Chapter 4

Findings

In order to analyse the role of Total Quality Management among the ISO 9000 Certified Manufacturing Organisations in Kerala, four different facets of the effect of Total Quality Management have been analysed. The resultant findings are explained in the following sections.

4.1 Analysing the relationship of Total Quality Management and the quality management standard ISO 9000 among the ISO 9000 certified manufacturing organisations in Kerala

From analysing the responses of the managers on the practice of TQM it has been found that there exists significant relationship between the TQM practice and ISO 9000 certification among the ISO 9000 certified manufacturing organisations in Kerala. Also it has been inferred that the ISO 9000 certified manufacturing organisations follow Total Quality Management in a moderate level.

4.2 Analysing the relationship between Total Quality Management and organisational performance among the ISO 9000 certified Manufacturing organisations in Kerala

This part of the study is divided into two sections; firstly it throws light on how Total Quality Management is practiced in the ISO 9000 certified manufacturing organisations in Kerala; secondly it points out the effect of Total Quality Management on the organisational performance of the organisations under study.
4.2.1 Analysing the practice of Total Quality Management among the manufacturing organisations in Kerala

The practice of TQM among the ISO 9000 certified manufacturing organisations could be analysed through the relevance on the practice of the elements of TQM among the manufacturing organisations in Kerala. The managers' responses to these TQM elements are explained below;

4.2.1.1 Opinion of the managers' on whether they encourage employee suggestions in their organisation

By analysing the use of employee suggestion system among the ISO 9000 certified manufacturing organisations in Kerala, it was found that 65% of the managers' are of the opinion that the employee suggestion systems are valuable to their organisations.

4.2.1.2 Opinion of the managers' on the relevance of Quality circle in the organisations

From analysing the practice of the concept Quality Circle among the ISO 9000 certified manufacturing organisations in Kerala, it was found that 29% of the managers' were of the opinion that quality circles they practice in their organisations are for improving employee morale. The expected prime purpose of quality circle in a TQM environment is that of improving the employee morale. It has been found from the table that variable rank and the response rank were the same for all the factors with respect to the relevance of the quality circle. 28% of the managers' were of the opinion that quality circle is for product and process improvement. 20% of the managers were of the opinion that quality circle for reducing cost. 17% of the managers' were of the opinion that through the quality circle- supervisors feel that they are being watched. 10% of the managers' opined that the quality circle was practiced for some other reasons.
4.2.1.3 **Opinion of the workers’ on whether they are the members of the quality circle**

From the analysis on the workers membership in quality circle 44% of the workers opined that they were the members of the quality circle.

4.2.1.4 **Workers’ opinion on the reasons for joining in quality circle**

In a TQM environment the important reason for the workers joining in the quality circle is to have the pride contributing to company’s progress, and the variable rank for this is given as one, the response rank for this is also one. The next important reason from a TQM perspective is for acquiring friends and creating good atmosphere. For this variable the variable rank is two and the response rank is also two. The workers give third importance to the variable- recognition and improving social status, but the variable rank for this variable is also three, 21% of the managers opined the same. Also there are 11% of the workers who were of the opinion that they joined quality circle because of the pressure from the superiors.

4.2.1.5 **Managers’ opinion on the practice of Total productive maintenance**

From the analysis it was found that 30% of the managers’ were of the opinion that they practice TPM in their organisations.

4.2.1.6 **Managers’ opinion on the relevant factors adopted their organisation to implement and maintain TPM**

From analysing the relevant factors adopted by the ISO 9000 certified manufacturing organisations in Kerala, the following responses were found from the responses of the managers; TPM stands for making operators feel the ownership and responsible for equipment maintenance, for this the response rank is two and the variable rank is one. It has been opined by 26% of the managers’ that, adhering to schedules for preventive maintenance is the most important factor of TPM, the variable rank for this factor is three and the response rank is also three. The second important variable of TPM is analysing and forecasting equipment failures, this has
been opined by 36% of the managers as the most important factor of TPM, the response rank for this factor is one. 12% of the managers are of the opinion that in TPM, only complex activities are assigned to maintenance department.

### 4.2.1.7 Workers' opinion on the Practice of TPM

From analysing the perspective of the workers that do practice TPM, 25% of the workers were of the opinion that they follow TPM in their organisation. It has been inferred that there is no much difference in the response about the practice of TPM among the managers and workers, because 25% of the workers and the 30% of the managers were of the opinion that they practice TPM.

### 4.2.1.8 Workers' opinion on the factors adopted by their organisation to maintain TPM

By analysing the workers’ opinion on the factors adopted by their organisation to practice TPM, it has been inferred that the most important variable about TPM is that only complex activities are assigned to maintenance department. But this variable’s variable rank is four. The variable rank one is for the factor - Making operators feels ownership and responsible for equipment failures, this has the response rank as three. So it has been inferred that organisations need to educate the workers on what exactly TPM is about and also the purpose of TPM. 19% of the managers are of the opinion that TPM means adhering to PM policy.

### 4.2.1.9 Workers' opinion about their authority to do TPM

By analysing the workers’ opinion about the authority to do TPM, it was found that 42% of the workers were of the opinion that they have enough authority to do TPM.

### 4.2.1.10 Managers' opinion on the reason for practicing Ergonomics in the organisation

In a TQM environment the expected reason for the practice of ergonomics is to provide a suitable place for the worker, the variable rank
given for this variable is one and the response rank for this variable is three. The next most important function with respect to Ergonomics is that - Proper machine and controls to reduce mental and physical strain, for this the variable rank is Two and the response rank is four. The response rank is one for the variable– Ergonomics is for a people task organisation, but the variable rank is four for the same. By analysing the reasons for practicing ergonomics in the organisation it is found that most of the managers are having a different opinion on the logic of practicing ergonomics. None of the managers opined that Ergonomics principles are not applicable to their organisation.

4.2.1.11 Managers’ opinion on the relevance of teamwork

From analysing the managers’ opinion on whether there any programmes to develop teamwork, it was found that 48% of the managers are of the opinion that the organisations encourages to have teamwork and 52% of the managers' opined that they had programmes to develop teamwork in there organisation.

4.2.1.12 Programs adopted by the organisations to have team work

By analysing the programmes adopted by the organisations to have teamwork, 29% of the managers' were of the opinion that they encourage team work by encouraging informal gathering outside working hours. 24% of the managers' opined that they have formal meetings to have teamwork. 24% of the managers’ opined that they had formal meetings to have teamwork. 23% of the managers' opined that they have training programmes to have teamwork.

4.2.1.13 Managers' opinion about the subordinate- superior relationship

In a TQM environment it is expected that the subordinates consider their superiors as a “coach” or “facilitator”, a 20% of the managers’ opined the same and thereby the variable rank for this factor will be given as one but the response rank for this factor is two. This means that the expectation
about the superior subordinate relationship expected in a TQM environment is slightly different from the actual practice. Also 40% of the managers' opined that there exits a “team” relationship in their organisations. 20% of the managers' opined that a “Boss” relationship exists in the organisations. 7% of the managers' were of the opinion that only a working relationship exists with the superiors.

4.2.1.14 Workers’ opinion on superior- subordinate relationship

From analysing the workers’ opinion on the relationship between the subordinates and the superiors, it was found that 60% of the workers' were of the opinion that the superiors consider subordinates as a team member, that is the majority of the workers opined that the superior-subordinate relationship is as a “Team” style. The expected superior subordinate relationship in a TQM environment is as a “Coach”. 11% of the workers opined that there exists a “coach” relationship, and the response rank for the “Coach” relationship is two and the variable rank for this variable is one. There exist 16% of the workers who are of the opinion that they consider their superiors as a friend. Also 5% of the workers feel that there is only working relationship between superiors and subordinates.

4.2.1.15 Managers’ opinion on the basis for Supplier selection

By analysing whether the ISO 9000 certified manufacturing organisations in Kerala consider the relationship with the suppliers as important, it was found that only 10% of the managers’ were considering the relationship with the suppliers as the basis for supplier selection, and the variable rank is one and the response rank is four. The responding managers gave prime importance to the cost, quality and delivery time for the selection of the suppliers that is 47% of the managers’ are of the opinion that supplier selection is based on least cost, quality and delivery time. 15% of the managers’ opined that the supplier selection is based on quality alone. Also 23% of the managers are of the opinion that the supplier selection is based on the delivery time. 5% of the managers are
of the opinion that the supplier selection is based on the least cost; this aspect has received the response rank of five.

4.2.1.16 Managers’ opinion on the supplier relationship

By analysing the buyer-supplier relationship among the ISO 9000 certified manufacturing organisations in Kerala, it has been found that, the response rank is one for the factor – suppliers will be maintained for that year of supply, which means the organisations do not place an important position for the suppliers. The expected variable about the buyer-supplier relationship is that of maintaining the buyer-supplier relationship for a longer time, for this variable the response rank is three. There were 22% of the managers’ who were of the opinion that the buyer-supplier relationship will be maintained till a new design has been developed. 21% of the managers’ were of the opinion that the buyer-supplier relationship will lasts only till the end of the supply of materials. 28% of the managers are of the opinion that the buyer-supplier relationship will be maintained for that year of supply. 22% of the managers opined that the relationship will be maintained for a longer time. 8% of the managers opined that there is no special relationship with the suppliers.

4.2.1.17 Managers’ opinion on the supplier development

By analysing how the suppliers are developed in the ISO 9000 manufacturing organisations in Kerala, it has been opined by 38% of the managers that supplier development was not practiced in their organisations. It has been opined by 13% of the managers that supplier development was done by providing technical support to the suppliers. 20% of the managers’ were of the opinion that supplier development was done by giving supply orders without bidding. 10% of the managers’ opined that this relationship was maintained through providing Political/ business influence of the buyer to help the suppliers. 19% of the managers’ are of the opinion that they develop their suppliers by providing financial support to the suppliers.
4.2.1.18 Workers’ opinion on whether they faced any problems with the quality of materials supplied

From analysing whether there was any problem with the materials supplied, it was found that 60% of the workers were of the opinion that they had problem with the materials supplied to them.

4.2.1.19 Workers’ opinion on the type of problems with the materials supplied

By analysing the problems with the materials supplied, 38% of the problems were with the quality of the materials supplied, 37% of the problems were with the quantity of the materials supplied. 22% of the problems were with the time delay and 3% of problems due to other reasons.

4.2.1.20 Workers’ opinion on whether they get same type of materials all the time

By analysing whether the workers get the same type of materials all the time, it was found that 63% of the situations they get the same type of the materials. In 37% of the instances the workers are not getting the same type of materials.

4.2.1.21 Workers’ opinion on whether the work was affected by the change in the type of materials supplied

By analysing whether the workers’ work was affected by the change in the type of materials supplied, it was opined that 55% of the workers’ were of the opinion that the change in the material had affected their work. 45% of the workers opined that there work will not be effected with the change in the material.

4.2.1.22 Workers’ opinion on the problems that the workers faced with the change in the type of materials supplied

By analysing the type of problems the workers’ faced with the change in the type of materials supplied, it was found that 37% of the workers’ were of the opinion that the main problem was that it needs more time to do the rework. 22% of the workers’ opined that the change in the type of materials supplied will reduce the quality of the finished product. 28% of the workers
opined that it needs more materials to do the work. 13% of the workers’ were of the opinion that they need to learn new techniques.

4.2.1.23 Managers’ opinion on the functions of R&D department in the organisation

By analysing the functions of R&D department in an organisation it was found that 31% of the managers’ are of the opinion that R&D department is for enabling continuous improvement. 29% of the managers’ are of the opinion that R&D department is for developing new products. 21% of managers’ opined that the R&D department is to do the value analysis. 16% of the managers’ are of the opinion that R&D department is for testing the products. 3% of the managers’ are of the opinion that R&D department is not functioning in their organisation.

4.2.1.24 Managers’ opinion on the responsibility for product design and development

By analysing managers’ opinion on the responsibility for product design and development, it was opined by 38% of the managers that a team of employees from different departments is responsible for the design and development of the new products. 35% of the managers’ were of the opinion that the new product design and development is the responsibility of the R&D department. 12% of the managers’ were of the opinion that a team consisting of employees and suppliers perform the new product design and development. 10% of the managers’ were of the opinion that consultants do the new product design and development. 5% of the managers’ are of the opinion that the new product design and development is not applicable in their organisations.

4.2.1.25 Managers’ opinion on the extent of up-gradation of technology

By analysing the extent of up-gradation of the technology among the organisations studied, it was found that. 29% of the managers’ were of the opinion that they upgrade the technology on a scheduled period on a continuous basis. 31% of the managers’ are of the opinion that the technological up-gradation is done as value analysis demands. 23% of
the managers’ opined that the technological up gradation is based on expected investments. 17% of the managers’ are of the opinion that the technological up-gradation was done when existing technology was outdated.

4.2.1.26 Workers’ opinion on the responsibility of the new product development

By analysing the use of interdisciplinary approach to product design and development, it was found that 13% of the workers’ were of the opinion that a team of employees from different departments are responsible for the design and development of the new products. 61% of the workers’ were of the opinion that the new product design and development is the responsibility of the R&D department alone. 14% of the workers’ were of the opinion that a team consisting of employees and suppliers does the new product design and development. 12% of the workers’ were of the opinion that a consultant does the new product design and development.

4.2.1.27 Managers’ opinion on the responsibility for the quality

By analysing the managers’ perception about the responsibility of the quality by the organisational members it was found that 7% of the managers’ are of the opinion that quality is the responsibility of the senior managers. 6% of the managers opined that quality is the responsibility of middle level managers. 10% of the managers’ opined that quality is the responsibility of the supervisors. 18% of the managers’ opined that the quality is the responsibility of workers. 59% of the managers’ opined that quality is the responsibility of every one in the organisation.

4.2.1.28 Managers’ opinion on whether they practice the Internal Customer concept

By analysing the ISO 9000 certified manufacturing organisations in Kerala in terms of the practice of TQM in their organisations it was found that 33% of the managers’ opined that they practice internal customer concept in their organisations.
4.2.1.29 Managers' opinion on the meaning of Internal Customer Concept in their organisation

By analysing the meaning given by the ISO 9000 certified manufacturing organisations in Kerala, for internal customer concept it was found that. 28% of the managers’ opined that, internal customer concept means all departments have a customer. The internal customer means selling is not always required as opined by 10% of the managers’. 19% of the managers’ are of the opinion that for them the internal customer means identifying and satisfying the customer. 34% of the managers’ are of the opinion that internal customer concept means everyone within the organisation as a customer. 9% of the managers’ are of the opinion that there are other meanings to internal customer concept. The variable rank and the response rank is the same for all the variables.

4.2.1.30 Managers' opinion on the attitude of labour unions about quality improvement practices

By analysing the attitude of the labour unions it was found 44% of the managers’ are of the opinion that the labour unions had a positive attitude towards quality improvement initiatives. 39% of the managers’ are of the opinion that the labour union attitude is neutral. 9% of the managers’ are of the opinion that labour union had a negative attitude towards quality improvement initiatives. 8% of the managers’ are of the opinion that the labour unions’ attitude was not applicable in their organisations.

4.2.1.31 Managers' opinion on the extent to which the superiors lead in a way that is consistent with the aims of the organisation

By analysing how the superiors led the organisation that is consistent with the aims of the organisation, it was found that 32% of the managers’ are of the opinion that, specificity of quality in companies’ business plan is of great importance. 27% of the managers’ are of the opinion that, acceptance of responsibility for quality by major departmental heads is more important. 17% of the managers’ are of the opinion that,
team building and group dynamics training for employees is more important. 13% of the managers’ are of the opinion that, involving employees in goal setting for quality is more important. 11% of the managers’ were of the opinion that this aspect was not applicable to them.

4.2.1.32 Managers’ opinion on whether the superiors appreciate the subordinates on their performance about quality

By analysing whether the superiors appreciate the value of having better quality of work, it was opined by 77% of the managers’ that in their organisations they appreciate the subordinates for having better quality in their work.

4.2.1.33 Workers’ opinion on the responsibility on quality improvement

By analysing the workers’ perception about the responsibility of the quality by the organisational members it was found that. 8% of the workers’ are of the opinion that quality is the responsibility of the middle level managers. 7% of the workers’ opined that the quality is the responsibility of workers. 10% of the workers’ opined that quality is the responsibility of the supervisors. 19% of the workers’ opined that the quality is the responsibility of workers. 56% of the workers’ opined that quality is the responsibility of every one in the organisation.

4.2.1.34 Workers’ opinion on whether they think that different departments work for a common goal

By analysing whether different departments work for a common goal, it was found that 73% of the workers’ are of the opinion that different departments work for a common goal.

4.2.1.35 Workers’ opinion on whether they practice 5S

By analysing whether the organisations practice 5S methodology in their organisations it was found that, 57% of the workers’ were of the opinion that they practice 5S methodology in their organisations.
4.2.1.36 Managers' opinion on whether their organisation is committed to quality improvement practices

This question has been asked to the managers’ to know the managers’ opinion about whether their organisations are committed towards quality management practices. It has been observed that 74% of the managers’ are of the opinion that their organisations are committed to the quality improvement practices. 26% of the managers’ are of the opinion that quality management practices are not practiced in their organisations.

4.2.1.37 Managers’ opinion on how their organisation is committed to quality

By analysing organisational commitment towards quality, it is found that 33% of the managers’ were of the opinion that organisation is committed to quality by setting objectives for quality improvement. 20% of the managers' were of the opinion that it was made possible by the senior officers demonstrating the importance of quality. 16% of the managers’ were of the opinion that by making long term plans for quality the organisation’s commitment towards quality was demonstrated. 31% of the managers’ were of the opinion that by continuously improving products/process the organisations demonstrates the importance of the quality.

4.2.1.38 Relative importance given by the managers’ on quality, cost of production and production schedule

By analysing the maximum importance given by the organisation among; quality of products, cost of production, meeting schedule, and quality of process. It was found that 41% of the managers’ are of the opinion that qualities of products are important for their organisations. 23% of managers’ were of the opinion that quality of process is of the second importance. 15% of the managers’ are of the opinion that cost of production is most important. 23% of the managers’ had opined that quality of processes is most important and 21% of the managers’ had opined that meeting schedule is most important.
4.2.1.39 Relative importance given by the workers’ on quality, cost of production and production schedule

By analysing the maximum importance given by the workers on the quality of products, cost of production, meeting schedule, and quality of process, it was found that 39% of the workers opined that quality of products is important for their organisations. The variable rank and the response rank were the same for this aspect. In total 30% of the managers were of the opinion that quality of process is of great importance in their organisations. For all other variables too the variable ranking and the response ranking were the same.

4.2.1.40 Managers’ opinion on their role in effective implementation of quality

The managers’ important role in the effective implementation of quality is to implement quality throughout their organisation. This has been opined by most of the managers and thereby the response rank and the variable rank is one for this variable. The second important role of the managers is to persuade other employees to maintain the value of having quality, for this variable the response rank is three. This means that the manager do not feel that this is the second important variable. For the managers the second important variable is that of always maintaining quality responsibility. For the third and fourth factor the response rank and the variable rank were the same.

4.2.1.41 Managers’ opinion on the importance given to quality, quantity, time and other factors while in fixing work standard

TQM emphasis on placing importance on quality in fixing the standard for the work-standard and thereby quality in the work-standard placed most important and the variable rank has been given as one for this variable. By analysing the importance given by the ISO 9000 certified manufacturing organisations in Kerala on fixing the basis of the work standard it has been opined by 51% of the managers’ that quality is the basis of work standard. The variable rank and the response rank for this
variable is one. The other variables response rank and the variable rank comparison are of no relevance in an organisation which is expected to practice TQM, because it is expected in a TQM perspective that quality should be the basis of work standard. Also there are 26% of the managers' who were of the opinion that quantity is the prime basis of work standard.

4.2.1.42 Workers’ opinion on whether their Organisation is committed to quality

By analysing the workers' perception about the whether their Organisation is committed to quality, it was found that 75% of the workers' are of the opinion that their organisation is committed to quality.

4.2.1.43 Workers’ opinion on how their organisation is committed to quality

When an organisation is said to follow TQM, when its senior officers are demonstrating the importance of quality they are able to transfer this concept of quality consciousness to everyone in the organisation. So this aspect is given the variable rank as one. By analysing organisational commitment towards quality, it is found that 38 % of the workers were of the opinion that their organisation is committed to quality through setting objectives for quality improvement and the response rank for this is one and the variable rank is four. 23% of the workers' were of the opinion that, the organisation is committed to quality made by the senior officers demonstrating the importance of quality and the variable rank for this is one and the response rank is two for this variable. The response rank and the variable rank is the same for the variable “making long term plans for quality”. For the variable continuously improving products and process the variable rank is two but the response rank is two.

4.2.1.44 Workers’ opinion on whether the money allocated for the maintenance of quality were adequate

By analysing the responses on whether money allocated for maintenance and improvement of quality is adequate, it was opined by
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75% of the workers that money allocated for maintenance and improvement and improvement of quality was not adequate.

4.2.1.45 Managers' opinion on whether they obtain customer feedback

From the survey to analyse whether the organisations obtain customer feedback it was observed that 79% of the managers' were of the opinion that they obtain the customer feedback. 21% of the managers' were opined that they do not obtain any feedback from the customers.

4.2.1.46 Managers' opinion on the extent of use of customer satisfaction surveys for quality improvement

Customers were given an important position in the philosophy of TQM. Practicing of marketing concept is very much expected in an organisation that is identifying the need of the customer and satisfying the needs of the customer is what is expected in an organisation which is said to practice TQM. From analysing the responses of the managers, it has been found that, in all the variables, variable rank and the response ranks were the same. It has been inferred that the ISO 9000 manufacturing organisations places an important consideration to the customers.

4.2.1.47 Managers' opinion on the awareness of the customer satisfaction survey results by the functional managers

By analysing whether functional managers are aware of the customer survey results, it was found that 52% of the managers were of the opinion that the functional managers are aware of the customer survey results. 48% of the managers are of the opinion that the functional managers are not aware of the customer survey results.

4.2.1.48 Managers' opinion on whether the sales and marketing people use quality as a saleable attribute

From analysing whether the sales and marketing people consider quality as a saleable attribute, it was found that 63% of the managers' consider that their sales and marketing people consider quality is a saleable attribute.
4.2.1.49 Managers’ opinion on whether they practice benchmarking

By analysing that the ISO 9000 certified manufacturing organisations in Kerala practice benchmarking in their respective organisations it was found that 30% of the managers opined that they practice benchmarking in their organisations.

4.2.1.50 Managers’ opinion on the benefits of benchmarking

By analysing the opinion of the managers in terms of the benefits that they derive from benchmarking it was found that 21% of the managers’ opined that the benchmarking could convince the people the credibility of the targets. 28% of the managers’ opined that benchmarking helped in performance improvement. 15% of the managers were of the opinion that benchmarking as a basis for training. 14% of the managers opined that benchmarking could improve customer expectations. 22% of the managers opined that benchmarking could reduce cost and cycle time.

4.2.1.51 Managers’ opinion on with whom do they benchmark

By analysing the ISO 9000 certified manufacturing organisations in Kerala, it was found that 38% of the managers opined that they benchmark the organisations in the same industry. 17% of the managers are of the opinion that they benchmark award winners. 16% of the managers’ are of the opinion that they benchmark organisations of the different industry. 12% of the managers are of the opinion that they benchmark organisations in the same locality. 17% of the managers’ are of the opinion that benchmarking is not applicable in their organisation.

4.2.1.52 Managers’ opinion on whether they provide training for employees on a continuous basis

By analysing the organisations in terms of providing training for their employees on a continuous basis it was opined by 52% of the managers’ that they provide training for employees on a continuous basis.
4.2.1.53 Managers’ opinion on the topics covered in the quality training curriculum

By analysing the topics covered in the quality training curriculum, it was found that 37% of the managers were of the opinion that great emphasis is on quality awareness. 19% of the managers were of the opinion that process management had given priority in their training programmes. 31% of the managers were of the opinion that quality measurement and statistical methods had given priority in their training programmes. 13% of the managers were of the opinion that group dynamics had been given priority in their training programmes.

4.2.1.54 Workers’ opinion on the frequency of employees meeting

By analysing the workers opinion on the frequency of employees meeting, it was found that 26% of the workers agreed they had weekly meetings, 25% of the workers were opined that they had training on a monthly basis, 17% of the workers mentioned that they had daily meetings and 33% of the workers opined that the meetings are organised in their organisation - as necessary arrangement.

4.2.1.55 Workers’ opinion on whether they received training on quality

By analysing whether the employees receive training about quality, it was opined by 36% of the workers that they have received training about quality from their organisation.

4.2.1.56 Workers’ opinion on the type of training they followed

By analysing the type of training adopted by the organisations, it was found that, 48% of the workers have received on-the-job training. 28% of the workers mentioned that they had off-the-job training in their organisation, and 24% of the workers were of the opinion that they had both type of training in their organisation.
4.2.1.57 Workers’ opinion on the topics covered in the quality training

By analysing the topics covered in the quality training curriculum, it was found that 33% of the workers’ were of the opinion that great emphasis is on quality awareness. 29% of the workers were of the opinion that process management and defect prevention had been given priority in their training programmes. 24% of the workers were of the opinion that quality measurement had been given priority in their training programmes. 14% of the workers opined that training emphasised on teaching techniques for using statistical tools.

4.2.1.58 Workers’ opinion on the attitude of the labour unions towards quality initiatives

By analysing the attitude of labour unions in an organisation towards quality initiatives, it was found that 20% of the workers’ were of the opinion that labour unions had a positive attitude towards quality initiatives. 30% of the managers’ were of the opinion that the labour unions had neutral attitude. 50% of the workers’ opined labour unions had negative attitude towards quality initiatives.

4.2.1.59 Managers’ opinion on the uses of SPC tools used in the organisations

By analysing the purpose for which the organisations use SPC tools in ISO 9000 certified manufacturing organisations in Kerala, it was found that 7% of the managers’ were of the opinion that SPC tools were for knowing the cost of quality. 25% of the managers’ opined that the SPC tools were used for root-cause corrective action. 25% of the managers’ are of the opinion that they use SPC tools for analysing the process quality. 22% of the managers’ are of the opinion that they use the SPC tools to compare the desired level of quality performances with the actual. 21% of the managers’ are of the opinion that SPC tools were not used in their respective organisations.
4.2.1.60 Managers' opinion on whether they display statistical evidence of change in quality

By analysing whether the ISO 9000 manufacturing organisations in Kerala displays statistical evidence of change in quality in their organisation, it was found that 34% of the managers were of the opinion that they display the same.

4.2.1.61 Managers’ opinion on the method of inspection practiced for raw-materials

By analysing the type of inspection practiced for inspecting raw-materials in the organisations it was found that the 17% of the managers opined 100% inspection. 76% of the managers opined the sampling method. 7% of the managers opined the method of inspection as Lot-by-lot inspection.

4.2.1.62 Managers’ opinion on the method of inspection practiced for work-in-process inventories

Among the ISO 9000 manufacturing organisations in Kerala, it was found that the 4% of the managers opined that they follow 100% screening. 41% of the managers’ opined those organisations adopt sampling method of inspecting WIP inventories. 35% of the managers’ opined that organisations follow Lot-by-lot inspection. 19% of the managers’ opined that organisations follow process inspection and there are 1% of the managers opined that other type of inspection practiced in the organisations.

4.2.1.63 Managers’ opinion on the method of inspection practiced for finished goods

By analysing the type of inspection practiced to inspect finished goods. Among the ISO 9000 manufacturing organisations in Kerala, It was found that 15% of the managers’ were following 100% screening. 38% of the managers’ were of the opinion that their organisations adopt sampling method of inspecting finished goods. 47% of the managers were of the opinion that the organisations follow Lot-by-lot inspection.
4.2.1.64 Managers’ opinion on the method of inspection practiced for Supplies

By analysing the type of inspection practiced to inspect supplies, among the ISO 9000 manufacturing organisations in Kerala, it was found that 4% of the managers’ were of the opinion that they follow 100% screening. 39% of the managers’ were of the opinion that their organisations adopt sampling method of inspecting finished goods. 57% of the managers’ were of the opinion that their organisations follow Lot-by-lot inspection.

4.2.1.65 Workers’ opinion on the extent of use of SPC tools in manufacturing

By analysing the use of SPC tools in manufacturing it was found that, 33% of the workers were of the opinion that they use SPC tools in their work.

4.2.1.66 Workers’ opinion on the reasons for using Statistical Process Control (SPC) tools

By analysing the purpose for which the workers use the SPC tools it was found that, 26% of the workers opined that SPC tools were used for knowing the cost of quality. 15% of the workers were of the opinion that they use SPC tools for performing root-cause corrective action. 18% of the workers were of the opinion that SPC tools were used to reward good performers. 32% of the managers opined that SPC tools were used for comparing desired with actual. 9% of the workers opined that there were other uses for SPC tools.

4.2.1.67 Workers’ opinion on the type of statistical process control tools and techniques used

By analysing the SPC tools and techniques used in the organisations, it was opined by the 33% of the workers that they use flow chart in their organisations. 20% of the workers opined that they use control charts. 39% of the workers opined that they use Bar-charts, pie-charts etc. in their organisations. 5% of the workers were of the opinion that they used Pareto diagram in their organisation.
4.2.1.68 Managers' opinion on whether they Discuss quality related issues in the executives' meeting

By analysing the responses of the managers' opinion on whether they discuss quality related issues in the executives meeting, it was found that 70% of the managers said that they discuss quality related issues in their meetings.

4.2.1.69 Topics discussed in meetings about quality

By analysing the responses of the managers' of ISO 9000 certified manufacturing organisations, it was found that 13% of the managers agree that they mostly discuss cost of non-conformance to quality as the important issue. 21% of the managers were of the opinion that failure cost analysis is of importance. 25% managers opined that they discuss root-cause prevention methods in their organisation. 41% of the managers are opined that performance appraisal is of importance for them.

4.2.1.70 Managers' opinion on the providing of feedback to the employees on their performance

To know the managers' opinion about providing feedback to the employees on their performance with respect to quality, the managers' perception about the same is as follows. 12% of the managers are of the opinion that they never provided feedback on workers performance. 30% of the managers are of the opinion that they provided the feedback occasionally. 39% is of the opinion that they sometimes provide the feedback on the workers performance. 19% of the managers opined that they often provide the feedback.

4.2.1.71 Managers' opinion on how the employees report any working conditions that interfere with quality

By analysing how do the employees of ISO 9000 certified manufacturing organisations report any working conditions that interfere with quality, it was found that 45% of the managers opined that their workers report the same to the supervisor immediately. 17% of the managers are of the opinion that workers report this matter to the
inspection or maintenance department immediately. 22% of the managers opined that the workers discuss the problem in the quality circle meeting. 16% of the managers opined that the workers were afraid to report the same.

4.2.1.72 Managers’ opinion on whether there is any cell / forum to discuss and clarify the queries of the employees regarding quality

By analysing whether the ISO 9000 certified manufacturing organisations in Kerala have cells or forums to discuss and clarify the queries of the employees regarding quality, it was found that 58% of the managers were of the opinion that they have the same in their respective organisations.

4.2.1.73 Managers’ opinion on the type of cell/forums to discuss about quality

By analysing the cells/forums to discuss and clarify the queries of the employees regarding quality among the ISO 9000 certified manufacturing organisations in Kerala, it was found that, 25% of the managers were of the opinion that they discuss/clarify in training programmes, 26% of the managers are of the opinion that they discuss/clarify quality issues in quality circles. 39% of the managers are of the opinion that they discuss/clarify quality issues by discussion with the supervisors. 10% of the managers are of the opinion that there are other forums to discuss/clarify about quality.

4.2.1.74 Managers’ opinion on the strategies adopted for the promotion of quality performance vs. goals

By analysing how the organisations make their quality improvement initiatives visible for its stakeholders, it was found that 27% of the managers opined that they made organisational wide notification. 24% of the managers are of the opinion that they made the same through slogans and posters. 29% of the managers opined that they make the quality improvement initiatives through advertisements. 8% of the managers are of the opinion that they make the quality improvement initiatives by sponsoring quality
related programmes. 12% of the managers were of the opinion that there were other strategies adopted for the promotion of quality

4.2.1.75 Workers’ opinion on whether they discuss about quality related issues in the meeting

By analysing whether the workers discuss quality related matters in their meetings, it was opined by 75% of the workers that they discuss quality related issues in their meetings.

4.2.1.76 Workers’ opinion on the topics related to quality they discuss in the meeting

In a TQM environment, the major concern that is to be discussed in a meeting is the non-conformance to quality by those organisations products, and the variable rank for this aspect is one and the response rank is four. By analysing the major issues that the workers opined that they discuss about the quality improvement, in their meetings, it was opined by 10% of the workers that they discuss cost of non-conformance to quality. 12% of the workers opined that they discuss failure cost analysis. 31% of the workers discuss prevention of failures, 43% of the workers were of the opinion that, the appraisal of the employees were performed in the meetings. 4% of the workers opined that there were other topics to be discussed in the meeting.

4.2.1.77 Workers’ opinion on whether they receive feedback on quality

By analysing the responses on whether the workers receive any feedback on quality, it was found that 51% of the workers were of the opinion that they receive the feedback on quality.

4.2.1.78 Workers’ opinion on the utilisation of feedback

By analysing whether the workers utilised the feedback on quality, it was found that 34% of the workers opined that they occasionally utilise feedback and 25% opined that they sometimes utilised the feedback and 25% opined that they often utilise feedback. 16% of the workers opined that they never utilised the feedback.
4.2.1.79 Workers’ opinion on documentation of quality related problems occurred during the work

By analysing whether the workers document the quality related problems occurred during the work, opined 13% of the workers that they never document quality problems. 19% of the workers were of the opinion that they occasionally document the quality problems. 33% of the workers were of the opinion that they some times document the problems. There were 35% of the workers who opined that they often document the problems.

4.2.1.80 Workers’ opinion on whether they have reported the problems with materials supplied to their supervisors

By analysing whether the workers’ had reported the problems with the materials supplied to their supervisors, it was found that 38% of the workers were of the opinion that they have reported the same.

4.2.1.81 Workers’ opinion on whether the supervisors took necessary actions on the problems reported

By analysing whether the supervisors took necessary actions when workers reported the problems, it was found that 49% of the workers were of the opinion that the supervisors took action for the same.

4.2.1.82 Workers’ opinion on whether they made suggestions about their work

By analysing the responses on whether the workers’ had made suggestions during their work, it was found that 25% of the workers were of the opinion that they have made suggestions about their work.

4.2.1.83 Workers’ opinion on how the employee suggestions were made

By analysing how the workers made their suggestions, it was found that, 21% of the workers opined that they make suggestions through employee suggestion boxes. 20% of the workers opined that they make suggestions through employee suggestion cards. 46% of the workers were of the opinion that they made suggestions in the meetings. 8%
suggest through on-line, 5% of the workers were of the opinion that they make suggestions through other means.

4.2.1.84 Workers’ opinion on whether they have any programmes to develop communication / teamwork

By analysing whether the organisations have programmes to have teamwork, it was found that 33% of the workers were of the opinion that they have programmes to have communication/teamwork.

4.2.1.85 Workers’ opinion on the type of programmes they had to develop communication/teamwork

By analysing the workers’ opinion about the use of different methods to have communication and teamwork, it was opined by 11% of the workers that they had informal gathering to have teamwork. 14% of the workers of the opinion that company sponsored tours are there for teamwork. 22% the workers were of the opinion that they have formal meetings to have teamwork. 47% of the workers opined that they had training programmes to have teamwork. 6% opined that they have other type of programmes available in their organisations to have teamwork.

4.2.1.86 Workers’ opinion on how does the management makes the quality improvement initiatives visible

By analysing how the organisations make their quality improvement initiatives visible for its stakeholders, it was found that, 29% of the workers opined that by announcing it in public. 22% of the managers are of the opinion that they made the same through slogans and posters. 29% of the managers were of the opinion that they make the quality improvement initiatives through advertisements and 13% of the managers are of the opinion that by sponsoring quality related programmes.

4.2.1.87 Workers’ opinion on whether they have numerical displays showing the advantages of having improved quality

By analysing the responses on whether the organisations have numerical displays showing the numerical advantage of having improved
quality in their organisation, it was found that 27% of the workers were of the opinion that in their organisation they display the same

4.2.1.88 Managers' opinion on the extent of Value analysis use in the organisation

By analysing whether the ISO 9000 certified manufacturing organisations in Kerala perform value analysis in their organisations, it was opined that 38% of the managers perform the same in their organisations.

4.2.1.89 Managers' opinion on the areas where value analysis was used

By analysing the areas in which the manufacturing organisations use Value analysis/Value engineering it was found that 25% of the managers were of the opinion that they practice Value analysis/Value engineering in the areas of material substitution. 14% of the managers were of the opinion that they practice Value analysis/Value engineering in the areas of packaging. 21% of the managers were of the opinion that they practice Value analysis/Value engineering in the areas of inspection and testing. 17% of the managers were of the opinion that they practice Value analysis/Value engineering in the areas of internal transportation. 9% of the managers were of the opinion that they practice Value analysis/Value engineering in the areas of warrantee. 8% of the managers were of the opinion that Value analysis/Value engineering is used in the areas of rework. 6% of the managers were of the opinion that they practice Value analysis/Value engineering in the areas of process opportunities.

4.2.2 Analysing the organisational performance of the ISO 9000 certified manufacturing organisations after its ISO 9000 certification

The organisational performance is analysed by using the twelve identified organisational performance measurement measures, they are mentioned below.
4.2.2.1 Change in customer satisfaction after ISO 9000 certification

It has been inferred that 48% of the managers have opined that the customer satisfaction level has increased significantly. 29% of the managers have opined that the customer satisfaction level has been increased marginally. 22% of the managers are of the opinion that there is no change in the customer satisfaction level. None of the managers opined that the customer satisfaction level has been either decreased significantly or marginally.

4.2.2.2. Change in profitability after ISO 9000 certification

From the responses of the managers it has been found that 41% of the managers are of the opinion that there is no change in the profitability and 37% of the managers are of the opinion that the profitability has been marginally increased. Also 19% of the managers are of the opinion that the profitability has been significantly increased. A very small percentage of the managers are of the opinion that the profitability has been either significantly or marginally decreased.

4.2.2.3. Change in employee satisfaction level after ISO 9000 certification

It has been inferred that 25% of the managers have opined that the employee satisfaction level has been increased significantly. 33% of the managers have opined that the employee satisfaction level has been increased marginally. 33% of the managers are opined that there is no change in the employee satisfaction level. 5% of the managers are of the opinion that there is a marginal decrease in employee satisfaction level. 4% of the managers are of the opinion that there is a significant decrease in employee satisfaction level.

4.2.2.4. Change in Labour efficiency level after ISO 9000 certification

It has been inferred that 24% of the managers have opined that the labour efficiency level has been increased significantly. 48% of the managers have opined that the labour efficiency level has been increased
marginally. 24% of the managers are opined that there is no change in the labour efficiency level. Also 4% of the managers are of the opinion that labour efficiency level has been either significantly or marginally decreased.

4.2.2.5. Change in Competitive position after ISO 9000 certification

It has been inferred that 25% of the managers have opined that the competitive position has been increased significantly. 33% of the managers have opined that the competitive position has been increased marginally. 34% of the managers are opined that there is no change in the competitive position. 9% of the managers are of the opinion that the competitive position has been decreased either significantly or marginally.

4.2.2.6. Change in the Market share after ISO 9000 certification

It has been inferred that 25% of the managers have opined that the market share has been increased significantly. 41% of the managers have opined that the market share has been increased marginally. 34% of the managers are opined that there is no change in the market share. None of the managers are of the opinion that the market share has been decreased either significantly or marginally.

4.2.2.7. Change in Quality of work force level after ISO 9000 certification

It has been inferred that 44% of the managers have opined that the quality of workforce level has been increased significantly. 35% of the managers have opined that the quality of workforce level has been increased marginally. 19% of the managers opined that there is no change in the quality of workforce level. 2% of the managers are of the opinion that the quality of workforce level has been decreased marginally.

4.2.2.8. Change in Multi-skilled work force level after ISO 9000 certification

It has been inferred that the 34% of the managers have opined that the multi-skilled workforce level has been increased marginally. 23% of the managers have opined that the multi-skilled workforce level has been
increased significantly. 27% of the managers opined that there is no change in the multi-skilled workforce level. 13% of the managers are of the opinion that the multi-skilled workforce level has been decreased marginally. 3% of the managers are of the opinion that the multi-skilled workforce level has been decreased significantly.

4.2.2.9. Change in Delivery time after ISO 9000 certification

It has been inferred that 44% of the managers are of the opinion that the delivery time has been decreased marginally. 36% of the managers are of the opinion that the delivery time has been decreased significantly. 16% of the managers are of the opinion that there is no change in the delivery time 3% of the managers have opined that the delivery time has been increased significantly. 1% of the managers have opined that the delivery time has been increased significantly.

4.2.2.10. Change in Cost of production after ISO 9000 certification

It has been inferred that 43% of the managers are of the opinion that the cost of production has been decreased marginally. 33% of the managers are of the opinion that the cost of production has been decreased significantly. 24% of the managers are of the opinion that there is no change in cost of production. None of the managers have opined that the cost of production has been either increased significantly or marginally.

4.2.2.11. Change in Customer complaints after ISO 9000 certification

It has been inferred that 33% of the managers are of the opinion that the customer complaints has been decreased marginally. 30% of the managers are of the opinion that the customer complaints have been decreased significantly. 37% of the managers are of the opinion that there is no change in customer complaints. None of the managers have opined that the customer complaints have been either increased significantly or marginally.
4.2.2.12. Change in Supplier lead-time after ISO 9000 certification

It has been inferred that 43% of the managers are of the opinion that the supplier lead-time has been decreased marginally. 26% of the managers are of the opinion that the supplier lead-time has been decreased significantly. 28% of the managers are of the opinion that there is no change in the supplier lead-time. 2% of the managers have opined that the supplier lead-time has been increased significantly. 1% of the managers have opined that the supplier lead-time has been increased significantly.

4.2.3 Analysis for determining any relationship exist between TQM and organisational performance among the ISO 9000 certified manufacturing organisations in Kerala

From the analysis using the statistical tools to find out the relationship between TQM and organisational performance among the ISO 9000 certified manufacturing organisations in Kerala, it has been found that there exists a significant positive relationship between Total Quality Management and Organisational Performance of the ISO 9000 certified manufacturing organisations in Kerala.

4.3 Analysing the practice of Total Quality Management between the ISO 9000 certified private and public sector manufacturing organisations in Kerala

From the analysis on the practice of total quality management between the private and public sector organisations in Kerala, it was found that there exists no significant difference in the practice of Total Quality Management between the ISO 9000 certified private and public sector manufacturing organisations in Kerala.

4.4 Analysing the perception about the practice of Total Quality Management between the managers and workers of the ISO 9000 certified manufacturing organisations in Kerala

It has been found from the analysis that there exists no significant difference in the perception about the practice of total quality Management
between the managers and workers of the ISO 9000 certified manufacturing organisation in Kerala.

In the foregoing chapter, major findings from the study have been presented. In the next chapter, major recommendations formulated on the basis of the study are presented.