

## PROBLEMS, ANALYSIS AND RECOMMENDATIONS OF THE AUTOMOTIVE VENDOR INDUSTRY OF PAKISTAN—I

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### ABSTRACT

*After a broad identification of the major problems faced by the automotive industry of Pakistan this paper presents very useful analysis and comprehensive recommendations for solution of major problems of the automotive vendor industry. The problems of automotive vendor industry are identified as a result of interviews with vendors of the industry. The problems of car vendors are divided into five major categories: processes/operations, supply chain, resources, testing & quality control, and poor technology climate. It includes both the vendors who are working for Japanese and local motorcycle assemblers. The analysis of the findings of survey interviews, expert's discussions, and media releases has unveiled some daunting facts pertinent to automotive vendor industry of Pakistan. The salient outcomes of the analysis are presented. On the basis of the analysis and interview results, comprehensive recommendations are also provided for the automotive vendor industry of Pakistan.*

**Keywords:** *Automotive industry, car vendors, motorcycles vendors, motorcycle assemblers*

### INTRODUCTION

The global competitive business environment has created new international trade challenges between developed and developing regions. Such challenges can affect corporate strategic directions and alter business and manufacturing strategies<sup>2,3,8</sup>. For manufacturing companies in developing countries, these challenges mean that they should take extra efforts to survive in the current global competitive environment<sup>6</sup>. Manufacturing is a key for survival in developing countries under such global competitive conditions because if manufacturing is given a more strategic role beyond the traditional support for marketing, it can play a major part in strengthening a company's market position<sup>12</sup>.

The available literature shows a widely documented contribution of manufacturing technologies to the overall competitive capabilities of companies<sup>5,10,11,12</sup>. However, in decades to come, the use of more advanced manufacturing technologies will undoubtedly emerge to be an important source of competitive advantage. Although, the advanced manufacturing technologies advantages and capabilities are already known, problems regarding the management process, from the planning to the implementation, represent the main hurdles to the effective use of

such technologies<sup>4</sup>. The remarkable industrial achievements of Asian countries like Korea and Taiwan are underpinned by the ability to master technological competencies. These countries acquired foreign technology from industrialised countries, during their early stage of industrialization, and became developers of their own technological capabilities. Both Taiwan and Korea have moved rapidly into new technology fields, and now achieve world-class levels in areas of state-of-the-art technology, especially in telecommunications and semiconductors<sup>7</sup>.

However; on the other hand, "the current status of Pakistan's manufacturing sector appears to be bleak, with mostly obsolete technology being employed in its industries. Moreover, given this obsolete generation of technology, complicated parts cannot be produced accurately and precisely, thus leads to high manufacturing time and cost. As a result, the final product is of an inferior quality and therefore unable to attract even the local consumer. Consequently, Pakistan is rapidly losing its share in the international market – this is obviously a sensitive issue for the government".

Pakistan is a developing country, with slow technological development, less penetration of roads, absence of skilled labor and inadequate infrastructure

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facilities, all of which have proved to be a major impediment in the development of the automotive industry in Pakistan<sup>1,9</sup>.

The automotive industry in Pakistan consists of four major segments, which include two/three wheelers, passenger vehicles (including cars, jeeps and station wagons), commercial vehicles (trucks and buses) and tractors. There are around 25 manufacturers and assemblers in Pakistan who have technical collaborations with Japanese and Korean manufacturers like Suzuki, Honda, Toyota, Hino, Hyundai and Mazda<sup>9</sup>.

The Pakistan automotive industry is an import driven market, and with a few exceptions, the entire automotive industry depends largely on imports from Japan, Korea, China, India and the US. The automotive industry in Pakistan has more assembling units than manufacturing units. The purchasing power of consumers is also one of the weaknesses, and self sufficiency still remains a dream for the automotive industry in Pakistan<sup>9</sup>.

Presently, the automotive industry in Pakistan is going through a major phase shift, with the entrance of new players from foreign countries. Pakistan does not qualify as a major exporter of automobiles with an exception of marginal exports of tractors. The market is dominated largely by Japanese and Korean manufactures with as much as 90 percent market share.

There are approximately 625 organized units in the auto parts industry of Pakistan, most of which are registered vendors to assemblers/OEMs. Many of these are bound to supply only to OEMs as per their agreement. This sector manufactures relatively sophisticated parts and is capital intensive. Along with organized sector there exists a huge sector of unorganized vendors, approximately 840 units, who are not registered and are not bound to any agreement. Majority of unorganized vendors supplies in the parts replacement market and not to the OEMs. As a matter of fact 90% of the automotive vendor industry of Pakistan comprises of SMEs (Small and Medium sized Enterprises) and 95% of them are self-financed. Some of the salient statistics of the vendor industry are given in Figure 1.

**METHODOLOGY**

This research does not encapsulate the analysis of the entire automotive industry but is focused solely

Estimated Vending Unit	1845 Units
Organized and Tier-one suppliers	625
Tier-two Suppliers	380
Unorganized and after market suppliers	840
Investment	Rs. 180 Billions
Direct Employment	200,000
Current Export (millions)	US \$ 54 Million
Export Growth Rate	35%
Exporting Units	24

Figure 1: Overview of Auto vendor industry of Pakistan (Number and their sizes) (PAAPAM Directory 2010)

towards the automotive vendor industry of cars and motorcycles. The vendor industry of Pakistan consists of small and medium sized manufacturers who produce spare parts for both foreign and local automotive assemblers.

As a part of our need assessment stage, detailed interviews were conducted with the vendors of both cars and motorbikes. It also includes some representatives of motorcycle assemblers. The vendors were highly supportive and revealed their technical and managerial problems in a comprehensive manner. For the ease of understanding and to bring the results into a presentable form, similar problems are lumped into one major category. The following sections present the interview results, as well as the frequency of each problem. The analysis of the findings of survey interviews, expert’s discussions, and media releases is presented. On the basis of the analysis and interview results recommendations are drawn for solving the major problems of the automotive vendor industry.

The remainder of the paper is structured as follows: section 3 represents major problems of automotive vendor industry. Section 4 mentions problems of motorcycle vendors. It is followed by the problems faced by motorcycle assemblers in section 5. The analysis of the findings of survey interviews is given in section 6. Section 7 presents comprehensive recommendations are presented for solving the major problems of the automotive vendor industry. At the end, conclusion is provided.

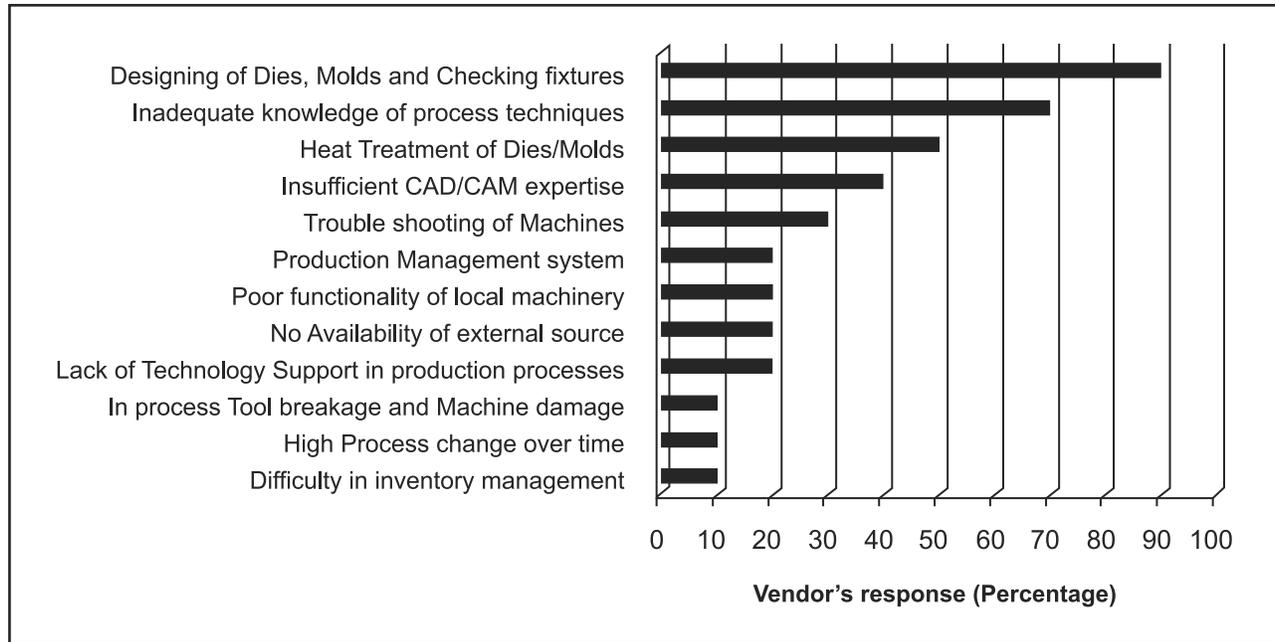


Figure 2: Problems faced by the vendors of cars in the category of processes/operations

**CAR VENDOR’S PROBLEMS**

The problems of car vendors are divided into five major categories: processes/operations, supply chain, resources, testing and quality control, and poor technology climate. The findings of the study on car vendors are discussed in the subsequent sections.

**Processes/Operations**

Problems faced by the vendors of cars in the category of processes/operations are shown in figure 2 and are discussed below.

Figure 2 shows a skewed graph, which means that 30% of problems are causing 70% of the damages. The most important problem being faced by the vendors of cars is that of die and mold designing. This problem is mainly mentioned by the vendors of sheet metal and forged components. According to them there does not exist adequate facilities of die designing in the market and at the same time, due to the shortage of die designers, vendors are impaired to develop in house facility of die designing.

It is followed by another major problem of inadequate knowledge on process techniques. According to a reasonable chunk of vendors, it is difficult to find technical information on process techniques and process controls. Absence of any such information is

not allowing them to upgrade the production processes and to optimize the existing ones.

Heat treatment of dies and molds is a common problem of metal and plastic parts vendors. It is quoted in most of the interviews that inappropriate heat treatment of dies and mold is actually the major reason behind die/mold breakage and wear. The process of heat treatment is mentioned as an intricate process, the process parameters of which are difficult to control.

Insufficient CAD/CAM expertise refers to the unavailability of CAD/CAM experts. This problem is again mainly mentioned by the vendors of sheet metal parts. According to them there are number of CAD/CAM experts available in the market but only for plastic mold designing, but when it comes to the designing of sheet metal dies and fixtures it becomes difficult to find even a single expert. Whereas, plastic vendors do not mention it as a major concern.

Issues pertinent to the usage of machinery are also very much in the lime light, includes trouble-shooting of machine and improper functionality of machines. Trouble shooting is primarily a problem of CNC machinery; additionally the improper functionality of conventional machinery also causes production hitches.

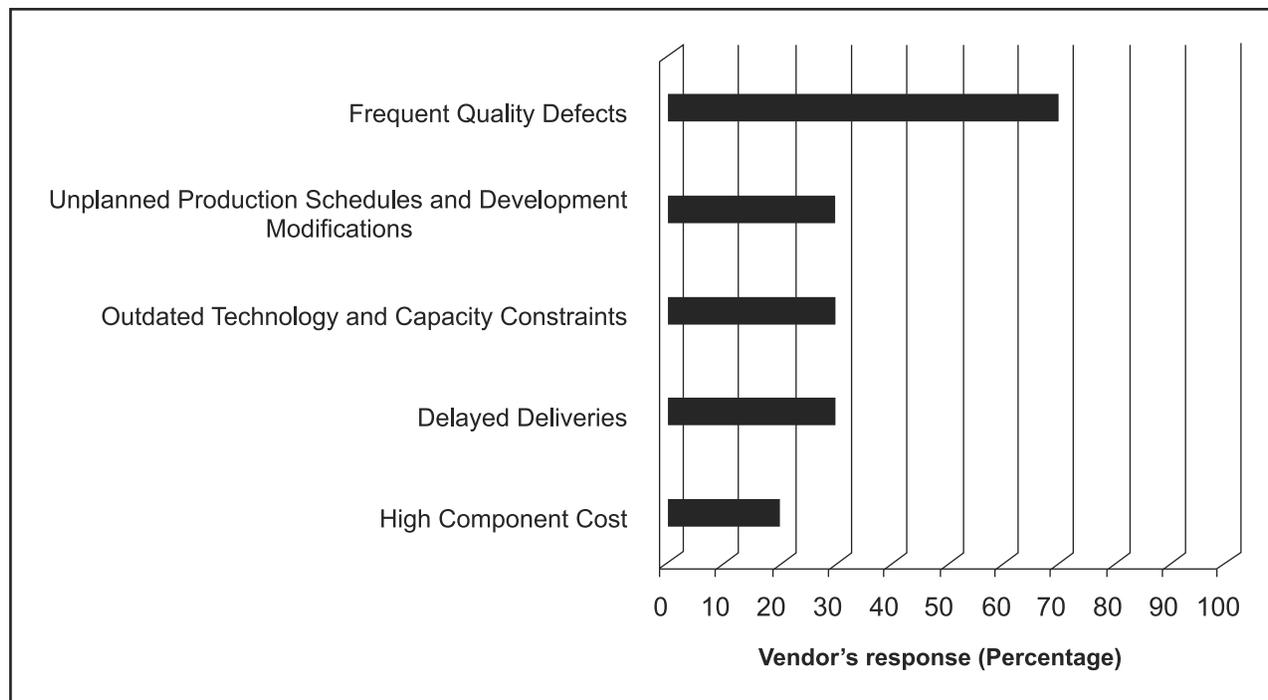


Figure 3: Problems faced by the vendors of cars in the category of supply chain

**Supply Chain**

Problems faced by the vendors of cars in the category of supply chain are shown in figure 3 and are discussed below.

The area of supply chain covers the problems being faced by the car vendors in the operations of supply chain. The typical supply chain for a car vendor consists of suppliers, vendor itself and OEM.

As reflected by the above graph the major supply chain issue is that of frequent quality defects on the part of suppliers, the ones who provide component parts to the vendors. According to the vendors, due to inadequate manufacturing techniques and poor quality control of suppliers, they very often receive substandard components. This problem becomes even costlier when vendors themselves have to eliminate the quality defects in the supplies of their suppliers.

The second major problem is that of unplanned production and development modifications by OEMs. It does happen that OEMs make structural changes in the underdeveloped parts in the midway of development process. Due to such unanticipated modifications vendors sometimes have to scrap the prepared tooling and start the development procedure all over again. Similarly, urgent modifications are made by

OEMs in their production schedules, which disturb the production planning of the vendor.

As per the statements of three vendors the technology being used by their suppliers is outdated and is not capable enough to meet the quality and production requirements of future. The suppliers are using the same manufacturing techniques since their inception. Most of the vendors mentioned that due to the lack of latest technology their suppliers are not geared for the future production volumes.

The problem of delayed deliveries is also one of the problematic areas for vendors. It is the lack of professional behavior on the part of suppliers that make them disobey their delivery commitments. Late supplies from suppliers sabotage the production processes of vendors and sometimes even result in the delay of deliveries to OEMs.

The component price of suppliers is not mentioned as a major concern. According to vendors the competitiveness in the market is keeping a good control over the price of suppliers.

**Resources**

Problems faced by the vendors of cars in the category of resources are shown in figure 4 and are discussed below.

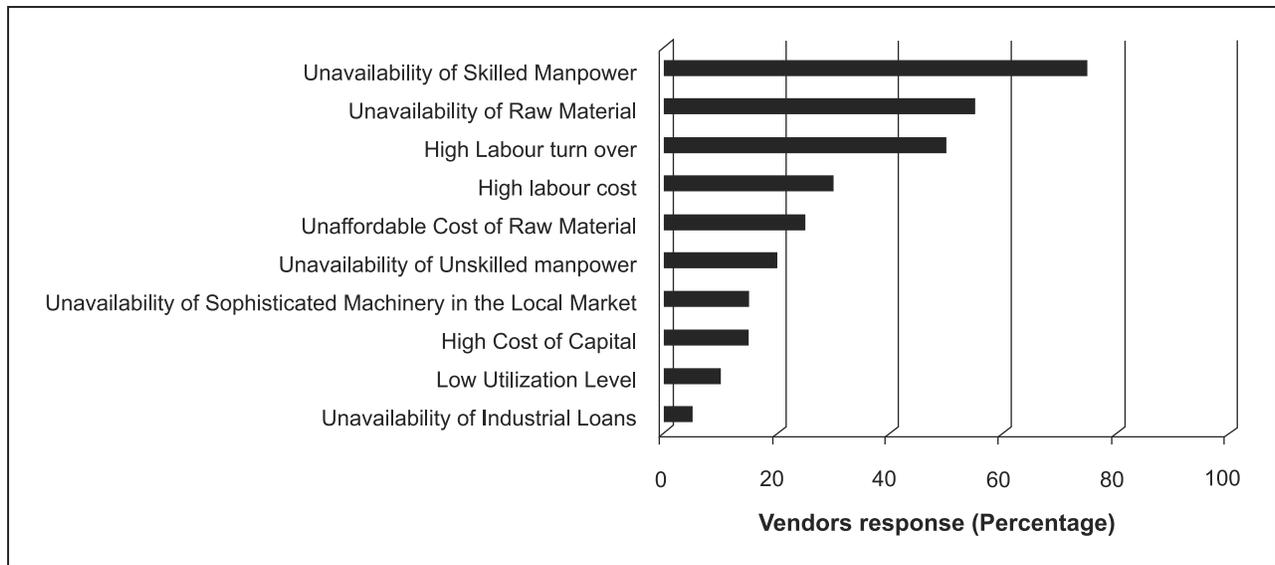


Figure 4: Problems faced by the vendors of cars in the category of resources

The most outstanding problem is the unavailability of skilled manpower. This problem is mentioned by the largest number of car vendors. According to vendors it has become almost impossible to find a skilled operator for both conventional and CNC machines. The huge gap between the supply and demand of skilled labor has resulted in high turn over rate of skilled labor. Additionally, in order to sustain the skilled workforce vendors are paying high wages, which has substantially increased the labor cost for them.

Followed by the shortage of labor there is an acute shortage of raw material. This problem is even intense in case of special alloy steels and high carbon steels. It is worth mentioning that this problem is almost non-existent for the vendors of plastic parts. It is because the raw material for plastic vendors is totally imported and comes with quality certifications.

Apart from labor and raw material the unavailability of sophisticated machinery is also mentioned as a secondary issue.

A small chunk of vendors has also registered the point of high cost of capital and unavailability of industrial loans. They mentioned the absence of cheap loans as the biggest impediment to business investment.

**Testing and Quality Control**

Problems faced by the vendors of cars in the category of testing and quality control are shown in Figure 5 and are discussed below.

Under the category of testing and quality control the most vital issue is that of long delays in the delivery of testing results by the existing testing facilities. Ten out of twenty vendors are of the view that current testing facilities like PITAC, PCSIR and MIRDC are so inefficient that they take even months to deliver the testing results.

The second major issue is that of limited number of testing facilities. Almost 45% of vendors feel that the number of testing facilities is not enough to meet the industry requirements. The problem is of larger concern to the car vendors of Gujranwala.

The range of testing services being offered by the present testing facilities is very limited. It is only the conventional tests which can be performed at the testing facilities, whereas, the specialized tests are almost non-existent.

Another problem, mentioned by car vendors, which came as a surprise to us is that the level of service being offered by testing facilities is highly dependant upon the personal relationship with the staff. With out knowing any staff member it becomes highly trouble some for a vendor to get the testing done. The cost of testing and the accuracy of results have also been mentioned as causes of concern by a small number of vendors.

Support of OEMs is highly insufficient for the in house development of testing facility.

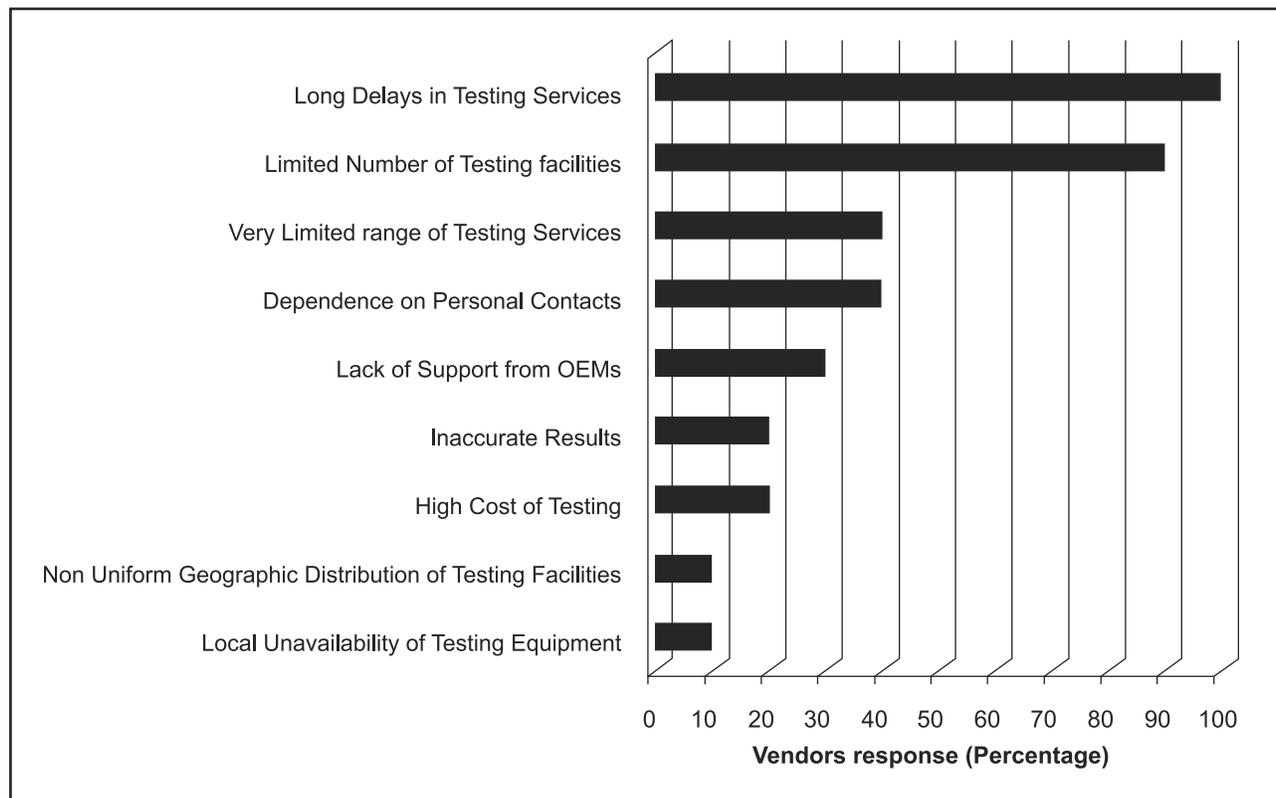


Figure 5: Problems faced by the vendors of cars in the category of testing and quality control

The geographic distribution of testing facilities is also a cause of concern for Gujranwala vendors. They feel that almost all the testing institutes are located in Lahore and there is no local facility available to them. The far distant locations have added substantially to their testing cost.

There is no availability of sophisticated testing equipment in the local market and this is what impedes the establishment of in-house testing facility.

**Poor Technology Climate**

Problems faced by the vendors of cars in the category of poor technology climate are shown in figure 6 and are discussed below.

One of major concerns mentioned by the car vendors of both Gujranwala and Lahore is the lack of immediate solutions. According to them all the development and upgradation initiatives always aim at the long term and state of the art projects, which always turn out to be unproductive. Vendors feel that their immediate problems are never addressed and they are not provided what they need.

Energy crises include frequent fluctuations and spikes of electricity. Unsteady flow of electricity is causing hefty losses to machinery and production

Policy issues involve unavailability of soft loans to the industry and the absence of price ceilings on different factors of production. There do not exist any such policies which can monitor and regulate the prices of production inputs. Additionally, some of the car vendors feel that the government policies are inefficient in the way that the decision making authority is not given to the implementers. This is what makes every proposed project to be passed through long bureaucratic process and to be finalized by the ones who do not have the panoramic view of the situation.

The OEMs are highly unfair as far as the profit distribution is concerned. The profit margins of OEMs have increased manifold over the last five years but they are not making a uniform distribution of profits across the supply chain.

Vendors very strongly believe that no support has been provided by the government in terms of subsidies and duty free imports, the factor which is

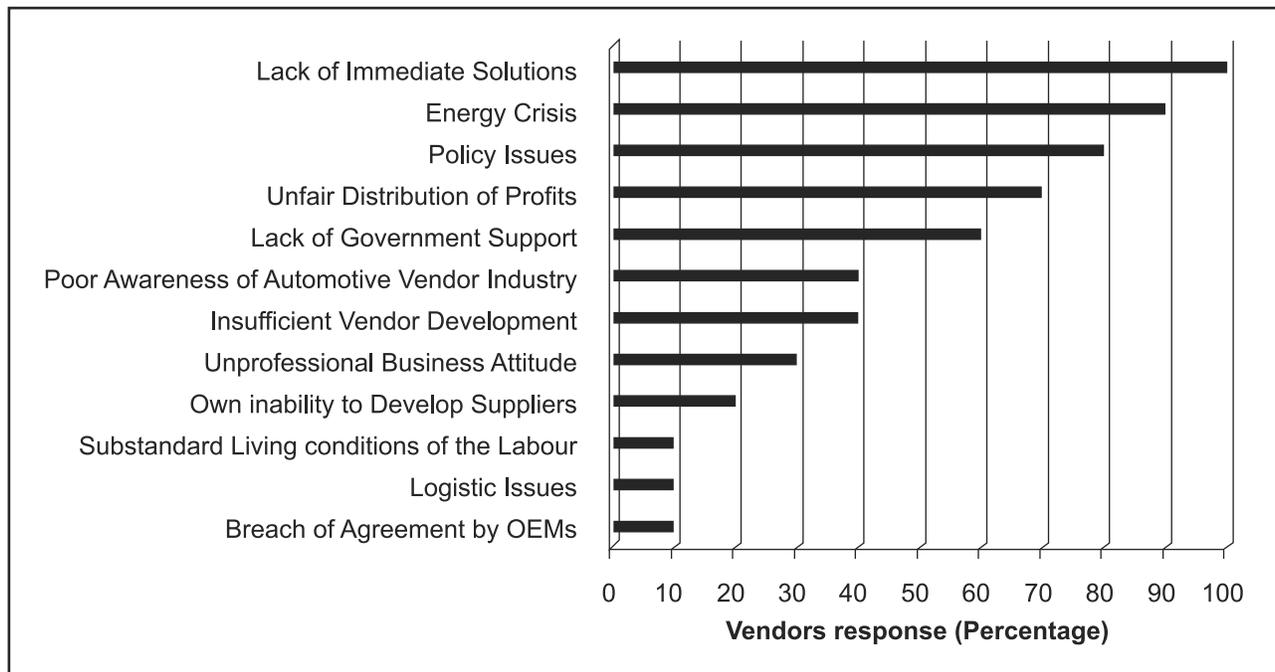


Figure 6: Problems faced by the vendors of cars in the category of poor technology climate

making the local vendors uncompetitive against imported substitutes.

There are quite a few vendors who feel that the automotive vendor industry has very low awareness among the students of engineering institutes and this is what keeping the industry deprived of a huge skill pool.

The vendor development efforts of OEMs are very limited. Trainings are conducted only on the lines of management systems, whereas, the technical front is always underdeveloped.

Unprofessional business attitude on the part of suppliers; suppliers are not professional enough to respect their commitments.

One of the car vendors also mentioned the problem of breach of agreement on the part of OEMs. It is due to the availability of cheaper Chinese products that OEMs are shedding their local vendors and opting for Chinese substitutes. Such a behavior is evident even in contractual agreements.

### MOTORCYCLE VENDOR'S PROBLEMS

The following problems have been identified as a result of our interviews with 22 vendors of motorcycles. It includes both the vendors who are working

for Japanese and local motorcycle assemblers. The findings of the study on motorcycle vendors are shown in Figure 7 and are discussed below.

The industry is in the need of help from technological point. So that, they are able to increase productivity and improve quality that will result in better value for their products.

The industry is in desperate need of skilled workforce. Workforce that has the basic knowledge of different day to day operations and trouble shooting.

The industry is not satisfied with the performance of existing testing laboratories like PSQCA, PITAC and PCSIR. They feel the absence of a quality, authentic, customer friendly, dedicated, widely acceptable and cheap testing laboratory fully dedicated to Automotive Industry.

Another major problem confronted by the industry is the quality, availability and price of specialized raw materials such as tool die steel, steel alloys, different grades of steel etc.

Problem that arises when trying to export is the non availability of different international standards.

A common facility centre for machinery procurement is suggested, so as the life of entrepreneur be

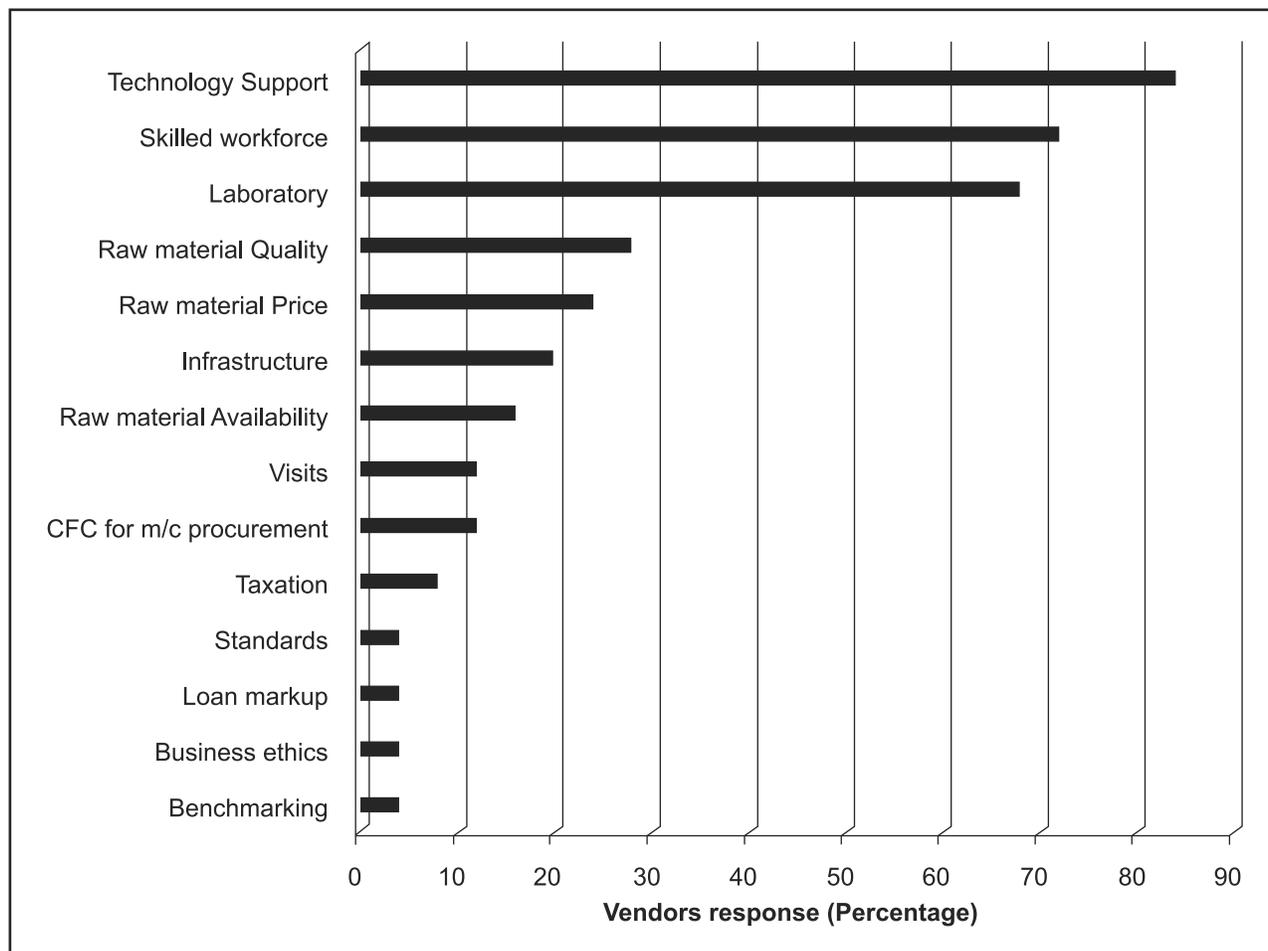


Figure 7: Problems faced by the motorcycle vendors

made easy and he gets all the information required under one roof.

The industry feels that visits to different industries for benchmarking will be helpful and the industry will be able to learn and implement the same in their factories.

**MOTORCYCLE ASSEMBLER’S PROBLEMS**

The need assessment survey also included 8 assemblers of motorcycles. Our interviews with the assemblers provided us an opportunity to have a view of the automotive industry from the perspective of OEMs. The major problems mentioned by the motorcycle assemblers are shown in figure 8 and are discussed below.

The industry lacks the technology required for the operation of a motor cycle assembly. They also lack the systems (like procurement, purchase, assem-

bly, quality assurance, final inspection, etc.) required for operation of a motor cycle assembly.

The industry feels that there must exist a laboratory fully dedicated to motor cycle assemblers where all parameters (such as assembly torque, assembly routing, emission controls, engine efficiency under different conditions, engine emissions, shock absorber tests etc.) of motor cycle can be tested and verified.

The major problem that is being confronted by motor cycle assemblers is lack of awareness on the part of entrepreneur. The entrepreneur lacks the knowledge on how to run a motor cycle assembly business from a management as well as technical point of view.

Development of criteria for vendors is also suggested along with establishment of an R&D/Design facility.

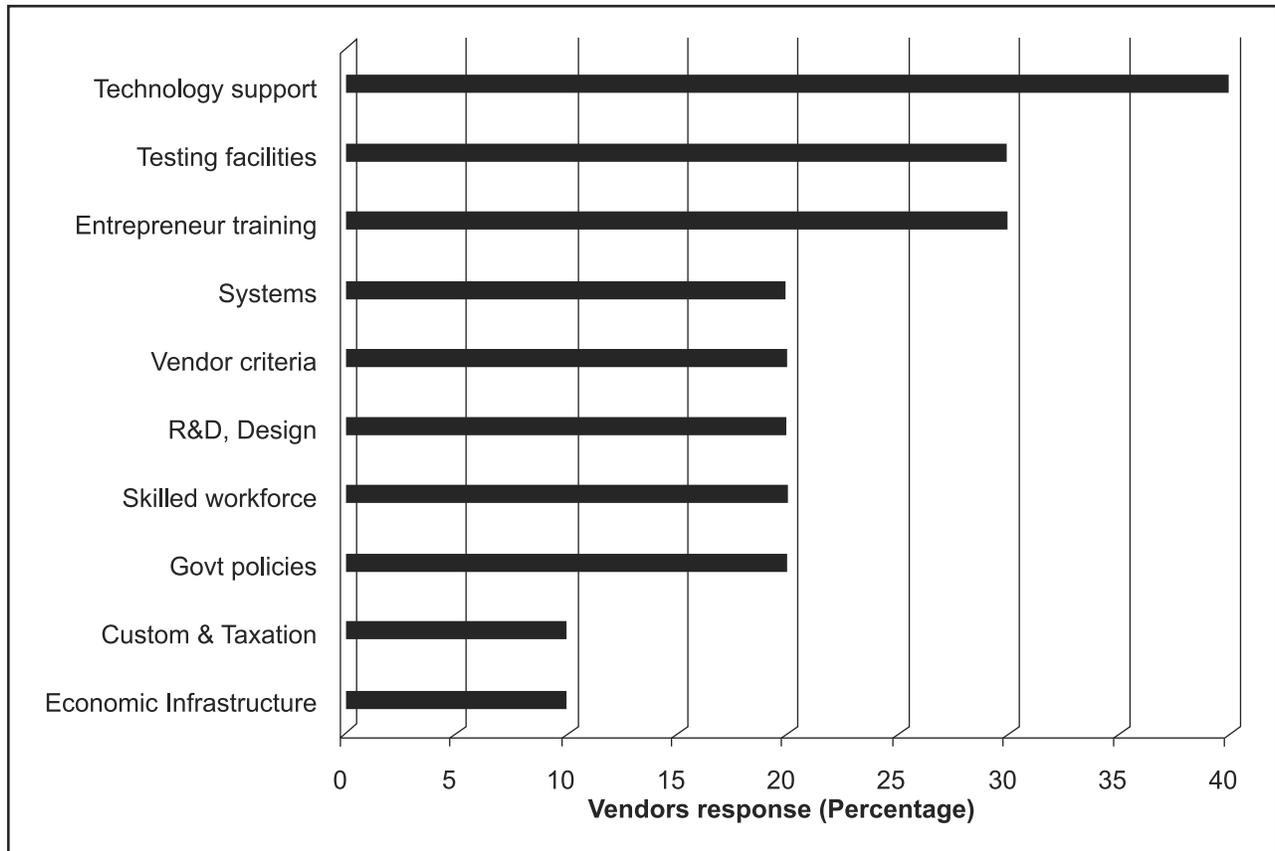


Figure 8: Problems faced by the motorcycle assemblers

**Analysis**

The analysis of the findings of survey interviews, expert’s discussions, and media releases has unveiled some daunting facts pertinent to automotive vendor industry of Pakistan. The salient outcomes of our analysis are as follows.

**Need of Immediate Attention**

The automotive vendor industry has been one of the fastest growing sectors of Pakistan’s economy for the last five years, but now it is at the verge of downfall. The problems being encountered by the vendor industry are of such a nature that if not addressed on immediate basis the industry will devastate, even a slight delay can nudge the industry on decline.

**Diminishing Competitive Advantage**

The largest problem which is emanated from the survey of both the car and motorcycle vendors is the unavailability of skilled manpower. Cheap and skilled

labor has always been the only competitive advantage of Pakistan and was the major incentive for all the automotive OEMs to set up their units in the region of Pakistan. The loss of labor competitive advantage is the biggest disincentive for the OEMs to sustain their business with the local vendors, The only factor that could make the Pakistani vendor industry a preference for global customers, in the time of globalization, is its ability to deliver good quality products at low cost. But with the absence of economical labor it will not be possible for the industry to deliver low cost products, which means losing its customers to global competitors.

**Competitive Disadvantage**

Survey has exposed that the local vendor industry of Pakistan is confronted with immense competitive disadvantage in the following areas:

- a- Lack of knowledge,.
- b- Lack of Technology

*c- Lack of Industry Raw.*

*d- Lack of Government.*

### **Revival of Competitive Advantage**

The analysis of problems being faced by the automotive vendor industry of Pakistan shows that the only way of immediately reviving the competitive edge is through gaining cost advantage. The availability of skilled manpower, development of information database, availability of required raw material and government support can be the steps taken to impart cost efficiency into the local vendor industry. The ability to produce at lower cost is indigenous to the local industry of Pakistan and it is the dimension on which the other global industries can not match the performance of Pakistani industry.

### **Need of Defensive Strategy**

It is mandatory for the local industry to flourish that a defensive strategy is adopted and a protected environment is provided by the government. A reasonable level of deterrence (tariff barriers, price floors, subsidies to local industry) is required which can make the local market of Pakistan highly unattractive for the global players and let the local vendors achieve a level playing ground.

### **High Dependence on OEMs; Need of Diversification**

The major chunk of vendors manufacture parts exclusively for OEMs and this is what brings OEMs in high bargaining power. It implies that majority of vendors have very limited range of customers and products. This is where lies the need for diversification, such opportunities should be provided to the local vendors that they can hit upon new markets and new products. However, the point to be taken care of is that it should be done in parallel to the revival of their competitive advantage, otherwise, the strategy of diversification may back fire. But there is a strong need of reducing the dependence of vendors on OEMs, because it will not let them develop beyond certain limits.

### **Recommendations**

On the basis of our analysis and interview results the following recommendations are drawn for solving the major problems of the automotive vendor industry.

### **Unavailability of Skilled Manpower/ High Cost of Labor**

- Identification of organizations working for skill development and upgradation of automotive vendor industry is required. In order to expedite the process instead of establishing exclusive skill development centers, the infrastructure of the existing training institutes like TEVTA and PITAC etc, should be utilized to the possible extent.
- Long term and state of the art projects should be avoided and the focus should be on small scale projects which will have the ability to deliver on immediate basis.
- Divide the automotive vendor industry into different geographical clusters and establish one training center per cluster.
- The liaison should be developed with local engineering institutes and collaborative efforts should be made to establish automotive specific training laboratories within the premises of universities.
- Vendors should be persuaded to sign internship contracts with TEVTA and PITAC etc, on voluntary basis, according to which traineeship programs will be arranged at the facility of vendors for the period of 2 to 3 months.
- The current course structure is purely theoretical based and delivers very general concepts in the fields of mechanical, electronics, civil etc. The course contents should be made either process or technology specific and job specialists should be produced. Additionally, training structure should have the break up of 70% theoretical lectures and 30% On-the-Job training (traineeship).
- The admission criteria of the existing training institutes are impeding further training of uneducated but skilled labor from getting admitted into the technical training institutes. Therefore, either the admission criteria of the existing institutes should be lowered or exclusive vocational institutes should be established for the low level labor.
- Formal visits should be organized for the graduating engineers. It will make them under-

stand the career prospects in the automotive sector.

- The students of the rural areas should be given nominal monetary incentive for getting admission in the training institutes. It is required to motivate the parents which otherwise are earning good amount of money from the employment of their children.

**Unavailability of Raw Material /High Cost of Material**

- There should be a centralized warehouse of materials (material bank) where materials like Alloy Steels, Tool Steels, Pig Iron and High Carbon Steels can be made available.
- Establishing a data base for vendors, which can provide easy accessibility to information on international sources of raw material supply.
- Peoples Steel Mill (PSM) is a new source of material production but it holds huge potential in itself. The current capacity of Peoples Steel Mill should be enhanced..
- Manufacturers should be allowed to import raw material on subsidized rates.
- The current processes of getting approval for duty free imports of raw material are very intricate and lengthy. These processes should be made simple and understandable for the vendors.
- Vendors should be allowed to purchase the raw material directly from Pakistan Steel Mill. It will cater to the problems of high cost and material holding.
- Availability of soft loans for the imports of raw materials.
- The production of raw material should be decentralized and Pakistan Steel Mill should establish its branches in other major industrial cities.

**Limited Number of Testing Facilities/ Long Delays in Test Results.**

- An exclusive automotive testing facility should be developed on urgent basis. The ownership

of these facility should also be handed over to a group of vendors.

- Reestablishment of PITAC, keep the existing management and congruently develop a new team of experts. The new experts should be hired through formal recruitment procedure, so that, a right person can be selected for the right job. It will stretch the pool of applicants to national level and will prevent any talent from being ignored.
- Implement strict monitoring and performance appraisal system, Also trainings in the foreign automotive laboratories should be arranged.
- Identify the list of tests which are required to be performed in automotive vendor industry and check their availability with the present facilities.
- Institutes like GIKI and NUST have well developed testing labs for metallurgical and mechanical testing. These are well equipped laboratories and offer wide range of testing, but are highly underutilized. So, we can always get into formal contract with engineering institutes which have well developed testing laboratories.
- Spread the testing facilities across the maximum number of industrial states. Instead of establishing one state of the art testing facility in one city, it is better to establish smaller facilities but in multiple cities. It will not only increase the availability but will also reduce the testing cost for the vendors operating in small cities.
- Support of OEMs should be gained by persuading them to support their vendors in the development of moderate level of in-house testing facilities. Additionally, OEMs should be taken on board for the development of exclusive testing center for automobile products.
- Local distributors of testing equipment should be developed who can import the required testing machinery as per the need of industry.
- The government-run testing facilities should be handed over to respective provincial governments. For instance, the governance of institutes like PITAC and PCSIR is decentralized and is transferred from federal to provincial govern-

ment. At the same there should be one federal authority like National Institute of Quality Control which can actually monitor the performance of and bring consistency among provincial institutes.

### **Inadequate Knowledge on Process Techniques**

- A centralized data base should be established where the information on different process techniques and process controls can be shared. It should be accessible for a very nominal membership fee and should be upgraded on regular basis. It is better to develop it with the coordination of foreign automotive experts, so that, unconventional inputs can be brought.
- Identify all special and trouble some operations in the automotive vendor industry. Once the operations are identified small briefing sessions should be held in different industrial locations, across the nation. It is through these sessions that the knowledge of different process techniques can be imparted.
- In order to make these briefing sessions fructified, all the lectures should be delivered in native languages and the selection of instructors should also be made according to the qualification of the audience.
- This is where the coordination with OEMs can be highly effective. Organize combined briefing sessions with OEMs, as they are in a better position to approach foreign experts.

### **CONCLUSION**

Pakistan is a developing country, with slow technological development, less penetration of roads, absence of skilled labor and inadequate infrastructure facilities, all of which have proved to be a major impediment in the development of the automotive industry in the country. These are some of the major reasons why the automotive industry in Pakistan has not been able to make a breakthrough in foreign markets.

A consistent Government policy for the automotive sector and a rational tariff plan is necessary to reduce uncertainty amongst local manufacturers and assemblers in Pakistan. Upgradation of technology,

reliable quality control, well trained manpower and strong financial support from Government is necessary for the very existence of automotive vendors and assemblers in Pakistan.

The automotive industry of Pakistan depends largely on imports from Japan, Korea, China, India and the US and self-sufficiency still remains a dream for the automotive industry in Pakistan. However, there is hope for upgradation in the auto industry. The Pakistan automotive market has become more competitive over the years, and there has also been a clear shift towards the small cars segment. It is hoped that the salient outcomes of the analysis and the detailed recommendations provided for the automotive vendor industry of Pakistan will definitely benefit the automotive industry in the country.

### **Acknowledgement**

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### **Abbreviations Used**

- OEM- Original Equipment Manufacturers
- SMEs- Small and Medium sized Enterprises
- CAD- Computer Aided Designing
- CAM- Computer Aided Manufacturing
- CNC- Computerized Numerically Controlled
- R&D- Research and Development

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