P-3007

Impact of Technological Improvements in Automobile service sector

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A PROJECT REPORT

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CHENNAI 600 025

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BONAFIDE CERTIFICATE

Certified that the Project report titled **Impact of Technological Improvements in Automobile service sector** is the bonafide work of Mr. Praveen kumar. S who carried out the work under my supervision. Certified further that to the best of my knowledge the work reported herein does not form part of any other project report or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

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ABSTRACT

ABSTRACT:

Automobile sector is the fastest growing industrial segment. The significant growth of automobile sector had made the human travel more sophisticated. The electrical and electronics systems [EES] made their contribution for significant growth in automobile sector for the past decade. This provides cost and feature advantages over conventional systems. Modern automobiles have extensively repackaged themselves in design, implementation and servicing using the new technological changes.

Following the changes in Automotive EES, the service sectors must be fully equipped in all their customer related endeavour. Today the service technician should be constantly retrained for emerging EES advancements being incorporated into newer vehicles. In this report an attempt is planned to measure the **competency of service stations.**

ACKNOWLEDGEMENT

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Every success stands as a testimony not only to the hardship encountered but also to the hearts and hands behind it. Likewise, the present project work has been undertaken and completed with direct or indirect help from many people and I would like to express my thanks to them.

I express our sincere thanks to Mr.Rajesh, A for his valuable guidance, suggestions and constructive criticisms given at every stage of my project work.

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INTRODUCTION

1.1 Introduction

India's automotive industry is one of the key drivers of the country's economy. At an estimated size of USD 38 billion, it accounts for close to 5 percent of India's GDP.1 Over the past 5 years (2002-03 to 2007-08), the industry has seen strong overall growth of 11.5 percent CAGR, with both domestic and export markets growing during the period.

The Auto Components industry has grown in tandem, and had a turnover of USD 18 billion in 2007-08, at a CAGR of 27.2 percent over the past 5 years.

The Government of India recognizes the significance of the automotive industry, and is actively involved in promoting its growth. The government's Automotive Mission Plan 2016 envisages the industry to grow to a size of USD 145 billion by 2016, so as to contribute 10 percent of GDP. As population of vehicles increases, the need for an efficient service network becomes important. Every year, the new vehicles sold add to the overall vehicle population that needs to be serviced and maintained, as scrapping of vehicles is low. In addition, rapid improvement in vehicle technology and the number of new models being introduced each year, add to the challenges of providing efficient service.

An effective service network is built on three key pillars:

1 .Service infrastructure – adequate workshops at the right locations, with proper machinery, tools and other facilities

2 .Availability of spare parts

3. Availability of skilled manpower.

Of the above, the third pillar – the availability of skilled manpower to service the ever growing vehicle is the important factor.

With this background, I have started to analyze Skill Gaps between Automotive Service and manufacturing Sector.

1.2 Problem Identified:

As in any service industry, automotive servicing is also dependent on the quality of its manpower, to deliver effectively. This involves four aspects:

1. Effective planning of resource for the short, medium and long term
2. Recruiting the right manpower ('right' both in terms of numbers and skill sets)
3. Providing effective training to ensure the skill sets are always updated and continuously upgraded
4. Developing and retaining the manpower.

From this above I have assessed the continuous up gradation of technical skill set of service team across three levels:

Technicians, Supervisors and Managers

1.3 Need for study

The Automotive market is getting increasingly crowded:

While the sale of vehicles has been increasing steadily over the years, the automotive industry in India has also been getting increasingly crowded, with a plethora of models competing for market share.

From just around 10 OEMs in the 1980s, the market has grown to a situation where many major global players are present in the country. Today, there are over 35OEMs across product categories in India. In addition, the range of models operating in the Indian market has grown manifold, driven by imperatives of customer demand, evolving emission and safety regulations and improvement in technology. For example, in passenger vehicles alone, there are over 50 basic models and hundreds of variants available in the market today, fighting for share in the crowded market space.

The pace of new product introduction has also quickened, with OEMs looking to bring out new models and variants almost every year. In addition, vehicle technology has undergone significant improvement over the past decade, with new materials, new features and increasing share of electronics in new models.

The imperative for effective service:

The Indian automotive customer today is well tuned to global markets and products, and expects the same levels of quality in products and services. The wide range of models and variants on offer, with little differentiation among products within the same price band, also encourages customers to switch from one brand to another easily. As a result, retaining customer loyalty is a key concern for manufacturers in India. In this scenario, providing effective after sales service for vehicles has assumed increased importance for OEMs in India. Not only do manufacturers need to provide a range of services and have a widespread service network to cater to the ever increasing number of vehicles on the road, but also ensure high levels of service quality and delivery, to retain customers. The proliferation of variants and rapidly evolving product technology are other dimensions that add to the challenge.

In view of the evolution in customer preferences and increased competitive pressures in the market, quality and delivery of after sales service has assumed critical importance for manufacturers. Quality of service was ranked as one of the key factors to retain customers, by respondents across the industry.

Several trends are driving change in automotive servicing today. As discussed earlier, the four major drivers for change are:

1. Changes in vehicle technology
2. Continuous change of models and variants
3. Need to penetrate new markets / geographies
4. Need for improved customer service and satisfaction.

1.4 Objective :

Automobile sector is the fastest growing industrial segment. The significant growth of automobile sector had made the human travel more sophisticated. The electrical and electronics systems [EES] made their contribution for significant growth in automobile sector for the past decade. This provides cost and feature advantages over conventional systems. Modern automobiles have extensively repackaged themselves in design, implementation and servicing using the new technological changes.

Following the changes in Automotive EES, the service sectors must be fully equipped in all their customer related endeavour. Today the service technician should be constantly retrained for emerging EES advancements being incorporated into newer vehicles. In this report an attempt is planned to measure the competency of service stations on new technology.

1.5 Deliverables :

I. The service teams feedback of their skill and training.

II. Questionnaire prepared and interviewed them

CHAPTER 2

LITERATURE SURVEY

Delivering the keynote address, Venu Srinivasan, vice-president, CII, and CMD of TVS Motor Co, urged industry to facilitate skills training to workforce both in the organised and unorganised sectors in view of technology upgradation by vehicle manufacturers. "As our consumer base is growing exponentially, there is a need for quality aftermarket service. Manufacturers need to look at the automotive aftermarket business as a revenue earner and provide consumers better quality services and thereby establish their brand," he said.

Reveiw AutoServ 2008 - Confederation of Indian Industry (CII) from 7-9 November 2008 at Chennai Trade Centre, Chennai

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- Automotive service technicians and mechanics must continually adapt to changing technology and repair techniques as vehicle components and systems become increasingly sophisticated.
- Formal automotive technician training is the best preparation for these challenging technology-based jobs.
- Opportunities should be very good for automotive service technicians and mechanics with diagnostic and problem-solving skills, knowledge of electronics and mathematics, and mechanical aptitude.

http://www.bls.gov/oco/ocos181.htm#nature

U.S. Department of Labor - Bureau of Labor Statistics Newsroom

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Automotive technology is rapidly increasing in sophistication, and most training authorities strongly recommend that people seeking work in automotive service complete a formal training program in high school or in a postsecondary vocational school or community college. However, some service technicians still learn the trade solely by assisting and learning from experienced workers. Acquiring National Institute for Automotive Service Excellence (ASE) certification is important for those seeking work in large, urban areas.

http://www.attstraining.com/index.html.

Training Solutions for Automotive Professionals

Article : Automotive service sectors Modernisation Pg : 18 – 28

Autocar – June 2008

RESEARCH METHODOLOGY

LITERATURE SURVEY

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Sampling Design:

The population size was 280 (across all service centers) and a sample size of 70 was chosen. Convenience sampling technique is chosen to select the samples.

3.2 Research design:

Interview method is used to collect the information from the employees. A series of questions are prepared and the employees are interviewed to collect factual data and to find the service team preparation to cope up the new technology

The objectives of using interview method are to maximize the response rate and to ensure that the obtained information is accurate and relevant to the study.

3.3 Research Objective:

To find out how the employees are well equipped to adopt new technology.

To find whether there is any significant relationship between the position of an employee in the organization and the level of acceptance of new technology.

3.4 Hypothesis:

To find whether there training on new technology which is embodied in latest car is given to the employee properly.

3.5 Data collection:

Primary data was collected from the employees using the interview. Secondary data was collected from the official records.

The employees are divided into 3 categories according to their organization levels. Managers, Technical trainers are considered as Higher level employees. Supervisor and advisor are considered as Middle level employees and Mechanics, attendees and etc are considered as Low level employees.

3.6 Data Analysis – Percentage Analysis

1. How would you rate your over all technical rating

S. No	Category	No of Persons	Percentage
1	Very Good	3	4
2	Good	7	10
3	Normal	58	83
4	Bad	2	3
5	Very bad	0	0
	Total	**70**	**100**

Table 1.1 Self rating of technical knowledge

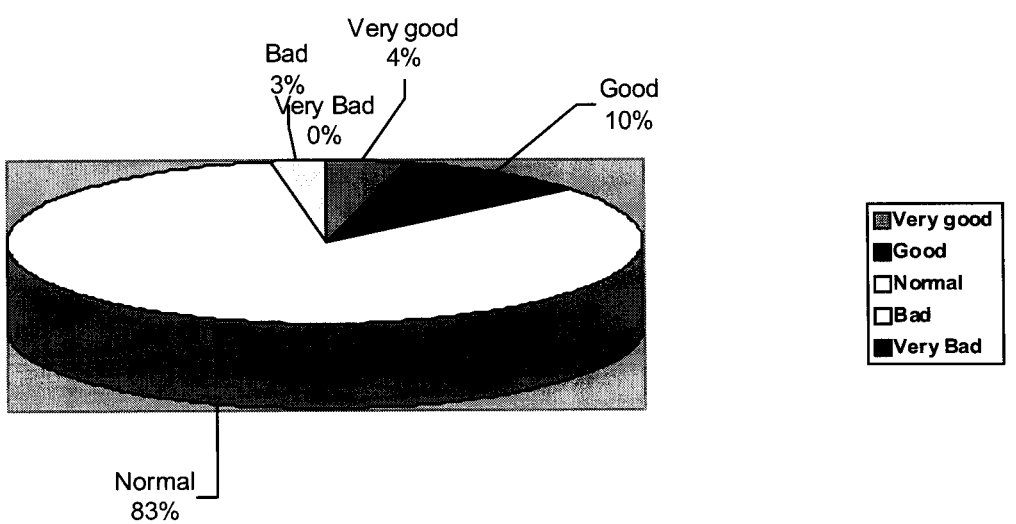

Chart 1.1 Self rating of technical knowledge

2. Is the training given is effective

S. No	Category	No of Persons	Percentage
1	Strongly Agree	9	13
2	Agree	18	26
3	Normal	36	51
4	Disagree	5	7
5	Strongly Disagree	2	3
	Total	**70**	**100**

Table 1.2 Training effectiveness

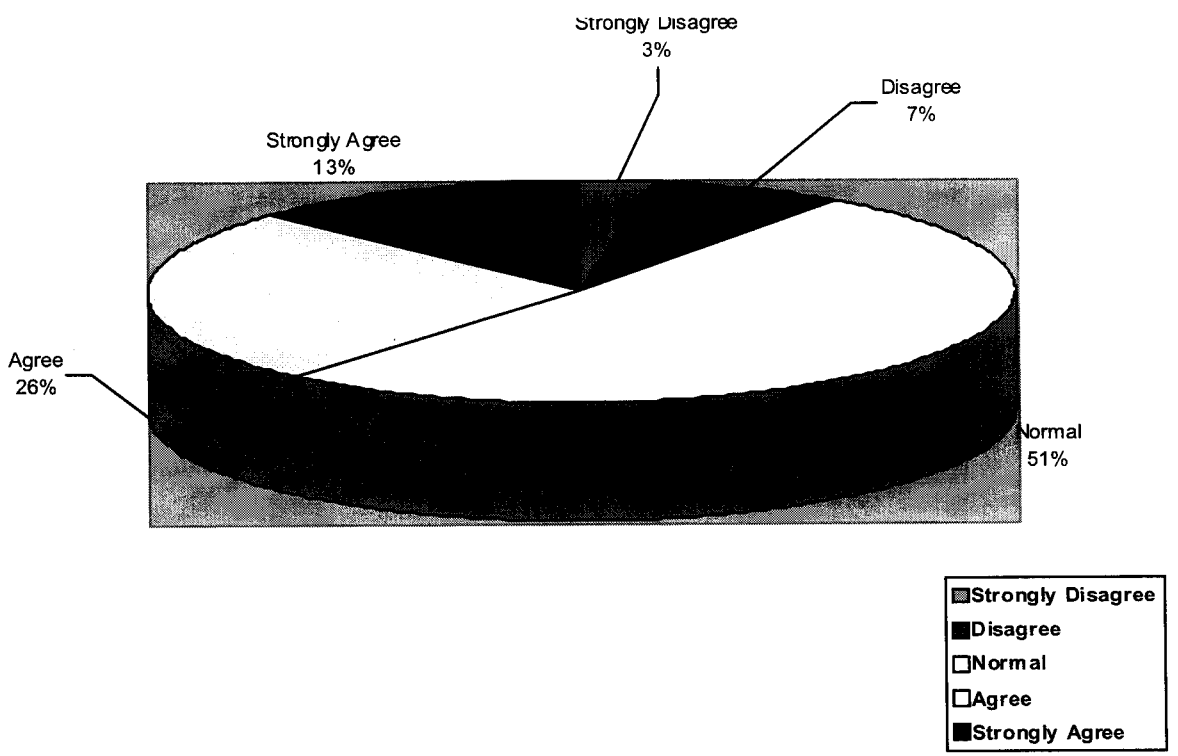

Chart 1.2 Training effectiveness

3. Whether you need some guidance/support from your superior for finding the problem

S. No	Category	No of Persons	Percentage
1	Strongly Agree	6	9
2	Agree	9	13
3	Normal	15	21
4	Disagree	35	50
5	Strongly Disagree	5	7
	Total	**70**	**100**

Table 1.3 Self reliance capability

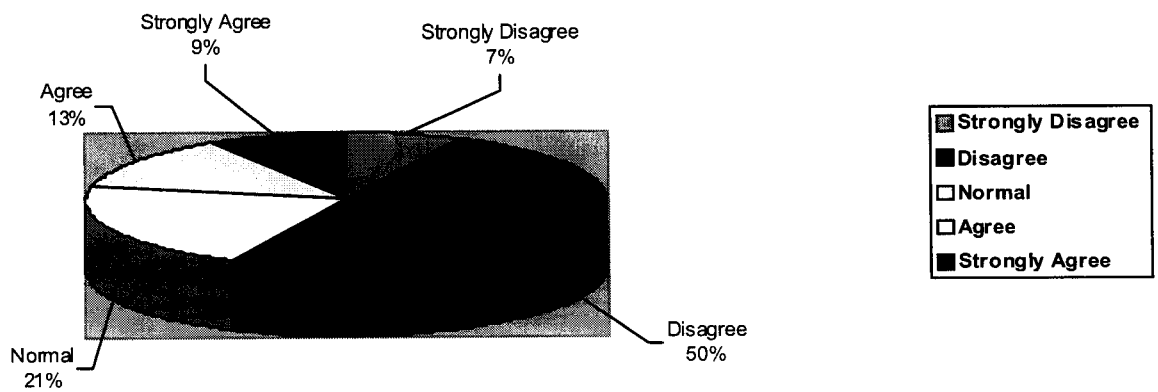

Chart 1.3 Self reliance capability

4. Are you aware of complete picture of the systems

S. No	Category	No of Persons	Percentage
1	Strongly Agree	7	10
2	Agree	28	39
3	Normal	18	26
4	Disagree	11	16
5	Strongly Disagree	6	9
	Total	**70**	**100**

Table 1.4 Awareness on complete picture of the system

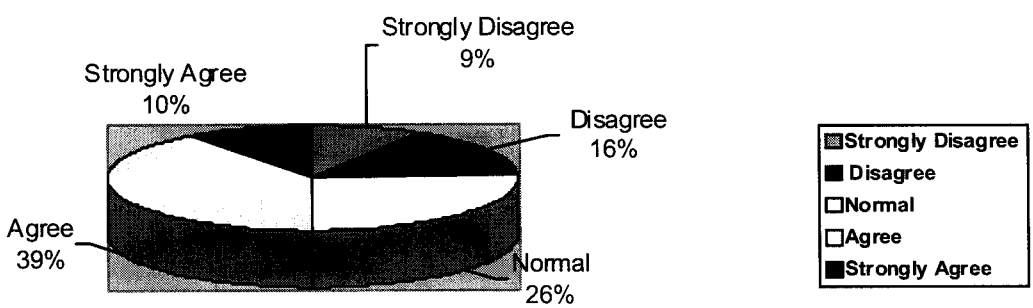

Chart 1.4 Awareness on complete picture of the system

5. Did management accepts the new technic\process\improvements created by you

S. No	Category	No of Persons	Percentage
1	Strongly Agree	11	16
2	Agree	42	60
3	Normal	10	14
4	Disagree	5	7
5	Strongly Disagree	2	3
	Total	**70**	**100**

Table 1.5 management acceptance of idea created by employees

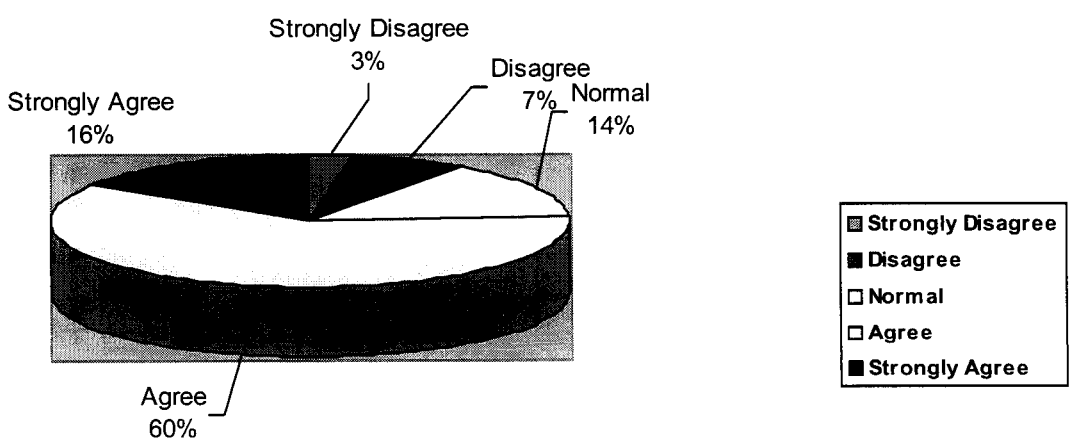

Chart 1.5 management acceptance of idea created by employees

6. Would you feel the training given by OEM is enough to make your work proper

S. No	Category	No of Persons	Percentage
1	Strongly Agree	3	4
2	Agree	10	14
3	Normal	48	69
4	Disagree	7	10
5	Strongly Disagree	2	3
	Total	**70**	**100**

Table 1.6 Concept understanding

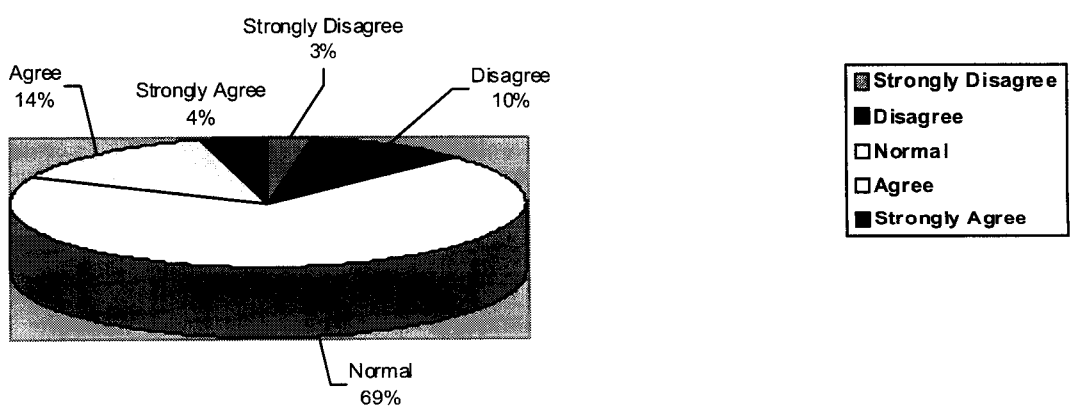

Chart 1.6 Concept understanding

7. would you feel diagnosing a problem is difficult

S. No	Category	No of Persons	Percentage
1	Strongly Agree	2	3
2	Agree	6	9
3	Normal	18	26
4	Disagree	33	46
5	Strongly Disagree	11	16
	Total	**70**	**100**

Table 1.7 Problem diagnosing

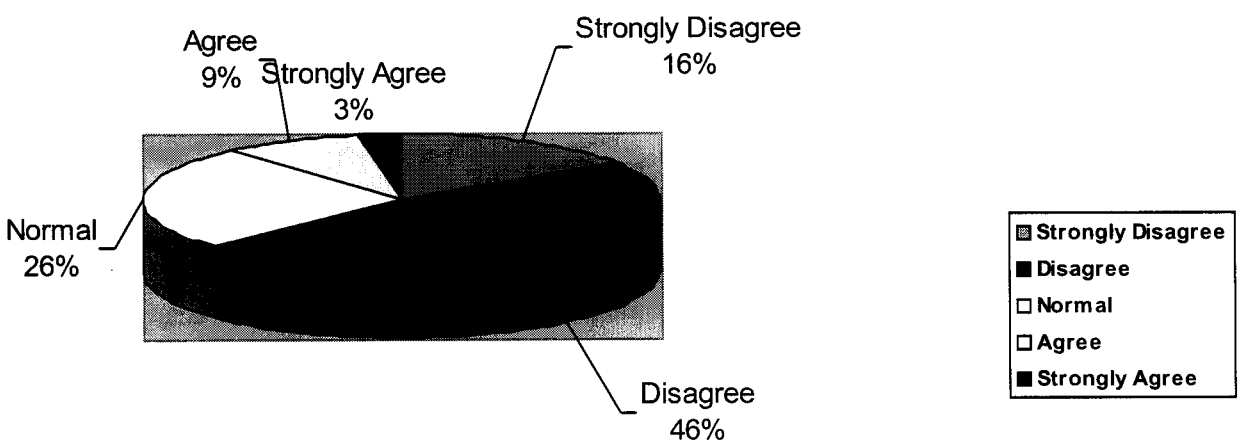

Chart 1.7 Problem diagnosing

8. Do you have proficiency to work on all models and variants

S. No	Category	No of Persons	Percentage
1	Strongly Agree	7	10
2	Agree	37	52
3	Normal	16	23
4	Disagree	6	9
5	Strongly Disagree	4	6
	Total	**70**	**100**

Table 1.8 proficiency to work on all models and variants

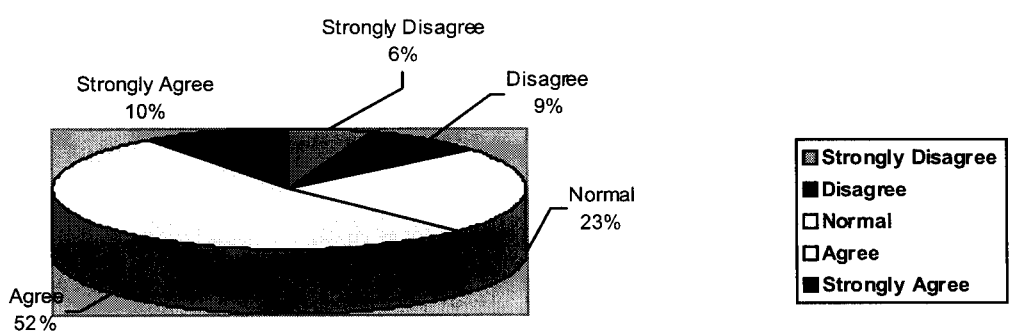

Chart 1.8 proficiency to work on all models and variants

9. Can you solve all problems raise around the car

S. No	Category	No of Persons	Percentage
1	Strongly Agree	3	4
2	Agree	13	19
3	Normal	21	30
4	Disagree	19	27
5	Strongly Disagree	14	20
	Total	**70**	**100**

Table 1.9 Solving all types of problem raise around the car

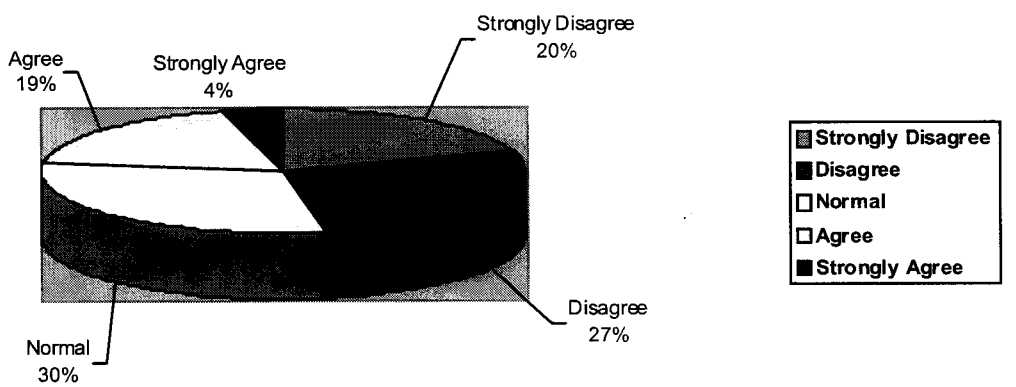

Chart 1.9 Solving all types of problem raise around the car

10. Is it possible to mange with out any supervisor (senior)

S. No	Category	No of Persons	Percentage
1	Strongly Agree	3	4
2	Agree	10	14
3	Normal	23	34
4	Disagree	19	27
5	Strongly Disagree	15	21
	Total	**70**	**100**

Table 1.10 possible to mange with out supervisor

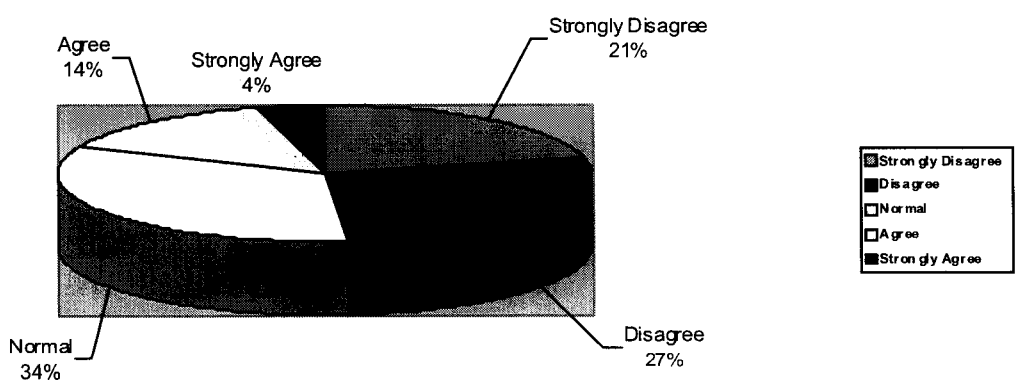

Chart 1.10 possible to mange with out supervisor

11. Whether tools help to perform you task effectively

S. No	Category	No of Persons	Percentage
1	Strongly Agree	11	16
2	Agree	41	58
3	Normal	16	23
4	Disagree	2	3
5	Strongly Disagree	0	0
	Total	**70**	**100**

Table 1.11 tools helps in performing task effectively

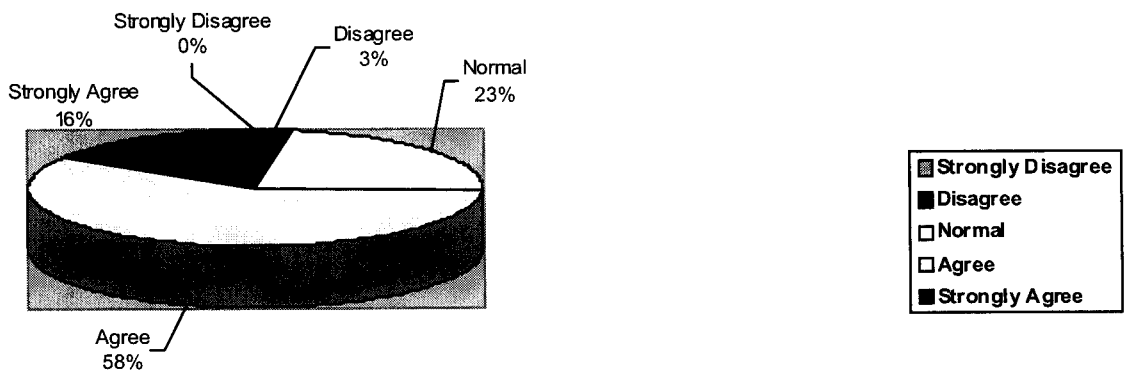

Chart 1.11 tools helps in performing task effectively

12. Would you feel more latest tool needs to be used to make job faster

S. No	Category	No of Persons	Percentage
1	Strongly Agree	1	1
2	Agree	2	3
3	Normal	7	10
4	Disagree	36	52
5	Strongly Disagree	24	34
	Total	**70**	**100**

Table 1.12 Need more latest tools

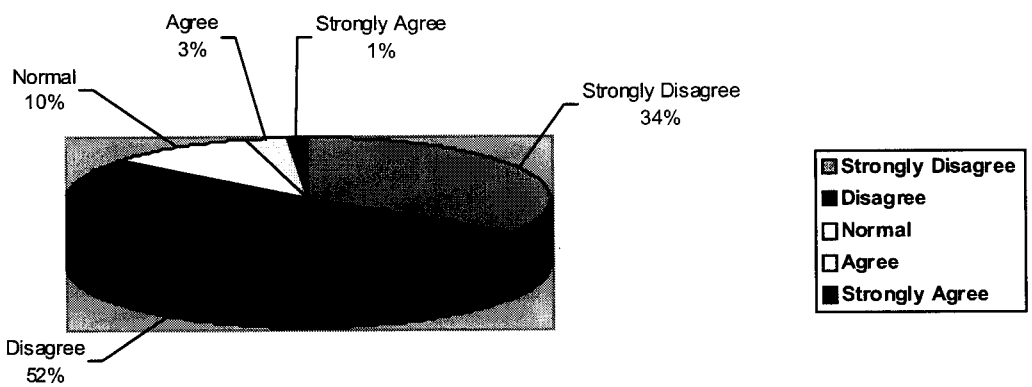

Chart 1.12 Need more latest tools

13. Spare part names are known properly

S. No	Category	No of Persons	Percentage
1	Strongly Agree	3	4
2	Agree	10	14
3	Normal	48	69
4	Disagree	7	10
5	Strongly Disagree	2	3
	Total	**70**	**100**

Table 1.13 Spare part names are known properly

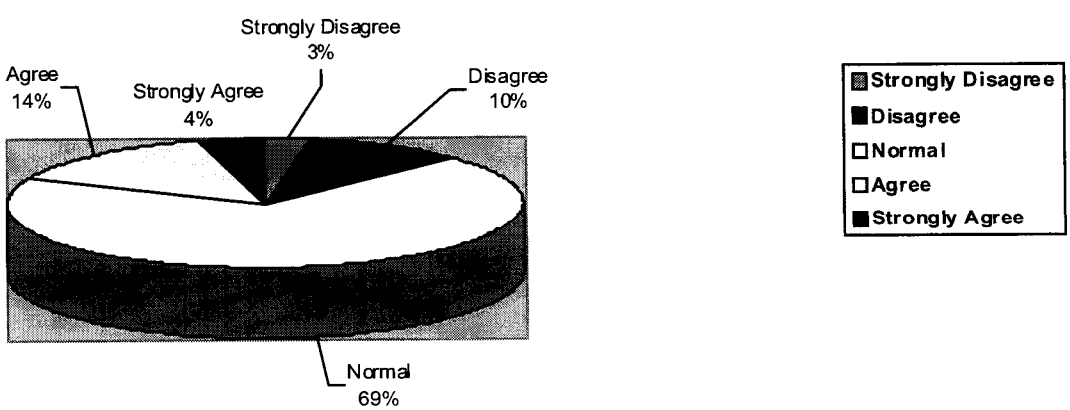

Chart 1.13 Spare part names are known properly

14. Is environment is available to learn new things

S. No	Category	No of Persons	Percentage
1	Strongly Agree	11	16
2	Agree	37	52
3	Normal	16	23
4	Disagree	4	6
5	Strongly Disagree	2	3
	Total	**70**	**100**

Table 1.14 Learning environment

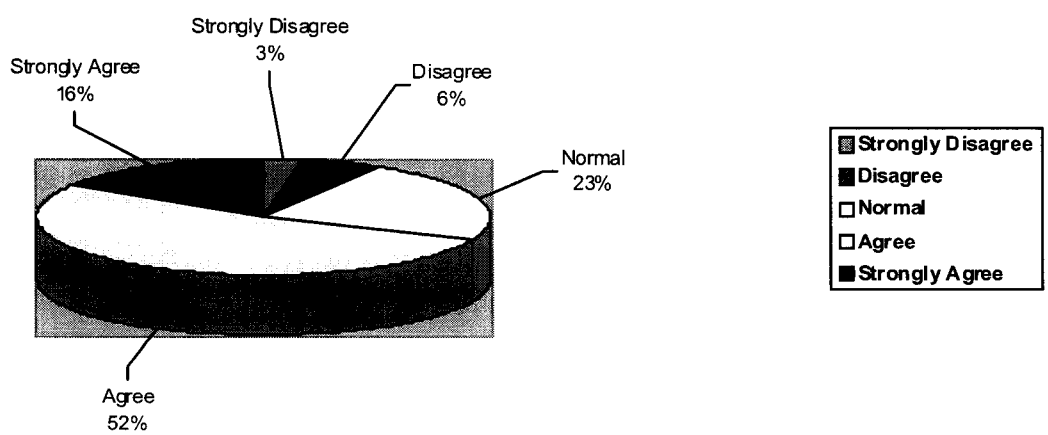

Chart 1.14 Learning environments

15. Are you interested to learn new things

S. No	Category	No of Persons	Percentage
1	Strongly Agree	3	4
2	Agree	19	27
3	Normal	28	41
4	Disagree	12	17
5	Strongly Disagree	8	11
	Total	**70**	**100**

Table 1.15 Interested in learning new things

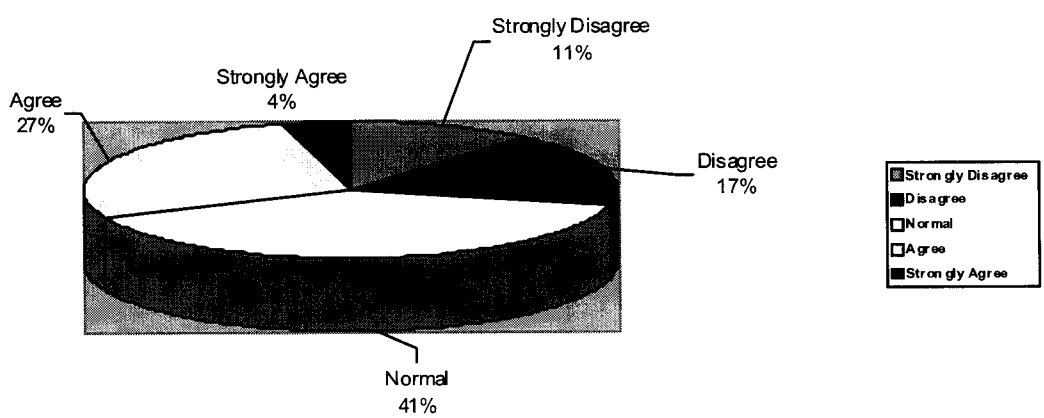

Chart 1.15 Interested in learning new things

16. You are strong in "Reading Text in manuals"

S. No	Category	No of Persons	Percentage
1	Strongly Agree	14	20
2	Agree	15	21
3	Normal	26	37
4	Disagree	11	16
5	Strongly Disagree	4	6
	Total	**70**	**100**

Table 1.16 Reading Texts

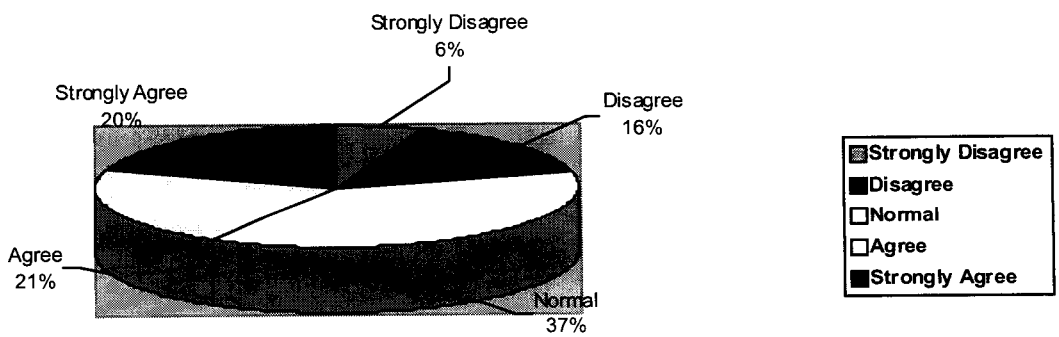

Chart 1.16 Reading Texts

17. You are strong in "Numeracy"

S. No	Category	No of Persons	Percentage
1	Strongly Agree	14	20
2	Agree	17	24
3	Normal	24	34
4	Disagree	13	19
5	Strongly Disagree	2	3
	Total	**70**	**100**

Table 1.17 Numeracy

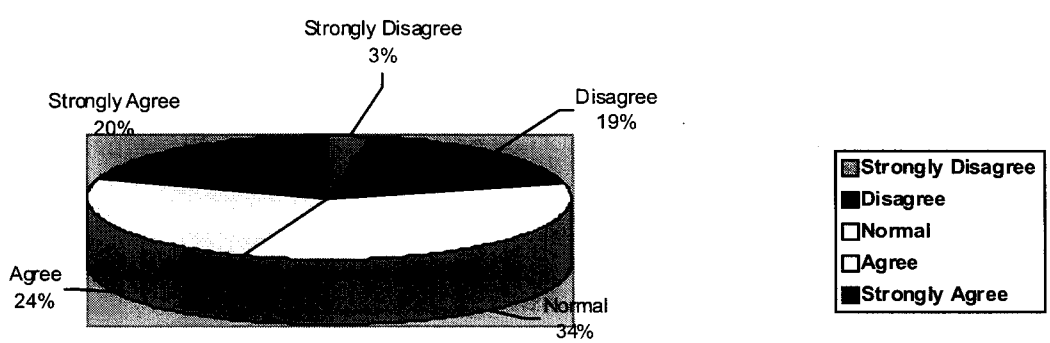

Chart 1.17 Numeracy

18. You are strong in "Writing Skills"

S. No	Category	No of Persons	Percentage
1	Strongly Agree	9	13
2	Agree	11	16
3	Normal	32	45
4	Disagree	14	20
5	Strongly Disagree	4	6
	Total	**70**	**100**

Table 1.18 Writing

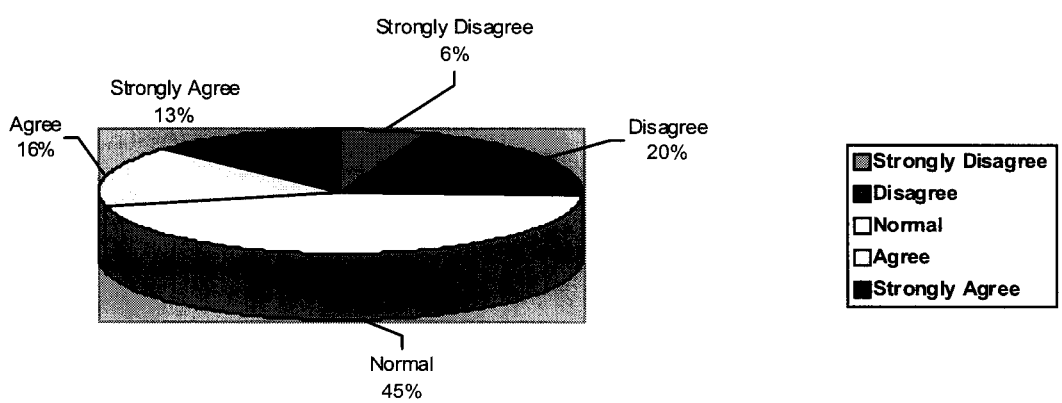

Chart 1.18 Writing

19. Your "Thinking Skills" is needed to your work

S. No	Category	No of Persons	Percentage
1	Strongly Agree	4	13
2	Agree	5	16
3	Normal	14	45
4	Disagree	35	20
5	Strongly Disagree	12	6
	Total	**70**	**100**

Table 1.19 Thinking Skills

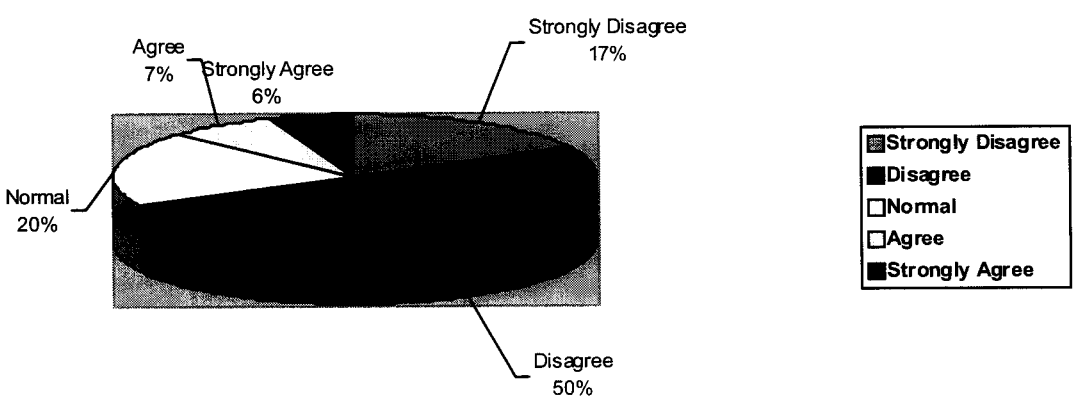

Chart 1.19 Thinking Skills

20. Your "Computer proficiency" is enough to your work

S. No	Category	No of Persons	Percentage
1	Strongly Agree	9	13
2	Agree	15	21
3	Normal	27	39
4	Disagree	14	20
5	Strongly Disagree	5	7
	Total	**70**	**100**

Table 1.20 Computer proficiency.

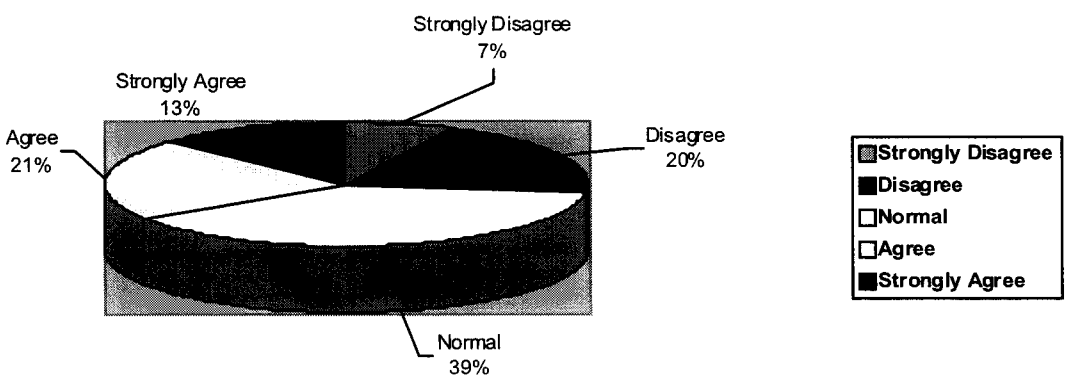

Chart 1.20 Computer proficiency.

Demographic data:

S. No	Position	No of Persons at each level
1	Higher Level	7
2	Middle Level	26
3	Lower Level	37
	Total	**70**

Table 2.1 No of persons in the higher, middle and lower positions

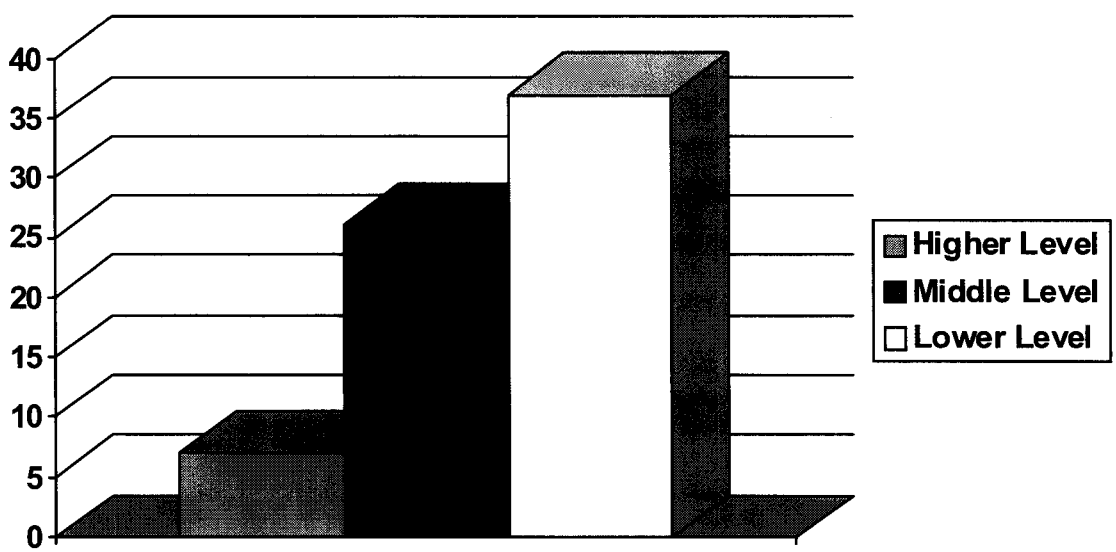

Chart 2.1 No of persons in the higher, middle and lower positions

ANOVA:

Analysis of Variance, enable us to test for the significance of the differences among more than two sample means.

Using analysis of variance, we will be able to make inferences about whether our samples are drawn from the population having the same sample mean.

Hypothesis:

To find whether service teams are capable of handling new technology with respect to their levels.

Null Hypothesis:

The service teams are not capable of handling new technology with respect to their levels.

Alternate Hypothesis:

The service teams are capable of handling new technology with respect to their levels

Calculations:

N=70

K=3

Grand Mean of the sample: 2.8257

n	Mean of X	Mean of Mean X	Mean – Mean of Mean X	(Mean – Mean of Mean X)^2	n*(Mean – Mean of Mean X)^2
7	3.1143	2.8257	0.2886	0.0833	0.5829
26	2.8404	2.8257	0.0147	0.0002	0.0056
37	2.7608	2.8257	-0.0649	0.0042	0.1559
				Variance 1 =	**0.7444/2=0.3722**

Table 3.1 Between Column Variance

n	Sum(Value – (Mean of X)^2)	Sum(Value – (Mean of X)^2)/(K-1)	(K-1)/(N-3)	(Sum(Value – (Mean of X)^2)/-1)*((K-1)/(N-3))
7	0.1236	0.0206	0.0896	0.0018
26	1.1801	0.0472	0.3731	0.0176
37	3.3357	0.0927	0.5373	0.0498
			Variance 2 =	**0.0692**

Table 3.2 Within Column Variance

F Value = Variance 1/ Variance 2

F Value = 0.3722/0.0692 = 5.3750

No of degrees of freedom in the numerator=2

No of degrees of freedom in the denominator=67

Degrees of freedom: Significance level = 0.05

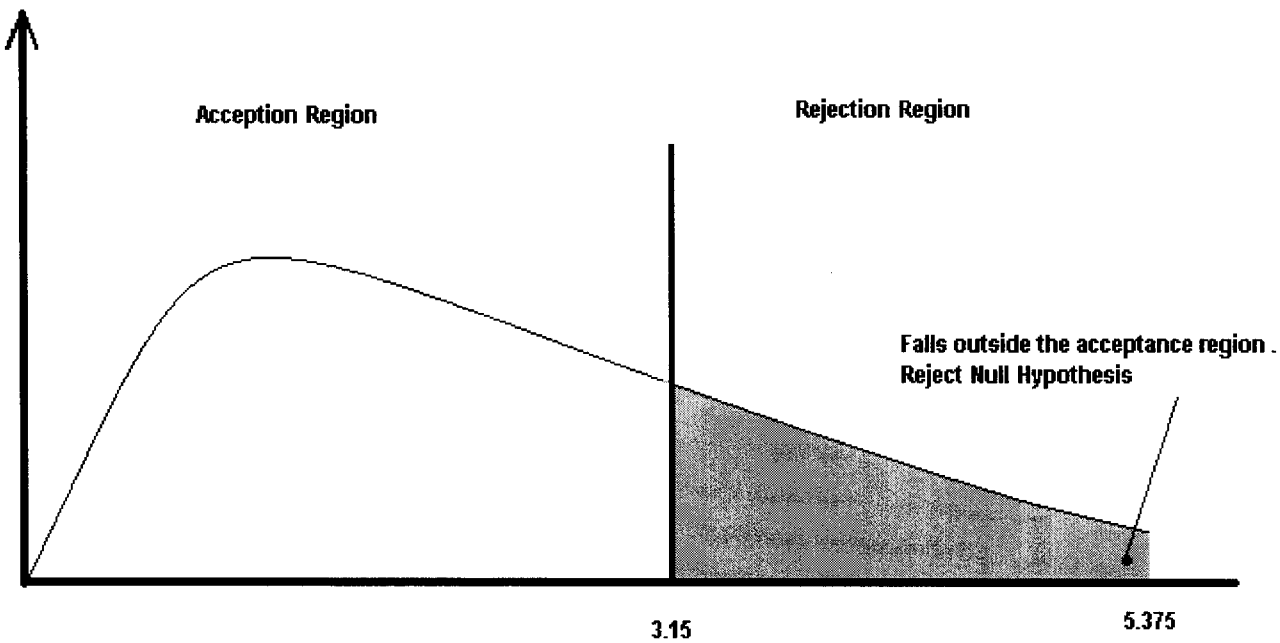

Fig 1.1 Hypothesis test at 0.05 level of significance

Since the F value falls outside the acceptance region, we reject null hypothesis and accept alternate hypothesis.

Therefore, the service teams are capable of handling new technology with respect to their levels

FINDINGS

CHAPTER 4

Findings:

- It is found from the above analysis that the most of the employees are trained on the technology according to their levels.
- Most of the employees are satisfied with the training given.
- Added to the above point, this will not be considered as the effective training as employees are not aware whole picture.
- Most of young employees are equipped to adopt service idea on technology.
- All employees are engaged of induction and training programs to get aware of the new technology.
- Most of the employees have self reliance capability.
- Most of the employees are aware of what is happening in industry.
- Management considers and response to the new ideas of employees
- Mostly all the employees say that the new technology change will have positive impact on future service quality.
- Many employees are capable of handling the modern tools properly.
- Most of the service centers have training centers inside the campus and updates the new technology quickly.
- Adopting new technology quickly will add value to the organization and business process.
- Very few have idea that implementing new technology is more risky to service with proper tools.
- Some higher level employees have capable of writing, reading and numeracy skills.
- Most of the employees are trained to operate computers.

Summary:

Data collected from the employees are analyzed using ANOVA test and it seems that the service teams are capable of handling new technology with respect to their levels.

From the data collected, it is proved that the people in the higher level employees are able to adapt to new technology than the lower level employees.

Since the higher level and middle level are trained frequently about the new technology, they are facilitating procedures and practices for the new technology. But the lower level employees are trained while the requirements come and training depth is limit as per their capability.The lower level peoples are not having much thinking skills.

Suggestions & Recommendations:

The lower level employees are needed to be allowed to make their own decision if it is good solution. The Information about the new technology change should be communicated to all the employees. The project planned should be shared to the employees so to make them aware on future projects. Proper induction programs and training programs need to be conducted to enhance the skill set of the employees. In case of this service sectors levels are need to consider making them aware on new technology.

There is some scarcity of well qualified and trained person. For addressing the gaps of industrial needs of no of qualified persons and presently available the following programs can be used.

I. Collaboration of institution for the Job oriented study.

II. Retention of well trained employees and experienced person.

Conclusion:

There is no doubt that automotive servicing in India is poised for growth. Even if new vehicle sales do not grow as expected, the requirements for servicing the existing vehicle population is not expected to diminish. Hence, a strong service sector is needed to support and sustain growth in the automotive industry.

As in any service sector, manpower plays a critical part in the success of automotive servicing. Currently, the sector faces key gaps in terms of numbers and skilled manpower. It is estimated that the automotive service sector would require manpower of about 0.5 million over the next 10 years. To meet this requirement, industry players may need to closely collaborate with technical training institutes to ensure a steady supply of trained employees. At the same time, players need to take steps to improve their employee retention, through focused recruitment and improved career planning and management.

From the above study it can be concluded that the service teams are capable of handling new technology with respect to their levels. Adopting new technology will enhance the organization service ability and provide more opportunity to compete well in the business market. Hence the process of adopting the new technology should be a continuous process.

APPENDIX

Questions:

1. How would you rate your over all technical rating

a. Very Good b. Good c. Normal d. Bad e. Very bad

2. Whether you need some guidance/support from your superior for finding the problem

a. Strongly Agree b. Agree c. Normal d. Disagree e. Strongly disagree

3. whether you need some guidance/support from your superior for finding the problem

a. Strongly Agree b. Agree c. Normal d. Disagree e. Strongly disagree

4. Are you aware of complete picture of the systems

a. Strongly Agree b. Agree c. Normal d. Disagree e. Strongly disagree

5. Did management accepts the new technic\process\improvements created by you

a. Strongly Agree b. Agree c. Normal d. Disagree e. Strongly disagree

6. Would you feel the training given by OEM is enough to make your work proper

a. Strongly Agree b. Agree c. Normal d. Disagree e. Strongly disagree

7. Would you feel diagnosing a problem is difficult

a. Strongly Agree b. Agree c. Normal d. Disagree e. Strongly disagree

8. Do you have proficiency to work on all models and variants

a. Strongly Agree b. Agree c. Normal d. Disagree e. Strongly disagree

9. Can you solve all problems raise around the car

a. Strongly Agree b. Agree c. Normal d. Disagree e. Strongly disagree

10. Is it possible to mange with out any supervisor (senior)

a. Strongly Agree b. Agree c. Normal d. Disagree e. Strongly disagree

11. Whether tools helps to perform you task effectively

a. Strongly Agree b. Agree c. Normal d. Disagree e. Strongly disagree

12. Would you feel more latest tool needs to be used to make job faster

a. Strongly Agree b. Agree c. Normal d. Disagree e. Strongly disagree

13. Spare part names are known properly

a. Strongly Agree b. Agree c. Normal d. Disagree e. Strongly disagree

14. Is environment is available to learn new things

a. Strongly Agree b. Agree c. Normal d. Disagree e. Strongly disagree

15 Are you interested to learn new things

a. Strongly Agree b. Agree c. Normal d. Disagree e. Strongly disagree

16. You are strong in "Reading Text in manuals"

a. Strongly Agree b. Agree c. Normal d. Disagree e. Strongly disagree

17. You are strong in "Numeracy"

a. Strongly Agree b. Agree c. Normal d. Disagree e. Strongly disagree

18. You are strong in "Writing Skills"

a. Strongly Agree b. Agree c. Normal d. Disagree e. Strongly disagree

19. Your "Thinking Skills" is needed to your work

a. Strongly Agree b. Agree c. Normal d. Disagree e. Strongly disagree

20. Your "Computer proficiency" is enough to your work

a. Strongly Agree b. Agree c. Normal d. Disagree e. Strongly disagree

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1. Business Research Methods by Donald R. Cooper and Pamela S. Schindler.

2. Statistics For Management by Richard I. levin , David S. Rubin