Current	0%	2%	22%	51%	25%
Thelper	05	11/0	Preferred	0%	27%	60%	5%	8%
Packer	7	29%	Current	0%	0%	0%	57%	43%
гаскег	/	29%	Preferred	0%	0%	57%	14%	29%
		469/	Current	3%	32%	24%	24%	16%
Total	296	46%	Preferred	5%	58%	29%	5%	3%

Key highlights follow:

- Overall satisfaction level with educational qualification in Metal Forging process was 46%.
- Three positions with lowest satisfaction were Painter, Metal Polisher and Heat Technician with 27%, 27% and 37% satisfaction levels.
- Quality Supervisor was the position with the highest satisfaction level of 88%. However, the preference for degree increased from 295 to 35%. 53% preferred Diploma/certificate while 12% were comfortable even with a short course.
- For supervisory positions in Metal Forging, an increased preference was observed for degree and diploma/certificate; increasing from 3% to 6% for degree and from 61% to 83% for diploma/certificate.
- A unique finding was that 5% enterprises preferred to hire a degree holder for machine operator position. This was not observed in any other subsector/process.
- Preference for hiring Machinist with diploma/certificate increased from current 41% to preferred 86%.
- Current satisfaction level for Heat Technician was only 37%. Preference for Diploma/Certificate increased from 21% to 42% while that for short courses increased from 32% to 53%. 5% enterprises were fine working with unqualified Heat Technician.





- For CNC Operator, a consensus opinion was observed. Currently, 54% held Diploma/Certificate, 31% held short course and 15% were Matric or Intermediate. Whereas, in preferred, 100% of the enterprises wanted to have a CNC Operator with Diploma/Certificate.
- For Painter and Electroplater positions, an increased preference was seen for Diploma/Certificate; increasing from 25% to 58% for Painter and from 33% to 58% for Electroplater.

7.4.6.6 Rubber/Plastic Parts

Satisfaction analysis with the current educational qualification of technical workforce in Rubber/Plastic parts subsector is presented in Table 89

Job Positions	Total Responses	Satisfied %	Current/ Preferred	Degree	Certificate/ Diploma	Short Course	None	Any Other
Supervisor/In-	1 47	710/	Current	1%	56%	18%	10%	14%
charge / Foreman	147	71%	Preferred	3%	78%	12%	3%	4%
Machine	45	58%	Current	0%	38%	20%	29%	13%
Operator	45	5070	Preferred	0%	49%	42%	9%	0%
Moulder	56	52%	Current	0%	29%	23%	36%	13%
Woulder	50	5270	Preferred	0%	52%	30%	14%	4%
Cutter /	51	53%	Current	0%	24%	10%	53%	14%
Trimmer	51	5570	Preferred	0%	27%	49%	22%	2%
Assembler	43	49%	Current	0%	30%	9%	33%	28%
Assembler	-13	4770	Preferred	0%	33%	56%	9%	2%
Helper	163	24%	Current	0%	0%	33%	60%	8%
Therper	105	2470	Preferred	0%	33%	30%	20%	17%
Quality	34	88%	Current	12%	68%	15%	0%	6%
Supervisor	54	0070	Preferred	15%	74%	9%	0%	3%
Quality	39	56%	Current	0%	44%	18%	15%	23%
Inspector	39	30%	Preferred	3%	67%	21%	8%	3%
Quality	39	31%	Current	0%	5%	33%	41%	21%
Assistant		5170	Preferred	0%	38%	28%	23%	10%
		50%	Current	1%	30%	22%	34%	14%
Total	617	50%	Preferred	2%	51%	28%	12%	7%

 Table 89 - Satisfaction with Current Educational Qualification in Rubber/Plastic Parts

Key highlights from the educational qualification analysis for Rubber/Plastic parts subsector are discussed in the following paragraphs:

- Overall satisfaction level from current educational qualification was only 50%.
- Quality Assistant was the position with the lowest satisfaction level of 31%. There was an increased preference for Diploma/Certificate from 5% to 38%.





- Quality Supervisor was the position with the highest satisfaction level of 88%. However, an increased preference was observed for degree courses from the current 12% to preferred 15%.
- 3% enterprises preferred degree courses for supervisory position in Rubber/Plastic parts subsector whereas, currently, only 1% supervisors were degree holders. 78% wanted to have a supervisor with diploma/certificate and 12% with a short course. 3% enterprises were willing to have a supervisor with no education.
- For machine operator, there was an increased preference for diploma/certificate and short courses. Preference increased from 38% to 49% for Diploma and from 20% to 42% for short courses. Currently, 29% of the enterprises employed machine operator with no educational qualification; however, this percentage reduced to 9% in preferred responses.
- For Moulder also, 52% wanted to hire persons with diploma compared to the current 29%. Preference for short courses also increased from 23% to 30%. Currently, 36% Moulders were without any education; however, in preferred responses, this percentage reduced to 14%.
- For Cutter/Trimmer, the preferred qualification was short course, 49% enterprises wanted this qualification compared to current 10%. 27% wanted to hire Trimmer having a diploma/certificate.

7.4.6.7 *Electronics/Electrical Parts*

Satisfaction analysis with the current educational qualification of technical workforce in Electronic/Electrical parts subsector is presented in Table 90.

Job Positions	Total Responses	Satisfied %	Current/ Preferred	Degree	Certificate/ Diploma	Short Course	None	Any Other
Supervisor/	26	0.40/	Current	11%	83%	6%	0%	0%
In-charge / Foreman	36	94%	Preferred	11%	89%	0%	0%	0%
Painter	8	88%	Current	0%	63%	25%	13%	0%
Painter	8	88%	Preferred	0%	75%	13%	13%	0%
Assembler	21	71%	Current	0%	67%	14%	19%	0%
Assembler	21	/1%	Preferred	0%	76%	24%	0%	0%
Packing	7	71%	Current	0%	43%	14%	14%	29%
Worker	1	/1%	Preferred	0%	57%	14%	14%	14%
Halman	21	220/	Current	0%	10%	55%	16%	19%
Helper	31	32%	Preferred	0%	61%	16%	6%	16%
		(00/	Current	4%	53%	24%	11%	8%
Total	103	69%	Preferred	4%	75%	12%	4%	6%

Table 90 - Satisfaction with Current Educational Qualification in Electronic/Electrical Parts

Key highlights of the educational qualification analysis for Electronic/Electrical parts subsector is discussed in the following paragraphs:





- Overall satisfaction level with educational qualification was 69% which was the highest among all subsector/processes.
- For supervisory positions, 11% preferred degree courses and 89% diploma/certificate. None preferred short courses or lower qualification. Electronic/Electrical parts subsector was found to be unique in this regard since none of the enterprises preferred short courses or lower qualification for supervisory positions.
- Lowest satisfaction of 71% was for Assembler. There was an increased preference for diploma/certificate from 67% to 76% and for short courses from 14% to 24%. 19% of the Assemblers currently working in the subsector were unqualified. However, nobody preferred to hire an Assembler with no qualification.
- Satisfaction with the position of Packing worker was also 71% and few enterprises mentioned a preference for engaging packing worker with diploma.
- Satisfaction with the qualification of Helper was only 32%. Surprisingly, 61% of the enterprises wanted to hire helpers with diploma/certificate. 55% of the helpers in Electronic/Electrical subsector were qualified through short courses and 10% through diploma/certificate. Only 16% helpers were unqualified.

7.4.6.8 Assembly/Sub Assembly

Satisfaction analysis with the current educational qualification of technical workforce in Assembly/Sub Assembly subsector is presented in Table 91.

Job Positions	Total Responses	Satisfied %	Current/ Preferred	Degree	Certificate/ Diploma	Short Course	None	Any Other
Supervisor/	96	77%	Current	14%	64%	15%	2%	6%
In-charge	90	11/0	Preferred	15%	82%	2%	0%	1%
Assembler	101	66%	Current	0%	62%	27%	3%	8%
Assembler	101	00%	Preferred	0%	88%	10%	0%	2%
Painter	21	48%	Current	5%	43%	19%	24%	10%
Fainter	21	4070	Preferred	5%	67%	29%	0%	0%
Assistant	117	21%	Current	0%	7%	73%	8%	13%
Assistant	117	21%	Preferred	0%	70%	26%	3%	1%
Quality	1.0		Current	11%	89%	0%	0%	0%
Assurance Incharge	19	89%	Preferred	11%	89%	0%	0%	0%
Quality	16	75%	Current	0%	69%	31%	0%	0%
Inspector	10	7.3 70	Preferred	0%	94%	6%	0%	0%
Quality	11	9%	Current	0%	0%	91%	9%	0%
Assistant	11	9%	Preferred	0%	91%	0%	9%	0%
		54%	Current	4%	44%	38%	5%	8%
Total	381	54%	Preferred	4%	80%	13%	1%	1%

Table 91 - Satisfaction with Current Educational Qualification in Assembly/Sub Assembly

Key highlights follow:





- Overall satisfaction level with the current educational qualification in Assembly/Sub Assembly subsector was 54%.
- 14% of the current persons in supervisory positions were holding degrees and it was almost same (15%) in the preferred scenario as well. Major share of this job was done by Diploma/Certificate holders; currently in 64% enterprises; whereas 82% enterprises preferred to have this qualification for their supervisors. Preference for short courses was very low whereas none of the enterprises wanted to hire an unqualified person for this position.
- Quality Assurance Incharge was the position with the highest satisfaction level of 89%. 11% responses were in favour of degree and the balance 89% for diploma/certificate.
- Assembler was the most important position in the subsector. Degree was not a preferred qualification for this position. 88% enterprises preferred to have diploma holders for this positions compared to 62% already doing that. The preference for short courses also increased from 10% to 27%. Currently, 3% enterprises were using unqualified Assemblers whereas none of the enterprises preferred this option.
- Assistant Assembler was the position with a very low satisfaction level of only 21%. The current share of Diploma/Certificate holders for this position was only 7%; whereas 70% enterprises preferred persons Diploma/certificate. 26% preferred short courses and 3% were comfortable even with an unqualified person for this position.
- Painter was the position unique in the sense that 5% of the responses were found to prefer degree courses for this position which is generally not considered to be such a position. Preference for diploma/short courses increased from 435 to 67% and for short courses from 19% to 29%. Painter position in Assembly/Sub Assembly was also unique in the sense that none of the enterprises wanted to hire painter without any educational qualification.
- Satisfaction level with Quality Assistant position was only 11%. Currently, none of the enterprises had diploma holders for these positions whereas 91% preferred this qualification.

7.4.6.9 Storekeeping

Satisfaction analysis with the current educational qualification of technical workforce in Storekeeping section is presented in Table 92.

Job Positions	Total Responses	Satisfied %	Current/ Preferred	Degree	Certificate/ Diploma	Short Course	None	Any Other
Store In-	34	76%	Current	12%	56%	15%	6%	12%
charge	54	7070	Preferred	12%	68%	18%	0%	3%
Storelisener	27	62%	Current	3%	41%	16%	14%	27%
Storekeeper	37		Preferred	3%	62%	19%	8%	8%
Assistant	19	26%	Current	0%	0%	53%	37%	11%
Assistant	19	20%	Preferred	0%	47%	26%	21%	5%
Tetel	00	60%	Current	6%	38%	23%	16%	18%
Total	90	00%	Preferred	6%	61%	20%	8%	6%

Table 92 - Satisfaction with Current Educational Qualification in Storekeeping





Key highlights follow:

- Overall satisfaction level with the current qualification in Storekeeping section was 60% which is the second highest among all subsector/processes.
- Satisfaction with the Store Incharge position was 76%. Currently, 12% held degrees and there was no change in this in preferred scenario. Preference increased from 56% to 68% for diploma/certificate courses and from 15% to 18% for short courses. Currently, 6% of the Store Incharges were unqualified but it was not preferred by any enterprise.
- Current satisfaction with the position of storekeeper was 62%. A moderate shift in educational qualification was found desirable; from 41% to 62% for Diploma/Certificate and from 16% to 19% for short courses. Currently, 14% enterprises had unqualified storekeepers and 8% wanted to continue with that approach.
- Assistant position had a low satisfaction of 26%. None of them held a diploma currently; however 47% preferred to have a diploma holder for this position. 21% were comfortable with an unqualified Store Assistant.





8.0 WORKFORCE FUTURE DEMAND PROJECTIONS

The survey identified the technical workforce demand of the auto parts sector over the next three years. The enterprises were asked about the additional number of workers required by them against all the key job descriptions. Table 93 presents the summary of the additional workforce requirements for the sampled 204 enterprises, for all the subsectors/processes, along with the existing workforce and the percent increase.

Subsector/Process	Existing Workforce	Projected Increase in 3 Years	Percent Increase	Compounded Yearly Increase
Design Section/Tools &				
Die/ Technical Support	1,168	149	12.8%	4.1%
Sheet Metal	8,171	1,673	20.5%	6.4%
Metal Casting	5,092	599	11.8%	3.8%
Metal Forging	1,407	207	14.7%	4.7%
Rubber/Plastic Parts	4,610	810	17.6%	5.5%
Electronics/Electrical Parts	1,164	153	13.1%	4.2%
Assembly/Sub Assembly	9,893	1,302	13.2%	4.2%
Storekeeping	380	65	17.1%	5.4%
Total	31,885	4,958	15.5%	4.9%

Future workforce demand of the auto sector for the surveyed enterprises for the next three years was found out to be 4958 persons. This represents an overall increase of 15.5% and translates into an annual compounded increase of 4.9%. Projected increase in different subsectors/processes has been compared in Figure 76.

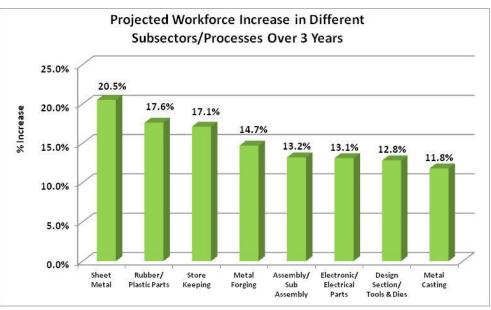


Figure 76 - Projected Workforce Increase in Subsectors/Processes

Workforce demand in Sheet Metal process is projected to grow by 20.5% which is the highest among all sub-sectors/processes; and translates into an annual growth of 6.4%. Sheet Metal is also the second largest in terms of the currently employed workforce in auto sector.





Rubber & Plastic and Metal Forging are the other sub-sectors/processes in which the demand is projected to grow by 17.6% and 14.7% respectively. Lowest percent increase of 11.8% is projected for Metal Casting process.

Analyzing the demand with respect to organization's size, it is seen that in small enterprises, workforce demand has been projected to grow at the highest rate of 26.8% which translated into an annual growth rate of 8.2%. Overall demand growth in medium and large enterprises was found to be 18.7% and 12.7% respectively. Table 94shows the workforce numbers and growth rates with respect to enterprise size.

	Small	Medium	Large	Total
Existing Workforce	1,012	12,731	18,142	31,885
Additional Demand	271	2,384	2,296	4,951
Overall Increase	26.8%	18.7%	12.7%	15.5%
Yearly Increase	8.2%	5.9%	4.1%	4.9%
No. of Enterprises	57	110	37	204
Average Demand per Enterprise	5	22	62	24

Table 94 - Additional Workforce Requirement in Small, Medium and Large Enterprises

Average increase per enterprise for the whole sample came out to be 24 persons while in terms of enterprise size, it was 5 persons for small, 22 for medium and 62 for large.

Analyzing with respect to formal/informal nature of the enterprise, the demand was found to be higher in formal sector compared that to informal sector. Moreover, the projected demand growth rate in formal sector was also higher than that in the informal sector. Table 95shows the results.

	Formal	Informal	Total
Existing Workforce	19,805	12,080	31,885
Additional Demand	3,241	1,671	4,912
Overall Increase	16.4%	13.8%	15.4%
Yearly Increase	5.2%	4.4%	4.9%
No. of Enterprises	127	77	204
Average Increase per Enterprise	26	22	24

 Table 95 - Additional Workforce Requirement in Formal and Informal Enterprises

Average number of additional persons required per enterprise is 26 in formal and 22 in informal sector.

It is useful to look into the relative shares of different subsectors/processes in the projected workforce demand and its comparison with their shares in the current workforce profile. Relative shares of subsectors/processes are shown in Figure 77.





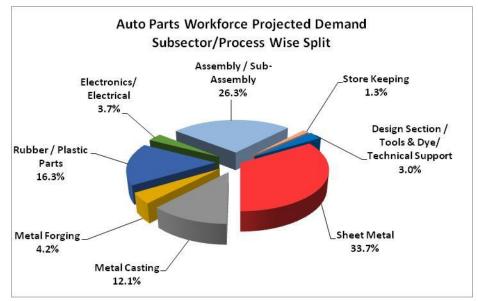


Figure 77 - Auto Parts Workforce Demand - Subsectors/Processes Distribution

Sheet Metal accounted for 33.7% share of the total projected demand, followed by26.3% for Assembly/Sub Assembly and 16.3% for Rubber & Plastic parts. Together, these three subsectors/processes accounted for 76.3% of the total demand. In the current workforce, the combined share of these three subsectors/processes was 71.1%.

Subsector/Process	Existing Workforce	Projected Increase in 3 Years	Share in Existing Workforce	Share in Projected Demand	Relative Change in Share
Design Section/Tools & Dies/Technical Support	1,168	149	3.7%	3.0%	
Sheet Metal	8,171	1,673	25.6%	33.7%	
Metal Casting	5,092	599	16.0%	12.1%	
Metal Forging	1,407	207	4.4%	4.2%	
Rubber/Plastic Parts	4,610	810	14.5%	16.3%	
Electronics/Electrical Parts	1,164	153	3.7%	3.1%	
Assembly/Sub-Assembly	9,893	1,302	31.0%	26.3%	
Storekeeping	380	65	1.2%	1.3%	
Total	31,885	4,958	100.0%	100.0%	

Table 96compares the shares of different subsectors/processes in the current workforce with the ones in projected workforce demand. Blue arrows indicate the subsectors/processes which have shown an increase while yellow arrows indicate a decrease in relative shares in total workforce. Shares of Sheet Metal, Rubber/Plastic parts and Storekeeping have increased while the rest have decreased. This indicates that these three subsectors/processes are being projected to grow at higher rate compared to others.





8.1 Workforce Demand in Three Years for Different Job Descriptions

Additional workforce demand for the next three years identified for all the job positions in the 204 surveyed auto parts sector enterprises is presented in Table 97-Table 101 Key highlights of the results of each of the subsectors/processes have been discussed in bullet points after each of the table.

8.1.1 Workforce Demand in Design Section/Tools & Dies/ Technical Support

Workforce demand projected for different positions in Design/Tools & Dies/Technical Support section is presented in Table 97; followed by the key highlights.

Job Positions	Currently Employed	Current Vacancies	Total Capacity	Expected Hiring in Next Three Years
Tools & Die Shop Supervisor / In-charge / Foreman	119	20	139	23
Tools & Die Maker	393	30	423	59
Designer/ Pattern maker	281	25	306	28
Assistant	264	22	286	35
Helper	14	-	14	4
Total	1,071	97	1,168	149

Table 97 - Workforce Demand for Different Positions in Design/Tools & Dies Section

- 23 new supervisory positions were required by the surveyed enterprises in Design/Tools & Dies section. This showed that industry needs to increase supervisor to employee ratio. In the current scenario, the ratio was 11% while in the projected future workforce demand, it was 15.4%.
- Tools & Die maker was identified as the position with the highest demand of 59 which was 39.6% of the total demand; higher than the current share of this position in the current workforce. This shows that the demand for this position is higher than what is currently available in the industry.
- Designer/Patter Maker was the other important position accounting for 18.7% of the total demand in this section.
- Additional demand for Assistants was more than that for Designers. Currently, the number of Designers is more than that of their Assistants. This showed that on a relative scale, auto parts sector is more interested in having Assistants rather than Designers.

8.1.2 Workforce Demand in Sheet Metal

Workforce demand projected for different positions in Sheet Metal process is presented in Table 98; followed by the key highlights.

Job Positions	Currently Employed	Current Vacancies	Total Capacity	Expected Hiring in Next Three Years
Supervisor/In-charge /Foreman	625	4	629	176

Table 98 - Workforce Demand for Different Positions in Sheet Metal Process



Sheet Cutter	324	7	331	69
Pressman	975	16	991	181
Welder	526	9	535	127
Driller	441	11	452	110
Oven Operator	392	4	396	63
Electroplater	350	9	359	72
Painter	391	7	398	79
Assembler	779	12	791	138
Quality Assurance Incharge	114	2	116	26
Quality Assurance Inspector	353	1	354	79
Quality Assistant	297	-	297	46
Helper	2,451	34	2,485	493
Packer	37	-	37	14
Total	8,055	116	8,171	1,673

- Ratio of supervisory positions to total workforce was 10.5% in the projected demand which is higher than 7.8% in the current workforce. That indicated a relative higher demand for supervisory positions. It is important to note that the number of supervisors required was 176 which were marginally less than the number of Pressman required (181).
- Pressman was the most wanted worker in the projected demand. Of the total requirement of 1,673 persons, 181 were Pressman which accounted for 10.8% of the total demand in Sheet Metal. This was lower compared to 12% share of Pressman in the current workforce profile.
- Assembler, Welder and Driller respectively were the second, third and fourth most desired jobs in the projected workforce demand of Sheet Metal; accounting for 8.2%, 7.5% and 6.6% shares of the total demand in this process.
- 493 Helpers were required which was 29.4% of the total; the same ratio as in the current workforce.

8.1.3 Workforce Demand in Metal Casting

Workforce demand projected for different positions in Metal Casting process is presented in Table followed by the key highlights.

Job Positions	Currently Employed	Current Vacancies	Total Capacity	Expected Hiring in Next Three Years
Melting & Casting Supervisor/In-charge	442	-	442	95
Machinist	988	1	989	111
CNC Operator	314	2	316	15
Assembler	1,009	-	1,009	76
Assistant Assembler	216	-	216	25
Painter	430	-	430	13
Electroplater	177	_	177	12

Table 99 - Workforce Demand for Different Positions in Metal Casting





Metal Polisher	159	-	159	13
Oven Operator	442	5	447	48
Quality Supervisor	30	-	30	18
Quality Inspector	164	-	164	25
Quality Assistant	56	-	56	18
Helper	654	-	654	130
Packer	3	-	3	-
Total	5,084	8	5,092	599

- Number of Supervisors required in Metal Casting was 95; 15.8% of the total projected demand. Whereas the share of supervisory positions in the current workforce in Metal Casting was only 8.7%. That indicated that the relative requirement of supervisors in this process is increasing. Required number of supervisors was even higher than those of Assemblers, Assistant Assemblers and Oven Operators.
- Machinist was the most desired job in the projected workforce demand for Metal Casting process. 111 machinists were required which constituted 18.5% of the total demand in this process.
- In the current workforce profile, Assembler was the most common job; however, in the projected demand, it was Machinist. There is a requirement of 76 Assemblers which is 12.7% of the total demand. In the current profile, Assembler accounted for 19.8% of the total workers. This indicated that relative demand of Assembler is on a decline while that of Machinist is on a rise.

8.1.4 Workforce Demand in Metal Forging

Workforce demand projected for different positions in Metal Forging process is presented in Table; followed by the key highlights.

Job Positions	Currently Employed	Current Vacancies	Total Capacity	Expected Hiring in Next Three Years
Forging Supervisor / In- charge / Foreman	117	1	118	17
Machine Operator	128	3	131	13
Machinist	340	12	352	47
Heat Technician	79	-	79	9
CNC Operator	53	-	53	3
Painter	50	-	50	20
Electroplater	47	-	47	3
Metal Polisher	42	-	42	3
Quality Supervisor	20	-	20	4
Quality Inspector	75	-	75	9
Quality Assistant	69	-	69	11
Helper	320	-	320	59
Others (Packer)	51	-	51	9

 Table 100 - Workforce Demand for Different Positions in Metal Forging





Total 1,391 16 1,407 207

- 17 supervisors were required in the surveyed enterprises for Metal Forging process. Relative shares of supervisors in the existing and projected workforce profiles were the same.
- Machinist was identified with the highest demand in Metal Forging process. Number of machinists required by the surveyed enterprises over the next three years was 47. Share in the projected demand was 22%, lower than 25% share in the current workforce.
- Painter was the second most desired job in Metal Forging for which the demand was identified as 20. Share of Painter in the projected demand was 9.6% while that in the current workforce was only 3.5%. Thus, the relative demand for Painters in Metal Forging was found to be on a high rise.
- Other important requirements projected for Metal Forging process were 13 Machine Operators, 11 Quality Assistants and 9 Quality Inspectors.

8.1.5 Workforce Demand in Rubber/Plastic Parts

Workforce demand projected for different positions in Rubber/Plastic parts is presented in Table; followed by the key highlights.

Job Positions	Currently Employed	Current Vacancies	Total Capacity	Expected Hiring in Next Three Years
Supervisor/ In-charge /Foreman	387	4	391	125
Machine Operator	278	9	287	77
Moulder	808	11	819	103
Cutter/Trimmer	462	2	464	70
Assembler	671	2	673	86
Helper	1,351	6	1,357	232
Quality Supervisor	61	2	63	30
Quality Inspector	274	4	278	48
Quality Assistant	274	4	278	39
Total	4,566	44	4,610	810

 Table 101 - Workforce Demand for Different Positions in Rubber/Plastic Parts

- 810 additional workers are required by the subsector. It is surprising that the highest number of persons were projected for the supervisory positions. Rubber & Plastic was found to be the only sub-sector/process that depicted such a trend. The share of supervisors in current workforce was only 8.4% whereas in the projected demand, the share was 15.4%. This showed an increasing demand trend for supervisors.
- Highest demand of 103 persons was that for the Moulder. Share of Moulder in current workforce was 17.7% while that in the projected demand, it was 12%. This showed a relative decrease in demand of Moulder in the industry.
- Other important positions in the projection demand included 86 Assemblers, 77 Machine Operators and 70 Cutters/Trimmers.
- No demand was projected for helpers.





8.1.6 Workforce Demand in Electronics/Electrical Parts

Workforce demand projected for different positions in Electronic/Electrical parts is presented in Table; followed by the key highlights.

Job Positions	Currently Employed	Current Vacancies	Total Capacity	Expected Hiring in Next Three Years
Supervisor/ In-charge / Foreman	114	-	114	10
Painter	138	-	138	18
Assembler	426	2	428	48
Packing Worker	149	-	149	14
Helper	326	9	335	63
Total	1,153	11	1,164	153

- Total number of positions required by the sampled enterprises in Electronic/Electrical subsector was 153.
- Assembler was identified as the position with highest demand of 48 persons; accounting for 31% of total demand in this subsector.
- 18 Painters and 14 Packing workers were also required by the surveyed enterprises.
- 41% of the total demand was constituted by Helpers.

8.1.7 Workforce Demand in Assembly/Sub-Assembly

Workforce demand projected for different positions in Assembly/Sub Assembly is presented in Table; followed by the key highlights.

Job Positions	Currently Employed	Current Vacancies	Total Capacity	Expected Hiring in Next Three Years
Supervisor/ In-charge / Foreman	818	-	818	102
Assembler	5,345	-	5,345	708
Painter	356	-	356	38
Assistant	2,936	-	2,936	382
Quality Assurance Incharge	50	-	50	11
Quality Inspector	306	-	306	39
Quality Assistant	82	-	82	22
Total	9,893	-	9,893	1,302

Table 103 - Workforce Demand for Different Positions in Assembly/Sub Assembly

• 102 supervisors were required by the subsector with a share of 7.8% in the total projected demand. This was lower than the share of 8.2% in the current workforce profile. Such a trend was observed only in this sector; otherwise in all other sectors, relative demand of supervisors was higher than that in the current workforce profile.





- Assembler was identified as the most wanted skilled person in Assembly/Sub Assembly subsector. Of the total projected workforce demand of 1302, 708 were Assemblers which accounted for 54% of the total. The ratio was same as in the current workforce profile.
- 382 Assistants are also required by the surveyed enterprises in the next three years.
- No demand was projected for helpers.

8.1.8 Workforce Demand in Storekeeping

Workforce demand projected for different positions in Storekeeping section is presented in Table 104; followed by the key highlights.

Job Positions	Currently Employed	Current Vacancies	Total Capacity	Expected Hiring in Next Three Years
Store In-charge	57	-	57	21
Storekeeper	269	-	269	33
Assistant	54	-	54	11
Total	380	-	380	65

Table 104 - Workforce Demand for Different Positions in Storekeeping

Key highlights follow:

- Total number of positions required in Storekeeping was 65 comprising of 33 Storekeepers and 21 Store Incharges.
- Share of Store Incharge in the total workforce was 15% while in the projected demand, it was 30%.

8.2 Workforce Demand Estimation for the Whole Sector

Workforce projections for the entire Auto Parts sector have been worked out on the basis of information collection from the sample of 204 enterprises. The information contained the current employment figures in the different subsectors/processes of the sector against all the key positions. In addition, the responding enterprises also provided information about their manpower needs for the next three years for all of those jobs. This information was extrapolated over the total number of enterprises in auto parts to project the manpower requirement for next three years for all the positions.

8.2.1 Key Assumptions and Methodology

Key assumptions and the methodology used in the projections are discussed below:

Assumptions

• Total number of enterprises in auto sector has been taken as 2300 (including Assemblers). ³⁸

³⁸An Overview of Trends in the Automotive Sector and the Policy Framework Automotive Sector in Pakistan Phase I, International Growth Center (IGC) Hafiz Pasha, Zafar Ismail, January 2012





- The share of all the subsectors/processes in the total population is the same as that in the sample.
- The share of formal and informal enterprises in the total population is the same as that in the sample.
- The share of small, medium and large enterprises in the total population is the same as that in the sample.

Calculations Methodology

- Projected growth rate for each position was calculated by dividing the requirement for next three years by the existing workforce.
- Total number of existing workforce in the whole auto sector was worked out by extrapolating the sample workforce number over the total 2300 enterprises.
- Existing manpower for each position in the total workforce was calculated by using the existing share of each position as found out in the sample.
- Manpower requirement for the next three years was calculated by applying the projected growth rates for each position on the current manpower employed against those positions
- Total skilled workforce requirements for the whole sector were calculated by adding the individual requirements for all the positions.

8.2.2 Projected Workforce Requirements for Next three Years

8.2.2.1 Whole Auto Parts Sector

Table 105 - Projected Workforce Requirements in Pakistan's Auto Parts Sector

	Sample			Entire Sector	
Job Positions	Total Current Capacity	Projected Hiring in Next 3 Years	Projected Increase %	Current Workforce for Whole Sector	Need for Next 3 Years
Total	31,885	4,958	15.5%	359,488	55,898

8.2.2.2 Design Section /Tools & Dies/ Technical Support

Table 106 - Projected Workforce Requirements in Design/Tools & Dies/Technical Support

	Sample			Entire Sector	
Job Positions	Total Current Capacity	Projected Hiring in Next 3 Years	Projected Increase %	Current Workforce for Whole Sector	Need for Next 3 Years
Tools & Die Shop Supervisor/In-charge	139	23	16.5%	1,567	259
Tools & Die Maker	423	59	13.9%	4,769	665
Designer/Pattern maker	306	28	9.2%	3,450	316
Assistant	286	35	12.2%	3,225	395
Helper	14	4	28.6%	158	45
Total	1,168	149	12.8%	13,169	1,680





8.2.2.3 Sheet Metal

		Sample	Entire Sector		
Job Positions	Total Current Capacity	Projected Hiring in Next 3 Years	Projected Increase %	Current Workforce for Whole Sector	Need for Next 3 Years
Supervisor / In-charge /Foreman	629	176	28.0%	7,092	1,984
Sheet Cutter	331	69	20.8%	3,732	778
Pressman	991	181	18.3%	11,173	2,041
Welder	535	127	23.7%	6,032	1,432
Driller	452	110	24.3%	5,096	1,240
Oven Operator	396	63	15.9%	4,465	710
Electroplater	359	72	20.1%	4,048	812
Painter	398	79	19.8%	4,487	891
Assembler	791	138	17.4%	8,918	1,556
Quality Assurance Incharge	116	26	22.4%	1,308	293
Quality Assurance Inspector	354	79	22.3%	3,991	891
Quality Assistant	297	46	15.5%	3,349	519
Helper	2,485	493	19.8%	28,017	5,558
Packer	37	14	37.8%	417	158
Total	8,171	1,673	20.5%	92,124	18,862

8.2.2.4 Metal Casting

Table 108 - Projected Workforce Requirements in Metal Casting

		Sample	Entire Sector		
Job Positions	TotalProjectedProjectedCurrentHiring in NextIncrease %Capacity3 Years		Current Workforce for Whole Sector	Need for Next 3 Years	
Melting & Casting Supervisor / In-charge /	442	95			
Foreman			21.5%	4,983	1,071
Machinist	989	111	11.2%	11,150	1,251
CNC Operator	316	15	4.7%	3,563	169
Assembler	1,009	76	7.5%	11,376	857
Assistant Assembler	216	25	11.6%	2,435	282
Painter	430	13	3.0%	4,848	147
Electroplater	177	12	6.8%	1,996	135
Metal Polisher	159	13	8.2%	1,793	147
Oven Operator	447	48	10.7%	5,040	541
Quality Supervisor	30	18	60.0%	338	203





Quality Inspector	164	25	15.2%	1,849	282
Quality Assistant	56	18	32.1%	631	203
Helper	654	130	19.9%	7,374	1,466
Packer	3	-	0.0%	34	-
Total	5,092	599	11.8%	57,410	6,753

8.2.2.5 Metal Forging

Table 109 - Projected Workforce Requirements in Metal Forging

		Sample	Entire Sector		
Job Positions	C Increase %		Current Workforce for Whole Sector	Need for Next 3 Years	
Forging Supervisor / In- charge / Foreman	118	17	14.4%	1,330	192
Machine Operator	131	13	9.9%	1,477	147
Machinist	352	47	13.4%	3,969	530
Heat Technician	79	9	11.4%	891	101
CNC Operator	53	3	5.7%	598	34
Painter	50	20	40.0%	564	225
Electroplater	47	3	6.4%	530	34
Metal Polisher	42	3	7.1%	474	34
Quality Supervisor	20	4	20.0%	225	45
Quality Inspector	75	9	12.0%	846	101
Quality Assistant	69	11	15.9%	778	124
Helper	320	59	18.4%	3,608	665
Packer	51	9	17.6%	575	101
Total	1,407 207 14.7%		15,863	2,334	

8.2.2.6 Rubber/Plastic Parts

Table 110 - Projected Workforce Requirements in Rubber/Plastic Parts

		Sample	Entire Sector		
Job Positions	Total Current Capacity	Projected Hiring in Next 3 Years	Projected Increase %	Current Workforce for Whole Sector	Need for Next 3 Years
Supervisor / In-charge / Foreman	391	125	32.0%	4,408	1,409
Machine Operator	287	77	26.8%	3,236	868
Moulder	819	103	12.6%	9,234	1,161
Cutter / Trimmer	464	70	15.1%	5,231	789
Assembler	673	86	12.8%	7,588	970
Helper	1,357	232	17.1%	15,300	2,616





Quality Supervisor	63	30	47.6%	710	338
Quality Inspector	278	48	17.3%	3,134	541
Quality Assistant	278	39	14.0%	3,134	440
Total	4,610	810	17.6%	51,975	9,132

8.2.2.7 Electronic/Electrical Parts

Table 111 - Projected Workforce Requirements in Electronic/Electrical Parts

		Sample	Entire Sector		
Job Positions	Current Hiring in Next 3		Projected Increase %	Current Workforce for Whole Sector	Need for Next 3 Years
Supervisor/ In-charge / Foreman	114	10	8.8%	1,285	113
Painter	138	18	13.0%	1,556	203
Assembler	428	48	11.2%	4,825	541
Packing Worker	149	14	9.4%	1,680	158
Helper	335	63	18.8%	3,777	710
Total	1,164	153	13.1%	13,124	1,725

8.2.2.8 Assembly / Sub-Assembly

Table 112 - Projected Workforce Requirements in Assembly/Sub Assembly

С		Sample	Entire Sector		
Job Positions	Total Current Capacity	Projected Hiring in Next 3 Years	Projected Increase %	Current Workforce for Whole Sector	Need for Next 3 Years
Supervisor/In-charge/ Foreman	818	102	12.5%	9,223	1,150
Assembler	5,345	708	13.2%	60,262	7,982
Painter	356	38	10.7%	4,014	428
Assistant	2,936	82	13.0%	33,102	4,307
Quality Assurance Incharge	50	11	22.0%	564	124
Quality Inspector	306	39	12.7%	3,450	440
Quality Assistant	82	22	26.8%	925	248
Total	9,893	1,302	13.2%	111,539	14,679

8.2.2.9 Storekeeping

Table 113 - Projected Workforce Requirements in Storekeeping

|--|





Job Positions	Total Current Capacity	Projected Hiring in Next 3 Years	Projected Increase %	Current Workforce for Whole Sector	Need for Next 3 Years
Store In-charge	57	21	36.8%	643	237
Storekeeper	269	33	12.3%	3,033	372
Assistant	54	11	20.4%	609	124
Total	380	65	17.1%	4,284	733



9.0 SKILLS SUPPLY ANALYSIS

9.1 Training Service Providers Profile

As per the requirements of the TOR, 21 TSPs were surveyed for getting the required information about the supply of skilled workforce for auto parts sector of Pakistan. Selection of TSPs was done in consensus with PSDF and due consideration was given to ensure the representativeness of the sample.

For getting a complete picture of the training resources available for auto parts sector, TSPs of Karachi were also included in the sample since a large auto parts cluster exists in Karachi. Moreover, with this approach, it also became possible to draw a comparison of TSPs in two major auto parts clusters in the country.

Eight institutes were selected each from Lahore and Karachi accounting for 80% of the total sample. Two institutes each were selected from Gujranwala and Gujrat. Figure 78shows the geographical distribution of TSPs sample.

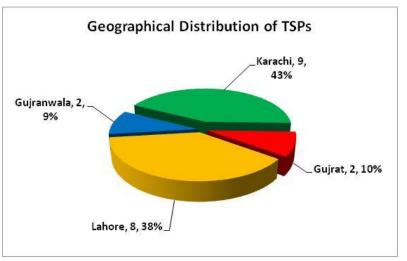
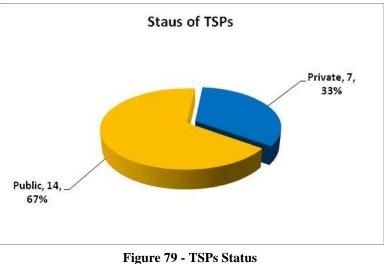


Figure 78 - TSPs Geographical Distribution

TSPs from both from public and private sectors were given representation in the sample. 14 (67%) institutes were from public and 33% from private sector. The split is shown in Figure 79.







Having both public and private sector institutes in the sample helped to draw comparison between the two types of operational setups and analyze their pros and cons.

Looking into the age of TSPs, it was found that 11 of the 21 surveyed institutes were established during the last two decades. This trend was aligned with the growth trend of the industry. This was the period during which the auto sector industry grew at high rate and the training sector responded to meet the growing demand for skilled workforce in the same period. Age distribution of the surveyed TSP is shown in Figure 80.

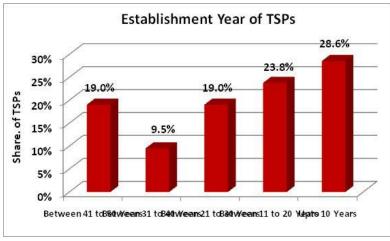


Figure 80 - TSPs Age

29% of the institutes had an age of ten years or less. 1975 to 1984 was the period during which only two of the surveyed TSPs were established. This was the period during which the automotive industry was in a stagnant phase. It was in the next decade in early eighties that international brands started entering the Pakistani market. The TSPs sector responded to this growing demand of skilled workforce as the number of TSPs established increased from 3 to 5 to 6 in the next three decades respectively.

9.1.1.1.1 <u>Registration/Affiliation</u>

The survey revealed that getting a registration/affiliation with a certifying body was considered very important by the TSPs. 20 of the 21 TSPs were found to be certified while one was in the process of getting certification. That indicated that TSPs sector was structured and operated in a formal manner. This was also indicated by the fact that all the 21 TSPs had their financial statements regularly audited every year.

Regarding registration/affiliation, there was a trend of getting affiliated with more than one body as that helps increase the credibility of the institute in the eyes of the prospective students.





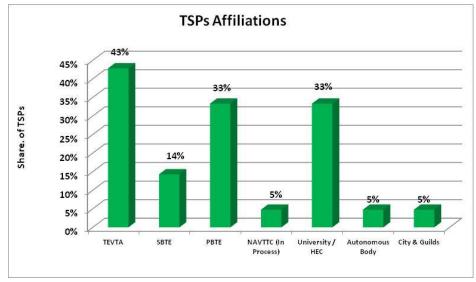


Figure 81 - TSPs Affiliations³⁹

Figure 81shows that TEVTA was the most common affiliating body for TSPs with 43% of the surveyed institutes affiliated with it. Punjab Board of Technical Education (PBTE) and University/Higher Education Commission (HEC) were also used by 33% and 33% TSPs respectively for affiliation. The institutes from Karachi were affiliated with Sindh Board of Technical Education (SBTE). The sample included one organization (PITAC) which was itself an autonomous body and therefore did not require any affiliation.

9.1.1.1.2 No. of Campuses

For increasing the outreach, TSPs establish multiple campuses at different locations. The profile of the surveyed TSPs show that 8 (40%) of the institutes existed with only one campus. These included three public sector institutes from Gujrat and Gujranwala and five institutes from Karachi; four of which were the private institutes. That meant that all the TSPs sampled from Lahore had more than one campus. Distribution of TSPs with respect to number of campuses is shown in Figure 82.

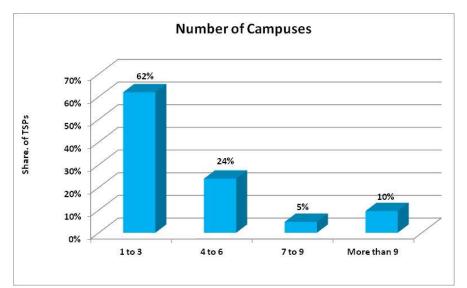


Figure 82 - TSPs Number of Campuses

³⁹ The percentages add to more than 100% due to multiple responses





The sample had 2 TSPs which had a wide coverage with 25 campuses all over Punjab. These were Government Apprenticeship Training Centre and Government Technical College Raiwind in Lahore. Both of these were affiliated with TEVTA.

9.2 TSPs Training Capacity Analysis

9.2.1 Training Courses Offered for Auto Parts Sector

Training Service Providers (TSPs) offer technical training courses for variety of sectors. The questionnaire inquired the surveyed TSPs about the training courses relevant to skills used in auto parts sector. All the 21 TSPs included in the survey offered Metal related courses. Electronic/Electrical related courses were the second most commonly offered courses and 80% TSPs offered those. Rubber/Plastic related courses were offered by 30% and Assembly/Sub Assembly related courses by 30% and 25% TSPs respectively. Frequencies of offered courses are shown in Figure 83.

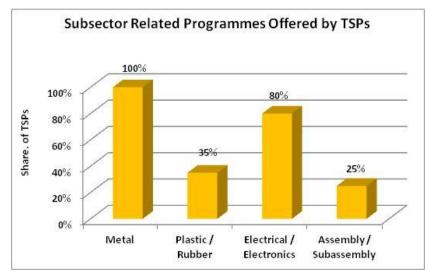


Figure 83 - Subsector Related Programmes Offered by TSPs⁴⁰

Metal and Electrical/Electronic related courses are more common since these skills are required by almost all the industries.

⁴⁰*The percentages add to more than 100 due to multiple responses*





9.2.2 Degree Programmes

Table 114 - Degree Programmes Offered by the Surveyed TSPs

Name of TSP	Name of Program	Number of Applications Received	Eligibility Criteria	Annual Available Seats	Current Enrollment (Male)	Current Enrollment (Female)	Passing %age	Total Fee (Rs.)
RachnaCollegeofEngineering&	BS Mechanical Engineering	10158	Entry Test and F Sc.	50	47	3	98%	116,000
Technology (RCET)	Industrial Manufacturing Engineering	10000	F Sc. Pre-Engg. with 60% Marks+ Entry Test	60	52	8	50%	200,000
	Electrical Engineering	10000	F Sc. Pre-Engg. with 60% Marks+ Entry Test	200	185	15	70%	200,000
PCSIR	Mechanical (Level-5)	10	DAE	30	10		80%	150,000
	Mechanical (Level-6)	20	B-Tech with Level-5	30	19	1	80%	270,000
UniversityofEngineeringandTechnology-Lahore	Industrial and Manufacturing Engineering	10000	F.Sc. Pre-Engg. with 60% Marks+ Entry Test	60	52	8	50%	200,000
Campus	Electrical Engineering	10000		200	185	15	70%	200,000
	Mechanical Engineering	10000		200	175	25	70%	200,000
	Polymer Engineering	10000		60	50	10	95%	200,000
	Metallurgical & Material Engineering	10000		60	55	5	85%	200,000
	Mechatronics & Control Engineering	10000		50	45	5	80%	200,000
Nazir Hussain University	Mechanical Engineering	150	F.sc Pre-Engg. with 60% Marks+	40	36	4	In Process	640,000





	Electrical Engineering	150	Entry Test	40	34	6	In Process	560,000
	Electronics Engineering	150	F.Sc. Engg. with 60% Marks	25	22	3	60%	360,000
NED University of	Mechanical Engineering	7000	F.Sc. Engg. with	180	169	11	90%	116,000
	Electrical Engineering	7000	60% Marks + Entry Test	160	150	10	80%	116,000
Technology	Electronics Engineering	7000		100	94	6	90%	116,000
	Industrial & Manufacturing	7000		110	102	8	80%	116,000
	Automotive Engineering	7000		40	36	4	85%	116,000
	Material Manufacturing	7000		40	34	6	90%	116,000
	Metallurgical Engineering	7000		70	63	7	85%	116,000
	Polymer & Petrochemical Engineering	7000		45	41	4	80%	116,000
DHA Suffah University	Mechanical	200	Intermediate with	50	35	10	80%	600,000
	Electrical	200	60%	50	35	15	80%	600,000



9.2.3 Degree Courses-Key Highlights⁴¹

9.2.3.1 Share of Different Trades

Analyzing the shares of different trades in auto sector related degree courses offered in the sampled TSPs, it was found that Electrical Engineering was the most commonly offered course. 33% of the total engineering seats were for this trade. Mechanical Engineering was the second most common course accounting for 27% seats. Industrial & Manufacturing Engineering covered another 12% seats. Together, these top three courses accounted for 72% of the total capacity of engineering seats in the sampled TSPs. The distribution is shown in Figure 84.

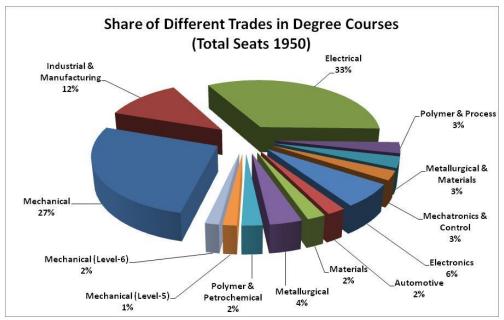


Figure 84 - Share of Different Trades in Degree Courses

It is interesting to note that Automotive Engineering was offered only by NED University of Engineering & Technology Karachi. Total number of seats for automotive engineering was 40 which accounted for 2% of the total. This indicated that there was not much trend producing trained workforce with specialized skills for auto sector. One of the emerging trends identified by the surveyed enterprises related to automation. There are two courses which could be related to that, Electronics and Mechatronics & Control. Together these two courses accounted for 9% of the total seats.

9.2.3.2 Male-Female Split

Share of females in the current enrollment of students in the surveyed TSPs offering degree courses was 10%. Majority of this was enrolled in engineering degree courses.

⁴¹The analysis only covers the courses which are more relevant for auto parts sector. It does not cover some other common courses like Civil Engineering, Chemical Engineering, Architectural Engineering, etc. which are offered by the sampled TSPs





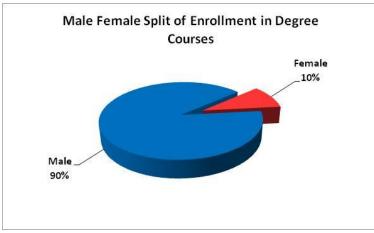


Figure 85 - Male-Female Enrollment Split in Degree Courses

9.2.3.3 Eligibility Criteria

Majority of the universities required F Sc. Engineering with at least 60% marks as the qualification to apply for admission to engineering degree course. In addition, the applicants also take an entry test. DHA Suffah University in Karachi did not require entry test. A different criterion was seen for degree courses offered by PCSIR. It required DAE Mechanical for Mechanical (Level 5) course and B Tech with Level 5 for Mechanical Level 6 course.

9.2.3.4 Course Fees

There was a marked difference in course fees for the same degrees between public and private sector TSP. Total fee charged for degrees in all trades by UET Lahore was PKR 200,000 whereas in NED University Karachi, it was PKR 116,000. In private universities, the fees were very high. For Mechanical Engineering, the fee range was PKR 600,000-640,000. For Electrical Engineering, it was PKR 600,000-560,000 whereas the fee for Electronics Engineering offered by private universities in Karachi was PKR 360,000.

9.2.4 Diploma/Certificate Courses

Details of the Diploma/Certificate courses offered by the surveyed institutes are provided in Table 115. It includes the name of the institute, available number of seats, current enrollment of male and female students and total fee for the course.





9.2.5 Diploma/Certificate Programmes

Table 115 - Diploma/Certificate Programme	es Offered by the Surveyed TSPs
-------------------------------------------	---------------------------------

Name of TSP	Name of Program	Number of Applications Received	Eligibility Criteria	Annual Available Seats	Current Enrollment (Male)	Current Enrollment (Female)	Passing %age	Total Fee (Rs.)
Govt. Apprenticeship	Turner/Machinist	37	Matric	14	14	0	90%	18,000
Training Centre-	General Fitter	40		34	34	0	95%	18,000
TEVTA	Welder	25		20	20	0	84%	18,000
Govt. Swedish Pakistani, Institute of	DAE Auto and Diesel	175	Matric	70	70	0	94%	75,000
Technology	DAE Auto -Mechanic	294		145	145	0	97%	72,000
	DAE-Electrical	305		154	154	0	93%	75,000
	DAE- Electronics	284	-	147	147	0	95%	75,000
	DAE- Automation	204		58	58	0	95%	75,000
	DAE-Foundry & Pattern Making	154		70	70	0	95%	75,000
	DAE-Metallurgy & Welding	150		60	60	0	92%	75,000
PCSIR	Precision Mechanical and Instrument Technology	400	Matric with Science	80	80		40%	69,000
	DAE Dies and Moulds	400	(60% Marks)	80	80		40%	92,000
	Mechanical (Level-3)	15	FSC	30	15		100%	165,000
Malaysian Institute of	DAE Mechanical	100	Matric	80	80		80%	36,000
Technology	DAE Electrical	120	with Science	100	100		80%	36,000





			(60% Marks)				
Allama Iqbal Group of Technology Colleges	DAE Mechanical	150	Matric with	100	100	90%	46,800
Institute of Engineering and Technology	DAE Mechanical	120	Science (60% Marks)	100	100	96%	57,600
Hasani college of	Mechanical Engineering	60	Matric	50	50	80%	115,500
technology	Electrical Engineering	65	with Science	50	50	85%	115,500
	Electronics Engineering	60	Matric with Science	50	50	75%	115,500
GOVT. vocational	Mechanical Engineering	200	Matric	100	100	60%	45,000
training institute	Electrical Engineering	100	with 60%	75	100	60%	45,000
	Electronics	50		25	25	60%	45,000
Vocational Training	Electrical Engineering	260	Matric	150	150	70%	36,000
Institute	Mechanical Engineering	260	7	150	150	80%	36,000
Jinnah Institute of	Mechanical	250	Matric	100	100	80%	36,000
management sciences	Electrical	250	With	100	100	90%	36,000
and technology	Electrical	250	Science	100	100	0.8	36,000



DAE Mechanical was the most common course in Diploma/Certificate category accounting for 29% of the total seats in the surveyed TSPs. Number of seats of DAE Electrical were the second highest with 28% share. This situation was in line with the situation found for degree courses where Electrical and Mechanical were identified as the two most common courses. However, the third largest course in Diploma/Certificate category was found to be DAE Electronics which accounted for 14% of the total seats. This was different from the trend found for degree courses where the share of Electronics Engineering was 6%. On an overall basis, the share of 3-year Diploma courses in Engineering (DAE) accounted for 92% of the total seats in Diploma/Certificate courses. The split of courses with respect to trades is shown in Figure 86.

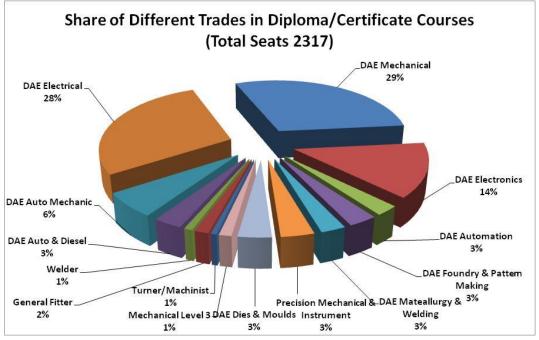


Figure 86 - Share of Different Trades in Diploma/Certificate Courses

Looking specifically with respect to auto sector, two courses were identified. DAE Auto & Diesel accounted for 3% and Auto Mechanic 6% of the total seats in this category. This share of specialized training for auto sector is more than that found in degree courses (2%).

9.2.5.1 Male-Female Split

There was no female representation in the current enrollment for Diploma/Certificate Courses.

9.2.5.2 Admission criteria

The required educational qualification for admission in Diploma courses was Matric in Science subjects with at least 60% marks. For some courses like Mechanical Level 3, the required educational qualification was F.Sc. Requirement for admission in certificate courses was simple Matric.

9.2.5.3 Courses Fee

In the public sector institutes of Punjab, average fees of DAE course was PKR 75,000 going as high as PKR 92,000 for some technologies. Fees for the similar courses in the public sector





institutes in Karachi ranged from PKR 36,000 to PKR 45,000. That meant that the technical education in Diploma/Certificate courses was cheaper in Sindh compared to Punjab. A similar trend was also seen for engineering degree courses.

The fees for similar courses were higher in private sector institutes and ranged from PKR 36,000 to PKR 115000 for DAE courses on different technologies. Diploma courses in some specialized courses were different. For example, the fee for Precision Mechanical and Instrument Technology by PCSIR was PKR 69,000 while a course in Mechanical (Level 3) cost PKR 165,000.

Total fee for certificate courses like Turner/Machinist, General Fitter and Welder in the institutes of Punjab was PKR 18,000.





9.2.6 Short Courses

Table 116 - Short Courses Offered by the Surveyed TSPs

Name of Program	Name of TSP	Number of Applications Received	Eligibility Criteria	Annual Available Seats	Current Enrollment (Male)	Current Enrollment (Female)	Passing %age	Total Fee (Rs.)
Turner / Machinist	Govt.	17	Matric	14	14	0	85%	3,800
Welder	Apprenticeship	14		10	10	0	80%	3,000
Auto Electrician	Training Centre- TEVTA	25		16	16	0	90%	7,600
Electrical	Govt. Technical	14	Matric	9	9	0	98%	940
Machinist	Training Centre	18		11	11	0	95%	940
Auto Mechanic		15		11	11	0	70%	940
Engineering Draughting, Mould Designing, Press Tool Design and Cutting Tool Design	PITAC	22	Matric	25	22		100%	6,300
Basic Welding		10		20	20		100%	5,250
Auto Cad Mechanical		22	Matric	25	20	2	100%	8,400
TIG Welding		10	Middle	20	10		100%	9,450
MIG Welding		10		20	10		100%	9,450
3D Cad/ Cam (Delcom, Power Shape and Power Mill)		24	Matric	25	22	2	100%	8,400
CNC Machining Centre		10		20	10		100%	8,400
CNC LATH (Turning Centre)		10		20	10		100%	7,350
CNC Injection		10		20	10		100%	6,300



Moulding								
CNC Milling		10	-	20	10		100%	4,200
Machine Shop Practice		10	-	20	10		100%	5,250
(Conventional)								
Inspection and		30		30	30		100%	4,725
Measuring Techniques								
Welding	Govt.	N/A	Matric	N/A	N/A	N/A	90%	2,720
Machinist Turner	Apprenticeship	N/A		N/A	N/A	N/A	90%	2,720
Fitter	Training Centre	N/A		N/A	N/A	N/A	90%	2,720
Auto Mechanic		N/A		N/A	N/A	N/A	97%	2,720
Mechanical		N/A		N/A	N/A	N/A	97%	3,250
Draughtsman								
Electrical		N/A		N/A	N/A	N/A	97%	3,250
Electronics		N/A		N/A	N/A	N/A	97%	3,250
CNC Machine Operator	PCSIR	60	Matric	40	40		100%	9,000
Machinist		60	with	40	40		100%	24,000
(Conventional)			Science					
			(60%					
			Marks)					
Welding	Malaysian Institute	110	Middle	100	100		100%	3,000
Auto CAD	of Technology	30	Matric	25	25		100%	3,000
(Mechanical)			with					
			Science	100				
Auto Cad Mechanical	Allama Iqbal	70	Matric	100	70		100%	5,000
	Group of							
	Technology							
Walding	Colleges	28	Middle	26	26		1000/	
Welding	Institute of Engineering and	28	Middle	26	26		100%	-
	Technology and							
	reemology							



Mechanical	Aman Tech	60	Matric	50	50	90%	1,020
Auto Mobile		70		50	50	80%	1,020
Fabrication and		60		50	50	90%	1,020
Welding							
Electronics		65		50	50	90%	1,020
Auto Cad		60		50	50	90%	1,020
Car Painting	Hasani College of	30	Primary	40	30	100%	6 1,020
	Technology						
Inspection Quality and	Govt. Technical	30	Matric	30	30	100%	6 3,760
Control	College Raiwind						



9.2.7 Short Courses

The number of short courses offered by the surveyed TSPs covers a wide variety of technical skills. Those included the skills required on shop floor level in manufacturing sector as well as different types of designing skills. Total number of seats for short courses offered by eleven surveyed institutes was 987.⁴² Number of seats in different institutes varied widely and fell in the range from 10 to 50.

9.2.7.1 Types of Course Trades

The more common short courses offered by the surveyed TSPs included those for Welder, Turner/Machinist, Auto CAD and CNC machines related courses and courses related to electrical, mechanical and electronic technologies. Courses specifically related to auto sector were not many. Five short courses were found related to Auto Mechanic, Auto Electrician, Automobile and Car Painter.

9.2.7.2 Male-Female Split

The share of females in short courses was negligible. Total number of females in the total student enrollment of 870 was only 4 (0.5%). Two of those women were enrolled in Auto CAD and two in 3D CAD/CAM courses. There was no trend of women to enter into the traditional rough and tough courses designed for manufacturing environment.

9.2.7.3 Admission Criteria

Required educational qualification for wide majority of short courses was Matric. Some courses however required a lesser qualification. For example, for a Welding course offered by a private institute in Karachi, and for TIG Welding and MIG Welding courses by PITAC, the required qualification was Middle (Grade 8). Similarly, in another institute, the required qualification was Primary (Grade 5) for a Car Painter course (an auto sector related course)

9.2.7.4 Course Fees

Fee range for the short courses offered by the surveyed TSPs was from PKR 940 to PKR 9,450. There was one Machinist course offered by PCSIR for which the fee was PKR 24,000.

9.2.8 Average Number of Students

Numbers of students passed out of each TSP were assessed. The number was higher for degree awarding institutes and lower for Certificate/Diploma and Short Course awarding institutes. Distribution of TSPs in different slabs with respect to number of students is shown in Table 117.

Ranges	Degree			Certificate / Diploma		Course	Total		
	No.	%	No.	%	No.	%	No.	%	
Up to 100	0	0%	0	0%	2	25%	2	11%	
101 to 200	0	0%	4	50%	0	0%	4	21%	
201 to 300	0	0%	0	0%	2	25%	2	11%	

⁴²The number does not include the capacity of Government Apprentice Training Center Lahore since the students enrollment depends on the number of people sent by industry for training.





301 to 400	0	0%	2	25%	0	0%	2	11%
401 to 500	2	67%	0	0%	0	0%	2	11%
More than 500	1	33%	2	25%	4	50%	7	37%
Total	3	100%	8	100%	8	100%	19	100%

9.2.9 Institutes' Training Capacity Assessment

9.2.9.1 Physical Infrastructure

The training capacity of the surveyed TSPs was assessed by asking direct question. 57% (12) of the surveyed TSPs said that the available infrastructure is not sufficient to meet the training objectives set for their institutes. Figure 87 shows the results. 7 of these institutes were from public and 5 from private sector.

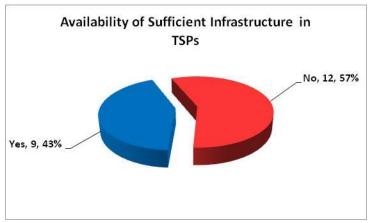


Figure 87 - TSPs View on Availability of Sufficient Infrastructure

83% of the unsatisfied TSPs mentioned that physical infrastructure (building, equipment, furniture, etc.) should be provided while 67% said that intellectual resources need strengthening. There was not much difference in this response between public and private sector TSPs. For public sector TSPs, 57% responses were for physical needs and the rest for intellectual needs; while for private sector TSPs, this split was 50-50.

9.2.9.2 Expansion Plans

90% of the surveyed TSPs expressed their intention to expand their training programmes in future. The two TSPs which did not want to expand were the public sector institutes (Government Apprentice Training Center Lahore & PCSIR). Two reasons quoted for not willing to expand were lack of funds and requirement of approvals from the government.





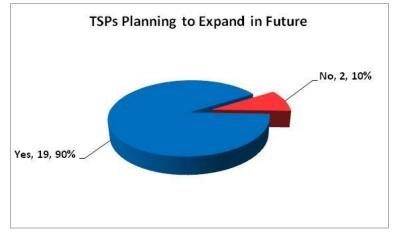


Figure 88 - TSPs Views on Expansion

Distribution of responses with respect to public and private TSPs showed that initiating new courses was the main theme of the expansion programmes envisaged by these institutes. Of the total responses obtained from public sector TSPs, 50% opted for this approach and 50% of the responses from private sector TSPs also went in the favour of this option. On an overall basis, 74% responses were for starting new courses. Physical/infrastructural expansion was the second preferred approach. Geographical outreach by establishing new campuses was the least preferred approach. Only one response each from public and private sector TSPs went in this favour. The analysis is shown in Table 118.

Responses	Public	%	Private	%	Total	%
New courses	9	50%	5	50%	14	74%
Physical/Infrastructural expansion	8	44%	4	40%	12	63%
Geographical outreach/New campus	1	6%	1	10%	2	11%
Total	18	100%	10	100%	28	147%

 Table 118 - TSPs Preferences for Expansion Plans⁴³

Projected increase in enrollment after expansion was seen more optimistically by private sector TSPs compared to public sector ones. Table 119shows the comparison of responses obtained for both.

Increase in Capacity	Public	%	Private	%	Total	%
Up to 10%	5	42%	2	29%	7	37%
Up to 20%	4	33%	1	14%	5	26%
Up to 30%	3	25%	4	57%	7	37%
Total	12	100%	7	100%	19	1

There were twelve responses from public sector TSPs and 25% projected an increase of 30% or more in enrollment whereas for private sector TSPs, four out of seven responses (57%)

⁴³ *The percentages add more than 100% due to multiple responses*





were optimistic to increase enrollment up to 30%. On an overall basis, the responses were almost evenly distributed between three slabs.

9.2.9.3 Sources of Funding

Multiple sources of funding were used by different TSPs. Some of them obtained funding from a single source while many of them used more than one source. For the institutes operating in public sector, government was the most common source of funding. 58% of the public sectors TSPs were funded solely by the government. 17% were partially funding by the government and they generated the balance funds through their own sources. There was one example (8%) where government and industry had joined hands to fund a TSP (Government Apprentice Training Centre Gujranwala). PCSIR operated in public sector but generated its own funds. Aman Tech was a public sector TSP in Karachi which was run through donors and self-generated funds. Distribution of TSPs with respect to different sources of funding is shown in Table 120.

	Public TSPs		Private TSPs		
Funding Source	Public	%	Private	%	
Government	7	58%	-	-	
Government & Self-Generated	2	17%	-	-	
Government & Industry	1	8%	-	-	
Self-generated	1	8%	6	86%	
Donor & Self-Generated	1	8%	-	-	
Donor	-	_	1	14%	
Total	12	100%	7	100%	

Table 120 - TSPs Funding Sources

This situation is a healthy sign since there is a trend of sharing the government's load by developing partnerships with other sector stakeholders. These synergies lead to more effective and efficient utilization of the available resources.

Six out of seven (86%) TSPs in private sector used self-generated funds while one, Nazir Hussain University in Karachi was funded fully by the donor.

9.2.9.4 Students Categories in Terms of Fee Concession

TSPs follow a wide variety of combinations in facilitating their students through fee concessions, free of charge services and stipends. There is a difference in approach of public and private sector TSPs. Table 121 shows the distribution of 21 surveyed TSPs where the students are categorized by fee structures.

Students' Categories	Public	Private
0% Students on Concessional Fee	4	1
5% Students on Concessional Fee	-	1
10% Students on concessional Fee	4	-
20% Students on Concessional Fee	1	-
25% Students on Concessional Fee	1	
30% Students on Concessional Fee	1	1

Table 121 - TSPs Distribution with respect to Fee Concession





25% Students on Concessional Fee & 5% Free	2	1
20% Students on Concessional Fee & 10% Free	-	2
100% Students on Concessional Fee	1	-
20% Students on Stipend	-	1
Total	14	7

Four of the twelve public sector TSPs (29%) charged full fee from their students. Another 29% were those which offered fee concession to their 10% students. Others offered concessionary fee facility to higher shares of students. There was one TSP, Government Apprenticeship Training Centre Gujranwala where 100% of the students were offered the benefit of concessionary fee. There were two TSPs which offered not only concessionary fee to 25% students but also provided free education to 5% of their students. No public sector TSP was found to be offering stipend to its students.

The private sector TSPs also followed a similar approach with different shares of students being offered concessions in their fees. Two institutes also offered free education to their 10% students. One TSP, Institute of Engineering & Technology in Lahore, also offered stipend to 20% students.

9.2.9.5 Channels for Enrollment of New Students

TSPs used eight different types of sources to enroll new students. The most commonly used channel was the newspaper which has been used traditionally and in spite of increased use of cyber channels, has still been able to maintain its utility. 93% of public sector and 100% of private sector TSPs used newspapers for advertising to enroll students. Distribution of handouts and brochures was the second most popular channel; used by 79% public and 86% private TSPs. Billboards and banners were also used and were more popular in private sector TSPs than that in public sector. Use of different channels by public and private sector TSPs is depicted in Figure 89.

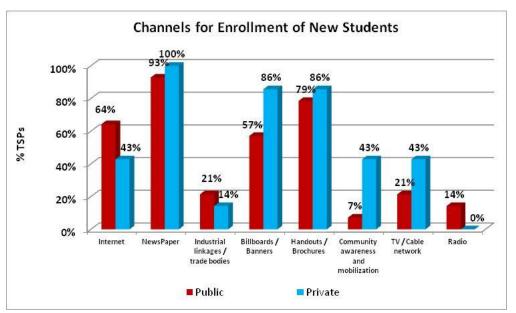


Figure 89 - Channels Used by TSPs for Enrollment of New Students⁴⁴

⁴⁴*The percentages add to more than 100 due to multiple responses*





Internet was also used for attracting students; however surprisingly the use of internet was more popular in public TSPs where 64% of them used this channel; compared to only 43% private TSPs. Community awareness and Cable TV was used more commonly by private TSPs. Radio was used on a limited scale and only by public sector TSPs.

9.2.10 Teaching Faculty

Total faculty in 21 surveyed TSPs was 1,063 which came out to be 51 per institute. 853 of these faculty members were from public sector (80%) and 210 from private sector TSPs (20%). Average faculty size came out to be 61 for public sector and 30 for private sector TSPs. Table 122shows the details.

ТЅР Туре	No. of Faculty Members	% Share	No. of TSPs	Faculty per TSP
Public Sector TSPs	853	80%	14	61
Private Sector TSPs	210	20%	7	30
Total	1,063	100%	21	51

 Table 122 - Number of Teaching Staff in the Surveyed TSPs

Looking into the employment status of the faculty members, it was found that 87% of the faculty members were permanent and 13% were part time. There was no difference in shares of permanent and part time faculty between public and private sector TSPs. The split is shown in Figure 90.

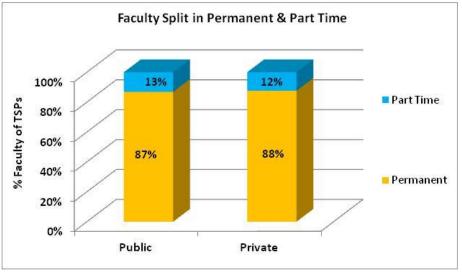


Figure 90 - TSPs Faculty -Permanent-Temporary Split

9.2.11 Training Modes Used by TSPs

TSPs used different training modes. Looking at the whole sample of 21, all of them used classroom training, while workshops/labs mode was used by 95%. On-job training with industry was not a very common mode and was used only by 38% TSPs. There was no major difference in the use of training modes between public and private TSPs; except for the use of On-job training with industry. It was used by a higher percentage of public TSPs compared to private ones. It was because the public TSPs maintain a better networking with the industry.





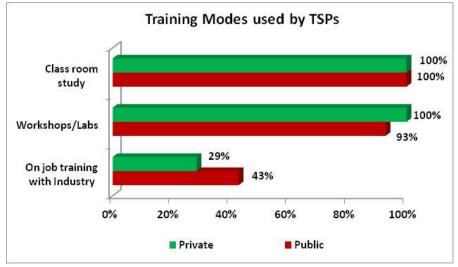


Figure 91 - Training Modes Used by TSPs⁴⁵

The study also analyzed the extent to which different training modes were used. Public and private sector TSPs did not differ very much. Use of workshops/labs was the most emphasized mode of training in both types of TSPs. In private TSPs, 54% training was conducted using Workshops/Labs while in public TSPs, it was 51%. The share of classroom study was also higher in private TSPs as 45% compared to 39% for public.

⁴⁵The percentages add to more than 100 due to multiple responses





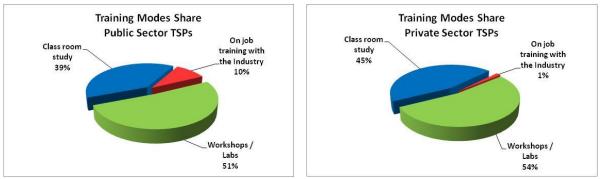


Figure 92 - Training Modes-Public TSPs

Figure 93 - Training Modes-Private TSPs

Use of on-job training was only 1% in private and 10% in public TSPs. These small figures also confirm the insufficient interaction between the training service providers and the industry.

9.2.12 Support Desired by TSPs

TSPs were inquired about the kind of support they would like to have for improving their services. The answers were received for all the options but were more clustered around support for provision of physical facilities. 71% of public TSPs wanted to have equipment support and 57% wanted infrastructure support. In case of private TSPs as well, these two were the most important areas identified for support; however the order of priority was reverse. 57% asked for infrastructure support and 43% for equipment support. Figure 94 shows the results.

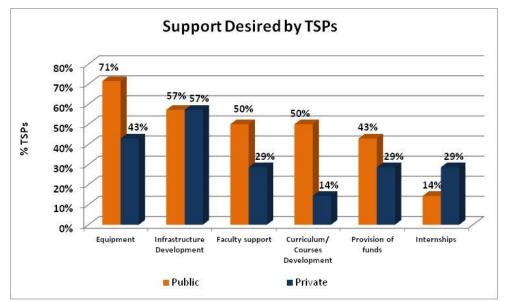


Figure 94 - Support Required by TSPs⁴⁶

Support for faculty and curriculum was highlighted more prominently by public TSPs than private ones. There were small numbers of TSPs that asked for provision of funds. An important difference in the required support was with respect to internships. Only 14% public TSPs required this support but 29% private TSPs wanted help in that regard. This finding

⁴⁶*The percentages add to more than 100 due to multiple responses*





once again confirms the finding that interaction of private TSPs with industry is weaker compared to that between public TSPs and industry.

9.2.13 Job Placement

9.2.13.1 Reasons for Not Getting Employment within 60 Days

Reasons for delayed job placement of the skilled manpower passing out from TSPs were explored. Economic turmoil and the related energy crisis were quoted by 62% TSPs as the most important reason in that regard. 48% TSPs were of the opinion that there is insufficient support from the industry due to which the students do not get the required practical exposure. And consequently, are not preferred for hiring. Lack of interest by students and poor law and order were also quoted as some less important reasons. Figure 95 shows the results.

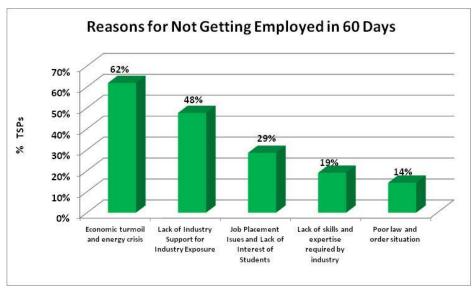


Figure 95 - Reasons for Not Getting Employment in 60 Days⁴⁷

One reason for delayed employment related to the skills quality and expertise of the passing students. However, that was quoted only by four TSPs (19%) which indicated that on an overall basis, majority of the TSPs rated the skills quality of their graduates good enough to be hired by the industry.

There was no major difference between the opinions of public and private sector TSPs on the reasons for unemployment; except that lack of students' interest was quoted as the second most important reason and poor law and order situation was not quoted by any private sector TSP.

9.2.14 Measures to Improve Skills Quality to Improvement Job Placement

Improvement in technical infrastructure in jobs and development of improved training material were the two most important reasons for skills improvement; quoted each by 67% TSPs. Development of training staff was considered as the least important. This measure was not quoted by any private sector TSP. Figure 96shows the results.

⁴⁷*The percentages add to more than 100 due to multiple responses*





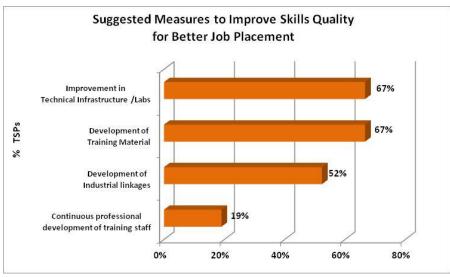


Figure 96 - Measures Suggested by TSPs for Better Job Placement⁴⁸

9.2.15 Follow-up Steps for Job Placement

90% of the TSPs were found to be following up with the potential employers from the industry to find a job for their graduates.



Figure 97 - TSPs Involved in Job Placement

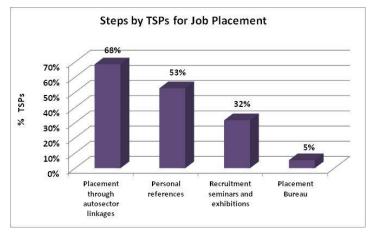


Figure 98 - Steps Taken by TSPs for Job Placement⁴⁹

⁴⁸The <u>percentages add to more than 100 due to multiple responses</u>





The most common mode used to help students get a job was the placement using auto sector linkages with TSPs. 69% TSPs were found to be using this route. Another similar mode was using personal references; quoted by 53% TSPs. The only difference between the first and the second mode was that the first related more to official channels while the second used specific relationships between persons in industry and TSPs. Use of formal routes, such as seminars/exhibitions and placement bureau was not found to be very common.

9.2.16 Skills Gaps and Suggested Improvement Measures

Two third of the surveyed TSPs agreed that there is a gap between the existing skills and the skills required by the employers. Figure 99shows the distribution of TSPs in that regard.

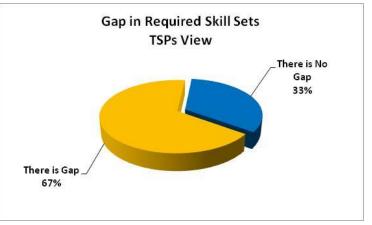


Figure 99 - TSPs View on Gaps in Required Skill Sets

The realization that there is room for improvement was more in private TSPs than that in public. 43% private TSPs said there is a gap compared to 29% for public TSPs.

9.2.16.1 Sector Experts View on Quality Rating of Technical Training Institutes

38% experts rated the quality of institutes as good and 55% rated that as average. There were some responses on two extremes also. Two experts (5%) rated the quality as poor and one (2%) rated it as excellent. Figure 100shows the split.

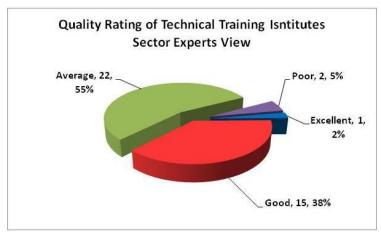


Figure 100 - Sector Experts View in Quality of TSPs

⁴⁹*The percentages add to more than 100 due to multiple responses*





From an overall perspective, the situation cannot be termed satisfactory as the two bottom ratings (average and poor) accounted for 60% responses and two top (good and excellent) only accounted for 40%. That shows that experts consider that there is room for improvement in performance of training service providers.

9.2.16.2 Suggested Measures to Bridge Demand-Supply Gap

Increasing industry exposure was the most important step quoted by TSPs to bridge the existing skill gap. 47% responses from public sector and 75% responses from private sector TSPs fell under this category (multiple responses chosen). Revamping of curricula was considered the second most important measure for improvement. Less emphasis was placed on increasing practical training hours. None of the private TSPs mentioned this measure. This indicated towards the perception of TSPs that the share of practical training in the total training hours is sufficient. This also confirmed another finding as per which the share of workshops/labs training mode was found to be more than 50% for both public and private TSPs. Need for equipment was not mentioned by any private TSP and only one public TSP. Figure 101shows the distribution.

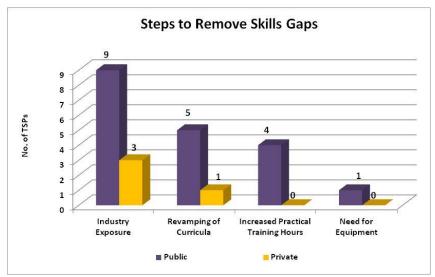


Figure 101 - TSPs Suggested Steps to Remove Skill Gaps

9.2.17 Improvement Options for Different Courses

The responding TSPs were asked to identify training programmes requiring improvements and suggested the most suitable option for achieving that. The three options were 'eliminating the programme', 'reviewing curriculum' or 'increasing practical training'. Total 40 responses were obtained of which none was in favour of eliminating any programme. The distribution of responses between the other two options for different courses is shown in Table 123.

	Total No. of Responses	Need for Curriculum Review		Need to In practical T	raining	
		No. of	%	No. of	%	
Course Type		Responses		Responses		
Degree	4	1	25%	3	75%	
Diploma/Certificate	12	6	50%	6	50%	
Short Course	24	14	58%	10	42%	





Total	40	21	53%	19	48%

On an overall basis, the responses were almost equally divided between the two options. However, a trend was observed as one moved from degree to short courses. In degree courses, more emphasis was placed on increasing practical training. In Diploma/Certificate courses, both the options were rated equally important; while for short courses, the need for curriculum review took over the need for increasing practical training.

9.2.17.1 Training Programme wise Recommendations

Recommended options for each of the identified training programme are presented in Table 124.

Degree Courses		
Course	Need for Curriculum Review	Need to Increase Practical Training
Mechanical	-	✓
Certificate/Diploma Courses		
Auto Mechanic	✓	-
Electrical	✓	-
General Fitter	✓	-
Mechanical	✓	-
CAD/CAM & Pattern Making	-	✓
EFI	-	\checkmark
Short Courses		
CAD/CAM & Pattern Making	✓	-
Auto Electrician	✓	-
Auto Mechanic	✓	-
Auto & Diesel	✓	-
CNC Machine Operator	✓	-
Electrical	✓	-
General Fitter	✓	-
Inspection and Measuring Techniques	✓	-
Machinist / Turner	✓	-
Mechanical	✓	-
Thermoforming	-	✓
Injection Moulding	-	✓

9.2.18 Curricula Development Modes

52% TSPs were found to follow the curricula developed by government bodies. This included both public and private sector TSPs. 48% used their own experts to develop curricula. Figure 102shows the responses percent of TSPs.





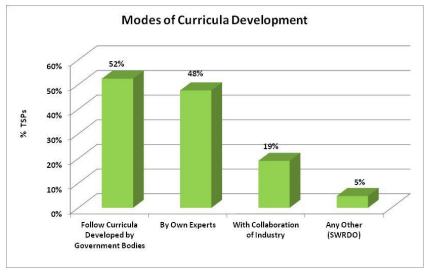


Figure 102 - Models of Curricula Development⁵⁰

Only 19% TSPs developed curricula in collaboration with the industry. The finding reconfirmed that there was insufficient interaction between training institutes and industry. One of the surveyed TSPs was found to use the expertise of non-government sector for curricula development. No major difference in approach was observed between public and private sector TSPs.

9.2.19 Curricula Endorsement by Industry

57% of the surveyed TSPs did not have any mechanism in place to obtain endorsement of industry; either at the time of curricula development or after that. The underlying reason for this was once again the insufficient and ineffective coordination between the suppliers and consumers of skilled workforce.

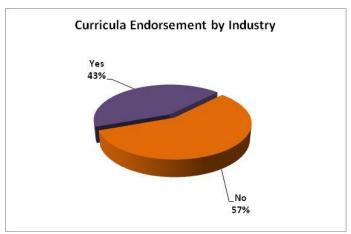


Figure 103 - Curricula Endorsement by Industry

The approach of the private TSPs was better in this regard. 71% of public sector TSPs did not have this mechanism of endorsement whereas for private sector TSPs, 71% had such a mechanism in place. Distribution of responses is shown in Table 125.

Table 125 - TSPs Curricula Endorsement by Industry

⁵⁰The percentages add to more than 100 due to multiple responses





Presence of Endorsement Mechanism	Public TSPs	%	Private TSPs	%
Yes	4	29%	5	71%
No	10	71%	2	29%
Total	14	100%	7	100%

Regarding use of specific mechanism, 5 out of 9 TSPs obtained industry's endorsement at the time of curricula design while 4 of them obtained that after designing the curricula. Motivating TSPs to involve industry at the start of this activity and taking it along during all the development phases can lead to an improvement and better acceptability of skilled graduates in the industry.

9.2.19.1 Sector Experts View on Effectiveness of Existing Curricula

Effectiveness of existing curricula was rated as good only by 35% experts. 65% experts rated it as not good; distributed as 55% average and 10% poor. Distribution is shown in Figure 104.

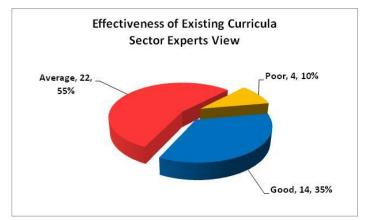


Figure 104 - Effectiveness of Existing Curricula - Sector Experts View

The responses indicate towards the immediate need to upgrade the existing curricula in line with the real industry needs while incorporating the modern practices.

9.2.19.2 Measures to Improve Curricula

Establishment of Curriculum Planning & Assessment Council was mentioned by 50% experts as the most important step for curriculum improvement. Increasing coordination between industry and TSPs was quoted by 45% experts as an important step for improving curriculum. Involvement of international experts focused training need analysis and continuous monitoring of changing curriculum needs were also quoted as important measures in that direction. Figure 105shows the results.





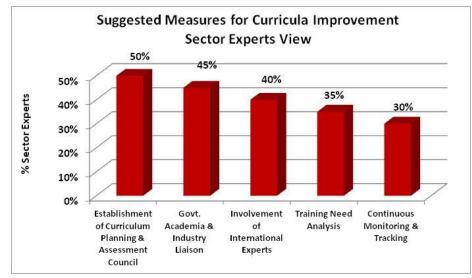


Figure 105 - Sector Experts Views on Measures for Curricula Improvement-Sector⁵¹

9.2.20 Plans for New Programmes

TSPs were inquired about their future plans to start new programs in different categories. Six TSPs out of 21 (29%) did not have any plans to start any new programmes. Four of these institutes were public and two private. The remaining fifteen TSPs provided information about their planned new programs. The summary regarding the number of programmes under three types of courses by public and private sector TSPs is provided in Table 126.

TSP Type	Degree	Diploma/ Certificate	Short Course	Total	Course per TSP
Public	4	3	18	25	2
Private	0	3	6	9	1
Total	4	6	24	34	2

Maximum number of new programmes was planned for short courses. 24 courses were identified of which 25 were from public and 9 from private TSPs. 6 Diploma/Certificate courses were equally divided between public and private institutes. 4 degree courses were planned only by public sector institute (Rachna College of Engineering & Technology, Gujranwala).

9.2.20.1 New Planned Courses

New courses planned by TSPs and the courses suggested by sector experts have been listed in the following tables. It can be observed that the courses suggested by experts are almost the same as planned by the TSPs. This indicates that there is a common understanding between the TSPs and the industry experts on the future technical needs of auto sector.

Programme Type	Courses Planned by TSPs	Courses Suggested by Experts
Degree Courses	Mechanical Engineering	Automobile Engineering

⁵¹*The percentages add to more than 100 due to multiple responses*





	Industrial & Manufacturing	Industrial & Manufacturing
	Engineering	Engineering
Certificate/Diploma	CNC Machine Operator	CNC Machine Operator
Courses	Forging ⁵²	
	Foundry	
	Machining	
	Core Blowing	
Short Courses	Moulding	Core Blowing
	Welding	Welding
	Turner	Die Casting
	Die Casting	Forging
	Forging	Machinist
	Machinist	Auto CAD (Mechanical)
	Mechanical Draftsman	
	Auto CAD (Mechanical)	
	Metal Casting	
	Surface Treatment	
	Automation	

Table 128 - TSPs New Planned Courses in Rubber/Plastic Parts Subsector

Programme Type	Courses Planned by TSPs	Courses Suggested by Experts
Degree Courses	No Course identified	No Course identified
Certificate/Diploma	Polymer Engineering	Polymer Engineering
Courses		
Short Courses	CAD/CAM (Mould Designing)	CAD/ CAM (Mould Designing)
	Injection & Moulding	Injection and Moulding
	CAM	CAM

Table 129 - TSPs New Planned Courses in Electronic/electrical Parts Subsector

Programme Type	Courses Planned by TSPs	Courses Suggested by Experts
Degree Courses	Electrical Engineering	Electrical Engineering
	Electronics Engineering	Electronics Engineering
Certificate / Diploma		
Courses	No course identified	No course identified
Short Courses	No course identified	No course identified

Table 130 - TSPs New Planned Courses in Assembly/Sub Assembly Subsector

Programme Type	Courses Planned by TSPs	Courses Suggested by Experts
Degree Courses	No course identified	No course identified
Certificate/Diploma		No course identified
Courses	No course identified	
Short Courses	Die and Mould (Fitting)	Die and Mould (Fitting)
	General Fitter	General Fitter

⁵² Forging was also specifically mentioned by PAAPAM as an important trade in which the Auto parts sector faces limitation to find good quality skilled workforce.





9.2.20.2 Courses Requiring Improvement-Sector Experts View

Three courses were identified for degree, five for Diploma/Certificate and seven for short courses by the sector experts; shown in Table 131.

Course Type	Name of Program	
Degree	Electrical	
	Mechanical	
	Polymer Engineering	
Diploma/Certificate	Auto Mechanic	
	Mechanical	
	Electrical	
	Welder	
	Foundry & Pattern Making	
Short Course	CAD/CAM & Pattern Making	
	Auto Electrician	
	Auto Mechanic	
	Auto & Diesel	
	Inspection and Measuring Techniques	
	Machinist	
	Mechanical	

Table 131 - Courses Requiring Improvement-Sector Experts View

Automotive sector specific courses mentioned included Auto Mechanic Diploma/Certificate and short courses in Auto Electrician, Auto Mechanic and Auto & Diesel. Most of the courses identified by the experts were the same which were also identified by the auto parts enterprises.

The experts also suggested remedial measures for improving in curriculum. For degree courses, the most common measure was increasing practical training during the course; while for Diploma/Certificate courses, the most commonly quoted measure was reviewing the curriculum in the light of current needs of the sector.

9.2.21 Demand of Skilled Workforce for Different Course Types

The study analyzed the demand of skilled workforce with respect to degree, diploma/certificate and short courses. Demand was rated as High, Medium or Low. Total responses obtained from TSPs for all three course types have been presented in Figure 106.





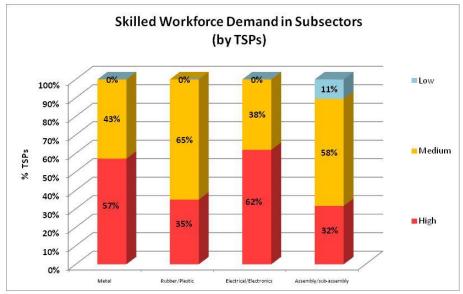


Figure 106 - Skilled Workforce Demand in Subsectors by TSPs

Demand was rated High in Metal and Electronic/Electrical parts subsectors. 57% TSPs rated demand as high in Metal and 62% in Electronic/Electrical subsectors. For Rubber/Plastic and Assembly/Sub Assembly subsectors, highest numbers of responses were obtained for Medium demand. Assembly/Sub Assembly was the only sector where 11% responses rated the demand for skilled workforce as 'Low'.

Table 132presents the number of responses obtained for different types of courses in the four subsectors.

	Degree		Diploma/Certificate		Short Course					
Subsector	High	Medium	Low	High	Medium	Low	High	Medium	Low	Total
Metal	-	1	-	11	4	-	1	4	-	21
Rubber/Plastic	1	-	-	3	7	-	3	6	-	20
Electrical/ Electronics	-	1	-	10	2	-	3	5	-	21
Assembly/Sub- Assembly	_	1	-	4	3	2	2	7	-	19

 Table 132 - Demand Intensity for Degree, Diploma & Short Courses in Subsectors (by TSPs)

In Metal subsector, maximum responses were obtained for Diploma/Certificate courses and 11 out of 15 responses were rated High. Thus, in Metal subsector, there was High demand for Diploma/Certificate courses.

In Rubber/Plastic parts subsector, the projected demand was evenly distributed between Diploma/Certificate and Short Courses; with 10 and 9 responses respectively. Thus in this sector, there was demand of Medium intensity equally distributed between Diploma/Certificate and Short Courses.

In Electronic/Electrical parts subsector, the number of responses in Diploma/Certificate was 12 compared to 8 for Short Courses. Of the 12 responses, 10 were rated for High demand. Thus, in this subsector, there was a High Demand for Diploma/Certificate courses.





In Assembly/Sub Assembly subsector, the number of responses for Diploma/Certificate and short courses was 9 for both. However, two responses for Diploma/Certificate courses fell in 'Low' demand range. Therefore, the demand assessment for Assembly/Sub Assembly subsector was of Medium intensity and was more focused on short courses.

9.2.22 Training of Trainers

100% of the surveyed TSPs arranged training of trainers' sessions. The common mode used for TOT was using teacher's training manuals available with the institutes. 71% of the surveyed institutes followed this approach. 48% TSPs endeavoured to use national and international experts to train their teachers. There was also the existence of some coordination between TSPs; shown by the fact that 38% TSPs used courses from other training institutes. This approach was not used very much by private TSPs and was mentioned only by one private institute (9%). Use of new approaches like online support courses was practiced only by 14% TSPs. The use of these methods was more commonly followed by private sector TSPs. Apart from these differences, the trend for TOT was almost same in public and private sector TSPs. Distribution of responses for TOT are shown in Figure 107.

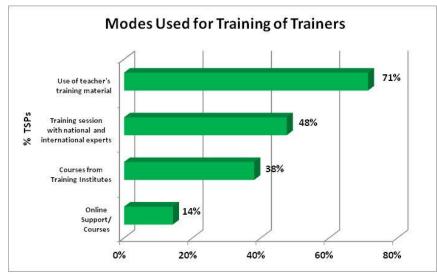


Figure 107 - Modes Used for Training of Trainers⁵³

9.2.23 Preferred Training Institutes & Programmes

The surveyed TSPs identified training institutes and programmes at national and international level that meet the industry's requirements for skilled workforce. Only 10 TSPs (48%) identified such programs. The results are tabulated in Table 133.

Institutes	Programs	Level		
National				
TEVTA	Welding	Diploma/ Certificate		
Swedish Pakistani Institute	Mechanical	Associate Degree		
		Diploma/ Certificate & Short		
DESCON	Welding	Course		

⁵³*The percentages add to more than 100 due to multiple responses*





GCT	Mechanical engineering	Associate Degree
UET	Mechanical	Degree
Punjab Poly Technic	DAE Mechanical engineering	Associate Degree
International		
ASHRAE	CAD-CAM	Short Course

9.2.24 New Courses Requirement

TSPs identified areas which are the emerging needs of auto sector and for which the TSP sector was not offering courses. The responses are shown in Figure 108.

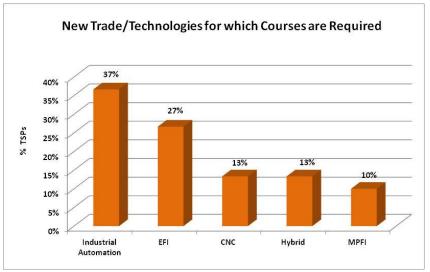


Figure 108 - New Trades for Initiating Courses

Industrial automation was ranked as the most important emerging need by 37% of TSPs. The finding was in line with the findings obtained from auto sector enterprises which also identified automation as an important emerging need. Electronic Fuel Injection system was the second most important skill area identified by 27% TSPs. This area was also highlighted by the demand side. CNC machines technology, Hybrid and MPFI (Multi Port Fuel Injection) were the other important areas which were also mentioned by auto parts enterprises. Thus a consensus was observed between the opinions of skills supply and demand sides. Such a situation is very helpful in designing focused interventions and development programmes in a sector.

9.2.25 Need for Certification

100% of the surveyed enterprises realized the need to get national or international certification. However, there was not very much clarity about the certification bodies. A wide array of responses was obtained from 21 TSPs. Names of possible certification bodies and the responses against each are shown in Table 134.

Table 134 - Recall for	Certification Bodies ⁵⁴
------------------------	------------------------------------

Name of Organization	No. of Responses	%
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⁵⁴*The percentages add to more than 100 due to multiple responses*





ΤΕντα	9	43%
PBTE	6	29%
SBTE	3	14%
UET	2	10%
HEC	2	10%
PEC	2	10%
PITAC	1	5%
PCSIR	1	5%
Gov. College of Technology	1	5%
City & Guilds	1	5%
Skill Development Council	1	5%
Malaysian Institute of Technology	1	5%
TTB	1	5%
American Welding Society	1	5%
Total	32	124%

43% of the surveyed TSPs considered TEVTA as the main certification body. These were the TSPs from public sector in Punjab. Punjab Board of Technical Education was the second most commonly quoted certification body. It was followed by Sindh Board of Technical Education which was quoted by three organizations belonging to public sector and located in Karachi. Many educational institutions were also quoted as the certification bodies. International organizations like City & Guilds and American Welding Society were also quoted.

The above results indicated that there is a need to create awareness in TSP sector about certification of institutes. The institutes should be enlightened about the importance and benefits of certification, possible options and the routes to achieve certifications.

9.2.26 Skills and Courses Requiring International Expertise

Skills and courses identified by TSPs are listed in Table 135 along with the source of international supplier.

Name of Skill/ Discipline	Name of Course	Source of International Supplier
EFI	EFI	UNDP
Electrical	Electrical Diploma	City & Guilds
Mechanical	CAD	City & Guilds
Auto Production	Technician	City & Guilds
Mechanical	Welding	City & Guilds
Mechanical	Welding & Fabrication	City & Guilds

 Table 135 - Skills/Courses Requiring International Expertise

City & Guilds has been identified as the main supplier. Looking through the results, it appears that the exposure of the surveyed TSPs is not broad enough to be able to answer this question in a focused manner. The responses should consequently be interpreted carefully.





9.2.27 Courses in Demand

The enterprises identified the courses in which workforce should be trained. Estimated demand for those jobs over the next one year was also obtained.

9.2.27.1 Degree Courses

Degree courses in demand with estimated numbers required over the next one year are shown in Table 136.

Course	No.	Share
Mechanical Engineering	104	59%
Electrical Engineering	32	18%
Mechatronics Engineering	15	9%
Industrial Engineering	13	7%
Metallurgical Engineering	9	5%
Automobile Engineering	3	2%
Total	176	100%

Table 136 - Degree Courses in Demand

Mechanical engineering was the most desired course in auto parts sector; accounting for 59% of the total demand for degree courses. It was followed by Electrical engineering with 18% of the responses. There was no mention of Electronics engineering by any of the enterprises; however, Mechatronics engineering was mentioned by 9% enterprises. This shows that the auto sector enterprises prefer a person with skills in both mechanical and electronics over the one with only electronics skills. Industrial and Metallurgical engineers were also in demand; however in smaller numbers.

An important observation was that there was very small demand for people having specialized skills in automotive industry. Only 3 enterprises (2%) expressed the demand for Automobile engineers. Skilled persons with relatively broader skills in particular fields were more preferred by the industry.

9.2.27.2 Diploma/Certificate Courses

Diploma/Certificate courses in demand with estimated numbers required over the next one year are shown in Table 137.

Course	No.	Share
CAD/CAM	66	32%
Welding	52	25%
CNC Machine Operation	25	12%
Precision Machining	25	12%
Injection Moulding	17	8%
Quality Control	9	4%
Mechanical	6	3%
Foundry	5	2%
Automation	1	0.5%

Table 137 - Diploma/Certificate Courses in Demand





Pressing & Stamping	1	0.5%
Total	207	100%

CAD/CAM was the most wanted course in Diploma/Certificate category. 32% auto sector enterprises desired to engage people with this skill in the next one year. Welding was the second most desirable skill covering 25% of the total demand. Automation was identified as the most important emerging trend in the sector. In line with that, demand for CNC machine operation was expressed by 12% respondents. With reference to Rubber/Plastic parts subsector, Injection Moulding was also mentioned by 8% enterprises.

In addition to the above, the requirement of skilled workforce in Forging and Electroplating trades was specifically mentioned in the feedback provided by PAAPAM.

9.2.27.3 Short Courses

The number of short courses in demand by auto sector was only five and the demand distribution was highly skewed in favour of CAD/CAM; accounting for 95% of the total responses. This is indicative of the importance assigned to designing skills in auto sector. The skill was rated as highest demand skill in both Diploma/Certificate and short courses categories. It indicated that the industry realizes the importance of computer and is well prepared to use this as a modern designing and manufacturing tool. Demand distribution for short courses is shown in Table 138.

Course	No.	Share
CAD/CAM	539	95%
Simulating Method Engineering	12	2%
Machinist	9	2%
Quality Control	4	1%
Measurement Tools	2	0.4%
Total	566	100%

Other important short courses mentioned by the enterprises were simulating method engineering (also design related), machinist and quality control and measurement tools.

9.2.28 Preferred National/International TSPs

Preference of the employers for hiring from some preferred TSPs was explored during the survey. 53% enterprises held a preference for any specific institute while 47% were found not to hold any preference in that regard. The response from the sector experts was different where 77% were found to have a preferred institute. Comparison is shown in Figure 109 and Figure 110.





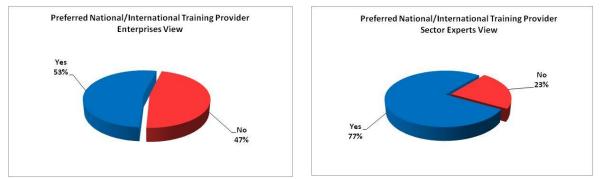


Figure 109 - Enterprises View on Preferred TSPs Figure 110 - Sector Experts View on Preferred TSPs

9.2.28.1 Recall of National/International TSPs for Different Programmes – Enterprises View

The enterprises were able to recall some institutes at national and international levels with respect to different programmes. Browsing through the lists of institutes and the recalled programmes, it can be inferred that the information available with the enterprises was not completely correct as many such programmes were mentioned for some organizations which do not offer any such programmes. In some cases, some organizations were mentioned as training organizations which actually existed with a different mandate. It can thus be inferred that there is limited awareness in business organizations about the TSP sector as a whole. It will be useful to create awareness in business enterprises about this sector with respect to different kinds of entities that exist and their roles. Figure 111provides the distribution of recall of the top institutes by auto sector enterprises for different programmes.

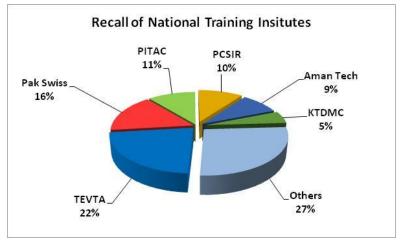


Figure 111 - Recall of National Training Institutes by Enterprises

A total of 157 national level programmes were mentioned by the responding enterprises. TEVTA had the highest recall of 22%. This showed that for most of the people, TEVTA was a training institute whereas actually, it is an Authority established to manage the technical and vocational education in Punjab. Pak Swiss Training Center Karachi had the second highest recall of 16%. This was in spite of the fact that the share of enterprises from Karachi was only 36%. PITAC, PCSIR were the third and fourth in terms of recall with 11% and 10% shares in total programmes mentioned by the enterprises. Aman Tech and KTDMC were also the institutes from Karachi that had high recalls of 9% and 5% respectively.





The 'Others' category was also sizeable with 27% responses. Number of organizations included in this category was 14 which also included some generic names like 'Technical Training Institute', 'Technical College' and 'Vocational Training Institute'. It also included SMEDA which is directly not a TSP. Similarly, Punjab Board of Technical Education was also mentioned as a TSP by some enterprises. Apart from these, the other TSPs in this category included NED University of Engineering & Technology, UET Lahore, Pakistan Welding Institute. SECW, NIDA (TUSDEC), University of Lahore, Government Polytechnic Institute and Plastic Technology Centre Karachi.

These institutes were mentioned for different programs. More frequently programmes for the top recalled TSPs are presented in Table 139.

TSP	Most Recalled Courses by Enterprises
TEVTA	Diploma of Associate Engineering (DAE)
	DAE Mechanical
	Welding
	Machinist
Pak Swiss Training Centre	Diploma of Associate Engineering (DAE)
	DAE Electrical
	CNC Machine Operator
PITAC	Diploma of Associate Engineering (DAE)
	CNC Machine Operator
	Auto CAD
PCSIR	Diploma in Precision Machining
	Mechanical Course
Aman Tech	Diploma of Associate Engineering (DAE)
KTDMC	DAE Dies & Moulds

 Table 139 - Most Recalled TSPs and Courses by Enterprises

Details of courses mentioned for each TSP recalled by the enterprises is presented in Annexure H.

9.2.28.1.1 <u>Recall of International Training Institutes by Enterprises</u>

There was a low recall of international training institutes by the surveyed auto sector enterprises. Only two institutes mentioned in that regard were:

- Institute of Cast Metals Engineers (one response)
- South African Institute of Welding (one response)

Two international courses were mentioned by the surveyed enterprises:

- Aluminium Metallurgy
- International Plate Welder

9.2.28.2 Recall of National/International TSPs for Different Programmes – Sector Experts View

The institutes recalled by the sector experts were the same as that by the enterprises. Total responses in this regard were 66 by the surveyed 40 experts. Distribution of responses is shown in Figure 112.





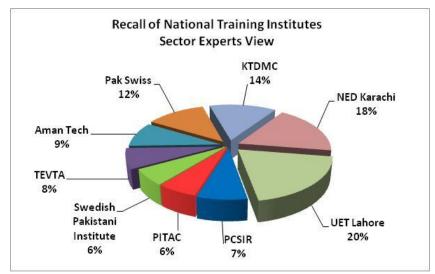


Figure 112 - Recall of National Training Institutes by Sector Experts

UET Lahore had the maximum recall of 20%; followed by 18% recall for NED University of Engineering & Technology Karachi. Swedish Pakistani Institute was one TSP that was identified by experts but not by enterprises.

These institutes were mentioned by the sector experts for different programs. More frequently programmes for the top recalled TSPs are presented in Table 140.

TSP	Courses	Recall
TEVTA	CAD / CAM	3
	DAE Mechanical	1
	DAE Electrical	1
UET Lahore	B.Sc. Mechanical	3
	B.Sc. Electrical	4
	Polymer & Process Engineering	1
	Metallurgy Engineering	3
	Mechatronics Engineering	2
KTDMC	DAE Tools & Dies	3
	CAD / CAM	1
	Mould Design Course	1
NED Karachi	B.Sc. Mechanical	5
	Metallurgy Engineering	3
	B.Sc. Electrical	3
PITAC	Mould Designing	4
Pak Swiss	CAD / CAM	2
	B.Tech Mechanical Engineering	3
	DAE tools & Dies	3
Aman Tech	DAE Electrical	1
	DAE Mechanical	1
	CAD / CAM	4

Table 140 - Most Recalled TSPs and Courses by Sector Experts





Swedish Pakistani Institute	Welding	3
	CAD / CAM	1
PCSIR	CNC Machine Operator	3

9.2.29 Satisfaction with Current Trained Workforce

Satisfaction level of the surveyed enterprises with the current trained workforce was assessed. 62% enterprises expressed their satisfaction in terms of the current workforce meeting the technical needs of their enterprise; while 38% expressed their dissatisfaction in that regard.

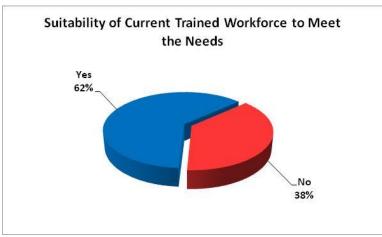


Figure 113 - Suitability of Current Trained Workforce

The satisfied enterprises were further probed about their level of satisfaction. An equal split was found between 'satisfied' and 'somewhat satisfied'. When seen for the whole sample, the share of satisfied enterprises came out to be 31%. Only 0.5% enterprises were found to be highly satisfied' with the present training level of their skilled workforce. 37.5% enterprises were not satisfied. Considering that half of the 'somewhat satisfied' as 'not satisfied' and half as 'satisfied, it can be said that 53% enterprises were not satisfied with their trained workforce. The distribution of enterprises with respect to satisfaction level is shown in Figure 114.



Figure 114 - Satisfaction with Current Training-Enterprises View





9.2.29.1 Usefulness of Current Educational System for Auto Parts Sector – Sector Experts View

78% of the sector experts were of the view that the current educational system is unable to serve the needs of auto parts sector.

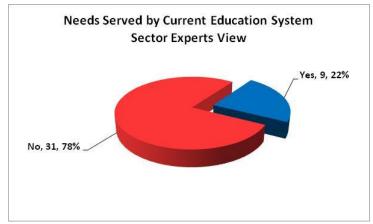


Figure 115 - Needs Served by Current Education System-Sector Experts View

9.2.29.2 Reasons for Dissatisfaction-Enterprises View

The most commonly quoted reason for dissatisfaction was lack of required skill in the trained workers. 60% dissatisfied enterprises quoted this reason. The other important reason quoted by 47% enterprises was insufficient theoretical knowledge. It showed that the business enterprises assign more importance to practical skills than the theoretical knowledge. The third reason was lack of soft skills which was considered important only by 4% enterprises. Distribution of responses is presented in Figure 116.



Figure 116 - Reasons for Dissatisfaction of Trained Workforce⁵⁵

9.2.29.3 Reasons for Ineffective Training System – Sector Experts View

The most important reason quoted by 61% experts was lack of required support from the government. This view has a direct link with the fact that major share of training capacity is in public sector. Supply and quality of the trained skilled human resource largely depends on the

⁵⁵*The percentages add to more than 100 due to multiple responses*





performance of government institutes. Government needs to bring skill training further higher in its priorities for improvement.

Lack of appropriate training mechanism was quoted by 55% experts as the second biggest reason in being unable to serve the sector needs. The most important concern in this regard was the insufficient share of practical training and lack of industry exposure to the passing out skilled workers. Not having demand driven curriculum was rated as the third largest reason by 45% experts. In sufficient physical infrastructure was the least important reason and was mentioned only by 26% experts. Figure 117shows the results.

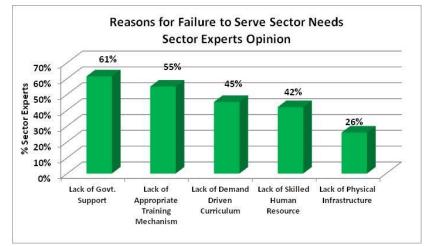


Figure 117 - Reasons for Failure to Serve Sector Needs-Sector Experts View⁵⁶

9.2.29.4 Sector Experts View on Skill Deficiencies

Lack of technical skill was quoted by 68% experts as the biggest deficiency in the skill set of the existing workforce. This is in line with the opinion of the enterprises where 60% respondents mentioned this as the most important deficiency. Lack of soft skills was the second biggest deficiency mentioned by 53% experts. However, this skill deficiency was not given importance by the enterprises and only 4% enterprises quoted this as an issue. This difference of opinion is a classic example of the fact that the when working in manufacturing environment, the approach is to meet the production targets for which importance is given only to those factors which directly affect the production. While having soft skills is very important, it is not considered as a factor which is directly affecting the production. So it is not rated important by the enterprises. However, the sector experts are able to look at the holistic picture in the long term scenario, going beyond the shop floor level. Thus they rated the soft skills as the second most important deficiency in the current workforce.

⁵⁶*The percentages add to more than 100 due to multiple responses*





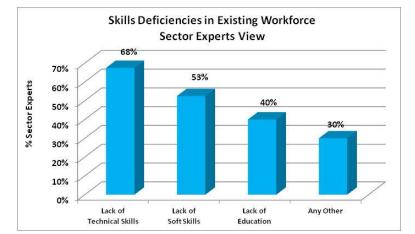


Figure 118 - Skill Deficiencies in Existing Workforce-Sector Experts View⁵⁷

Lack of educational qualification was considered the third most important skill deficiency. This result was also found in the enterprises survey where a vast majority of the enterprises desired to hire skilled workforce with higher educational qualifications; for almost all the job positions in all the subsectors/processes.

30% responses also fell under 'others' category. More commonly occurring skills deficiencies under this head were lack of industrial exposure, insufficient equipment for training in institutes and lack of automation skills.

Regarding suggestions for improving the training system, the highest emphasis was placed on increasing practical training through competence based training. 63% enterprises quoted this as the key step in the right direction. 32% enterprises suggested introducing improved technical courses and 21% suggested reviewing the existing curricula.

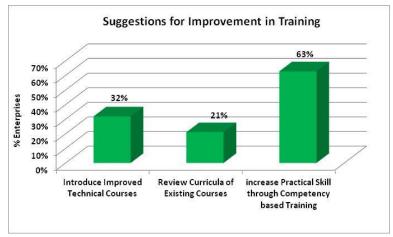


Figure 119 - Suggestions for Improvement in Training⁵⁸

9.2.30 New Technological Advancements Identified by Sector Experts

Table 1411ists down the new technological advancements in auto parts sector.

Table 141 - New Technological Advances Identified by Sector Experts



⁵⁷The percentages add to more than 100 due to multiple responses

⁵⁸*The percentages add to more than 100 due to multiple responses*

Sr. No	Latest Technologies
1.	3D Printing
2.	CNC Center Lathes
3.	Hybrid Technology
4.	Ultra Sonic Cleaning
5.	Nail Making Machines
6.	Laser Scanner
7.	Triple Cylinder Machine for Production of Foils
8.	Gear Shaping machines
9.	Solar Panels
10.	Electronic Fuel Injection
11.	Cross Wedge Rolling Machines
12.	Portable Plasma Cutting Machines
13.	Screw Extruder
14.	Polymer Technologies
15.	Specific Gravity Testers
16.	Automation
17.	Computerized Systems
18.	Shell Forming Machines

The sector experts emphasized the need for ongoing research and development for moving on the path of continuous improvements in processes and business operations.

9.2.31 Need for New Skills to Meet Emerging Trends

The surveyed enterprises identified new skills for different job positions which are listed in Table 142.

Assembler
Assembly Process Knowledge
Assembly Sequence
Assembly Line Training
Assembly Sequence
CNC Machine Operator
CNC Machine Operation
Die Handling and Aligning
Technical Training
Lathe Machine Operator
Machine Operation
Machinist
Precision Machining
Metallic alloys casting technique
Sand Iron Casting Technique
Tool Handling
Moulder





Dies and Mould Making
Technical Training
Material Selection
Electroplater/Painter ⁵⁹
Paint pressure, Thickness adjustment
Paint Thickness Determination
Anodizing techniques
Designer/Pattern Maker
Auto CAD
Pressman
Power Hydraulic Press
Precision Machining
Technical Training and Education
Quality Inspector
Benchmark Knowledge
Cutter/Trimmer
Wastage Control
Welder
Welding points selection
Spot Welding Technique
Welding and Drilling Inspection
Interpretation of Technical Drawings

9.2.32 Suggested Measures to Tackle New Technologies – Sector Experts View

The most commonly suggested measure to tackle with the new technological challenges in auto parts sector was establishment of new institutes. The concept behind this suggestion was not just to increase the number of institutes but to establish such institutes which are developed on modern grounds and are adequately equipped with the required machinery and equipment for training, follow modern curricula and have properly trained trainers.

⁵⁹ Electroplating was specifically mentioned in a feedback provided by PAAPAM as an important trade in which the industry has difficulty in finding good quality skilled workforce.





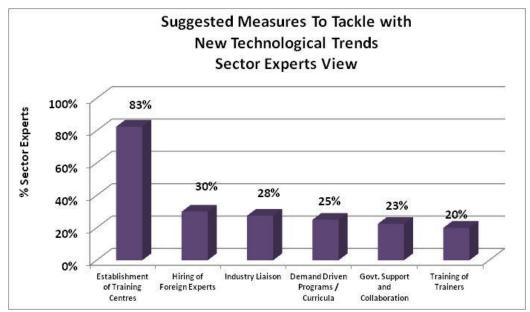


Figure 120 - Suggested Measures to Tackle with New Technological Trends⁶⁰

All other measures were suggested only 20-30% experts indicating that these measures are expected to have only a limited role in enabling the industry adopt the modern technological options. These relatively less important measures included hiring foreign experts, liaison with industry, having demand driven programs, increasing government support and effective training of trainers.

9.2.32.1 Skills/Steps Required to Cope with New Technological Challenges

The most common suggestion in this regard was improving the overall level of technical skills imparted to workforce. 27% responses were obtained highlighting its importance. Increased practical experience was the other important step to improve the quality of workforce. The responses and their relative shares are shown in Table 143.

Required Skill	No. of Responses	Percent
Technical education	13	27%
Practical Experience	6	12%
Literacy & Basic education	5	10%
Computer Education	4	8%
Automation	4	8%
Adaptability to New Technology	4	8%
Communication skills	4	8%
Interpersonal skills	2	4%
Overall soft skills	2	4%
Other measures	5	10%
Total	49	100%

 Table 143 - Skills Required Coping with New Technological Challenges

Literacy and basic education was considered as an important prerequisite to deal with the emerging technological challenges. Along with that, adequate level of computer education

⁶⁰*The percentages add to more than 100 due to multiple responses*





was also deemed desirable by the responding experts. Skill in automation, coupled with adaptability skills was also identified as important areas to concentrate upon.

Enhancement of soft skill was also considered important for coping with the emerging challenges. 16% of the total responses highlighted this area. Having good communication and interpersonal skills were specifically mentioned by the respondents.

5% responses fell in 'others' category which included using well trained experts, providing focused on the job training, improving vocational training institutes and training on ERP.

9.2.33 Hard-to-Fill Positions and Required Skills-Sector Experts View

Job Positions	Required Skills		
Design Section/Tool & D	Design Section/Tool & Dies/Technical Support		
	Process Planning & Control (3)		
Supervisor	CAD / CAM professional skills (4)		
	Die making & sequencing (1)		
CNC Machine Operator	CNC Machine Operation (4)		
	CAD/CAM Professional Skills (3)		
Die Maker	Die making & sequencing (1)		
	Die gauge selection (1)		
	CAD / CAM Professional Skills (2)		
Technician	Die making & sequencing (1)		
Sheet Metal			
Supervisor	Process Implementation & Control (3)		
Electroplater ⁶¹	Electroplating Techniques (2)		
Heat Technician	Temperature Control (1)		
Pattern Designer	Interpretation of Designs (2)		
Assembler	General Assembly Process (1)		
Metal Casting			
Electroplater	Electroplating Techniques (4)		
Heat Technician	Temperature Control (1)		
Machinist	Casting design consideration (1)		
Quality Inspector	TQM Application (2)		
Metal Forging ⁶²			
Machinist	Barreling and Cogging (2)		
	Forgeability of Metal (1)		
Quality Inspector	Quality Compliance (1)		
	TQM Application (1)		
Rubber and Plastic			
Machine Operator	Process & Machine Schematics (5)		

Table 144 - Hard-to-Fill Positions -Sector Experts View

constrained to find good quality skilled workforce.





⁶¹ Electroplating was mentioned by PAAPAM in its feedback as an important area in which the Auto Parts sector faces difficulty to find good quality human resource. ⁶² Forging was also mentioned by PAAPAM in its feedback as an area where the Auto Parts sector is

Moulder	Compression moulding skills (4)	
Trimmer	Instrument Usage (1)	
Electronic / Electrical Parts		
Assembler	Fuel Gauge operation (6) Ignition coil operations (4) Starter drive operations (3)	
Packer	Wires And Buses Packing Techniques (4)	
Assembly / Sub Assembly		
Assembler	Assembly Line Balancing (3)	
Quality Inspector	TQM Application (5)	





10.0 ON-JOB TRAINING

10.1 Auto Parts Enterprises Training Capacity Analysis

A skilled worker successfully completing his training programme cannot be productive immediately as he passes out from the institute. When a fresh graduate is hired first by an enterprise, he has very limited practical exposure and thus needs further training to prepare him/her for undertaking the assigned job. The organizations have to invest on these fresh graduates to provide training to them. Along with the fresh employees, the organizations also conduct training programmes for their existing employees to improve their capacity, increase productivity and train them on new processes and techniques. The survey assessed the effectiveness of this training capacity within the enterprises.

10.1.1 Training Provision

76% of the surveyed enterprises were found to be providing training to their employees. This was a positive indicator as the willingness of the organizations to train their employees showed that most of the enterprises believed in a long term vision for the sector. This was also an indicator of the optimism held about the long term future growth of the industry. Enterprises were willing to invest in their human resource in short term to reap the long term benefits like effectively meeting high market demand, high productivity and adoption of modern technological options. The split of enterprises providing training or otherwise is shown in Figure 121.



Figure 121 - Enterprises Providing Training to Employees

Looking at the split of enterprises with respect to size, it was confirmed that the practice of not providing training to the employees was more common in small enterprises. 44% of the small enterprises in the sample did not provide training while the same percentages for medium and large enterprises were 17% and 11% respectively. Size-wise distribution is shown in Table 145.

Enterprise		Training Provided		Training No.	ot Provided
Size	Total No. of	No. of	%	No. of	%
	Enterprises	Enterprises	Enterprises	Enterprises	Enterprises
Small	57	32	56%	25	44%
Medium	110	91	83%	19	17%





Large	37	33	89%	4	11%
Total	204	156		48	

10.1.1.1 Number of Employees Trained

Number of employees trained by the surveyed enterprises during last one year was assessed. The number of trained employees was up to 10 in 62% of the enterprises. Distribution of enterprises in four ranges of trained employees is presented in Figure 122.

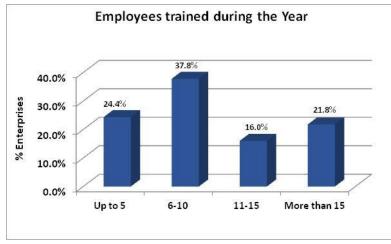


Figure 122 - Employees Trained During the Year by Enterprises

Total number of employees trained during the last one year was 2,895 which averaged out to be 14 employees per enterprise. The averages varied with respect to enterprise size. Average number of people trained by large enterprises was 41 whereas for medium and small, the respective figures were 10 and 4. However, an opposite trend was seen when the number of trained persons were seen as a share of existing workforce. This percentage was 25% for small enterprises and 9% and 8% respectively for medium and large ones. The analysis is presented in Table 146.

Enterprise Size	Employees Trained	No. of Enterprises	Employees Trained Per Enterprise	Current Employment	Trainees as % Employment
Small	248	57	4	1,012	25%
Medium	1,145	110	10	12,731	9%
Large	1,502	37	41	18,142	8%
Total	2,895	204	14	31,885	9%

 Table 146 - Average Number of Employees Trained in Small, Medium & Large Enterprises

A higher trained to total employees ratio for small enterprises indicate that on relative scale, smaller enterprises have to focus more on training of employees. It also indicates a higher turnover of employees in small enterprises. Fresh people join the enterprises, get trained and leave for better opportunities.

10.1.1.2 Reasons for Not Providing Training

Lack of resources was quoted as the most common reason for not training employees. 50% of the enterprises that did not provide training quoted this as the key reason. The fear of trained





employees leaving after being trained was quoted by 25% (12) enterprises. Other important reasons were lack of required skills for training, unavailability of training materials and business confidentiality threats. The responses are shown in Figure 123.

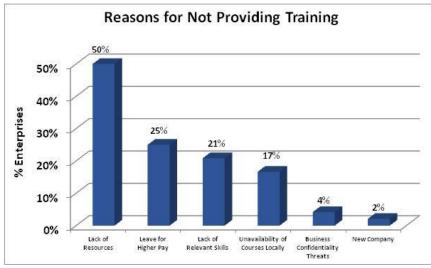


Figure 123 - Reasons for Enterprises not Providing Training

10.1.1.3 Budget for Training of Employees

46% of the enterprises providing training to their employees performed this activity in a planned manner and made budgetary allocations for this purpose. Figure 124shows the split.

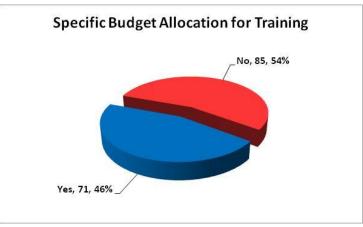


Figure 124 - Enterprises Allocating Budget for Training

The tune of this spending was less than 1% of the total budget for 51% of the enterprises and 1-10% for 46% enterprises. There were only 2 enterprises which were found to spend more than 10% of their budget for training their employees. Surprisingly, these were not the large enterprises. One of them was medium and other small.

10.1.1.4 Availability of Dedicated Physical Facilities

The practice of having a dedicated training centre in an enterprise is an indicator of the importance the enterprise assigns to training. The practice was however found to be less prevalent. Only one third of the enterprises that provided training had this facility.







Figure 125 - Enterprises Having Training Centre

The split of these enterprises with respect to size was 59% medium, 33% large and 8% small. All the 4 small enterprises having a training center were from Lahore cluster.

The relative importance of training between Lahore and Karachi clusters was also assessed. It was observed that the enterprises in Karachi assign a greater importance to training compared to the enterprises in Lahore. Share of enterprises with training centres was 55% in Karachi which was higher than the share of Karachi enterprises in the sample (36%). The trend was reverse for Lahore. Table 147shows the results.

Cluster	No. of Enterprises with Training Centre	% Share	% Share in Sample
Karachi	28	55%	36.3%
Lahore	21	41%	58.3%
Others	2	4%	5.4%
Total	51	100%	100.0%

Table 147 - Enterprises with Training Centers in Lahore and Karachi

10.1.1.5 Average Duration of Training

Average duration of training for 41% enterprises that provide training was less than one month. 22% enterprises conducted training of one month while 33% provided training for an average duration of one to three months. That meant that 96% of the enterprises completed the training of their employees in three months. The training imparted by the enterprises was of practical nature and was meant to make the employee productive in the minimum possible time; and reduce the training cost.







Figure 126 - Average Training Duration by Enterprises

Karachi Tools Dies and Mould Center conducts one year training and was categorized under 'Others' category.

10.1.1.6 Provision of Experience Letter of Training

The practice of providing experience letter to trained people was not followed by majority of the enterprises. Only 38% surveyed enterprises were found to follow the practice of providing experience letter to the trained workforce.

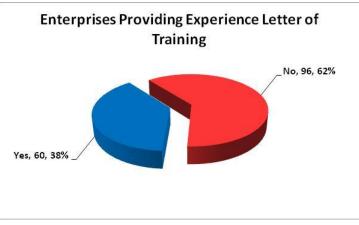


Figure 127 - Provision of Experience Letter by Enterprises

10.1.1.7 Training Modes

The most common training mode used by enterprises was on job training. 95% of the enterprises used this mode for training their existing as well as new employees. For new employees, training through VTIs was used by 4% enterprises and for existing workers by 2% enterprises. Apprenticeship was the third training mode used by 1-2% enterprises. Shares of different training modes for existing and new employees are shown in Figure 128.





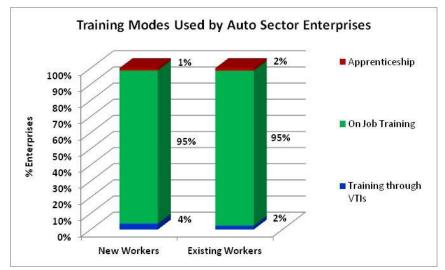


Figure 128 - Training Modes Used by Enterprises

On job training is a preferred mode since this route can make a new worker productive in minimum time. The new workers work as the assistants of the existing experienced workers. So no extra supervisory function is required for these trainees. No extra equipment is required for training since the trainees also work on the same job stations. Also, the adaptation of the new entrants to their work environment occurs in minimum time.

10.1.2 Preferred Modes of Training

94% of the enterprises preferred the mode of on-job training for their workers. 19% also sent their workers to VTIs for training and 11% also adopt the route of apprenticeship for training their employees. The distribution is shown in Figure 129.

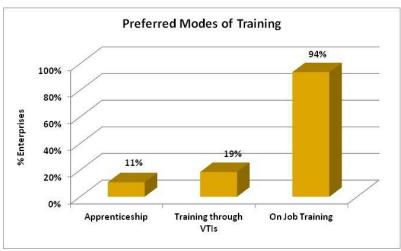


Figure 129 - Preferred modes of Training by Enterprises⁶³

All the three training options require investment by the company; however sending employees to VTIs for strengthening their skills is a more expensive option. Not only the enterprise spends money for executing that training but also bears the cost of his leave from his work station. In that context, 19% enterprises using VTIs for training appears to be a reasonable figure.

⁶³*The percentages add to more than 100 due to multiple responses*





The route of Apprenticeship/Internship was followed by 11% enterprises. As per the general observation, most of the business enterprises did not consider this route a very effective way of training and consequently, was usually not taken very seriously; either by the enterprise or by the trainee. Enterprises accommodate these apprentices to oblige certain people or organizations. These apprentices/interns are engaged for short periods of time. Very few of them are retained and majority leaves to find some proper job. So, neither the trainee nor the trainer takes the pain to do justice to attain the objectives of this training. The trainee however gets to know the work environment and develops interaction and communication skills.

This was also confirmed from the reasons quoted by the enterprises due to which the trainings were not effective. Workers' non-serious attitude and lack of interest was the most frequently quoted reason in that regard. Other reasons included lack of resources and lack of proper trainers.

10.1.3 Apprenticeship Situation

10.1.3.1 Training Arrangements of TSPs with Auto Parts Enterprises

Majority 76% of TSPs did not have any training arrangements with auto parts sector enterprises. Figure 130shows the split.

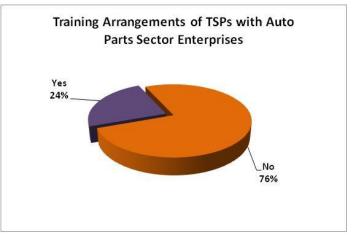


Figure 130 - Training Arrangements of TSPs with Enterprises

Analyzing with respect to TSP type, 71% public sector TSPs and 86% private sector TSPs did not have any such arrangement. This validates the previous finding that the coordination between suppliers and consumers of skilled workforce is weak and needs strengthening.

10.1.3.2 Interns/Apprentices Intake per Year

There were 5 TSPs which were found to have an arrangement with auto sector enterprises for internship/apprenticeship. Of these, 4 TSPs were able to accommodate up to 100 of their graduates as interns/apprentices. One TSP was able to accommodate from 100 to 200 skilled workers. Names of TSPs, number of trainees, training periods and monthly remuneration is shown in Table 148.

TSP Name	No of	Training	Remuneration
	Trainees	Period	(PKR)



Govt. Apprenticeship Training Centre- TEVTA	135	1 Year	7,000
Institute of Engineering and Technology	35	3 Months	-
Aman Tech	20	1 Month	-
NED University of Engineering and Technology	50	1 Month	15,000
Plastic Technology Centre	50	1 Month	4,000





11.0 PSDF AWARENESS.

Punjab Skills Development Fund is designing and implementing initiatives to meet the growing demand of skilled workforce in different sectors including auto sector. In order for this to happen effectively, there is a need of a close interaction between PSDF and the sector stakeholders. This includes the business enterprises which generate demand for skilled workforce and the training institutes which supply the skilled workforce. In this context, it was deemed important to get an idea about the current awareness about PSDF and the degree of interest of these stakeholders to work with PSDF.

11.1 PSDF Overall Awareness

Overall awareness for PSDF was inquired from the enterprises and the TSPs. Only 14% of the surveyed enterprises were found to have heard about the organization. This situation was better in TSPs where 52% institutes were found to be aware of the fund. Distributions of responses from the two stakeholder groups are presented in Figure 131and Figure 132.

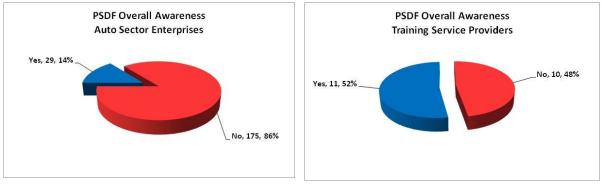


Figure 131 - PSDF Awareness in Enterprises

Figure 132 - PSDF Awareness in TSPs

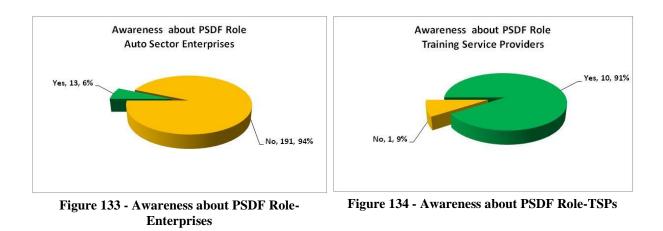
Such a low awareness about PSDF points towards the need to initiate efforts to bridge this gap. It is not very surprising to find such a low awareness from the business enterprises since training is not their main area of operations. However, a low awareness of the level where about half of the surveyed training institutes were found to not even heard the name of PSDF must ring some bells. However, one point of relief can be that 8 of these 10 institutes were from Karachi so the chance of them knowing about a skill related initiation in Punjab was slim. The two unaware institutes were from Punjab; including UET Lahore and Government Technical Training Center Gujrat.

11.2 Awareness of PSDF's Role

There was a very limited awareness about the role of PSDF in auto sector enterprises. Only 6% of the total surveyed enterprises knew that PSDF has a role to play in workforce training. This share was lower than that of the general awareness which meant that majority of those enterprises that had heard of PSDF did not know about its role either. 29 enterprises had heard about PSDF and 13 of those knew about its role (44%). Figure 133 and Figure 134.



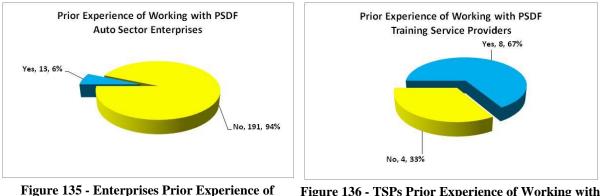




The situation was better in the case of TSPs. Of the 11 TSPs that had heard about PSDF, 10 also knew about its role in training. Rachna College of Engineering & Technology Gujranwala did not know about that.

11.3 Prior Experience of Working with PSDF

All the 13 enterprises that knew about the role of PSDF were those that also had experience of working with PSDF. 67% of the TSPs that knew about PSDF role also had prior experience of working with the organization. Figure 135 and Figure 136show the responses distribution.



Working with PSDF



The institutes from Punjab that did not have experience included UET Lahore, Rachna College of Engineering and Technology, Government Apprentice Training Center Lahore and two institutes from Gujrat.

11.4 Interest in Obtaining Information about PSDF

83% enterprises showed their interest in obtaining more information about PSDF while 71% TSPs showed interest in this regard. Results are shown in Figure 137 and Figure 138.





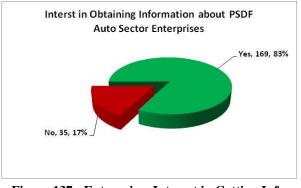


Figure 137 - Enterprises Interest in Getting Info about PSDF

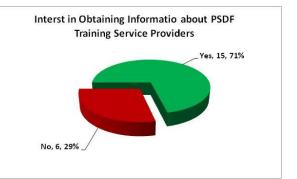


Figure 138 - TSPs Interest in Getting Info about PSDF





12.0 RECOMMENDATIONS

The study confirmed that auto parts manufacturing sector is a growing sector as demonstrated by the findings that only 19% enterprises mentioned to have a negative growth trend in revenues in the local market and only 10% in the export market. 85% sector experts projected the growth rate to be positive and 15% projected it to be stable. The positive growth of auto parts sector was also confirmed by the employment growth trend as per which 40% enterprises reported an increase and only 12% reported a decrease in number of employees. These projections signal towards the growing need for skilled workforce in the sector. Such optimistic growth projection mandates that the TSP sector gear itself to meet this growing demand.

The other indicator of the strong demand for qualified skilled workforce was that large number of the surveyed enterprises were not satisfied with the current educational and technical qualification and desired to hire workforce with improved qualification. For managerial/supervisory positions, the preference was more towards the degree courses while for worker positions, a preference from short courses to diploma/certificate and from no qualification/Matric/Intermediate to short/diploma/certificate courses was observed. This indicates the propensity of auto parts sector to absorb more qualified/better trained workforce.

12.1 Courses in Demand

PSDF should design training and development programmes in line with the demand identified during the study.

12.1.1 Training on Industrial Automation

The most rapidly growing need identified by the auto sector enterprises and the TSPs was for the technical workforce trained in industrial automation. This was quoted by 81% enterprises as the most common emerging technological change. 60% enterprises quoted the increasing use of CNC machines as the new trend which was related to automation. This was mainly relevant to metal parts manufacturers but was also rated important by rubber/plastic parts manufacturers.

12.1.2 Skills in Demand

12.1.2.1 Technical Skills in Demand

Skills in demand have been identified with respect to three aspects, the positions in the current workforce with highest shares, the positions with the highest projected need for manpower and the positions for which the hard-to-fill vacancies were found to be the highest. These have been listed in Table 149for all the subsectors/processes.

Subsector/ Process	Top Three Positions with Highest Current Number	Top Three Positions with Highest Projected Need	Top Three Hard-to-Fill Positions
Design Section/ Tools & Dies/Technical Support	 Tools & Die Maker Designer/Pattern Maker Assistant 	 Tools & Die Maker Assistant Designer/Pattern Maker 	 Tools & Die Maker Designer/Pattern Maker Supervisor

Table 149 - Skills in Highest Demand in all Subsectors/Processes





Sheet Metal	 Pressman Assembler Welder 	 Pressmen Supervisor Assembler 	 Driller Sheet Cutter Pressman
Metal Casting	 Assembler Machinist Over Operator 	 Machinist Supervisor Assembler 	 Oven Operator CNC Operator Machinist
Metal Forging	 Machinist Machine Operator Heat Technician 	 Machinist Painter Supervisor 	 Machinist Machine Operator Supervisor
Rubber/Plastic Parts	 Moulder Assembler Cutter/Trimmer 	 Supervisor Machine Operator Assembler 	 Moulder Machine Operator Supervisor
Electronics/Elec trical Parts	 Assembler Packer Painter 	 Assembler Painter Packer 	1. Assembler
Assembly/Sub- Assembly	 Assembler Assistant Painter 	 Assembler Assistant Supervisor 	None
Storekeeping	 Storekeeper Store In-charge Assistant 	 4. Storekeeper 5. Store In-charge 6. Assistant 	None

Degree, Diploma/Certificate and Short courses in demand are listed in Table 150.

Degree Course	Diploma/Certificate Course	Short Course
 Mechanical Engineering Electrical Engineering Mechatronics Engineering Industrial Engineering Metallurgical Engineering Automobile Engineering 	 CAD/CAM Welding CNC Machine Operation Precision Machining Injection Moulding Quality control Mechanical Foundry Automation Pressing & Stamping 	 CAD/CAM Simulating Method Engineering Machinist Quality Control Measurement Tools

In addition, the new courses highlighted by the TSPs for which there is a demand-supply gap in the industry are listed below:

- Industrial automation
- CNC machines





- Electronic Fuel Injection system
- Multi-Port Fuel Injection System
- Hybrid Technology

Table 151 lists the technical skills in demand for different positions.

Assembler Assembly Process Knowledge Assembly Sequence Assembly Line Training Assembly Sequence
Assembly Sequence Assembly Line Training Assembly Sequence
Assembly Line Training Assembly Sequence
Assembly Sequence
CNC Machine Operator
CNC Machine Operation
Die Handling and Aligning
Lathe Machine Operator
Machine Operation
Machinist
Precision Machining
Metallic alloys casting technique
Sand Iron Casting Technique
Tool Handling
Moulder
Dies and Mould Making
Material Selection
Electroplater/Painter
Paint pressure, Thickness adjustment
Paint Thickness Determination
Anodizing techniques
Designer / Pattern Maker
Auto CAD
Pressman
Power Hydraulic Press
Precision Machining
Quality Inspector
Benchmark Knowledge
Cutter/Trimmer
Wastage Control
Welder
Welding points selection
Spot Welding Technique
Welding and Drilling Inspection
Interpretation of Technical Drawings

Table 151 - Technical Skills in Demand





12.1.2.2 Soft Skills in Demand

61% enterprises quoted workers' improper attitude as the second most important reasons for high employee turnover which indicates that along with the technical skills, there is an equally important need to focus on improving soft skills.

Occupational Health and Safety Skills and work ethics were considered as the two most critical soft skills and consequently should be given a high priority in designing future programmes soft skills improvement. Timeliness, Professionalism and Communication were the other soft skills that were rated as of medium criticality and consequently should also be included in the programme.

As per the responses of the enterprises, specialised training programmes should be initiated for communication and Literacy & Numeracy skills while all other soft skills should be taught as part of existing training programmes.

12.1.3 Skills Quality

Positions in different subsectors/processes with respect to skills rating as 'Satisfactory' 'Barely Satisfactory' and 'Unsatisfactory' have been segregated and listed in Table 152. This classification serves as a guide to develop plans to improve the current skills quality in auto parts sector.

	Skills Rating ⁶⁴			
Subsector/ Process	Satisfactory	Barely Satisfactory	Unsatisfactory	
Design Section/ Tools & Dies/ Technical Support	• Die Making & Sequencing	None	None	
Sheet Metal	• Surface Treatment	 Cutting Welding & Drilling Assembly & Finishing Inspection/QC & Packing 	 Pressing Stamping Heat Treatment 	
Metal Casting	 Heat Treatment Inspection/QC & Packaging 	 Machining Surface Treatment Assembly & Finishing 	 Melting & Casting Stores/Material Handling 	
Metal Forging	Inspection/ Quality	Machining	Heating & Forging	

Table 152 - Skills Quality Rating for All Positions in All Subsectors/Processes

To sum up the discussion, in this section, the responses as 'very satisfactory' and 'satisfactory' were considered as the same category (satisfactory) and similarly, the responses as 'unsatisfactory' and 'very unsatisfactory were considered as the same category (unsatisfactory)





⁶⁴As per the criteria defined in the qualitative assessment section of report, five categories were defined based on the combined percentage of 'Excellent' and 'Good' responses in total responses.

^{80%} and above responses was rated 'very satisfactory', 70-80% 'satisfactory', 60-70% 'barely satisfactory', 50-60% 'unsatisfactory' and below 50% 'very unsatisfactory'.

	Control & Packing	Heat TreatmentSurface Treatment	
Rubber/Plastic Parts	• Inspection/QC & Packing	 Mixing & Compounding Assembly & Finishing 	 Injection & Moulding Cutting & Trimming
Electronics/ Electrical Parts	 Painting & Finishing Inspection /QC 	Components IntakeAssembly LinePacking	None
Assembly/ Sub- Assembly	 Chassis Shop Paint Shop Assembly/Sub Assembly - A Inspection, Testing, QC & Finishing 	 Assembly/Sub Assembly – Assembly Line Assembly/Sub Assembly - B Assembly/Sub Assembly - C Assembly/Sub Assembly - D 	• Assembly/Sub Assembly - E

12.2 Establishment of Specialised Institutes for Auto Sector

The survey revealed that the existing TSPs have very limited capacity to offer specialised courses for automobile sector. Only NED University of Engineering and Technology offers a degree in automotive engineering. Similarly, some institutes offer diploma/certificate in Auto Mechanic and Auto & Diesel and few others offer short courses in Automobile and Auto Mechanic.

Despite the fact that auto sector is a large sector contributing significantly to the local economy, there is still no specialized training institute in the whole country for providing sector specific technical training to the workforce. During the past years, many other sectors have been successful in establishing dedicated training institutes for themselves. Some examples in this regard are Construction Technology Training Institute Islamabad, Leather Goods Services Centre Bannu, Gems & Gemmological Institute of Pakistan Peshawar, Fan Development Institute Gujrat, Pakistan Readymade Garments Technical Training Institute Lahore, Pakistan Knit Wear Training Institute Lahore. It is the need of the day to establish specialised training institutes for automobile sector of Pakistan.

This recommendation has also been made in many previous documents/reports done for automobile sector. Auto Industry Development Programme recommended establishing 'Centres of Excellence' specifically for training of manpower for Auto sector; which will offer training programmes of reasonable duration along with the short courses. JICA's report on Pakistan's auto sector also recommended establishment of 'Pakistan Automotive Institute' with a broader mandate of acting as a research and technical support organization specialized in quality improvement, safety inspection, environmental preservation relating to automobiles and automotive parts.





12.3 Strengthening of TSP Sector

12.3.1 Support Institutes for Certification

TSPs should get themselves certified from credible organizations as majority of the employers mentioned this as their requirement before hiring. 65% enterprises required certification for hiring at management level and 46% required this for hiring at worker level.

Government should facilitate the TSPs for getting certification from local and foreign certification bodies. This facilitation may be in the form of financial support for sharing of costs like consultancy, certification fees, etc. or in the form of technical support. The approach will move the TSPs to upgrade the quality of their services to higher levels required for getting the certification; consequently increasing the worth of their students in the eyes of their potential employers. Interaction of the local TSPs with foreign certification bodies will increase their exposure about new developments in the field of technical skills training. The step will be received positively by the TSPs as there is already a trend of TSPs getting affiliations/certifications with more than one body.

12.3.2 Infrastructure Development

57% of the surveyed TSPs were not satisfied with their current infrastructure. 71% TSPs desired to have equipment support and 57% wanted support for building infrastructure. Infrastructure/Labs development was quoted 67% as the most important measure to improve the quality of skilled workforce. It is therefore recommended to develop modern infrastructure in the TSPs.

TSPs should be facilitated to implement their expansion plans. 90% TSPs expressed their intentions to expand their scale and scope of their training programmes. Introducing new courses should be adopted as the preferred mode for expansion; as suggested by 74% TSPs. This should be supported by the corresponding expansion in physical infrastructure; including the buildings for classrooms and new workshops equipped with modern machinery and equipment for ensuring practical training of the trainees.

12.3.3 Curriculum Development

Curriculum development was quoted by 67% TSPs as the most important measure to improve skills quality. The view was also endorsed by sector experts where only 35% rated the existing curricula as good.

However, the approach used for curricula development needs to be reviewed. Majority of the TSPs followed the traditional approach of using the curricula developed by government bodies with some using their experts. Only 19% TSPs were found to be collaborating with the industry for curricula development and 50% of those obtained the endorsement after curricula is designed. This approach forms the basis for the existing demand-supply gap. There is an immediate need to incorporate the inputs of industry in this process to bridging this gap. It is therefore recommended to make it mandatory for the TSPs to involve industry and get its endorsement in designing/revising curricula for technical skills courses.

Suggested measures for improvement of curricula are listed below in order of priority:

• Curriculum Planning and Assessment Council should be established comprising of members from all stakeholder groups.





- Interaction between industry and TSPs should be increased to agree on the real needs from a course curriculum.
- International experts should be involved for developing curricula in line with the modern technological practices.
- Thorough training need analysis should be carried out before designing/revising curriculum for any technical course.
- Continuous monitoring and tracking should be carried out so as to keep incorporating any required changes in curriculum.

12.3.3.1 Increase the Allocation of Practical Training

One of the most common recommendations coming from the enterprises as well as from the sector experts was to increase practical training during the course. 76% of the surveyed enterprises mentioned prior experience necessary for hiring technical workforce. This requirement is due to the fact that currently, the share of practical work in the training is not sufficient enough to impart the required technical skills in the worker.

12.3.4 Remedial Measures to Improve Skills Quality

There is a need to implement remedial measures to bridge the identified skills deficiencies. The two suggested remedial measures were: i) to have more specialized trainings under the existing programmes or ii) to have a new programme or revision in the existing programmes. Design Section/tools & Dies was the only section where majority of the enterprises wanted to have a new program or a revision in the existing program. This was in spite of the fact that the section received the highest skills quality rating among all subsectors/processes. That meant that majority of the enterprises do not foresee any further improvement in skills quality by having more focused training under the same programmes. In line with this finding, it is recommended to have new training programmes for Design Section/Tools & Dies.

For all other subsectors/processes, it is recommended to have more specialized trainings under the existing programs.

12.3.5 Training of Trainers

100% of the surveyed TSPs arranged training of trainers' sessions. However, there is a need to improve the current practices for training of trainers. Majority of TSPs used the traditionally available material for this purpose. Only 48% institutes carried out training of trainers in collaboration with national or international experts. Similarly courses from other known training institutes were used only by 38% and online support only by 14% TSPs.

The TSPs need to align their approach for training of trainers with the modern day practices being used in developed countries. Inadequately trained/qualified teachers can only produce workers with substandard skills level. There is a need to create awareness in TSPs about the new sources that may be tapped for training of trainers. Special refresher courses should be designed for the management and the teaching faculty of TSPs to enable them starts using modern practices for ToT.

12.4 Recommended Delivery Options

12.4.1 Increase On-Job Training

During the training courses in TSPs, reliance on on-job training is very low. Only 43% public and 29% private TSPs used this mode of training. The relative use compared to classroom and





workshop training was even lesser; only 10% for public and 1% for private TSPs. Insufficient opportunities from the industry for providing industry exposure was quoted by 48% TSPs as the second most important hurdle in job placement. Insufficient contribution of the industry is also evident from the finding that one fourth of the surveyed enterprises were not providing any kind of training to their employees. PSDF should therefore implement measures to increase emphasis on-job training by developing better coordination between the TSPs and the business enterprises. This will improve the skills quality of the trained workforce.

More internship opportunities should be made available by the industry. One of the reasons for reluctance of the industry in this regard is the incremental cost associated by offering this facility. PSDF should further facilitate bearing the cost of interns getting on-job training in auto parts manufacturing units.

It is important to highlight that there is a need to create awareness in TSPs as well about the importance of on-job training. Although, the use of on-job training was very small, but the desire of using this mode was also small in TSPs. Only 14% public TSPs and 29% private TSPs wanted support for internships of their students. Awareness should be created in TSPs about the importance of on-job training for their students.

Only 14% public TSPs required this support but 29% private TSPs required help in that regard.

12.4.2 Strengthening Linkages between Training Institutes and Business Enterprises

Strengthening linkages between industry and training is one of the most important recommendations for improving the quality of skilled workforce. This is the key to help bridge the gap existing between the skilled workers (the product) supplied by the TSPs and the expectations of the industry (the customer). This increased interaction will be useful in all areas of skills sector. It will improve the effectiveness of introduction of new courses, curriculum development/revisions, training of trainers, implementing TSPs expansion plans, internships/apprenticeships and job placement.

It will be useful to form a group having representatives of the industry, training institutes and the government for this purpose. The group should meet at regular intervals and the stakeholders should share their needs, plans and issues with each other. Information sharing on regular basis will help take a consensus approach and adopt a proactive approach to tackle any issues and implement plans to improve the quality of skilled workforce.

12.5 Job Placement

12.5.1 Increase Interaction between Employers and TSPs

The survey indicated that there is insufficient interaction between the employers and the educational institutes supplying skilled workforce. Only 11% enterprises were found to hire through universities/training centres. There is a need to improve this interaction. TSPs should maintain a constant interaction with the business enterprises and invite them to their premises for direct hiring. This will be a cost effective option for the enterprise. Moreover, they will be hiring with the reference of the institute which will also improve the quality of the engaged human resource.





12.5.2 Promote Good Hiring Practices in Business Enterprises

The survey revealed 24% enterprises did not follow any formal recruitment process and 42% hired through informal interviews. This highlights the need to educate the auto sector enterprises about formal recruitment practices. While this will lead to improved quality of hired manpower, it will also make the proceedings more structured for the candidates. The need for education on good hiring practices is the highest in small and medium enterprises since 46% and 53% small enterprises respectively recruit without any formal process and through informal interviews. For medium enterprises, the respective percentages were 16% and 41%. Following formal hiring process was not an issue for large enterprises.

The formal recruitment processes may be a combination of test and interview. Tests to assess the technical skills can be developed jointly by the enterprises and the TSPs. Similarly, the enterprises can use some personality tests to assess the soft skills of the candidates. Use of tests for hiring will not only improve the quality of hired manpower but will also increase the interest of the students to improve their learning levels.

Sector associations like PAAPAM and PAMA should take initiative to get a task force notified which should comprise of members from business enterprises, TSPs, key sector experts and relevant government departments to come up with the programme for inducting a test-based system for hiring in auto parts sector.

12.5.3 TSPs Provide Training to Passed out Students on Job Placement

For facilitating their students, the TSPs should also provide training on job placement. This should include awareness and education about all the involved steps like identifying job opportunities from all possible sources, developing attractive CVs, writing cover letters, and appearing in interviews in a confident and professional manner. The techniques used for this purpose may include classroom lectures as well as mock interviews conducted by people from the industry. This will also help improve the currently insufficient interaction between the TSPs and the business enterprises.

12.5.4 Promote Formal Job Placement Techniques

90% of the TSPs provided support to their passed-out student support for job placement. However, most of this support was provided through personal and institutional references. While this is an effective way of job placement, there is an equally important need to also use more formal ways like recruitment seminars/exhibitions and placement bureaus. Currently, only 32% TSPs were found to be using seminars and 5% used placement bureau. Engaging in activities like seminars/exhibition will not help in job placement but will also increase the much desired interaction between the employers and TSPs. Participation in these seminars should be broadened and selected training and certification bodies from developed countries may also be invited. Similarly, suppliers of training machinery and equipment can be a part of such events. This will help promote the required harmony among different stakeholders.

12.5.5 Increase the Participation of Female Workforce in Auto Sector

The current share of females in auto parts sector workforce was only 6% which needs to be increased. Females should be preferred by the business enterprises for hiring in office jobs like HR, Administration, Finance and IT. On shop floor level, females can be accommodated in quality assurance jobs. Government can play a role in this regard by announcing some incentives for the enterprise meeting some minimum share of females in its total workforce (10% can be a reasonable figure to start with).





12.6 An Active PSDF Role

12.6.1 Increase PSDF Awareness

PSDF has been operating in Punjab for the past five years and has contributed positively to technical and vocational skills training in the province. However, the current awareness of the organization is low compared to the tune of good work done by it. It is therefore recommended to initiate efforts to increase its awareness among the sector stakeholders. This recommendation is especially more relevant with respect to business enterprises where only14% enterprises knew about the organization and only 6% knew about its role. PSDF's awareness was good in the TSPs of Punjab; however, most of the TSPs from Karachi did not know about the organization.

PSDF should increase its awareness by interacting more frequently with auto sector associations including PAAPAM, PAMA and APMA. This interaction can be done by individual meetings; however, a more effective approach will be holding awareness seminars for auto sector (and for other sectors also).

PSDF already issues a newsletter. There is a need to do this activity on a regular basis so that the sector stakeholders are kept aware of the good work being done by the organization.

12.6.2 Suggested Initiatives for PSDF

12.6.2.1 Subsidise Trainees

The trainees opting for technical and vocational courses, especially the short courses and diploma, usually belong to lower to middle income segment of the society and it is difficult for them to bear the cost of training. About three fourth of the surveyed TSPs were found to be offering some sort of fee concession; however, the percent of students covered under such subsidies did not go beyond 25%. It is therefore recommended that PSDF should provide stipends to bright students who have difficulties in affording their cost of studies. This support should be extended at all three levels of degree, diploma/certificate and short courses.

12.6.2.2 Support for Internships

PSDF should intervene to bridge the gap of on-job training, duly emphasized by the surveyed enterprises and the TSPs. The practice of sharing cost of stipends with the trainees during the internship/apprenticeship programmes should be continued by PSDF. There is a preference in the industry to engage technical workforce with prior experience; since the enterprises are hesitant to bear the initial cost of training. Support by PSDF in this regard will help reduce this issue. The other role that may be taken by PSDF is acting as a contact between the industry and the TSPs for placement of interns/apprentices for on-job training.

12.6.2.3 Support for TSPs Certification

TSPs certification has been assigned a high importance; both by the enterprises and the TSPs themselves. PSDF should play an active role in facilitating the TSPs to attain certifications from different national and international bodies. This facilitation should begin from the level of identifying the relevant bodies, supporting the TSPs to meet the compliance requirements and sharing the cost of certification. The international links of PSDF, through its donor partner can be used effectively for this purpose.





12.6.2.4 Curricula Development Support

Curricula development is the other area where PSDF can support the TSPs using its international links. The organization can develop linkages with the leading training institutes from all around the world to bring home the modern technological trends and the best training practices. International curricula development experts can be brought to Pakistan as well as the local experts can be sent to other countries for training.

12.6.2.5 Training of Trainers

The expertise of PSDF can be very useful in training of trainers. Support may be lent for training of local teachers by inviting master trainers from the leading institutes of the developed countries. Local teachers should also be sent abroad for training and increasing their exposure. PSDF may design and implement Training of Trainers Programmes for different industrial sectors including auto sector.





13.0 ANNEXURES

13.1 Annexure A – List of Studies/Reports in Automotive Sector

- 1. Auto Industry Development Program, Ministry of Industries, Production & Special Initiatives, Government of Pakistan
- 2. An Overview of Trends in the Automotive Sector and the Policy Framework, By Hafiz Pasha & Zafar Ismail, International Growth Centre, January 2012
- 3. The Automotive Parts Sector in Pakistan Export performance and potential -Implications of the WTO Agreements, European Commission TRTA for Pakistan, September 2007
- 4. Motor Vehicles and Trailers Auto Parts Manufacturing, International Finance Corporation & State Bank of Pakistan, 2011
- 5. Diagnostic Study Auto Parts Cluster Lahore, Pakistan, SMEDA/UNIDO, June 2006
- 6. Project for Automobile Industry Development Policy in the Islamic Republic of Pakistan Main Report, JICA, January 2011
- 7. India-Pakistan Trade: Perspectives from the Automobile Sector in Pakistan, Vaqar Ahmed & Samavia Batool, January 2015





13.2 Annexure B – List of Auto Parts Sector Enterprises Surveyed

Sr. No	Name of Entity	City	Sector	Status
1.	3D Engineering Services	Karachi	Metal	Formal
2.	A & A Metal Industries (Pvt.) Ltd.	Karachi	Metal	Formal
3.	Adamjee Engineering (Pvt.) Ltd.	Karachi	Metal	Formal
4.	Aftab Technologies (Pvt.) Ltd.	Karachi	Metal	Formal
5.	Agri Auto Industries Limited	Karachi	Metal	Formal
6.	Agri Auto Stamping Company (Pvt.) Ltd	Karachi	Metal	Formal
7.	Al-Aftab Metals Engineering Industries (Pvt.) Ltd	Karachi	Metal	Formal
8.	Ali Brothers Forging	Karachi	Metal	Formal
9.	Ali Industrial & Engineering Works	Karachi	Metal	Formal
10.	Ali Machine Tool Company (Pvt.) Ltd.	Karachi	Metal	Formal
11.	Allied Engineering Works	Karachi	Metal	Formal
12.	Badar-e-Tausif Engineering Works	Karachi	Metal	Formal
13.	Dawn Precision Engineering	Karachi	Metal	Formal
14.	Engineering Excellence Company	Karachi	Metal	Formal
15.	Faraz Industries (Pvt.) Ltd.	Karachi	Metal	Formal
16.	Feroz industries	Karachi	Metal	Formal
17.	Friction Material Components (Pvt.) Ltd	Karachi	Metal	Formal
18.	G. S. Foundries & Engineering Services	Karachi	Metal	Formal
19.	General Engineering Industries	Karachi	Metal	Formal
20.	Global Industrial Enterprises	Karachi	Metal	Formal
21.	H.S. Engineering Works	Karachi	Metal	Formal
22.	International Automotive Engineers (Pvt.) Ltd	Karachi	Metal	Formal
23.	Javed Steel Manufacturing Works	Karachi	Metal	Formal
24.	Kamran Engineering industries	Karachi	Metal	Formal
25.	Karachi Tools Dies & Moulds Centre	Karachi	Metal	Formal
26.	Landhi Engineering Works (Pvt.) Ltd.	Karachi	Metal	Formal
27.	Loads Limited	Karachi	Metal	Formal
28.	Mehran Commercial Enterprises	Karachi	Metal	Formal
29.	Metal Art	Karachi	Metal	Formal
30.	Mumtaz Engineering	Karachi	Metal	Formal
31.	Omar Jibran Engineering Industries (Pvt.) Ltd	Karachi	Metal	Formal
32.	Pakistan Wire Industries (Pvt.) Ltd	Karachi	Metal	Formal
33.	Peoples Steel Mills Limited	Karachi	Metal	Formal

 Table 153 - List of Surveyed Automobile Sector Enterprises





Sr. No	Name of Entity	City	Sector	Status
34.	Pressed Steel Industries (Pvt.) Ltd.	Karachi	Metal	Formal
35.	Razi Sons (Pvt.) Ltd.	Karachi	Metal	Formal
36.	Shaheen Engineering Works	Karachi	Metal	Formal
37.	Shahid Engineering Works	Karachi	Metal	Formal
38.	Sherani Engineering	Karachi	Metal	Formal
39.	Sigma Industries (Pvt.) Ltd	Karachi	Metal	Formal
40.	Super Tech Auto parts (Pvt.) Ltd.	Karachi	Metal	Formal
41.	Taha Industrial Corporation	Karachi	Metal	Formal
42.	Techno Pack Industries (Pvt.) Ltd.	Karachi	Metal	Formal
43.	The Mechanizers	Karachi	Metal	Formal
44.	Transmission Engineering Industries Limited	Karachi	Metal	Formal
45.	Zaib Engineering (Pvt.) Ltd	Karachi	Metal	Formal
46.	Zia Engineering Works	Karachi	Metal	Formal
47.	Madina Auto Industries	Karachi	Metal	Informal
48.	A-one Techniques (Pvt.) Ltd.	Karachi	Rubber / Plastic	Formal
49.	Asif Rubber Industries (Pvt.) Ltd.	Karachi	Rubber / Plastic	Formal
50.	Automotive Spares &Accessories (Pvt.) Ltd.	Karachi	Rubber / Plastic	Formal
51.	Auvitronics Limited	Karachi	Rubber / Plastic	Formal
52.	Crystal Corporation	Karachi	Rubber / Plastic	Formal
53.	Essa Engineering Industries (Pvt.) Ltd.	Karachi	Rubber / Plastic	Formal
54.	Jamshed & Sons	Karachi	Rubber / Plastic	Formal
55.	Mohammadi Engineering Services	Karachi	Rubber / Plastic	Formal
56.	Nasir Engineering Works	Karachi	Rubber / Plastic	Formal
57.	Pak Orient Engineering Company	Karachi	Rubber / Plastic	Formal
58.	Pakistan Safety Glass Works (Pvt.) Ltd	Karachi	Rubber / Plastic	Formal
59.	Plastech Autosafe (Pvt.) Ltd.	Karachi	Rubber / Plastic	Formal
60.	Procon Engineering (Pvt.) Ltd.	Karachi	Rubber / Plastic	Formal
61.	Qaim Automotive MFG. (Pvt.) Ltd.	Karachi	Rubber / Plastic	Formal
62.	Tariq & Sons Engineering Works	Karachi	Rubber / Plastic	Formal
63.	Transfigure Auto Engineering Services	Karachi	Rubber / Plastic	Formal
64.	Alsons Auto Parts (Pvt.) Ltd.	Karachi	Electrical / Electronic	Formal
65.	Atlas Battery Limited	Karachi	Electrical / Electronic	Formal
66.	Electropolymers (Pvt.) Ltd.	Karachi	Electrical / Electronic	Formal
67.	Millennium Engineering (Pvt.) Ltd.	Karachi	Electrical / Electronic	Formal
68.	Ragnor	Karachi	Electrical / Electronic	Formal





Sr. No	Name of Entity	City	Sector	Status
	Thal Engineering	Karachi	Electrical /	Formal
69.			Electronic	
70.	Crown Lifan Pakistan (Pvt.) Ltd.	Karachi	Assembly /	Informal
70.			Sub-Assembly	
71.	Hinopak Motors Limited	Karachi	Assembly /	Informal
	In due Motor Component Limited	Varaahi	Sub-Assembly	Informal
72.	Indus Motor Company Limited	Karachi	Assembly / Sub-Assembly	Informal
	Pak Suzuki Motor Company	Karachi	Assembly /	Informal
73.	Limited	Ruruem	Sub-Assembly	morma
7.4	Rubatech Manufacturing Company	Karachi	Assembly /	Informal
74.	(Pvt.) Ltd.		Sub-Assembly	
75.	A. H. Engineering (Pvt.) Ltd.	Lahore	Metal	Formal
76.	Affaq Corporation	Lahore	Metal	Formal
77.	Al-Raheem Forging & Engineering	Lahore	Metal	Formal
//.	Industries			
78.	Ata Muhammad Enterprises (Pvt.)	Lahore	Metal	Formal
	Ltd	T -1	Madal	E
79.	Automotive Engineering (Pvt.) Ltd.	Lahore	Metal	Formal
80.	Covico Engineering Works	Lahore	Metal	Formal
81.	Excel Engineering (Pvt.) Ltd.	Lahore	Metal	Formal
82.	Ghulam Muhammad & Sons	Lahore	Metal	Formal
83.	Hawks Engineering Works	Lahore	Metal	Formal
84.	Hussain Engineers	Lahore	Metal	Formal
85.	Infinity Engineering (Pvt.) Ltd.	Lahore	Metal	Formal
86.	Jamal Engineering	Lahore	Metal	Formal
87.	KadKam Technology (Pvt.) Ltd.	Lahore	Metal	Formal
88.	Kortech Auto Industries (Pvt.) Ltd.	Lahore	Metal	Formal
89.	M. Usman & Sons	Lahore	Metal	Formal
90.	Mecas Engineering (Pvt.) Ltd.	Lahore	Metal	Formal
91.	Metaline Industries (Pvt.) Ltd.	Lahore	Metal	Formal
92.	MGA Industries (Pvt.) Ltd.	Lahore	Metal	Formal
93.	Millat Equipment Limited	Lahore	Metal	Formal
94.	Novelty Manufacturing (Pvt.) Ltd.	Lahore	Metal	Formal
95.	Pakistan Spring and Engineering Company (Pvt.) Ltd.	Lahore	Metal	Formal
96.	Prime Engineering	Lahore	Metal	Formal
97.	R.K. Gears (Pvt.) Ltd.	Lahore	Metal	Formal
98.	Ravi Autos (Pvt.) Ltd.	Lahore	Metal	Formal
99.	Razzaq Engineering Works	Lahore	Metal	Formal
100.	Royal Tech	Lahore	Metal	Formal
101.	Sajid Engineering	Lahore	Metal	Formal
102.	Shabir Brothers	Lahore	Metal	Formal
103.	Shaheen Engineering (Pvt.) Ltd.	Lahore	Metal	Formal
104.	Sir Engineering Enterprises (Pvt.)	Lahore	Metal	Formal





Sr. No	Name of Entity	City	Sector	Status
01.110	Ltd	City	Dector	Status
105.	Suleman & Co (Pvt.) Ltd.	Lahore	Metal	Formal
105.	The Searock Industries	Lahore	Metal	Formal
100.	United Industries LHR (Pvt.) Ltd.	Lahore	Metal	Formal
107.	United Screw Industries (Pvt.) Ltd.	Lahore	Metal	Formal
100.	Zahoor Die Casting Co	Lahore	Metal	Formal
	Jodhala Complex (Pvt.) Ltd.	Gujranwal	Metal	Formal
110.	Jounara Complex (1 vi.) Ltd.	a	Wietai	1 Ormai
111	Karamat & Sons Engineering Works	Gujranwal	Metal	Formal
111.		a		
112.	Silver Falcon Engineering	Gujranwal	Metal	Formal
112.	Corporation	а		
113.	Tariq Engineering Products (Pvt.)	Gujranwal	Metal	Formal
	Ltd.	a Cuironnual	Matal	E a mer a l
114.	United Mechanical Industries (Pvt.) Ltd.	Gujranwal a	Metal	Formal
115.	Abdul Aziz Bara Workers	Lahore	Metal	Informal
115.	Ace Pak	Lahore	Metal	Informal
110.	Adnan Engineering Works	Lahore	Metal	Informal
117.	Amjad Engineering	Lahore	Metal	Informal
118.	AQ Industries	Lahore	Metal	Informal
119.	AR Engineering	Lahore	Metal	Informal
120.	Awais Brothers Frame Makers	Lahore	Metal	Informal
121.	Cantex Enterprises	Lahore	Metal	Informal
122.	Haji Saadiq Enterprise	Lahore	Metal	Informal
125.		Lahore	Metal	Informal
124.	Happy Manufacturing Company (Pvt.) Ltd.	Lanore	Wietai	mormai
125.	HT Engineering	Lahore	Metal	Informal
126.	Ilyas Engineering works	Lahore	Metal	Informal
127.	Imran Engineering	Lahore	Metal	Informal
128.	International Steel Engineering	Lahore	Metal	Informal
129.	Javed Engineering Works	Lahore	Metal	Informal
130.	Maqbool Foundries	Lahore	Metal	Informal
131.	Mazhar & Sons	Lahore	Metal	Informal
132.	Mughal Engineering Works	Lahore	Metal	Informal
133.	Mughal Powder Coding	Lahore	Metal	Informal
134.	N.J.F Engineering Services	Lahore	Metal	Informal
135.	Nawaz Brothers	Lahore	Metal	Informal
136.	OEM (Pvt.) Ltd.	Lahore	Metal	Informal
137.	Rehmat Sons & Company	Lahore	Metal	Informal
	Senior Automobile (Pvt.) Ltd	Lahore	Metal	Informal
138.	(Rozgar)			
139.	Shafiq Engineering	Lahore	Metal	Informal
140.	Sigma Engineering	Lahore	Metal	Informal
141.	T.S Engineering	Lahore	Metal	Informal





Sr. No	Name of Entity	City	Sector	Status
142.	TA International (Pvt.) Ltd.	Lahore	Metal	Informal
143.	The Patriot Engineers	Lahore	Metal	Informal
144.	Universal Tooling Services	Lahore	Metal	Informal
145.	Waqas Usman Auto	Lahore	Metal	Informal
146.	Yousaf Steel Works	Lahore	Metal	Informal
147.	Alpha Engineering	Lahore	Rubber / Plastic	Formal
148.	Ashraf Engineering Works (Pvt.) Ltd.	Lahore	Rubber / Plastic	Formal
149.	Bright Star Engineering (Pvt.) Ltd.	Lahore	Rubber / Plastic	Formal
150.	Ghauri Tyre & Tube (Pvt.) Ltd.	Lahore	Rubber / Plastic	Formal
151.	Hamza Enterprises	Lahore	Rubber / Plastic	Formal
152.	Meralastik Rubber & Engineering Products	Lahore	Rubber / Plastic	Formal
153.	National Plastic Industries	Lahore	Rubber / Plastic	Formal
154.	Risan Synthetic Technic	Lahore	Rubber / Plastic	Formal
155.	S.M Traders	Lahore	Rubber / Plastic	Formal
156.	Shah Nawaz Plastic Molding	Lahore	Rubber / Plastic	Formal
157.	Splendid Sealing Industry	Lahore	Rubber / Plastic	Formal
158.	Synthetic Products Enterprises (Pvt.) Ltd.	Lahore	Rubber / Plastic	Formal
159.	Techmen (Pvt.) Ltd.	Lahore	Rubber / Plastic	Formal
160.	Thermosole Industries (Pvt.) Ltd.	Lahore	Rubber / Plastic	Formal
161.	TM Rubber (Pvt.) Ltd.	Lahore	Rubber / Plastic	Formal
162.	Volta Dies & Moulds	Lahore	Rubber / Plastic	Formal
163.	Aamir Motor Works	Lahore	Rubber / Plastic	Informal
164.	Aeroplane Rubber	Lahore	Rubber / Plastic	Informal
165.	Al-Khobar Plastic	Lahore	Rubber / Plastic	Informal
166.	Amjad Moulding	Lahore	Rubber / Plastic	Informal
167.	Fahad Engineering	Lahore	Rubber / Plastic	Informal
168.	H.S Autos	Lahore	Rubber / Plastic	Informal
169.	Imran Rubber works	Lahore	Rubber / Plastic	Informal
170.	Khalid & Sons	Lahore	Rubber / Plastic	Informal
171.	M. Ashraf Engineering	Lahore	Rubber / Plastic	Informal
172.	Mehboob Engineering	Lahore	Rubber / Plastic	Informal
173.	Mehdi Hassan Injection Moulding	Lahore	Rubber / Plastic	Informal
174.	Next EVA	Lahore	Rubber / Plastic	Informal
175.	Raza Hajvery	Lahore	Rubber / Plastic	Informal
176.	Rehman Engineering	Lahore	Rubber / Plastic	Informal
177.	S.T. Engineering Services (Pvt.) Ltd.	Lahore	Rubber / Plastic	Informal
178.	SFD Hamza Auto	Lahore	Rubber / Plastic	Informal
179.	Techast Engineering	Lahore	Rubber / Plastic	Informal
180.	Zafar Moulding PVC	Lahore	Rubber / Plastic	Informal
181.	Automotive Components Ltd.	Lahore	Electrical /	Formal





Sr. No	Name of Entity	City	Sector	Status
			Electronic	
100	Hybrid Technics (Pvt.) Ltd.	Lahore	Electrical /	Formal
182.			Electronic	
102	O'Field International (Pvt.) Ltd.	Lahore	Electrical /	Formal
183.			Electronic	
104	Alpha Tech Engineering	Lahore	Electrical /	Informal
184.			Electronic	
185.	T.N.W Engineering (Pvt.) Ltd.	Lahore	Assembly /	Formal
165.			Sub-Assembly	
186.	United Industrial Aid	Lahore	Assembly /	Formal
100.			Sub-Assembly	
187.	Atlas Honda Limited	Lahore	Assembly /	Informal
107.			Sub-Assembly	
188.	Babar Brothers	Lahore	Assembly /	Informal
100.			Sub-Assembly	
189.	Eagle Group of Industries	Lahore	Assembly /	Informal
			Sub-Assembly	
190.	Haji Saleem & Sons	Lahore	Assembly /	Informal
		T 1	Sub-Assembly	
191.	Honda Atlas Cars Pakistan Ltd	Lahore	Assembly /	Informal
		т 1	Sub-Assembly	T C 1
192.	Millat Tractors Limited	Lahore	Assembly /	Informal
	Name Asia Asstance altile (Dect.) I tel	T -1	Sub-Assembly	Informal
193.	New Asia Automobile (Pvt.) Ltd.	Lahore	Assembly /	Informat
	Pak Adil Mazda Body Maker	Lahore	Sub-Assembly /	Informal
194.	Fak Auli Mazua Douy Makei	Lanore	Sub-Assembly	mormai
	Pakistan Cycle Industrial Co-	Lahore	Assembly /	Informal
195.	Operative Society Ltd.	Lanore	Sub-Assembly	mormar
	Pakstar Automobile (Pvt.) Ltd.	Lahore	Assembly /	Informal
196.		Lunore	Sub-Assembly	Informu
	Plum Qingqi Motors Ltd	Lahore	Assembly /	Informal
197.			Sub-Assembly	
100	Sher Brothers	Lahore	Assembly /	Informal
198.			Sub-Assembly	
100	United Auto Industries (Pvt.) Ltd	Lahore	Assembly /	Informal
199.			Sub-Assembly	
200	Rastgar Engineering Company	Islamabad	Metal	Formal
200.	(Pvt.) Ltd.			
201.	Bolan Castings Limited	Lasbela	Metal	Formal
202.	Crown Tyres& Rubbers (Pvt.) Ltd.	Sadiqabad	Rubber / Plastic	Informal
	Pakistan Accumulators (Pvt.) Ltd.	Islamabad	Electrical /	Formal
203.			Electronic	
20.4	Crown Motors Company (Pvt.) Ltd.	Sadiqabad	Assembly /	Informal
204.			Sub-Assembly	





13.3 Annexure C – List of Training Service Providers Surveyed

Sr. No	Name of TSP	City
1	Govt. Swedish Pakistani Institute of Technology	Gujarat
2	Govt. Technical Training Centre	Gujarat
3	Govt. Apprentices Training Centre	Gujranwala
4	Rachna College of Engineering and Technology	Gujranwala
5	Jinnah Polytechnic Institute	Karachi
6	Hassani College of Technology	Karachi
7	NED University of Engineering and Technology	Karachi
8	Vocational Training Institute – Saddar	Karachi
9	Government Vocational Training Institute	Karachi
10	DHA Suffa University (main campus)	Karachi
11	Nazir Hussain University	Karachi
12	Aman Tech	Karachi
13	Govt. College of Technology	Lahore
14	Govt. Apprentices Training Centre	Lahore
15	Pakistan Industrial Technical Assistance Centre (PITAC)	Lahore
16	University of Engineering And Technology (UET)	Lahore
17	Malaysian Institute of Technology	Lahore
18	Allama Iqbal College of Technology	Lahore
19	Institute of Engineering & Technology	Lahore
20	Pakistan Council of Scientific &Industrial Research (PCSIR)	Lahore

 Table 154 - List of Surveyed Training Service Providers





13.4 Annexure D – List of Sector Experts Surveyed

Sr. No	Name of Expert	Organisation	Position Held	Experience (Years)
1.	Mohsin Syed	Hytech Vocational & Technical Training Foundation	CEO	25
2.	Muhammad Nawaz	Al Reheem Forging & Engineering Industries	CEO	30
3.	M. Hanif Memon	Auto Mark International	CEO	30
4.	Asif Alvi	Asif Rubber Industries (Pvt.) Ltd.	CEO	40
5.	Syed Farrukh Jamal	I CAT Transmission	CEO	30
6.	Aslam Rayaz	Super Tech Auto parts (Pvt.) Ltd.	CEO	20
7.	Hafeezullah Baloch	Millat Tractors Limited	Regional Manager	16
8.	Noman Khan	Transfigure Group of Companies	Advisor	17
9.	Muhammad Ayyaz	Green wheels (Pvt.) Ltd.	Director	10
10.	Sunnan Haseeb	TA international (Pvt.) Ltd.	Director	13
11.	Waqas Ejaz	Ahmad Glass Industries (Pvt.) Ltd	Director	22
12.	Syed Faisal Ali	S.T. Engineering Services	Business Development Executive	20
13.	Kosuke Lgavashi	DJK Japan	Production Head	15
14.	Abdullah Zaman	Mehran Commercial Enterprises	Executive Export Marketing	15
15.	Obaid Bukhari	A-one Techniques (Pvt.) Ltd.	Business Development Executive	12
16.	Mujtaba Yaqoob	Thal Engineering	Business Development Executive	16
17.	Gul Hameed	UET Lahore	Professor	29
18.	Dr. Hassan Ali	RachnaCollegeofEngineering&Technology	Registrar	10
19.	Muhammad Zafar Iqbal	Govt. College of Technology, Railway Road Lahore	Faculty Member	15
20.	Haroon Memon		Consultant	25
21.	Mr. Zahid Kaleem	Govt. Swedish Pakistan Institute, Gujrat	Vice Principal	18

Table 155 - List of Surveyed Sector Experts





Sr. No	Name of Expert	Organisation	Position Held	Experience (Years)
22.	Annar Haroon	Toyota Creek motors (Pvt.) Ltd.	Planning Executive	18
23.	Shiraz Ahmad	Agri-auto Industries Limited	Production Head	16
24.	Ali Hussain	New Asia Automobile (Pvt.) Ltd.	Production Head	12
25.	S.M. Saeed Hasan	Rastgar& Company (Pvt.) Ltd.	Production Head	14
26.	Ashfaq Ahmed	Sherani Engineering	Production Head	17
27.	Muhammad Adil	A. & A. Metal Industries (PVT) Ltd	General Manager	12
28.	Karamat Hussain Bokhari	Equiptech (Pvt.) Ltd.	General Manager	15
29.	Sultan Mehmood	Pecs Industries (Pvt.) Ltd.	General Manager	21
30.	Usman Ali Ahmad	Aman Tech Foundation	General Manager	15
31.	Firoz Hirani	Essa Engineering Industries (Pvt.) Ltd	General Manager	10
32.	Anwar Habib	Landhi Engineering Works (Pvt.) Ltd.	General Manager	13
33.	Muhammad Asadullah	Procon Engineering (Pvt.) Ltd.	Senior Manager P & D	20
34.	Baber Kaleem Khan	Pakwheels.com	Manager Planning	18
35.	Mansoor Ahmad Khan	Meralastik Rubber and Engineering Products	Production Manager	14
36.	Gulraiz Ahmad	Volta Dies & Moulds	Manager Quality Control	10
37.	Arshad Ali	Plum Qingqi Motors LTD.	Manager R&D	20
38.	Muhammad Yasir Arfaat	Pak Suzuki Motor Company Limited	Manager R&D	16
39.	Muhammad Aslam	Rubatech Manufacturing Company (Pvt.) Ltd.	Plant Manager	15
40.	Khayyam Riaz	Faraz Industries (Pvt.) Ltd.	Production Manager	10





13.5 Annexure E - Production Processes Used in Auto Parts Manufacturing Sector

13.5.1 Sheet Metal Process Flow

Process	SHEET METAL PROCESS FLOW Description			
Process	Sheet metal cutting is the		ough Shear	Cutting without Shear:
Cutting	process of cutting a flat piece of metal sheet in the designed pattern. In this process, shearing forces are applied on the edges of punch and die to separate the required part of sheet metal in desired shape.	 involves: Shearing: sheet meta through str. Punching: is applied to 	a piece of l is separated aight line cuts. shearing force to separate the om a piece of are Piercing,	 Laser Beam Cutting: high powered laser is used to cut through sheet metal. Plasma Cutting: a focused stream of plasma or ionized gas is used to cut sheet metal
Pressing / Stamping	It is process that may utilize numerous types of special machines. It also includes cutting and forming a sheet metal into desired shape or profile. It has three basic eld Sheet metal (thr be made in desire Stamping press; Stamping die.		al (through which a part is to desired shape); press; and	
Welding & Drilling	 Welding Process: involves fastening of two or more pieces of metal together by use of heat and pressure. Drilling Process: A process in which rotating cutting tool to make circular holes in solid materials. 		 Portable drilling machine Bench drilling machine Pillar drilling machine 	
Heat Treatment	Material is heated or chilled, normally to extreme temperatures, to achieve a desired result. (such as hardening or softening of a material)			
Surface Treatment	This process involves the treatment of metal parts before any coating (painting or electroplating). The purpose of this treatment is to increase the 'surface energy level' of a metal surface so that it may easily adhere to the Paint or electroplating material that is about to take place.			
	Painting:		Electroplatin	g:
Painting/ Electroplating	In this process, a mixture of is prepared and sprayed on a sheet pieces. Painting process has fo processes: Sanding Existing Painted S Sanding Replacement Parts Masking Priming Flexible and	relevant metal llowing sub Surfaces	reduce dissolv a coherent m Coating throu than that of 'corrosion degradation' d Additionally, expand and co	ss electric current is used to ved metal cations. This forms etal coating on an electrode. ogh electroplating is stronger painting, both in terms of resistance' and 'limited due to strikes. as electroplated coating can ontracts at the same rate as is and contraction rate of metal,





	Surfaces Priming Metal Parts Spraying the Color 	it can be used in environments where temperature changes drastically over time.	
Assembly and Finishing			
Inspection/ Quality Control	Quality Control is a process in which quality control department examines the quality of all factors involved in production process to ensure that the product produced by each process is fit for the purpose. The process emphasizes, testing of auto parts throughout the production processes involved in production and finalization of the auto part and uncovered defects are reported to the management who makes the decision that whether they have to deny or approve the product to be sold as final product.		
Packing	This process involves enclosing, labeling or protecting the auto parts for its distribution, storage, intended use or sale.		





13.5.2 Metal Casting Process Flow

D	METAL CASTING PROCI			
Process	Descr	ription		
	Melting is a process by which a solid form of metal if transformed to liquid form by combustion or electricity	Die Casting (Permanent Mold Casting) Die Casting involves the following stages:		
Melting and Casting	Casting is a process by which liquid form of metal is transformed to solid from. This can be done through:	1. Clamping2. Cooling3. Ejection4. Injection5. Trimming		
	• Die Casting or	Sand Casting (Consumable Mold Casting)		
	 Sand Casting 	Sand Casting comprises of following main stages:		
		1. Mold-making2. Clamping3. Pouring4. Cooling5. Removal6. Trimming		
Machining	In this process a cutting tool is used to remove unwanted material from a work piece of auto part to produce it in the desired shape. This process includes Drilling, Cutting, Turning, Milling etc. It can be done manually or by a Computerized Numerically Controlled Machine (CNC)			
Heat Treatment	Material is heated or chilled, normally to extreme temperatures, to achieve a desired result. (Such as hardening or softening of a material.) Heat treatment involves follow techniques: Annealing Case Hardening Precipitation Strengthening; Tempering and Quenching.			
Surface Treatment	Surface treatment: this process involves the treatment of metal parts before any actual coating takes place. The purpose of this treatment is to increase the 'surface energy level' of a metal surface so that it may easily adhere to the Paint or electroplating material that is about to take place.			
	Painting:	Electroplating:		
Painting/ Electroplatingpieces.forms a electroplatingPainting processes:process has following sub processes:forms a electroplating		t reduce dissolved metal cations. This forms a coherent metal coating on an electrode. Coating through electroplating		
	 Sanding Replacement Parts Masking Priming Flexible and Rigid Plastic Surfaces Priming Metal Parts Spraying the Color 	Additionally, as electroplated coating can expand and contracts at the same rate as is the expansion and contraction rate of metal, it can be used in environments where temperature changes drastically over time.		
Assembly and Finishing	Assembly is a process in which different pa product, which can perform a desired function	arts are combined to form a product or a sub		
	 Mostly, auto parts are manufactured as a sub product and they are manufactured different components using one or more of the mentioned processes (i.e. Melting, Ca or Machining etc.) these components are then assembled together to form a de product. 			





Inspection/ Quality Control	Quality Control is a process in which quality control department examines the quality of all factors involved in production process to ensure that the product produced by each process is fit for the purpose. The process emphasizes, testing of auto parts throughout the production processes involved in production and finalization of the auto part and uncovered defects are reported to the management who makes the decision that whether they have to deny or approve the product to be sold as final product.
Packing	This process involves enclosing, labeling or protecting the auto parts for its distribution, storage, intended use or sale.





13.5.3 Metal Forging Process Flow

	METAL FORGING PROCI	ESS FLOW			
Process		iption			
Heating and Forging	This process involves deforming a piece of metal by applying comprehensive forces and creating a desired geometric change to that deformed piece of metal. The forging process is a basic process in industrial metal manufacturing, particularly in the steel manufacturing and extensive iron industry.				
Machining		e unwanted material from a work piece of auto s process includes Drilling, Cutting, Turning, Computerized Numerically Controlled Machine			
Heat Treatment	Material is heated or chilled, normally to extreme temperatures, to achieve a desired result. (Such as hardening or softening of a material.) Heat treatment involves followin techniques: Annealing Case Hardening Precipitation Strengthening; Tempering and Quenching.				
Surface Treatment	Surface treatment: this process involves the treatment of metal parts before any actual coating takes place. The purpose of this treatment is to increase the 'surface energy level' of a metal surface so that it may easily adhere to the Paint or electroplating material that is about to take place.				
	Painting:	Electroplating:			
Painting/ Electroplating	 In this process, a mixture of relevant color is prepared and sprayed on relevant metal sheet pieces. Painting process has following sub processes: Sanding Existing Painted Surfaces Sanding Replacement Parts Masking Priming Flexible and Rigid Plastic Surfaces Priming Metal Parts Spraying the Color 	In this process electric current is used to reduce dissolved metal cations. This forms a coherent metal coating on an electrode. Coating through electroplating is stronger than that of painting, both in terms of 'corrosion resistance' and 'limited degradation' due to strikes. Additionally, as electroplated coating can expand and contracts at the same rate as is the expansion and contraction rate of metal, it can be used in environments where			
Inspection/ Quality Control	 Spraying the Color temperature changes drastically over time. Quality Control is a process in which quality control department examines the quality of all factors involved in production process to ensure that the product produced by each process is fit for the purpose. The process emphasizes, testing of Rubber/Plastic auto parts throughout the production processes involved in production and finalization of the said auto part and uncovered defects are reported to the management who makes the decision that whether they have to deny or approve the product to be sold as final product 				
Packing	This process involves enclosing, labeling or protecting the auto parts for its distribution, storage, intended use or sale				



13.5.4 Rubber & Plastic Parts Process Flow

	RUBBER & PLASTIC PROCESS FLOW					
Process	Descr	iption				
	Mixing and Compounding:	Internal Mixer				
Mixing and Compounding	It is the process of combining raw rubber and compounding ingredients (such as plasticizers, activators and fillers). The compounding ingredients are added in one or more stages of mixing and Curing chemical (vulcanizing agent) is usually added at the last stage of mixing in order to prevent pre-curing of the compound. Mixing can be carried out either in internal mixer or occasionally on two roll mills.	A machine that contains two rotors which shear the rubber mix against the wall of the vessel. Two rolls mills A machine having two parallel roll mills. The machine operator places the ingredients into the nip, formed between the rolls, and mixes the compound by cutting it off the rolls. Then material is re- filled into the nip until all the ingredients have been added.				
Injection Molding	Plastic Injection molding is a process of forming an article by forcing molten plastic material under pressure into a mould where it is cooled, solidified and subsequently released. Four factors should be considered	In this process of filling uncured rubber ribbon stock into a rotating screw of the injection unit. At this stage material is plasticized to a targeted elevated temperature.				
	in process: Temperature Timing Pressure Shot Size	To activate the cure system in the rubber compound (vulcanization of Rubber), a runner and gate system is used to inject the Rubber material into the mold cavity under high pressure and elevated temperature				
Cutting and Trimming	cutting tools. A pattern is selected according	tic flash through cutting machines or portable to the type of rubber or plastic and machines precise cutting is very important for reducing				
Assembly and Finishing	Assembly is a process in which different parts are combined to form a product or a sub product, which can perform a desired function. Mostly, Rubber/Plastic auto parts are manufactured as a sub product and they are manufactured as different components using one or more of the mentioned processes (i.e. Mixing & Compounding, Injection Molding etc.) these components are then assembled together to form a desired product.					
Inspection/ Quality Control	Quality Control is a process in which quality control department examines the quality of all factors involved in production process to ensure that the product produced by each process is fit for the purpose. This process emphasizes, testing of Rubber/Plastic auto parts throughout the production processes involved in production and finalization of the said auto part and uncovered defects are reported to the management who makes the decision that whether they have to deny or approve the product to be sold as final product.					
Packing	This process involves enclosing, labeling or storage, intended use or sale	protecting the auto parts for its distribution,				





13.5.5 Electrical/Electronic Parts Process Flow

	ELECTRICAL/ELECTRONICS PROCESS FLOW
Process	Description
Components Intake	A process of receiving and safekeeping of procured components (such as wirings, relays, fuse, circuits, LEDs, ignition system, automatic power control systems)during the period for which they are not required for use and moving them out of stores for production/assembly department, when requested.
	The objective is to efficient and economic maintenance of said components and timely issuance of the right components to production/assembly department, when requested.
Assembly Line	When the required Electrical/Electronic components are issued from the Intake/store department to the production/assembly department, they are then transferred to the relevant Sub assembly.
Finishing &Quality Control	Quality Control is a process in which quality control department examines the quality of all factors involved in production process to ensure that the product produced by each process is fit for the purpose. When electrical/electronic components are finalized at their relevant sub-assemblies, they are then sent to Quality Control Department for quality examination. After passing quality examination the components are assembled and finalized and sent to packing department.
Packing	This process involves enclosing, labeling or protecting the auto parts for its distribution, storage, intended use or sale





13.5.6 Assembly/Sub Assembly Process Flow

	ASSEMBLY / SUB-ASSEMBLY
Process	Description
Chases Shop	With reference to automobiles assembly, chassis assembly is the first step which is performed at a separate sub assembly called as 'Chassis Shop'. At this stage different chassis components combined together to form a chassis shell. After that, chassis shell is sent to paint shop for painting and surface treatment.
Paint Shop	 Painting: Painting is the second step where chassis shell is painted at separate sub assembly called 'Paint Shop'. In this process, a mixture of relevant color is sprayed on the chassis shell after its surface treatment. Without proper surface treatment, any painting fails to have proper bonding to the metal. After this stage, the chases shell moves to component assembly areas. Surface treatment: This process involves the treatment of the surface of chassis shell before Painting. The purpose of this treatment is to increase the 'surface energy level' of a metal surface so that it may easily adhere to the Paint or electroplating material that is about to take place.



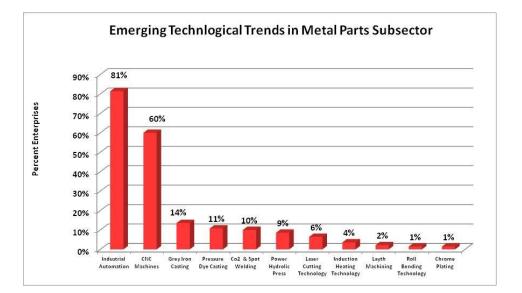


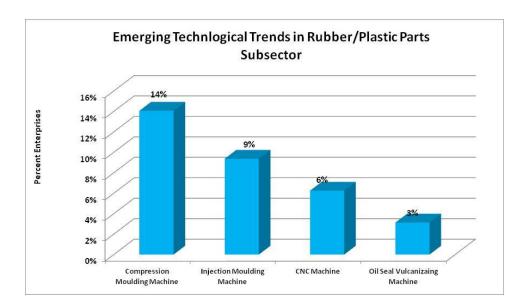
	In Assembly line complete Engine, Running Gears, Driving System, Basic Control System, Electrical System, and Accessories are sequentially installed on the chassis shell.							
	Sub Assembly – Engine:							
	Engine is placed in the front of the chassis, with the crankshaft perpendicular to the axles, as per basic mechanical arrangement.							
	Engine Sub- Assembly includes assembling the following on chassis frame:							
	 Mechanical Parts Fuel System Cooling system 							
	 Lubricating System Exhaust System 							
	Sub Assembly – Running Gear:							
	This process includes the installation Wheels, Tyre and Rims, Springs and Shock absorbers, and Suspension system on chassis shell.							
Assembly Line	Sub Assembly– Driving System and Basic Control System:							
	Driving System:							
	This includes, Installation of Clutch System, Transmission system, adjusting Drive Line, and fitting Rear Axle.							
	Basic Control System:							
	This includes, includes installation of steering system and Brake system is in the chassis frame.							
	Sub Assembly – Electrical System:							
	Electrical System comprises different types of circuits including:							
	 Starting Circuit Charging Circuit Ignition Circuit 							
	 Lighting Circuit Horn Circuit 							
	Sub Assembly- Accessories:							
	At final stage of Assembly Line, different Accessories are installed in chassis Shell. A list of main accessories is given hereunder:							
	 Heater Air- Conditioner Radio 							
	Wind Screen Wiper Indicators Mirrors etc.							
Inspection,	It is a process in which Quality Control Department examines the quality as well as performance of the unit released from the 'Final Assembly Line' and after passing the quality examination, the product is sent to finishing department from where unit is released for sale or intended use.							
Testing , QC& Finishing	If any defect is found, it is sent back to the assembly with the recommendations and the product is treated as per the recommendations of Quality Control Department and then it has to pass the quality control exam and sent for finishing department from where it is released for resale or intended use.							





13.6 Annexure F – Emerging Technological Changes⁶⁵

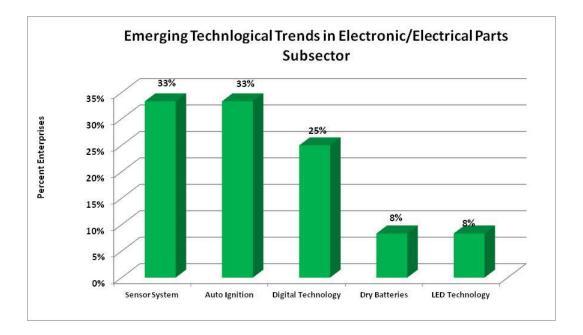


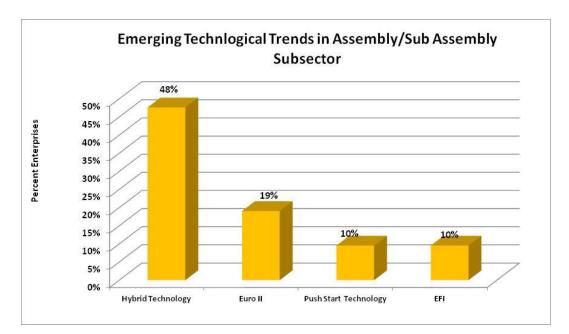


⁶⁵The sum of percentages may exceed 100% due to multiple responses











13.7 Annexure G – Qualitative Assessment of Skills (Detailed Responses)

		Total No. of	Excellent	Good	Average	Poor
Sub Sector	Skill	Responses				
	Die Making & Sequencing	73	6	49	18	0
Design Section /	Die Designing Sequence	62	2	41	19	0
Tools &	CAD / CAM professional					
Die/	skills	59	2	42	15	0
Technical	Die gauge selection	51	1	34	16	0
Support	Total	245	11	166	68	0

13.7.1	Design	Section /	/ Tools &	& Die/ 7	Fechnical	Support
10./.1	Design	beenon /			common	Support

13.7.2 Sheet Metal

		Total No. of	Excellent	Good	Average	Poor
Sub Sector	Skill	Responses	C	urrent S	kill Level	
	Instrument usage					
	precision	53	1	33	19	0
	Blade Handling	50	2	34	14	0
	Dimensions Marking	42	3	23	16	0
	Cutting size adjustment	38	1	21	16	0
Cutting	Total	183	7	111	65	0
	Pressing and stamping					
	Skills	65	5	33	27	0
	Die fitting	52	1	30	21	0
	Die handling	54	3	33	17	1
Pressing /	Die aligning	48	1	25	22	0
Stamping	Total	219	10	121	87	1
	Angle setting skills	70	3	39	27	1
	Object placement	68	1	40	27	0
	Nozzle Adjustment skills	68	7	39	22	0
	Advance drilling					
Welding &	techniques	62	2	43	17	0
Drilling	Total	268	13	161	93	1
	Oven operating				1.0	
	techniques	32	1	13	18	0
	Temperature control	34	1	22	11	0
	Heat specification conformance	34	1	22	11	0
	Cleaning oxides	34	1		11	0
Heat	techniques	27	0	15	11	1
Treatment	Total	127	3	72	51	1
Surface	Electroplating techniques	54	0	36	18	0
Treatment /	Formula deriving	52	0	36	15	1
Painting /	Humidity level		~			1
Electroplating	determination	48	3	33	12	0





	Paint mixing	47	1	36	10	0
	Total	201	4	141	55	1
	Nut Fitting	53	0	34	19	0
	Process determination and adjustments	46	3	27	16	0
	Determining Assembly Sequence	40	1	27	11	1
Assembly &	Ensure standardized assembly	38	2	26	10	0
Finishing	Total	177	6	114	56	1
	Defect identification	48	2	31	14	1
T (* (Quality compliance	45	4	24	17	0
Inspection / Quality	Quality inspection	41	3	23	15	0
Control &	TQM application	42	3	30	9	0
Packing	Total	176	12	108	55	1

13.7.3 Metal Casting

Sub Sector		Total No. of	Excellent	Good	Average	Poor
Sub Sector	Skill	Responses	Current Skill Level			
Metal Casting	Sand Casting Techniques	26	1	10	15	0
	Casting design consideration	24	0	13	11	0
- Melting &	Casting Defects removal	19	2	7	9	1
Casting	Solidification Time adjustment	16	0	11	5	0
	Total	85	3	41	40	1
	Positioning system handling	28	1	15	12	0
	Casting design consideration	22	1	16	5	0
Metal Casting - Machining	Pressure die casting machine handling	23	1	14	7	1
	Machining components with repeatable accuracy	17	0	8	9	0
	Total	90	3	53	33	1
	Cleaning oxides techniques	7	1	5	1	0
Metal Casting - Heat Treatment	Oven operating techniques	3	0	3	0	0
Treatment	Troubleshooting	3	0	3	0	0
	Total	13	1	11	1	0
Metal Casting - Surface	Paint Mixing	27	0	19	8	0
	Humidity level determination	23	1	17	5	0
Treatment /	Electroplating techniques	24	1	13	10	0
Electroplating	Polishing Techniques	21	1	12	8	0
	Total	95	3	61	31	0





	Nut Fitting	19	1	11	6	1
	Process determination	14	0	10	4	0
Metal Casting	and adjustments	14	0	10	4	0
- Assembly &	Ensure standardized	10	0	Ō		0
Finishing	assembly	12	0	8	4	0
	Determining Assembly					
	Sequence	7	2	4	1	0
	Total	52	3	33	15	1
Metal Casting	Quality compliance	15	0	11	4	0
- Inspection /	Quality inspection	14	0	11	3	0
Quality	TQM application	13	2	9	2	0
Control & Packing	Defect identification	11	0	6	5	0
	Total	53	2	37	14	0
Metal Casting	Reasonable Inventory					
- Stores / Material	Knowledge	31	1	19	11	0
	Inventory Management	33	1	17	15	0
Handling	Total	64	2	36	26	0

13.7.4 Metal Forging

Sub Sector	Skill	Total No. of	Excellent	Good	Average	Poor	
Sub Sector	SKIII	Responses	Responses Current Skill Level				
	Tube Swaging	20	0	8	12	0	
	EDM Machine operation	15	0	10	5	0	
Heating & Forging	Open and closed die functions	11	0	9	2	0	
	Ultra sonic cleaning	8	0	5	3	0	
	Total	54	0	32	22	0	
	Barreling and Cogging techniques	23	1	13	7	2	
	Precision forging techniques	20	0	11	8	1	
Machining	Tool Paths, Cutting and Plotting Motions	16	0	10	4	0	
	operations Application of specific	16	0	12	4	0	
	lubricants	14	0	10	4	0	
	Total	73	1	46	23	3	
	Cleaning oxides techniques	12	0	5	7	0	
	Temperature control	12	0	9	3	0	
Heat Treatment	Oven operating techniques	10	0	6	3	1	
	Heat specification conformance	10	0	7	3	0	
	Total	44	0	27	16	1	
Surface	Anodizing techniques	19	0	8	11	0	
Treatment / Electroplating	Application of required design	15	0	11	3	1	





	Buffing and polishing techniques	13	0	10	3	0
	polishing Techniques	10	0	8	2	0
	Total	57	0	37	19	1
	Quality compliance	24	2	15	7	0
Inspection/	Quality inspection	16	1	13	2	0
Quality Control &	Defect identification	3	1	1	1	0
Packing	TQM application	13	0	11	2	0
	Total	56	4	40	12	0

13.7.5 Rubber & Plastic

Sub Sector		Total No. of	Excellent	Good	Average	Poor
Sub Sector	Skill	Responses	C	urrent S	kill Level	
	Fire and explosion safety measures	31	0	23	8	0
	Sequential Mixing	28	0	16	12	0
Mixing and Compounding	Shrinkage, weight and volume handling Rubber sheet gauge	25	0	16	9	0
	adjustment	22	0	13	9	0
	Total	106	0	68	38	0
	Transfer moulding skills	46	0	28	17	1
Rubber and Plastic -	Compression moulding skills	41	0	20	20	1
Injection &	Shrinkage adjustments	31	0	18	13	0
Moulding	Process & machine schematics	24	0	14	10	0
	Total	142	0	80	60	2
	Cutting Size Adjustment	39	0	21	17	1
Rubber and Plastic -	Efficiency & Effectiveness	37	0	16	20	1
Cutting &	Task Accomplishment	28	0	17	11	0
Trimming	Wastage Control	25	0	15	9	1
	Total	129	0	69	57	3
	Determining Assembly Sequence	34	0	20	14	0
	Nut Fitting	26	0	18	8	0
Assembly & Finishing	Process determination and adjustments Ensure standardized	25	0	13	12	0
	assembly	20	0	12	8	0
	Total	105	0	63	42	0
Inspection/	TQM application	33	2	23	8	0
Quality	Defect identification	29	1	18	10	0
Control &	Quality compliance	25	1	15	9	0
Packing	Quality inspection	20	0	16	4	0





Total	107	4	72	31	0
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13.7.6 Electronic/Electrical Parts

Sub Sector		Total No. of	Excellent	Good	Average	Poor
Sub Sector	Skill	Responses	С	urrent S	kill Level	
Components	Reasonable Inventory Knowledge	21	2	12	7	0
Intake	Inventory Management	7	0	4	3	0
	Total	28	2	16	10	0
	Circuit resistance test operations	12	0	8	4	0
Assembly	Starter drive operations	9	2	1	6	0
Line	Fuel Gauge Operations	11	1	7	3	0
	Ignition coil operations	8	1	5	2	0
	Total	40	4	21	15	0
	Paint mixing	8	0	7	1	0
Painting &	Humidity level determination	8	0	5	3	0
Finishing	Nozzle Adjustment	2	0	2	0	0
-	Formula deriving	3	0	3	0	0
	Total	21	0	17	4	0
	TQM application	5	0	4	1	0
Inspection /	Quality compliance	7	1	5	1	0
Quality	Defect identification	7	1	4	2	0
Control	Quality inspection	6	0	5	1	0
	Total	25	2	18	5	0
	Ceramic Packaging techniques	7	0	5	2	0
Dealeine	System-Level Packaging techniques	4	0	2	2	0
Packing	Material handling	5	0	2	3	0
	Metal Packaging techniques	4	0	3	1	0
	Total	20	0	12	8	0

13.7.7 Assembly/Sub Assembly

Sub Sector		Total No. of	Excellent	Good	Average	Poor
Sub Sector	Skill	Responses	C	urrent S	kill Level	
	Assembly line balancing	12	0	10	2	0
Assembly /	Appropriate Object					
Sub	placement	11	0	9	2	0
Assembly -	Monitoring assembly					
Chassis Shop	process	10	0	7	3	0
	Assembly process pattern	8	0	5	3	0





	Total	41	0	31	10	0
	Recommended Spray					
A combly /	Nozzle	12	0	5	7	0
Assembly / Sub	Surface preparation	13	0	11	2	0
Assembly -	Formula Deriving	10	0	7	3	0
Paint Shop	humidity level		0	0	0	0
_	Adjustment	8	0	8	0	0
	Total	43	0	31	12	0
	Efficient performance of	12	0	8	4	0
Assembly /	assembly tasks Construction of	12	0	0	4	0
Sub	prototype	13	0	10	3	0
Assembly -	Sequencing of tasks	10	0	6	4	0
Assembly Line	Removal of production	10	0	0		0
Line	constraints	8	0	6	2	0
	Total	43	0	30	13	0
	Removal of production					
	constraints	10	0	10	0	0
A 11 /	Sequencing of tasks	9	0	8	1	0
Assembly / Sub	Efficient performance of					
Assembly - A	assembly tasks	7	0	7	0	0
rissembly ri	Construction of					
	prototype	4	0	2	2	0
	Total	30	0	27	3	0
	Removal of production constraints	15	0	12	3	0
		15	0	12	5	0
Assembly /	Efficient performance of assembly tasks	12	0	7	5	0
Sub Assembly - B	Construction of					
Assembly - D	prototype	9	0	6	3	0
	Sequencing of tasks	7	0	5	2	0
	Total	43	0	30	13	0
	Removal of production					
	constraints	9	0	6	3	0
Assembly /	Efficient performance of					
Sub	assembly tasks	11	0	6	5	0
Assembly - C	Sequencing of tasks	9	0	6	3	0
	Construction of	11	0	7		0
	prototype	11	0	7	4	0
	Total	40	0	25	15	0
	Removal of production constraints	5	0	5	0	0
		5	0		0	
Assembly /	Efficient performance of assembly tasks	10	0	6	4	0
Sub		4	0	2	2	0
Assembly - D	Sequencing of tasks Construction of	4	U	<u>ک</u>	2	U
Assembly - D		1	1			
		11	0	6	5	0
	prototype Total	11 30	0	6 19	5 11	0





Sub	constraints					
Assembly - E	Efficient performance of assembly tasks	6	0	2	4	0
	Sequencing of tasks	6	0	4	2	0
	Construction of prototype	9	0	4	5	0
	Total	27	0	15	12	0
	TQM application	7	0	7	0	0
Inspection,	Quality inspection	4	0	3	1	0
Testing , QC & Finishing	Defect identification	15	0	14	1	0
	Quality compliance	12	0	8	4	0
	Total	38	0	32	6	0





13.8 Annexure H – Details of TSPs and Courses Recalled by Enterprises

TSP/Course	No. of Responses
Aman Tech	
DAE Mechanical	2
Mechanical	3
DAE	6
Machinist	1
BE Mechanical	2
Total	14

KTDMC	
Forging	1
DAE Dies & Moulds	3
Diploma	2
DAE	2
Total	8

NED	
BE Mechanical	1
DAE Mechanical	2
Degree	3
Diploma	1
Total	7

NIDA	
Welding Inspection	1

Pak Swiss	
CNC Machine Operator	3
CAD/CAM	1
Diploma	2
DAE	13
Short Courses	1
Degree	1
DAE Electrical	3
DAE Dies & Moulds	1
Total	25

PCSIR	
Diploma in Precision Machining	7
Mechanical course	3
Mechanical Engineering	1
DAE	2
Foundering	1





DAE Chemical	1
Short Courses	1
Total	16

PITAC	
Injection Moulding	1
Machine Operator	1
Foundry	1
Short Courses	3
Mechanical Diploma	1
DAE	3
B Tech	1
CNC Machine Operator	2
Quality Control	1
Diploma	1
Auto CAD Designer	2
Total	17

SECW	
Metallic Alloy Casting	2

SMEDA	
Machinist	1
Sand Cast Course	1
DAE	1
Total	3

Technical College	
DAE	2
DAE Mechanical	3
Total	5

ТЕУТА	
Electrical Diploma	1
Machinist	3
CNC Machine operator	2
DAE Mechanical	4
Assembly	1
DAE	12
Machine operator	1
Welding	3
Cutter	1
Degree	2
BS Mechanical	1
DAE Metallurgy & Welding	1





Short Courses	3
Total	35

VTI	
Machine operator, shapes, welding	1
Assembly / Moulding	1
Diploma	1
Total	3

Govt. Polytechnic Institute	
DAE Mechanical	2

PFA	
Cast Defect Analysis & Control	1

Punjab Technical Board	
DAE	2

Technical Institute	
DAE Mechanical	1
DAE	2
B Tech	1
Short Courses	1
Total	5

UET Lahore	
Mechanical Engineering	4
Metallurgical Engineering	1
DAE	1
Total	6

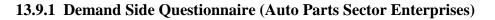
Plastic Technology Centre Karachi	
DAE Polymer	1
Poly Technic	
Mechanical Diploma	1
Short Course	1
Total	3

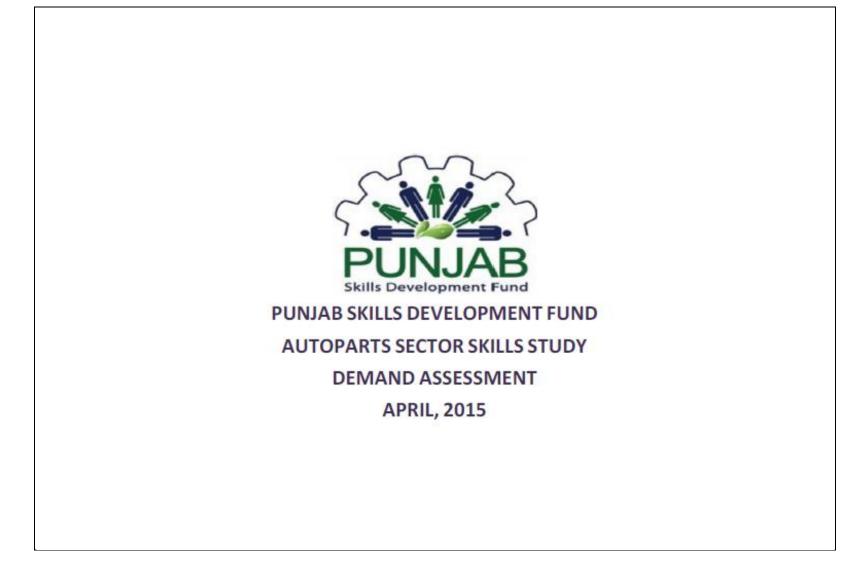


13.9 Annexure I -: Questionnaires















Sector Skills Study Assalam-O-Alaikum, we represent Punjab Skills Development Fund (PSDF), and are in the process of conducting Sector Skills Study Autoparts Sector. In order to conduct this study, we, the Anjum Asim Shahid Rahman, Chartered Accountants, Member Firm of Grant Thor a-vis its workforce so that based on the findings of this study, PSDF can accordingly design its training program to enhance the skills se the workforce employed/to be employed by the Autoparts sector. We will not use your identity or your individual response in reporting the findings gathered through this study, instead, your suggest and responses will be aggregated along with the responses of other Autoparts sector entities. We would like to assure you information that you share with us will be held strictly confidential within our offices and shall not be used for any purpose other the one described above. If there is anything you do not understand during the interview, please feel free to seek clarification. Thank you for taking time out interview. This interview will take approximately minutes. Form No. Interviewer: Reviewed By: Approved By:	JNJAB	Punjab Skills Development Fund (PS
Autoparts Sector. In order to conduct this study, we, the Anjum Asim Shahid Rahman, Chartered Accountants, Member Firm of Grant Thom International, are undertaking a primary survey to develop our understanding of the jobs and skills requirements of Autoparts Sector a-vis its workforce so that based on the findings of this study, PSDF can accordingly design its training program to enhance the skills as the workforce employed/to be employed by the Autoparts sector. We will not use your identity or your individual response in reporting the findings gathered through this study, instead, your suggest and responses will be aggregated along with the responses of other Autoparts sector entities. We would like to assure you information that you share with us will be held strictly confidential within our offices and shall not be used for any purpose other the one described above. If there is anything you do not understand during the interview, please feel free to seek clarification. Thank you for taking time ou this interview. This interview will take approximately minutes. Form No. Interviewer: Reviewed By:		SECTOR SKILLS STUDY
International, are undertaking a primary survey to develop our understanding of the jobs and skills requirements of Autoparts Sector a-vis its workforce so that based on the findings of this study, PSDF can accordingly design its training program to enhance the skills at the workforce employed/to be employed by the Autoparts sector. We will not use your identity or your individual response in reporting the findings gathered through this study, instead, your suggest and responses will be aggregated along with the responses of other Autoparts sector entities. We would like to assure you information that you share with us will be held strictly confidential within our offices and shall not be used for any purpose other the one described above. If there is anything you do not understand during the interview, please feel free to seek clarification. Thank you for taking time ou this interview. This interview will take approximately minutes. Form No. Interviewer: Reviewed By:		we represent Punjab Skills Development Fund (PSDF), and are in the process of conducting Sector Skills Study
and responses will be aggregated along with the responses of other Autoparts sector entities. We would like to assure you information that you share with us will be held strictly confidential within our offices and shall not be used for any purpose other the one described above. If there is anything you do not understand during the interview, please feel free to seek clarification. Thank you for taking time ou this interview. This interview will take approximately minutes. Form No. Interviewer: Reviewed By:	International, are un a-vis its workforce se	dertaking a primary survey to develop our understanding of the jobs and skills requirements of Autoparts Sector that based on the findings of this study, PSDF can accordingly design its training program to enhance the skills se
this interview. This interview will take approximately minutes. Form No. Interviewer: Reviewed By:	and responses will information that you	be aggregated along with the responses of other Autoparts sector entities. We would like to assure you a share with us will be held strictly confidential within our offices and shall not be used for any purpose other t
Interviewer: Reviewed By:		
Reviewed By:	Form No.	
	Interviewer:	
Approved By:	Reviewed By:	
	Approved By:	



		ENTITY BACKGR	OUND	
Sr. No	. Particulars	Responses		
1.	District / Cluster	Lahore Karachi	🗆 Gujranwala	Other
2.	Establishment Name			
3.	Mailing/Physical Address			
4.	Year of Establishment			
5.	Size of Establishment	Small Annual sales up to PKR 25 Million	Medium Annual sales more than PKR 25 Million up to PKR 250 Million.	 Large Annual sales More than PKR 250 Million.
	Affiliation with PAAPAM ¹	Yes	D No	
	Registration / Affiliation Status	Any Government Departm	ent 🛛 Any Regulatory Body	None
6.	Nature of Entity	 Sole Proprietorship Public Ltd. Co. 	Partnership Firm	Private Ltd Co.
7.	E-mail Address			
8.	Telephone Number			
	Telephone Number Website Address			
8.				Self Employed Employee
8. 9. 10.	Website Address	te? Please provide some of		Self Employed Employee
8. 9. 10.	Website Address Contact Person (Name, Designation)	ate? Please provide some of a Rubber / Plastic Parts		Self Employed Employee
8. 9. 10.	Website Address Contact Person (Name, Designation) ich Sub- Sector does your entity opera		your major products.	
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8. 9. 10. In wh 1. 2. 3.	Website Address Contact Person (Name, Designation) ich Sub- Sector does your entity opera		your major products.	
8. 9. 10. 1. 2. 3. 4.	Website Address Contact Person (Name, Designation) ich Sub- Sector does your entity opera		your major products.	
8. 9. 10. 1. 2. 3. 4. 5.	Website Address Contact Person (Name, Designation) ich Sub- Sector does your entity opera		your major products.	



revenue for the next three years?	Importer Manufacturer Exporter If Importer, how would you categorize your entity among the following? Self-Consumption Selling and Distribution If Manufacturer, how would you categorize your entity among the following? O EM ² After Market If Exporter, which of the above-mentioned products do you export and to which countries? Countries Products Countries Products Importer Importer What has been the trend of revenue growth of your entity during last three years? Export Market Importer Upward Importer Importer Importer Downward Importer Importer Importer What percentage of your revenue is attributable to export and local markets? Also, what is the expected percentage increase revenue for the next three years? Importer Importer	Importer Manufacturer Exporter If Importer, how would you categorize your entity among the following? Self-Consumption Selling and Distribution If Manufacturer, how would you categorize your entity among the following? OEM ² After Market If Exporter, which of the above-mentioned products do you export and to which countries? Countries Products Manufacture Manufacture Manu	Importer Manufacturer Exporter If Importer, how would you categorize your entity among the following? Self-Consumption Selling and Distribution	
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Export Market			Trend Domestic Market Upward □ Downward □ Varied □ What percentage of your revenue is attributable to export and local markets? Also, what is the experience	
	Export Market	Domestic Market	Trend Domestic Market Upward □ Downward □ Varied □ What percentage of your revenue is attributable to export and local markets? Also, what is the experience for the next three years?	e expected percentage increase
Domestic Market	Domestic Market		Trend Domestic Market Upward □ Downward □ Varied □ What percentage of your revenue is attributable to export and local markets? Also, what is the experiment for the next three years? Target Market Current Revenue Mix in Percentage Expected Percentage	e expected percentage increase
			Trend Domestic Market Upward □ Downward □ Varied □ What percentage of your revenue is attributable to export and local markets? Also, what is the experiment for the next three years? Target Market Current Revenue Mix in Percentage Expected Percentage Export Market □	e expected percentage increase
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			Trend Domestic Market Upward □ Downward □ Varied □ What percentage of your revenue is attributable to export and local markets? Also, what is the experiment for the next three years? Target Market Current Revenue Mix in Percentage Expected Percentage Export Market □	e expected percentage increase



PUN	NJAB				Pu	ajab Skills Development Fund (PSDF
5.			on of your installed prod eating hurdles in reachin Lack of Skill Shortage of	ng optimum capaci ed Human Resource	□ Old	Technology and Infrastructure
5.	Any plan for impro	vement in the cur	rent installed capacity u No	tilization level in th	e upcoming three years?	
7.		sion in your instal	rease in the current ins ed capacity in the upcor No rovement:			%
	Product-line (pleas	e specify)	🗆 Metal 🛛	Rubber / Plastic	Electrical/Electronic	Assembly / Sub Assemb
8.		nat are beginning	Il production after such to, or are expected to		y in terms of Technology,	% Organisational Changes, Pric
	Organizational Changes	3. 1. 2. 3.				
	Price Competition	1. 2. 3.				
I		з.				



Ś	Autoparts Sector Skills St	udy- Demand Assessment			Punjab Skills D	evelopment Fund (PSDF)
PU	NJAB					
			WORKFORCE PI	ROFILE		
9.	What are the work hours at	t your factory?			hours	
10.	Which of the following sour	rces does your entity use t	o hire employees	2		
	Level	Tick				
	Management (Managers / Supervisors)	Internet University/Training Centre	Recruitment	Newspapers Personal Referrals	Help Wanted Signs	Job Postings Others
	Production Staff / Workers	Internet		Newspapers	Help Wanted Signs Contractors	Job Postings Others
		University/Training Centre Internet	Recruitment	Newspapers	Help Wanted Signs	□ Job Postings
	Others	University/Training Centre	Recruitment	Personal Referrals	Contractors	Others
11.	What is the recruitment / h	iring process for workers?				
	 No Formal Recruitment Pro Formal Application Process 	cess Informal Interview Other (Please Specif			Formal	Interview with Candidate
12.	Is prior experience necessa	ry for hiring?				
	Middle Management Level	Required		s:	Not Rec	
	Technical / Worker Level	Required		S:	Not Rec	quired
13.	Is prior certification necess	ary for hiring? If required,				
	Middle Management Level	Required	From whor	n:	Not Rec	
	Technical / Worker Level	Required	From whor	n:	□ Not Rec	quired
_						
						6



Kindly	complete the m	atrix below	based on pr		Hard to	Fill Vacancies	tity specialize	s:	Please specify the	Education	& Qualification
Process	Job Level / Trade	Job Title	Current Employees	Vacanc ies	(amo No.	ng Vacant)* Reasons ⁴	in Next Three Years (No.)	Current Skill Level [®]	Required Skills in Current Employees	Current Level ⁴	Preferred Level ⁴
å Dye/	Tools & Dye Shop Supervisor / In-charge / Foreman										
Tooka	Tools &Dye maker										
Section / T Support	Designer/Pattern maker										
es las	Assistant										
Design 5 Technical 5	Other										
		1			HEET ME	TAL (Stampin	g and Pressing)				
	Cutting Supervisor /	1	1							l	
50	In-charge /Foreman					l					
-	Cutter Helper										
Dowing	Other		+								
	Pressing Supervisor / In-charge / Foreman										
2	Pressman										
D Pressing/ Samping	Helper										
É E	Other										
	Welding & Drilling Supervisor / In- charge / Foreman										
olling	U Welder										
	Driller										
Welding&	Helper		1								
8	Other		+		<u> </u>						
	Supervisor/In-		+								
C Heat Treatm	charge / Foreman										
<u>ة گ</u> ت	Heat Technician / Oven Operator										

6 1 = Degree, 2 = Certificate or Diploma, 3 = Short Course, 4= Any Other (Please Specify), 5= None.





			Current	Vacanc		Fill Vacancies	Expected Hiring	Current	Please specify the Required Skills in	Education	& Qualification
Process	Job Level / Trade	Job Title	Employees	ies	No.	Reasons ⁴	in Next Three Years (No.)	Skill Level ⁴	Current Employees	Current Level ⁴	Preferred Leve
	Helper										
	Other										
	Shop Supervisor/In- charge / Foreman										
	Electroplater										
and and	D Painter										
l Surface Treatment I Painting I Electroplating	Helper										
222	Other										
4	Assembly Shop Supervisor/ In-charge / Foreman										
C Assembly 8 Finishing	Assembler		_								
Paris and Paris	Helper										
62	Other										
	Quality Assurance In-charge										
🗆 Inspection / Quality.control & Packing	Quality Control Inspector										
king of a	Quality Assistant										
095	Other										
	•			•		METAL - CAS	TING				
	Store In-charge										
D Stores / Material Handling	Store Keeper										
888	Assistant Assistant										
051	Other										
	Melting & Casting Supervisor / In- charge / Foreman										
*	Machinist										
Carding	Helper										
63	Other										
Nadi Madi	Machining Supervisor / In-charge / Foreman										





			Current	Vacanc		Fill Vacancies ng Vacant) ⁸	Expected Hiring	Current	Please specify the Required Skills in	Education 8	k Qualification
Process	Job Level / Trade	Job Title	Employees	ies	No.	Reasons ⁴	in Next Three Years (No.)	Skill Level ⁴	Current Employees	Current Level ⁴	Preferred Leve
	CNC Operator										
	Machinist /										
	Operator		_								
	Helper										
	Other										
	Supervisor / In- charge / Foreman			[[[
	Heat Technician /										
	Oven Operator										
C Heat Treatment	Helper										
οĔ	Other										
	Electroplating										
2	Supervisor / In-charge / Foreman										
Lau I	Painter					<u> </u>					
Conflace Treatment / Electroplating	Electroplater										
a la	Metal Polisher										
100	Helper										
0 5	Other										
	Assembly Shop										
	Supervisor/In- charge / Foreman										
ŝy ŝ	Assembler										
Ē r	Assistant Assembler										
1Ass high											
	Other										
-	Quality Assurance In-charge										
s 8	Quality										
§8_	Control Inspector										
C inspection / Quality Control & Packing	Quality Assistant										
032	Other										
						METAL - FOR	IGING				
	Forging Supervisor /										
L Heating &Forging	In-charge / Foreman										
□ ² / ₂ ⁴ / ₂	Machine Operator										

6 1 = Degree, 2 = Certificate or Diploma, 3 = Short Course, 4= Any Other (Please Specify), 5= None.





			Current	Vacanc		Fill Vacancies ng Vacant) ^a	Expected Hiring	Current	Please specify the Required Skills in	Education 8	& Qualification
Process	Job Level / Trade	Job Title	Employees	ies	No.	Reasons ⁴	in Next Three Years (No.)	Skill Level ^a	Current Employees	Current Level*	Preferred Level
	Helper								cinprogrees		
	Other										
	Machining Supervisor / In- charge/ Foreman										
	CNC Operator										
in the second se	Machinist										
D Machining	Helper										
ō	Other										
an t	Supervisor / In- charge / Foreman										
5 E	Heat Technician										
Treatme	Helper										
U F	Other										
 Surface Treatment/ Electroplating 	Electroplating Supervisor / In-charge / Foreman										
ě.	Painter										
100	Electroplater										
o tec	Metal Polisher										
3 5	Helper										
	Other										
Inspection / Quality Control & Packing	Quality Assurance In-charge Quality		_								
85	Control Inspector										
6 ji 6	Quality Assistant										
682	Other										
					Пе	UBBER AND P	ASTIC			1	
	Mixing and Compounding Supervisor / In-										
2 2	charge / Foreman Machine Operator										
Compounding	Helper										
N I	Other										
Οõ	Doner										





			Current	Vacanc		Fill Vacancies ng Vacant) ⁸	Expected Hiring	Current	Please specify the Required Skills in	Education 8	& Qualification
Process	Job Level / Trade	Job Title	Employees	ies	No.	Reasons ⁴	in Next Three Years (No.)	Skill Level ⁴	Current Employees	Current Level ⁴	Preferred Leve
	Moulding Supervisor/In-										
	charge / Foreman										
8	DMoulder										
di g	Helper										
Cirjection & Moulding	Other										
	Cutting Supervisor/		_					-			
	In-charge / Foreman										
a 8	Cutter / Trimmer										
Outing	Helper										
D Outing	Other										
	Assembly Shop								-		
	Supervisor/In-										
2	charge / Foreman										
ží E po											
🗆 Assembiyā. Finisking	Helper										
0.5	Other										
	Quality Assurance										
2 8	In-charge Quality		_								
88	Control Inspector										
diny of	Quality Assistant										
🗆 Inspection / Quality Control & Packing	Other										
						CTRICAL / ELE	CTRONIC				
	Store In-charge										
	Store Keeper										
8 8	Assistant Assistant		_								
 Stores / Components Intake 	Other										
005											ļ
~	Assembly Shop Supervisor/ In-										
Assembly	charge / Foreman										
× v	Assembler										
Š.	Helper										

5 = Excellent 2 = Good 3 = Average 4 = Poor 6 1 = Degree, 2 = Certificate or Diploma, 3 = Short Course, 4= Any Other (Please Specify), 5= None.





			Current	Vacanc		Fill Vacancies	Expected Hiring	Current	Please specify the Required Skills in	Education 8	& Qualification
Process	Job Level / Trade	Job Title	Employees	ies	No.	Reasons ⁴	in Next Three Years (No.)	Skill Level*	Current Employees	Current Level ⁴	Preferred Leve
	Other										
	Paint Supervisor / In-charge / Foreman										
문문	Painter										
Painting	Helper										
08	Other										
exing	Assembly Shop Supervisor/In- charge / Foreman										
ACC 1	Assembler										
Dirspection, Testing and Quality Control	Helper										
ő t	Other										
-	Packing Supervisor / In charge / Foreman Worker										
Packing	Helper										l
	Other	<u> </u>									l
0						MBLY / SUB-	ACCENTRY				1
	Shop Supervisor/In-				LI ASSE	MIDLT / SUB-	ASSEMIDET				
0.	charge / Foreman		_								
8	Shop Assistant										1
5	Helper										
Charact Shop	Other										
-	Shop Supervisor/In-										l
8	charge / Foreman										
Paint Shop	Painter										
	Helper										
	Other										
A.	Line Supervisor/ In - charge / Foreman Assembler										
D Assembly time	Assistant										
2 8	Other		_								l





JAB									Punjab S	ikills Developn	nent Fund (PS
Process	Job Level / Trade	Job Title	Current	Vacanc		Fill Vacancies ng Vacant) ⁸	Expected Hiring	Current	Please specify the Required Skills in	Education 8	k Qualification
riocess	200 cerer, made	100 1100	Employees	ies	No.	Reasons ⁴	Years (No.)	Skill Level ⁴	Current Employees	Current Level ⁴	Preferred Level
	Line Supervisor/ In- charge / Foreman										
2	Assembler										
D Sub Nsembly	Assistant										
ŭ₹ I	Other										
1	Line Supervisor/ In charge / Foreman										
. <u>À</u>	Assembler		_								
D Sub Asembly	Assistant										
	Other										
	Line Supervisor/In- charge / Foreman										
~	Assembler		_	<u> </u>							
4 Ê	Assistant Assistant										
D Sub- Assembly	Other										
	Line Supervisor/In-										
- Vdmax	Assembler										
	Assistant										
č₹ I	Other										
	Line Supervisor/ In-										
1	charge / Foreman										
A A											
D Sub- Asembly	Assistant Other										
141		ļ									
	Line Supervisor/In- charge / Foreman										
🛛 inspection, Testing , OCA Finishing	Assembler										
a la la	Assistant Assistant										
6 # E	Other										

Any vacancy that require higher efforts of an organization to fill either due to insufficient skills of lack of required qualification etc.

4 Reasons of Hard to Fill: 1 = Lack of Required Skill, 2 = Lack of Required Qualifications, 3= Difficult Working Hours, 4 = Lack of Interest of people, 5 = Inappropriate / Hard Environment, 6 = Too much competition, 8= low pay, 9=Lack of required attitude, 10= poor carrier progression, 11 difficult access Any Other (please Specify Above)

5 1= Excellent 2= Good 3= Average 4= Poor

6 1 = Degree, 2 = Certificate or Diploma, 3 = Short Course, 4= Any Other (Please Specify), 5= None.



UNJAB			Punjab Skills Development Fund (PSI
. How many employees does your ent	ity have?		
Males %	Females	%	
. What is the employment status of yo	our employees?		
Permanent %	Temporary (includes D	aily Wagers)	%
What is the annual turnover rate of	the employees in your entity?		
🗆 High	Medium		Low
Is retention an issue?			
Yes	D No		
If Yes, why?			
Excessive Workload	Worker's Attitude		Minimum or No Benefits
Higher Paying Opportunities	Others		
What is the payment frequency of years	our employees?		
Daily	□ Weekly D	□ Monthly □ Ot	thers
). What is the average monthly salary	paid to your employees?		
□ Middle Management Level Rs.	per Month	Supervisory Level	Rs per Month
Machine Operator Level Rs	per Month	Helper Level	Rs per Month
 Compared to twelve months ago, has 	s the number of employees in yo	ur organization:	
Increased	Decreased	Remained the same	e
Entity did not exist one year ago	Do not know		



AB							Punjab Skills I	Development Fund
					SKILLS ANALYSIS	5		
	ould you rate the critica cies in these skills?	ality le	vel ³ of ea	ch of	your department	? What remedi	al measures do you s	suggest to over
		0	riticality Leve	al		Rei	medial Measures	
Product	Processes	High	Medium	Low	Need for Further Specialized Trainings	New Program/ Program Revision	Any Other (Please explain)	Comments
	Design Section / Tools & Dye/ Technical Support							
	Cutting							
	Pressing / Stamping							
	Welding & Drilling							
Sheet	Heat Treatment.							
Metal	Surface Treatment Painting Electroplating							
	Assembly & Finishing							
	Inspection/ Quality Control & Packing							
	Stores / Material Handling							
	Melting & Casting							
	Machining							
Metal –	Heat Treatment							
Casting	Surface Treatment / Electroplating.							
	Assembly & Finishing							
	Inspection/ Quality Control & Packing				•	0		
	Heating & Forging							
	Machining					-	-	
	Heat Treatment	- T						
Metal – Forging	Surface Treatment / Electroplating		0			0	•	
	Inspection/ Quality Control & Packing		•			٥		
	Mixing & Compounding							

³ The relative importance of Process in the overall business operations, whether it is highly important or less important.





			Criticality Le	vel		Rer	medial Measures	
Product	Processes	High			Need for Further Specialized Trainings	New Program/ Program Revision	Any Other (Please explain)	Comments
and	Injection & Moulding							
Plastic	Cutting & Trimming							
	Assembly & Finishing							
	Inspection / Quality Control & Packing							
	Stores / Components Intake						0	
	Assembly Line	- 	- <u> </u>					
Electrical	Painting & Finishing	- H	- <u></u>			i i i		
1	Inspection, Testing and Quality				_		-	+
Electronic	Control							
	Packing						0	
	Chassis shop	15		15	ă	i i i		
	Paint Shop	10		18				
	Assembly Line							
	Sub-Assembly							
Assembly	Sub-Assembly	1		10	Ē			
/ Sub-	Sub-Assembly							
Assembly	Sub-Assembly							
	Sub-Assembly							
			_					
	Inspection & Finishing							
	Quality Control & Packing Ould you rate the criticality							overcome deficienc
these sk	Quality Control & Packing Ould you rate the criticality	y level		lowing	soft skills? What n	emedial measure Suggeste	d Remedial Measures	overcome deficienc
these sk Soft Skills	Quality Control & Packing ould you rate the criticalit ills?	y level Cr High	in the fol iticality Leve Medium	lowing Low	Need for Specialized Training	emedial measure Suggeste Include as Part of exist Programmes	d Remedial Measures	overcome deficienc
these sk Soft Skills	Quality Control & Packing Ould you rate the criticality	y level	in the fol iticality Leve Medium	lowing	Soft skills? What r	emedial measure: Suggeste Include as Part of exist Programmes	d Remedial Measures	
these sk Soft Skills	Quality Control & Packing ould you rate the criticalit ills?	y level	in the fol iticality Leve Medium	lowing Low	Need for Specialized Training	Emedial measures Suggeste Include as Part of exist Programmes	d Remedial Measures	
these sk Soft Skills	Quality Control & Packing ould you rate the criticalit ills?	y level	in the fol iticality Leve Medium	lowing	Soft skills? What r	emedial measure: Suggeste Include as Part of exist Programmes	d Remedial Measures	
these sk soft Skills Commu Uiteracy Creativi	Quality Control & Packing ould you rate the criticalit ills?	y level	in the fol iticality Leve Medium	lowing	Need for Specialized Training	Emedial measures Suggeste Include as Part of exist Programmes	d Remedial Measures	
5oft Skills	Quality Control & Packing ould you rate the criticalit ills?	y level	in the fol Iticality Leve Medium	Lowing	Need for Specialized Training	emedial measure Suggeste Include as Part of exist Programmes	d Remedial Measures	
these sk soft Skills Commu Uteracy Creativi	Quality Control & Packing uld you rate the criticalit iills? inication Skills and Numeracy ty ional Health and Safety ion	y level	In the fol Iticality Leve Medium	Low Contract	Need for Specialized Training	emedial measure: Suggeste Include as Part of exist Programmes	d Remedial Measures	
Soft Skills	Quality Control & Packing Ould you rate the criticalit ills? nication Skills and Numeracy ty tional Health and Safety ion onalism	High	Medium	Lowing	Need for Specialized Training	emedial measure: Suggeste Include as Part of exist Programmes	d Remedial Measures d Remedial Measures Any C	
Soft Skills	Quality Control & Packing Ould you rate the criticalit ills? nication Skills and Numeracy ty tional Health and Safety ion onalism ace Ethics	High	Medium	Low I	Need for Specialized Training	Emedial measure: Suggeste Programmes	d Remedial Measures d Remedial Measures Any C C C C C C C C C C C C C	
soft Skills Commu Uteracy Creativ Occupa Motivat Profess Workpla Timelin	Quality Control & Packing Ould you rate the criticali ills? nication Skills and Numeracy ty tional Health and Safety ion onalism acc Ethics ES	High	Medium	Low I	Need for Specialized Training	emedial measure: Suggeste Include as Part of exist Programmes	d Remedial Measures d Remedial Measures Any C C C C C C C C C C C C C	
Soft Skills	Quality Control & Packing Con	High	Medium	Low I	Need for Specialized Training	Emedial measure: Suggeste Programmes	d Remedial Measures d Remedial Measures Any C C C C C C C C C C C C C	



5	Autoparts Sector Skill	ls Study- Demand Ass	essment				
PU	NJAB					Punjab Skills Development Fund	(PSDF)
		6.1. 6.11. · · ·			h		
24.	In your opinion which o					Deckies	
	Raw Material Handling Forging	Electroplating Stamping	Moulding Assembly line	Melting	Finishing and Other		
	Casting	Machining	□ Inspection & Testing		<u> </u>		
			TRAI	NING			
25.	Does your entity provid	e training to its wo	orkforce?				
	Yes		No (Give reasons & mo	ove to Q No.32)			
	If No, please tick						
	Lack of Resources			Confidentiality Threat	ts	Lack of Relevant Skills	
	Unavailability of Courses		Leave for			Any other reason	
26.	Do you have a specific b	oudget allocated fo		our employees?			
	Yes		□ No				
	If yes, what percentage			-			
	□ Less than 1% □ Be	etween 1- 10%	Between 10 - 20%	Greater than	20%		
27.	Do you have a training o	centre at your loca					
	Yes If yes, please provide th	o number of train	□ No	et 12 months	Numbers		
20			-	st 12 months.	Numbers _		
28.	If yes, what is the avera	□ 1 Month	□ 1 - 3 Months	4 - 6 Months	Others		
29.	Does your entity provid Yes	e experience lette	r / certificate at the end No	of the training?			
30.	What is relative share in	n percentage of the	e following types of train	ning that your entity	provides?		
							17





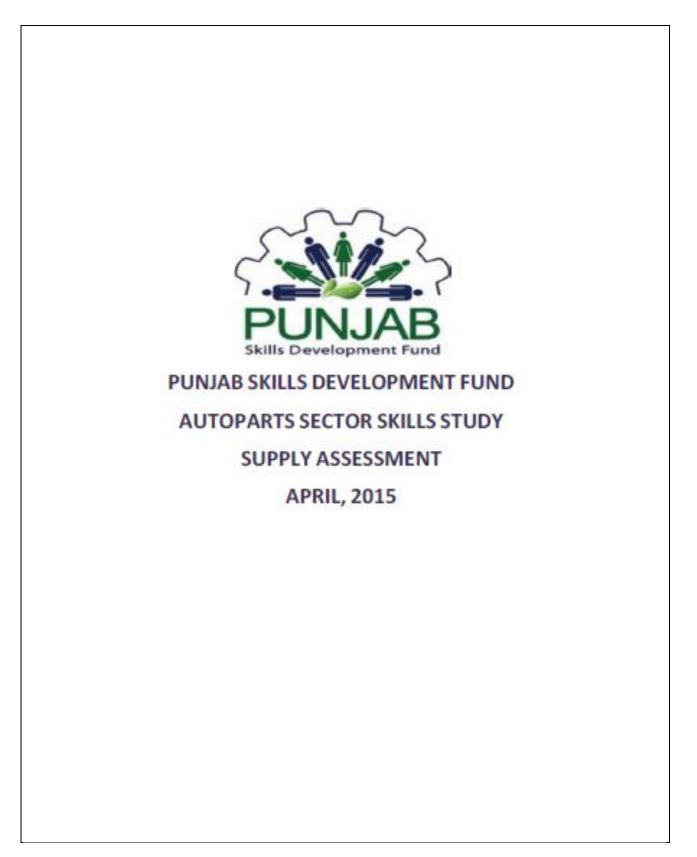
F									
	Category New workers / interns	Training thr	ough Vocational T	raining Institutes (%)	On Job Training (%)	Apprenticeship	⁴ (%)	Other (%)(Please Specify)	Average Duration (Perio
t	Existing workers								
	Kindly specify the	e preferred	mode of train	ing and specify th	he reasons for not	opting for pre	eferre	d modes, if so?	
	Training through	vocational t	training institut	es 🗖 On J	Job Training				Apprenticeship
	Please specify re	asons/hurd	lles not allowir	ng the entity to u	se the preferred n	node?			
	2.				6				
	twelve (12) mon		h you would li	ke for your work	force to be trained	d in and the te	entativ	ve demand for such v	vorkers in the next
h	Courses			Level ⁵				HR Demand (No)
t	001303						_	The bernand (ree	.,
┟									
ł									
	Is there any Nati workforce?	onal or Inte	ernational Voc	ational/ Technica	I Training Institute	e or Training P	rovide	er from whom you pro	efer to recruit your
	Yes				□ No				
	If yes, please pro	vide the na	ime(s) of the i	nstitute(s) and pr	eferred program(s	s) of the traini	ng pro	vider(s).	
ļ	National Institutes		Preferred Prog	gram	International Institu	utes	Prefe	erred Program	
┟									
- 1							+		
ſ							+		
F			1				1		



5	Autoparts Sector Skills Study- Demar	nd Assessment		
PUN	JAB			Punjab Skills Development Fund (PSDF)
34.	Does the trained workforce produce If not, then what deficiencies do you			ional training system serve the needs of your entity? ovements do you suggest?
	□If satisfied:,	□If dissatisfied, why?		What improvements do you suggest?
	Highly satisfied Satisfied Somewhat satisfied Others	Lack of Theoretical Knowledge Lack of Required Skill / Training Lack of Soft Skills Other		Need to introduce new technical courses Need to review curricula of existing courses Need to increase practical training duration Introduction of competency based training ⁶ and assessment Any other
35.		n the workforce in the cont	ext of en	nerging technologies? Please provide a list of these skills:
1	Job position		Skill Nee	eded
36.	Have you heard of PSDF?			□ Yes □ No
37.	Are you aware of the role of PSDF in	Trainings?		🗆 Yes 🗖 No
38.	Do you have any prior experience we	orking with PSDF?		🗆 Yes 🗖 No
39.	Will your institute be interested in of	otaining information about F	PSDF's tr	aining initiatives? 🛛 Yes 🗆 No
40.	Any other suggestion for improving t	he workforce skills of your e	ntity?	
l				
I				
		THANK YOU	FOR Y	OUR TIME!
⁶ Con task,	npetency Based Training is a training that is de activity or exercise well enough to be assesse	esigned to allow a learner to dem d as "competent".	onstrate h	is ability to do something. Learners simply have to demonstrate they can do a
				19



13.9.2 Supply Side (TSPs) Questionnaire









Autoparts Sector Skills Study- Supply Assessment

Punjab Skills Development Fund

SECTOR SKILLS STUDY

Assalam-O-Alaikum, we represent Punjab Skills Development Fund (PSDF), and are in the process of conducting Sector Skills Study for Autoparts Sector.

In order to conduct this study, we, Anjum Asim Shahid Rahman, Chartered Accountants, Member Firm of Grant Thornton International, are undertaking a primary survey to develop our understanding of the jobs and skills requirements of Autoparts sector vis-avis its workforce so that based on the findings of this study, PSDF can accordingly design its training program to enhance the skills set of the workforce employed / to be employed by the Autoparts sector.

We will not use your identity or your individual response in reporting findings gathered through this study, instead, your suggestions and responses will be aggregated along with the responses of other Autoparts sector entities. We would like to assure you any information that you share with us will be held strictly confidential within our offices and shall not be used for any purpose other than the one described above.

If there is anything you do not understand during the interview, please feel free to seek clarification. Thank you for taking time out for this interview. This interview will take approximately ____ minutes.

Form No.	
Interviewer:	
Reviewed By:	
Approved By:	





Crewe			Punjab Si	kills Development Fo
		PROFILE		
ir. No.	Questions	Responses		
1.	District	Lahore	🗆 Gujrar	nwala
		🗆 Karachi	Other;	
2.	Name of Institute / TSP			
3.	Year of Establishment			
4	Status	Public	Privat	
		Not for Profit	C Othe	r
5.	Do you get your Financial Statements audited?	🗆 Yes	I No	
6.	Whether your institute is either currently affiliated / registered / certified or in process of getting the same from any department / body / institute / university etc.	Yes If yes, please provide Government Depa TEVTA NAVTTC Autonomous Bod If in process, please City	artment (ple PVTC Unive y Any (details: ase specify) :
8.	E-Mail Address			
9.	Mailing / Physical Address			
10.	Telephone Number			
11.	Website Address			
12.	Contact Person	Name:		
		Designation:		





	Ser.	Autoparts Sector Si	dils Study- Supply	Assessment	t							
	PUNJAB									Pun	jab Skills Devel	opment Fund
1.	For which of	the following areas	in the autoparts	sector, are	you curre	ntly pro	widing tra	inings?				
	Metal		Plastic/Rubber		🗆 Ele	ctrical/	Electronics		Assembl	y/Sub-Assen	nbly	
2.	Which of the	Autoparts Sector n	elated programs (ioes your i	nstitute of	fer, ple	ase speci	fy following c	ietails?			
	Name of Program / Course	Level (Please tick one option for each program)	Number of Applications Received	Eligibility Criteria	Available Seats	instit Caj	rrent autional pacity siment) Female	Passing %	Fee Charged (Rs.)	Starting Salary of graduates	Employment within 60 days of graduation (%)	Examining / Certifying Body
		Degree Certificate / Diploma Short Course Any other										
		Degree Certificate / Diploma Short Course Any other										
		Degree Certificate / Diploma Short Course Any other										
		Degree Certificate / Diploma Short Course Any other										
		Degree Certificate / Diploma Short Course										
					l				I			_
												4







S. E	NUMB		Punjab Sk	ills Development Fund
3.	Kindly provide the average annu in last five years related to autopa		students graduated	from this institution
	(Numb	er)		
	Do you have sufficient infrastruct	ure available t	o train the students	17
	TYes Ves		D No	
	If not, please indicate what infras	tructure is req	uired?	
	 Physical (building, equipment, furn fixtures etc.) 	iture and	Intellectual (fac	ulty, management etc.)
	Do you plan to expand your auto-	parts training	provision in the fut	ure?
	🗆 Yes		D No	
	If yes, please identify the type of	expansion:		
	New courses		Physical / infras	tructural expansion
	Geographical expansion / new carr	ipus	Any other	
	If not, please provide the reason:			
	Lack of funds		Lack of skilled h	uman resource
	Limited demand		any other	
	If the response to Q4 is yes, enrolment capacity after expansion What is the source of funding of y	on	_%	
	Government Donor(s)		Industry Self-generated	
	Any Other:		□ Sen-generateu	
	How would you categorize your s		ns of fee charged a	t your institute?
	Full fee		Concessional fe	
	Free of charge			%
	Which of the following sources do			
	Internet Newspa		Industrial Unka	
	Billboards / Banners Hand-ou TV / Cable Network Radio	ts / Brochures	Community Aw Any Other	
	Kindly specify the faculty details r	elated to abov		
		t time	e mentioned cours	Total
	Permanent Par	t time		Total
	. What are the training modes ava			he students and also
1	Drovide the relative hercentages	or these mone		



-2020.		Punjab Skills Development Fund
PUNJAB		
UWorkshops/Labs	<u>%</u>	Any other%
12. Suggest desired contri	bution by industry and p	ublic sector TSPs:
Provision of funds		Development of Infrastructure
Equipment		Faculty Support
Development of Curric	ulum /Courses	Any Other
	re the reasons for som oyment within 60 days of	e of your graduates being unable to fine of graduation?
Lack of skills and exper	tise required by industry	Lack of Industry Support for Industry
		Exposure
Economic turmoil and		Poor law and order situation
Any Other		Social and cultural issues
set possessed by the s	tudents of your institute	ke to take to improve the quality of skills for better job placements?
Development of training	ng material	Continuous professional
		development of training staff
Improvement in techn Any other		Development of industrial linkages
		o find suitable jobs for your unemployed
🗆 Yes		□ No
If yes, identify the folk	ow up step:	
Personal References Placement through I		Recruitment Seminars and Exhibition Any Other
 Do you think that the demand in the job ma 		he skills set of your graduates and their
Yes		D No
If yes, what measures	do you propose to bridg	e this gap?
Industry Exposure		Increased Practical Training Hours
Revamping of Curricul	1	Any Other
17. Which of the current to vis-a-vis the following		red by your institute require improvement
Name of Program	Level	Improvement Options
	Degree	Elimination of Program
	Certificate / Diploma	Need for Curriculum Review
	Short Course Any other	Need to Increase Practical Training
	Degree	Elimination of Program
	Certificate / Diploma	Need for Curriculum Review

Short Course



6

Need to increase practical training

P23			Pu	injab Skills Development Fund
(.MB			7	
	Any other	r	_	
	Degree Certificat	(Distance)		tion of program counticulum review
	Short Cou			
	Any other		Need to	increase practical training
	Degree	-	Eliminat	tion of program
	Certificat		Need for	r curriculum review
	Short Cou Any other		Need to	increase practical training
How does yo	our institute develop th	e curricula of	the progra	ms being offered?
By Own Exp	erts		D Wit	h Collaboration of Industry
	icula Developed by Gove	mment Bodies		Other
the curricula I Yes	and the training conte	ents being off	ered to stud No	lents?
If yes, please	specify:			
Industry inc	ut at the time of designing	ne curricula	Ellod	stry endorsement after devel
I Any Other_ Please ident		you are plan	curricu ning to intr	ustry endorsement after devel ala roduce in the wake of futu vocational training needs an
Any Other_ Please ident needs of the	ify any new programs	you are plan	curricu ning to intr	ia roduce in the wake of futu
I Any Other_ Please ident needs of the trends?	ify any new programs industry, based on na	you are plan tional and int Level	curricu ning to intr	ia roduce in the wake of futu vocational training needs an
I Any Other_ Please ident needs of the trends?	ify any new programs industry, based on na	you are plan tional and int Level Degree	curricu ning to inti ternational	Ia roduce in the wake of futu vocational training needs an Required Competencies
I Any Other_ Please ident needs of the trends?	ify any new programs industry, based on na	you are plan tional and int Degree Certificate Short Cou	curricu ning to inti ternational e / Diploma	Ia roduce in the wake of futu vocational training needs an Required Competencies
I Any Other_ Please ident needs of the trends?	ify any new programs industry, based on na	you are plan tional and int Level Degree	curricu ning to inti ternational e / Diploma	Ia roduce in the wake of futu vocational training needs an <u>Required Competencies</u> Professional level of skills Broad range of skills
I Any Other_ Please ident needs of the trends?	ify any new programs industry, based on na	you are plan tional and int Degree Certificate Short Cou Any other	curricu ning to inti ternational e / Diploma	Ia roduce in the wake of futu vocational training needs an Required Competencies Professional level of skills Broad range of skills Basic skills
I Any Other_ Please ident needs of the trends? Subsector	ify any new programs industry, based on na	you are plan tional and int Degree Certificate Short Cou Any other Certificate	curricu ernational a / Diploma rse c / Diploma	Ia roduce in the wake of future vocational training needs an Required Competencies Professional level of skills Broad range of skills Basic skills Limited skills
Any Other_ Please ident needs of the rends? Subsector	ify any new programs industry, based on na	you are plan tional and int Degree Certificate Short Cou Any other Certificate Short Cou	curricu ernational e / Diploma rse e / Diploma rse	Ia roduce in the wake of futu vocational training needs an Required Competencies Professional level of skills Broad range of skills Basic skills Limited skills Professional level of skills
Any Other_ Please ident needs of the rends? Subsector	ify any new programs industry, based on na	you are plan tional and int Degree Certificate Short Cou Any other Certificate	curricu ernational e / Diploma rse e / Diploma rse	Ia roduce in the wake of futury vocational training needs an Required Competencies Professional level of skills Broad range of skills Limited skills Professional level of skills Broad range of skills
Any Other_ Please ident needs of the rends? Subsector	ify any new programs industry, based on na	you are plan tional and int Degree Certificate Short Cou Any other Certificate Short Cou Any other	curricu ernational e / Diploma rse e / Diploma rse	Ia roduce in the wake of future vocational training needs an Required Competencies Professional level of skills Broad range of skills Limited skills Professional level of skills Broad range of skills Broad range of skills Broad range of skills
Any Other_ Please ident needs of the rends? Subsector	ify any new programs industry, based on na	you are plan tional and int Degree Certificate Short Cou Any other Certificate Short Cou	curricu ernational e / Diploma rse / Diploma rse	Ia roduce in the wake of future vocational training needs an Required Competencies Professional level of skills Broad range of skills Limited skills Professional level of skills Broad range of skills Broad range of skills Limited skills Limited skills
Any Other_ Please ident needs of the rends? Subsector	ify any new programs industry, based on na	you are plan tional and int Degree Certificate Short Cou Any other Certificate Short Cou Any other Certificate Short Cou Any other Certificate Short Cou	curricu ernational e / Diploma rse / Diploma rse / Diploma rse	Ia roduce in the wake of future vocational training needs an Required Competencies Professional level of skills Broad range of skills Limited skills Broad range of skills Broad range of skills Broad range of skills District skills District skills District skills District skills District skills District skills District skills
Any Other_ Please ident needs of the rends? Subsector	ify any new programs industry, based on na	you are plan tional and int Degree Certificate Short Cou Any other Certificate Short Cou Any other Certificate Certificate Certificate	curricu ernational e / Diploma rse / Diploma rse / Diploma rse	Ia roduce in the wake of future vocational training needs an Required Competencies Professional level of skills Broad range of skills United skills Professional level of skills Broad range of skills United skills United skills Broad range of skills
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Any Other_ Please ident needs of the rends? Subsector	ify any new programs industry, based on na	you are plan tional and int Degree Certificate Short Cou Any other Certificate Short Cou Any other Degree Certificate Short Cou Any other Certificate Short Cou Any other Certificate Short Cou Short Cou	curricu ernational e / Diploma rse / Diploma rse / Diploma rse / Diploma rse	Ia roduce in the wake of future vocational training needs an Required Competencies Professional level of skills Broad range of skills United skills Professional level of skills Broad range of skills Dimited skills Professional level of skills Broad range of skills Broad range of skills Dimited skills Broad range of skills Broad range of skills Dimited skills
Please ident needs of the rends? Subsector	ify any new programs industry, based on na	you are plan tional and int Degree Certificate Short Cou Any other Certificate Short Cou Any other Certificate Short Cou Any other Certificate Short Cou Any other Certificate Short Cou	curricu ernational e / Diploma rse / Diploma rse / Diploma rse / Diploma rse	Ia roduce in the wake of future roduce in the wake of future Required Competencies Professional level of skills Broad range of skills
Please ident needs of the rends? Subsector Wetal parts	ify any new programs industry, based on na	you are plan tional and int Degree Certificate Short Cou Any other Certificate Certificate Short Cou Any other Certificate Short Cou Any other Certificate Short Cou Any other	curricu ernational e / Diploma rse / Diploma rse / Diploma rse / Diploma rse	Ia roduce in the wake of future roduce in the wake of future Required Competencies Professional level of skills Broad range of skills Basic skills United skills Broad range of skills
Any Other_ Please ident needs of the trends?	ify any new programs industry, based on na	you are plan tional and int Degree Certificate Short Cou Any other Certificate Short Cou Any other Degree Certificate Short Cou Any other Certificate Short Cou Any other Certificate Short Cou Short Cou	curricu ernational e / Diploma rse / Diploma rse / Diploma rse / Diploma rse	Ia roduce in the wake of future roduce in the wake of future Required Competencies Professional level of skills Broad range of skills

NJAB		Pu	njab Skills Development Fun
Subsector	Name of the Program	Level	Required Competencies
		Short Course Any other	Basic skills Limited skills
		Degree Certificate / Diploma Short Course Any other	Professional level of skills Broad range of skills Basic skills Limited skills
		Degree Certificate / Diploma Short Course Any other	Professional level of skills Broad range of skills Basic skills Limited skills
Electrical / Electronics		Degree Certificate / Diploma Short Course Any other	Professional level of skills Broad range of skills Basic skills Limited skills
		Degree Certificate / Diploma Short Course Any other	Professional level of skills Broad range of skills Basic skills Limited skills
		Degree Certificate / Diploma Short Course Any other	Professional level of skills Broad range of skills Basic skills Limited skills
Assembly/ Sub- Assembly		Degree Certificate / Diploma Short Course Any other	Professional level of skills Broad range of skills Basic skills Limited skills
		Degree Certificate / Diploma Short Course Any other	Professional level of skills Broad range of skills Basic skills Limited skills

Subsector	Level	Demand for skilled
		workforce
Metal parts	Certificate / Diploma	□ High
_	□ Short Course	Medium
	Any other	Low .
Plastic / Rubber	Certificate / Diploma	🗆 High
	□ Short Course	Medium
	Any other	Low .
Electrical / Electronics	Certificate / Diploma	🗆 High
	Short Course	Medium
	Any other	Low .



UNIAB	P	unjab Skills Development Fund
Subsector	Level	Demand for skilled workforce
Assembly / Sub-assembly	Certificate / Diploma Short Course Any other	High Medium Low
2. Do you arrange Training of	Trainers (ToT) sessions for your	trainers on regular basis?
Yes	□ No	
If yes, which of the followin	g mechanism(s) is used for Trai	ning of Trainers (ToT):
Teacher's Training Material	Online Support/	Courses
Training session with nation International Experts Any Other		aining Institutes
If no, what is required?		
Funds	Trainers / Exper	ts
Training Content Any Other	Infrastructure /	equipment
training provider(s).	name(s) of the institute(s) and	
National Institutes	Preferred Program	
International Institutes	Preferred Program	
International Institutes	Preferred Program	
 Please list any new trade imparted and for which knowledge): 	s, technologies, or skills for no courses are currently ava	which trainings need to b ilable (to the best of you
4. Please list any new trade imparted and for which knowledge): 1	es, technologies, or skills for no courses are currently ava	which trainings need to be ilable (to the best of you

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Ster.		Punjab Skills Development Fund
UNJAB		
Yes		□ No
If yes, please identif required:	y the names of such or	ganizations from which the certification is
1		
2.		
3		
	l courses international e international suppliers?	experts need to be engaged and please
Name of Skill/Discip	line Name of Course	Source of International Supplier
Autoparts sector enti-		of training arrangements in place with any
Yes		D No
If wes, what is the ave	arage number of trainees	' intake of your institute each year?
Number		
	period of training?	
. What is the average i		-
 What is the average I Month 	3 Months	6 Months
	3 Months Other (please	_
□ 1 Month □ 1 Year		e specify):
□ 1 Month □ 1 Year	Other (please	e specify):
I Month I Year What allowance / rer PKR	Other (please muneration do most train	e specify):
I Month I Year What allowance / rer PKR Have you heard of P5	Other (please muneration do most train	e specify): nees receive, if at all?
I Month I Year What allowance / rer PKR Have you heard of PS Are you aware of the Do you have any price	Other (please muneration do most train 	e specify): nees receive, if at all? U Yes D No PYes D No th PSDF? D Yes D No
I Month I Year What allowance / rer PKR Have you heard of PS Are you aware of the Do you have any price	Other (please muneration do most train 	e specify): nees receive, if at all?
I Month I Year What allowance / rer PKR Have you heard of PS Are you aware of the Do you have any prio Will your institute initiatives?	D Other (please muneration do most train SDF? Trole of PSDF in Trainings or experience working wit be interested in obtain	e specify): nees receive, if at all? Yes D No Yes No th PSDF? Yes No hing information about PSDF's training
I Month I Year What allowance / rer PKR Have you heard of PS Are you aware of the Do you have any prio Will your institute initiatives?	D Other (please muneration do most train SDF? Trole of PSDF in Trainings or experience working wit be interested in obtain	e specify): nees receive, if at all? Yes D No Yes No th PSDF? Yes No hing information about PSDF's training Yes No support from PSDF's training initiatives?
I Month I Year What allowance / rer PKR Have you heard of PS Are you aware of the Do you have any priot Will your institute initiatives? Will your institute be	Dother (please muneration do most train SDF? role of PSDF in Trainings or experience working wit be interested in obtain interested in obtaining s	e specify): nees receive, if at all? Yes D No Yes No th PSDF? Yes No hing information about PSDF's training Yes No support from PSDF's training initiatives?

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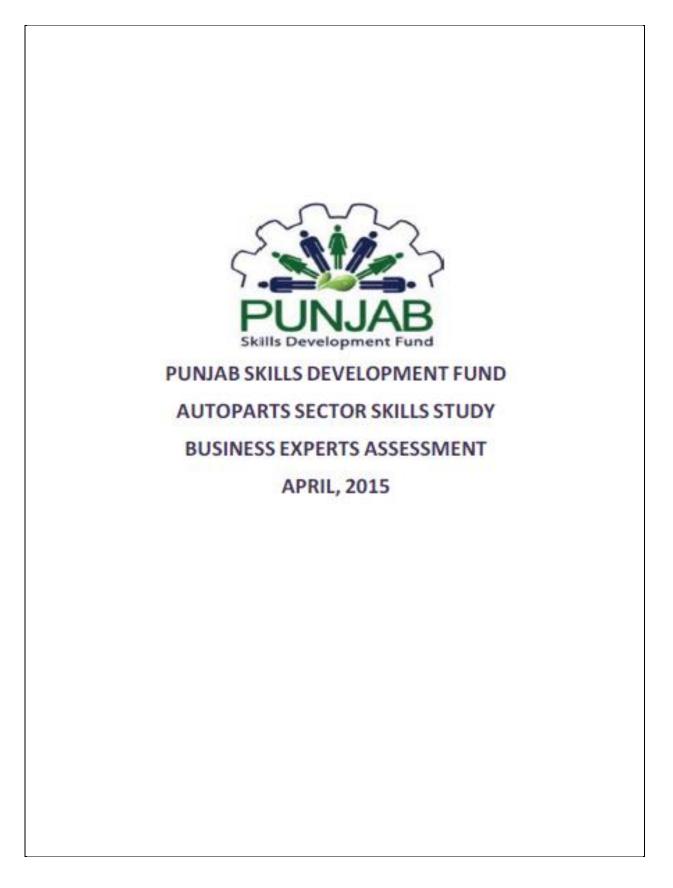


c Ma				Punjab Skills De	evelopment Fun
PUNJAB					
1					
2					
3					
36. Any O	her Suggestions:				
		THANK YOU FOR	YOUR TIM	E!	



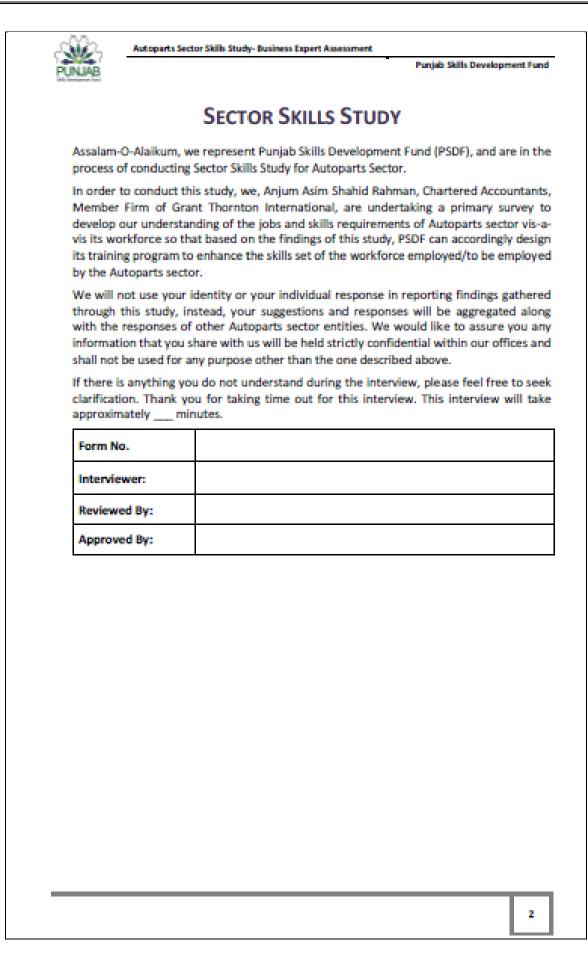


13.9.3 Questionnaire for Sector Experts











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Autoparts Sector Skills Study- Business Expert Assessment

Punjab Skills Development Fund

PERSONAL PROFILE

Sr. No.	Particulars	Responses
1	Name	
2	Organization(if any)	
3	Position Held	
4	Qualification	
5	Sector Experience (Years)	
6	E -Mail Address	
7	Mailing/Physical Address	
8	Telephone Number	
9	Sub Sector(s) dealing with:	

1. With respect to future growth prospects of Autoparts Sector in Pakistan, what trend do you see in the upcoming five years in the sector?

Increasing	Decreasing	□ No Change
------------	------------	-------------

If it is increasing / decreasing, kindly specify the _____%.

(In case of decrease write the % in brackets.)

2. In your opinion, are suitably gualified/trained workers available in the autoparts manufacturing labour market??

Metal Autoparts	Easily Available	Difficult to find	Not Available
Rubber / Plastic Autoparts	Easily Available	Difficult to find	□Not Available
Electrical /Electronic Autoparts	Easily Available	Difficult to find	□Not Available
Assembly / Sub- Assembly	Easily Available	Difficult to find	□Not Available

3. How would you rate the skills set possessed by the workforce available to Autoparts sector?

Metal Autoparts	Excellent	Good Good	Average	Poor
Rubber / Plastic Autoparts	Excellent	Good Good	Average	Poor
Electrical /Electronic	Excellent	Good Good	Average	Poor
Autoparts				
Assembly / Sub-Assembly	Excellent	Good Good	Average	Poor

4. In your opinion, which of the following deficiencies exist in the skills set of existing workforce in the Autoparts sector?

Lack	of	Technical	Skills
Lack	of	Training	

Lack of Education	Lack o
Lack of Required	🗆 🗆 Any O
Aptitude	Specify

of Soft Skills ther (Please

5. Kindly elaborate Technical Skill deficient areas of existing workforce in Autoparts sector; please also tick the appropriate remedial measure(s).

Aptitude





LIAB	Punjab Skills Development I						
Product	Processes	Deficient	Reasons for	Suggested Measures (Tick all that apply)			
Category		Skilb /Trades	hard to fill	Designing of Demand Driven Programs	Need for Revision in Existing Curriculum	Improve ments in Mode of Training	Any Other (Pleas Explain
	Design Section / Tools & Dye/ Technical Support			•	•	•	
	Cutting						
	Pressing /						
	Stamping Welding &						
	Drilling						
	Treatment						
Sheet Metal	Surface Treatment Painting Electroplating			٥	٥	٥	
	Assembly &						
	Finishing Inspection / Quality Control						
	& Packing						
	Stores / Material						
	Handling Melting & Casting						
	Machining						
Metal -	Heat Treatment						
Casting	Surface Treatment /						
	Electroplating Assembly &						
	Finishing						
	Inspection / Quality Control & Packing						
	E Packing & Heating & Forging						
	Machining						
	Heat Treatment						
Metal – Forging	Surface Treatment /						
	Electroplating Inspection / Quality Control					•	
	& Packing						
Rubber	Mixing and Compounding						
and	Injection & Moulding						
Plastic	Cutting & Trimming						





Sie	Autoparts Sector	Skills Study-Busi	ness Expert Asse	ssment			
PUNJAB				-	Punjab Ski	lls Developr	rent Fund
Product	Processes	Deficient	Reasons for	Suggest	ted Measures	Tick all that	apply)
Category		Skills /Trades	hard to fill	Designing of Demand Driven Programs	Need for Revision in Existing Curriculum	Improve ments in Mode of Training	Any Other (Please Explain)
	Assembly & Finishing				٥		
	Inspection / Quality Control & Packing						
	Stores / Components Intake			۰	٥	۰	
Electrical	Assembly Line				0		
Electronic	Painting & Finishing				٥		
	Inspection, Testing and Quality Control						
	Packing						
	Chases Shop						
	Paint Shop Assembly						
	Line						
	Sub- Assembly Line						
	Sub- Assembly Line						
Assembly / Sub Assembly	Sub- Assembly Line						
	Sub- Assembly Line				۵	٥	
	Sub- Assembly Line					۵	
	Inspection, Testing , QC& Finishing				٥		

6. Kindly elaborate Soft Skill deficient areas of existing workforce in Autoparts sector; please also tick the appropriate remedial measure(s).

	5	uggested Measures	(Tick all that apply)
Deficient Areas	Designing of Demand Driven Programs	Need for Revision in Existing Curriculum	Improvements in Mode of Training	Any other (Please Explain)
Communication Skills				
Occupational Health and Safety				
Motivation				
Professionalism				
Timeliness				
Team Work				



UNJAB				Punjab Skills Development Fu
the Denningment Rend				
U Workpla				
	prevailing for toparts sec		and Vocational	Training System serve th
	rtoparts sec	torr		
□ Yes			□ No	
If No, what	could be th	e reason(s) for such	gap?	
	propriate tra visical infrast	ining mechanism		demand driven curriculum tovt. support
	illed human i		La rack of §	tovc. support
any other	r (please spe	cify):		
3.				
How would	Lucu rate	the quality of TS	e newiding tra	inings relating to Autopart
sector?	a you rate	the quality of 15h	s providing tra	mings relating to Autopart
		Good	Average	D Poor
_		_		being offered by the TSPs?
Excellent		Good	Average	Poor
1. 2. 3.				the Autoparts sector, whic
1. 2. 3. I. Please spe	cify the pro		ing offered to	the Autoparts sector, whic
1. 2. 3. I. Please spe	cify the pro	grams currently be	ing offered to ion? (If any) Updatio	n/Modification Required
1 2 3 I. Please spenneed updat	cify the pro	grams currently be cation in your opin	ing offered to ion? (If any) Updatio	n/Modification Required ation of Program
1 2 3 I. Please spenneed updat	cify the pro	grams currently be cation in your opin	eing offered to ion? (If any) Updation Elimina Need f	n/Modification Required ation of Program for Curriculum Review
1 2 3 I. Please spenneed updat	cify the pro	grams currently be cation in your opin	eing offered to ion? (If any) Updation Elimina Need to Need to	n/Modification Required ation of Program
1 2 3 I. Please spenneed updat	cify the pro	grams currently be cation in your opin	eing offered to ion? (If any) Updation Elimina Need f Need to Elimina	n/Modification Required ation of Program or Curriculum Review to Increase Practical Training
1 2 3 I. Please spenneed updat	cify the pro	grams currently be cation in your opin	ting offered to ion? (If any) Updation Elimina Need to Elimina Need to Need to Need to	n/Modification Required ation of Program for Curriculum Review to Increase Practical Training ation of Program for Curriculum Review to Increase Practical Training
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1 2 3 1. Please spenneed updat	cify the pro	grams currently be cation in your opin	ting offered to ion? (If any) Updation Elimina Need to Elimina Need to Elimina Need to Elimina Need to Need to Need to Elimina	n/Modification Required ation of Program for Curriculum Review to Increase Practical Training ation of Program for Curriculum Review to Increase Practical Training ation of Program for Curriculum Review to Increase Practical Training ation of Program for Curriculum Review to Increase Practical Training
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1 2 3 1. Please speneed updat Name of Pr	cify the pro ion / modifi ograms ¹	grams currently be cation in your opin	ting offered to ion? (If any) Updation Elimina Need to Elimina Need to Elimina Need to Elimina Need to Need to Need to Elimina	n/Modification Required ation of Program for Curriculum Review to Increase Practical Training ation of Program
	cify the pro ion / modifi ograms ¹	grams currently be cation in your opin	ting offered to ion? (If any) Updation Elimina Need to Elimina Need to Elimina Need to Elimina Need to Need to Need to Elimina	n/Modification Required ation of Program for Curriculum Review to Increase Practical Training ation of Program
1 2 3 1. Please spenneed updat	cify the pro ion / modifi ograms ¹	grams currently be cation in your opin	ting offered to ion? (If any) Updation Elimina Need to Elimina Need to Elimina Need to Elimina Need to Need to Need to Elimina	n/Modification Required ation of Program for Curriculum Review to Increase Practical Training ation of Program
	cify the pro ion / modifi ograms ¹	grams currently be cation in your opin	ting offered to ion? (If any) Updation Elimina Need to Elimina Need to Elimina Need to Elimina Need to Need to Need to Elimina	n/Modification Required ation of Program for Curriculum Review to Increase Practical Training ation of Program

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Name of the Programs Sub – Sector Required Skills Level Programs Metal Professional level of skills Diploma Basic skills Diploma Certificate Course Assembly / Sub-Assembly Limited skills Any other Basic skills Certificate Certificate Basic skills Certificate Certificate Basic skills Certificate Course Basic skills Certificate Course Basic skills Certificate Course Basic skills Carve other Course Metal Professional level of skills Diploma Basic skills Course Course Basic skills Course Course Basic skills Course Certificate Basic skills Course Cartificate Basic skills Course Cartificate Basic skills Course Cartificate Basic skills Course Cartificate Basic skills Course Ca
Metal M
Electrical / Electronics Assembly / Sub-Assembly Limited skills Course Assembly / Sub-Assembly Limited skills Course Rubber / Plastic Electrical / Electronics Assembly / Sub-Assembly Limited skills Course Course Rubber / Plastic Electrical / Electronics Electrical / Electronics Rubber / Plastic Rubber / Plastic Electr
Assembly / Sub-Assembly Limited skills Any other Metal Professional level of skills Diploma Rubber / Plastic Broad range of skills Corrificate Assembly / Sub-Assembly Limited skills Any other Metal Professional level of skills Course Metal Professional level of skills Course Bubber / Plastic Broad range of skills Course Bubber / Plastic Broad range of skills Course Bubber / Plastic Broad range of skills Course Assembly / Sub-Assembly Limited skills Any other Metal Professional level of skills Diploma Bubber / Plastic Broad range of skills Course Assembly / Sub-Assembly
Rubber / Plastic Broad range of skills Corrificate Bestic skills Course Assembly / Sub-Assembly Limited skills Carse Metal Professional level of skills Course Cartificate Bubber / Plastic Broad range of skills Cartificate Bubber / Plastic Broad range of skills Course Bubber / Plastic Broad range of skills
Assembly / Sub-Assembly Limited skills Any other Metal Professional level of skills Diploma Rubber / Plastic Broad range of skills Course Assembly / Sub-Assembly Limited skills Course Metal Professional level of skills Course Metal Professional level of skills Diploma Metal Professional level of skills Diploma Rubber / Plastic Broad range of skills Course Hubber / Plastic Broad range of skills Course Metal Professional level of skills Course Rubber / Plastic Basic skills Course Basic skills Course Course S. Is there any national or international vocational/technical TSPs which can be u benchmark? Yes No If yes, please provide the name(s) of the institute(s) and preferred program Intaining provider(s).
Image: State of the institutes Image: State of the institute state of the institute state of the institutes Image: State of the institute state of the institute state of the institute state of the institute state of the institutes Image: State of the institute of the insthe insthe institute of the institute of the institute
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. In the wake of emerging developments in the global Autoparts industry, v
technological advancements do you foresee in the near future in Pakistan?





PUN	LIAB	ector Skills Study-Business Exp	Punjab Skills Development Fo
15.1	How would you to	ckle the skills-related	challenges emerging as a result of the
	technological devel	opments?	
	2.		
	3		quired in the light of above technologic
	developments?	ts in skill set will be re	quired in the light of above technologic
	3.		
			which are difficult to fill because of no arts Sector, in your opinion?
:	Sub Sector	Job Title	Required Skill
_			
L			
	Any other suggest Autoparts sector:	on for the improveme	nt of skills set of the workforce for the
		THANK YOU FOR	YOUR TIME!

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Autoparts Sector Skills Study-Business Expert Assessment

Punjab Skills Development Fund

Annexure 1: Name of Related Programs

šr. No.	Program	Duration
	Diploma of Associate Engineering	(DAE)
1.	Auto & Diesel	3 Years
1.	Auto Electrician	3 Years
2.	Auto Mechanic	3 Years
3.	Electrical	3 Years
4.	Electronics	3 Years
5.	Foundry & Pattern Making	3 Years
6.	Instrumentation	3 Years
7.	Machinist	3 Years
8.	Mechanical	3 Years
9.	Mechatronics	3 Years
10.	Metallurgy & Welding	3 Years
11.	Welder	3 Years
	G-11	
12.	Auto Mechanic	2 Years
13.	Electrical	2 Years
14.	Instrumentation, Measurements & Control	2 Years
15.	Machinist	2 Years
16.	Welder	1.5 & 2 Year
	G-III	
17.	Auto Electrician	1 Year
18.	Auto Mechanic	1 Year
19.	Auto Mechanic	1 Year
20.	Electrical	1 Year
21.	Electronics	1 Year
22.	Machinist	1 Year
23.	Mechanical	1 Year
24.	Mechanist	1 Year
25.	Tractor & Auto Mechanic	1 Year
26.	Welder	1 Year

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Autoparts Sector Skills Study- Business Expert Assessment

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ŝr. No.	Program	Duration
Certificate		
27.	Auto Cad	6 Months
28.	Auto Cad	3 Months
29.	Auto Electrician	6 Months
30.	Auto Electrician	3 Months
31.	Auto Mechanic (Diesel)	6 Months
32.	Auto Mechanic (Petrol)	6 Months
33.	Auto Mechanic (Petrol)	3 Months
34.	Heat Treatment	3 Months
35.	Machinist	6 Months
36.	Welder	6 Months
37.	Welder	3 Months



