Total Quality Management in Knitwear Industry with Reference to Coimbatore District

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Introduction to TQM

Total Quality Management is a management approach that originated in the 1950's and has steadily become more popular since the early 1980's. Total Quality is a description of the culture, attitude and organization of a company that strives to provide customers with products and services that satisfy their needs. The culture requires quality in all aspects of the company's operations, with processes being done right the first time and defects and waste eradicated from operations. Total Quality Management, TQM, is a method by which management and employees can become involved in the continuous improvement of the production of goods and services. It is a combination of quality and management tools aimed at increasing business and reducing losses due to wasteful practices.

Some of the companies who have implemented TQM include Ford Motor Company, Phillips Semiconductor, SGL Carbon, Motorola and Toyota Motor Company.[1]

TQM Defined

TQM is a management philosophy that seeks to integrate all organizational functions (marketing, finance, design, engineering, and production, customer service, etc.) to focus on meeting customer needs and organizational objectives. TQM views an organization as a collection of processes. It maintains that organizations must strive to continuously improve these processes by incorporating the knowledge and experiences of workers. The simple objective of TQM is "Do the right things, right the first time, every time". TQM is infinitely variable and adaptable. Although originally applied to manufacturing operations, and for a number of years only used in that area, TQM is now becoming recognized as a generic management tool, just as applicable in service and public sector organizations. There are a number of evolutionary strands, with different sectors creating their own versions from the common ancestor. TQM is the foundation for activities, which include:

- Commitment by senior management and all employees
- Meeting customer requirements
- Reducing development cycle times
- Just In Time/Demand Flow Manufacturing
- Improvement teams
- Reducing product and service costs
- Systems to facilitate improvement
- Line Management ownership
- Employee involvement and empowerment
- Recognition and celebration
- Challenging quantified goals and benchmarking
- Focus on processes / improvement plans
- Specific incorporation in strategic planning

This shows that TQM must be practiced in all activities, by all personnel, in Manufacturing, Marketing, Engineering, R&D, Sales, Purchasing, HR, etc.[2]

Principles of TQM

The key principles of TQM are as following:

- Management Commitment
    1. Plan (drive, direct)
    2. Do (deploy, support, participate)
    3. Check (review)
    4. Act (recognize, communicate, revise)
- Employee Empowerment
    1. Training
    2. Suggestion scheme
    3. Measurement and recognition
    4. Excellence teams
- Fact Based Decision Making
    1. SPC (statistical process control)
    2. DOE, FMEA
    3. The 7 statistical tools
    4. TOPS (FORD 8D - Team Oriented Problem Solving)
- Continuous Improvement
    1. Systematic measurement and focus on CONQ
    2. Excellence teams

3. Cross-functional process management
4. Attain, maintain, improve standards

- Customer Focus
  1. Supplier partnership
  2. Service relationship with internal customers
  3. Never compromise quality
  4. Customer driven standards

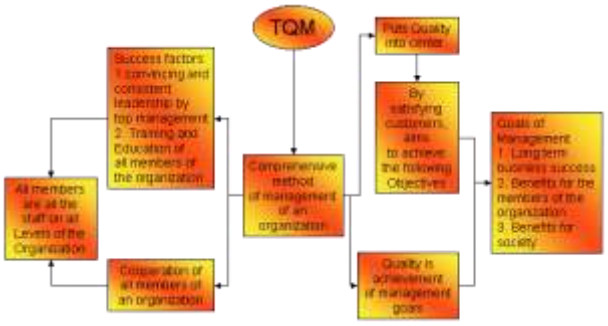
The Concept of Continuous Improvement by TQM

TQM is mainly concerned with continuous improvement in all work, from high level strategic planning and decision-making, to detailed execution of work elements on the shop floor. It stems from the belief that mistakes can be avoided and defects can be prevented. It leads to continuously improving results, in all aspects of work, as a result of continuously improving capabilities, people, processes, and technology and machine capabilities.

Continuous improvement must deal not only with improving results, but more importantly with improving capabilities to produce better results in the future. The five major areas of focus for capability improvement are demand generation, supply generation, technology, operations and people capability.

A central principle of TQM is that mistakes may be made by people, but most of them are caused, or at least permitted, by faulty systems and processes. This means that the root cause of such mistakes can be identified and eliminated, and repetition can be prevented by changing the process.

Structure of **TQM** according to these definitions:



TQM is seen as the most comprehensive approach to Quality thinkable for an enterprise.

The pillars of **Total Quality Management are T Q M**

T stands for Total :

It is the Integration of the Staff, Suppliers, Customers and other Stakeholders. Away from Party-specific Thinking to a more holistic approach.

Q stands for Quality:

It is the Quality of the work and the process of the Enterprise leading to Quality of Products.

M for Management:

It stresses the leadership task "Quality" and the Quality of leadership. From a scientific point of view **TQM** can count as school of Leadership. From the enterprises point of view **TQM** can be seen as a Leadership Model.

Textile Scenario

The Indian textile industry plays a pivotal role through its contribution to industrial output, employment generation and export earning of the country. It contributes about 14 per cent to industrial production and four percent to GDP, and accounts for 16.6 per cent of the ^country's export earnings. India has a total of 42.97 million spindles and more than 20 lakh powerlooms. This clearly shows the strength of the industry to meet both domestic and global demands. In the past, strict control regime prevented the industry from going in for modernization and achieving scale of production. At present, the textile industry is passing through a transition period in its efforts to capitalize the enormous opportunities thrown open by the removal of quota system amidst stiff competition from textiles producing countries like China, Bangladesh, Pakistan, Vietnam, etc.

NEED FOR THE STUDY

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OBJECTIVES OF THE STUDY

To measure effectiveness of TQM in Knitwear industries in Coimbatore and to contribute suggestions for improvements.

METHODOLOGY

"Research design is the arrangement of activities for the collection and analysis of the data in a manner that aims to combine relevance to the purpose with economy in procedure. Descriptive research studies are those studies which are concerned with describing the characteristics of a particular individual, or a group. The study is concerned whether certain variables are associated with the study. And also the study is concerned with specific predictions, with narration of facts and characteristics concerning an individual, group or situation. Both primary and secondary data were collected for this study. The researcher collected data using questionnaire as the method of data collection considering the necessity of getting detailed reliable information. The data were collected through questionnaire exclusively constructed for the purpose of the study. The schedule was designed such that the required data for the achievement of the study should be easily obtained. The Interview schedule consists of face sheet containing name of research topic, personal data of the respondents. It also contains questions specifying the working condition of the respondents. The entire group from which a sample is chosen is known as sampling unit. The research data was collected from the Textiles industries in Coimbatore. The technique used for the research is Probability Sampling because the population is finite. The Sampling technique selected for the study is Simple random sampling technique. It is one where respondents are selected from the total population. **Simple random sample** is a group of subjects (a sample) chosen from a larger group (a population). Each subject from the population is chosen randomly and entirely by chance such that each subject has the same probability of being chosen at any stage during the sampling process. This process and technique is known as Simple Random Sampling. The collected data have been analysed with the help of tools like simple percentage method was used. To frame the hypothesis of the study the Chi-square test is used.

LIMITATIONS OF THE STUDY

The researcher conducted the study and data collection was done within a short period. Due to the limited period of time to ascertain the information from the respondents was not sufficient.

Table Showing Nature of the Concern

Nature of Concern	Number of Respondents	Percentage of Respondents
Firm Company	51	51%
Sole Proprietor	49	49%
Total	**100**	**100**%

From the above table it is clear that 51 percent of the respondents opined that they run a firm type of company and the rest 49 percent run a sole proprietor type concern.

Table Showing Age of the Concern

Age of Concern	Number of Respondents	Percentage of Respondents
Less than 5 years	33	33%
6 to 10 years	44	44%
10 to 15 years	23	23%
Total	**100**	**100**%

From the above table shows that the 44 percent of the concerns has 6 to 10 years of experience in running the firm, 33 percent of the concerns have less than 5 years of experience and the rest 23 percent of the concerns have 10 to 15 years of experience in running the firm.

Table Showing Nature of Export

Status of Export	Number of Respondents	Percentage of Respondents
Registered Exporters	43	43%
100% EOU	25	25%
Export House	7	7%
Star Trading House	20	20%
Super Star Trading House	5	5%
Total	**100**	**100**%

Nature of Export	Number of Respondents	Percentage of Respondents
Merchant Exports	46	46%
Manufacturing Exports	51	51%
Third Party / Buying house	3	3%
Total	**100**	**100**%

From the above table it is understood that 51 percent of the concerns are involved in manufacturing exports, 46 percent of the concerns are involved in merchant exports and the rest 3 percent of the concerns are involved in the third party / buying house type of export.

Table Showing Status of Export

From the above table it is clear that 43 percent of the companies status is registered exporters, 25 percent of the companies status is 100% export oriented units, 20 percent of the concerns are star trading houses, 7 percent of the concerns status is export house and the rest 5 percent obtains super star trading house.

Table Showing Monthly Turnover

Turnover / month	Number of Respondents	Percentage of Respondents
Less than 1 crore	58	58%
More thatn 1 crore	42	42%
Total	**100**	**100**%

The above table shows that more than half (58 percent) of the concerns monthly turnover is less than Rs.1 crore and 42 percent of the concerns turnover is more than Rs.1 crore.

Table Showing Competitive Advantages of India

Competitive Advantage	Number of Respondents	Percentage of Respondents
Low Labour Cost	42	42%
Fashion Design	6	6%
Capital Cost	32	32%
Raw Material Advantage	13	13%
Skilled Labour Force	2	2%
Economic Growth	2	2%
Production of Wide Range	3	3%
Total	**100**	**100**%

The above table details that 42 percent of the concerns states that India has low labour cost as their competitive advantage when compared to other countries, 32 percent of the concerns mention that capital cost as the main competitive advantage in India, 13 percent indicated raw material as the main competitive advantage and the rest 6, 3,2 and 2 percent of the concerns respectively stated Fashion Design, Production of Wide Range of products, Skilled Labour Force and Economic Growth as the competitive advantage that India posses when compared with other countries.

Table Showing Opinion on Quality

Opinion on Quality	Number of Respondents	Percentage of Respondents
Fitness for use	15	15%
Degree of Excellence	53	53%
Customer Satisfaction	18	18%
Ability to satisfy the needs	14	14%
Total	**100**	**100**%

The above table shows that more than half (53 percent) of the concerns stated that quality means degree of excellence, 18 percent indicated quality as customer satisfaction, 15 percent of the concerns means fitness for use and the rest stated quality means ability to satisfy the needs.

Table Showing Tools used for Quality Management

Tools used for Quality Management	Number of Respondents	Percentage of Respondents
Method of removing waste	20	20%
Involving everyone in improving the ways in which things are	12	12%
To communicate with and help each other	44	44%
Achieve a top quality performance	21	21%
Develop effectiveness	3	3%
Total	**100**	**100**%

The above table reveals that 44 percent of the concerns used to communicate with and help each other as the quality management tool, 21 percent of the concerns used Quality Management tool a to achieve a top quality performance, 20 percent of the concerns used quality management tool as a method of removing waste and the rest 12 and 3 percent of the concerns used management tool as involving everyone in improving the ways in which things are and develop effectiveness respectively.

Table Showing Quality Abbreviation Used in the concern

Quality Abbreviations used	Number of Respondents	Percentage of Respondents
Acceptable quality level	9	9%
American Society for Quality control	11	11%
British Standard	23	23%
Effective Quality Circle	29	29%
European organisation for quality	18	18%
Total	**100**	**100**%

The above table reveals that 29 percent of the concerns used quality abbreviation used effective quality circle, 23 percent of the concerns used British Standards, 18 percent of the concerns used European Organisation for Quality, 11 percent of the organization used American Society for Quality Control and the rest 9 percent used Acceptable Quality Level as their standards.

Table Showing Quality control followed in Knitwear Industry

Quality Control in Knitwear industry	Number of Respondents	Percentage of Respondents
Because Bad Quality is Expensive	24	24%
Because customer is the king	32	32%
Because there is a problem	7	7%
To have Good value addition	10	10%
To minimize waste	27	27%
Total	**100**	**100**%

The above table reveals that 32 percent of the concerns followed quality control because they treat customer as the king, 27 percent of the concerns followed quality control to minimize waste, 24 percent of the concerns followed quality control because bad quality is expensive, 10 percent followed quality control to have good value addition and the rest 7 percent of the concerns followed quality control because there is a problem without quality.

Table Showing Opinion about the Concept connected with Quality Control

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Quality Control	Number of Respondents	Percentage of Respondents
ISO-9000	49	49%
Basic Element of the System through documentation	32	32%
Creates a quality system rooted in your customers requiremen	17	17%
Ensures uniform systems that are universally recognized	2	2%
Total	**100**	**100**%

The above table reveals that majority (49 percent) of the concerns stated that ISO-9000 certification is the major concept connected with quality control, 32 percent of the organizations mentioned basic element of the system through documentation, 17 percent of the organization creates a quality system rooted in the customers requirements and the rest 2 percent of the organization declared concept connected with quality control is to ensure uniform systems that are universally recognized.

Table Showing Main requirements for a good appraisal quality management

Requirement	Number of Respondents	Percentage of Respondents

Requirement	Number of Respondents	Percentage of Respondents
Management Commitments	21	21%
Incoming Goods conformity	13	13%
Employee involvements	39	39%
Fabric inspections	14	14%
Operator control systems	7	7%
End Line Inspection	4	4%
Factory pre-final	2	2%
Total	**100**	**100**%

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The above table exhibits that 29 percent of the organization stated that the main requirement for a good quality management is employee involvement, 21 percent of the organization mentioned management commitments, 14 percent indicated fabric inspections, 13 percent expressed incoming goods conformity, 7 percent stated operator control system, 4 and 2 percent mentioned end line inspection and factory pre-final respectively.

Relationship between Turnover and Policies followed

Turnover	Policies followed				Total
	Competitors Strategy	Market Trend	Our Own Standard Quality	Quality Specified by the Buyers	
Less than 1 crore	13	20	7	18	58
	10.4	15.7	11.6	20.3	58.0
More thatn 1 crore	5	7	13	17	42
	7.6	11.3	8.4	14.7	42.0
Total	18	27	20	35	100
	18.0	27.0	20.0	35.0	100.0

Chi-Square Value : 9.322
df.: 3
Table Value : 7.815

H_0 : Null Hypothesis

There is no significant relationship between turnover and policies followed by the companies.

H_1 : Alternative Hypothesis

There is significant relationship between turnover and policies followed by the companies.

$$\chi^2 = \frac{(0 - E)^2}{E} = 9.322$$

Degree of Freedom

= (c-1) (r – 1)

= (4-1) (2-1)

= 3 x 1

= 3

= 7.815

The result of the chi-square test reveals that the calculated chi-square value is more than the table chi-square value at 5% level of significance and therefore, relationship between turnover and policies followed by the companies is significant. Thus the hypothesis is that the relationship between turnover and policies followed by the companies holds good. Thus the alternative hypothesis is accepted.

Relationship between Nature of exports and Opinion on Quality

Nature of exports	**Opinion on Quality**				**Total**
	Ability to satisfy the needs	**Customer Satisfaction**	**Degree of Excellence**	**Fitness for use**	
Manufacturing Exports	5	13	27	6	**51**
	7.1	9.2	27.0	7.7	**51.0**
Merchant Exports	9	5	23	9	**46**
	6.4	8.3	24.4	6.9	**46.0**
Third Party / Buying house	0	0	3	0	**3**
	.4	.5	1.6	.5	**3.0**
Total	**14**	**18**	**53**	**15**	**100**
	14.0	**18.0**	**53.0**	**15.0**	**100.0**

Chi-Square Value : 8.281
df.: 6
Table Value : 12.592

H_0 : Null Hypothesis

There is no significant relationship between nature of Exports and Opinion on Quality Control.

H_1 : Alternative Hypothesis

There is significant relationship between Nature of Exports and Opinion on Quality Control.

$$\chi^2 = \frac{(0 - E)^2}{E} = 8.281$$

Degree of Freedom
= (c-1) (r – 1)

= (4-1) (3-1)

= 3 x 2

= 6

= 12.592

The result of the chi-square test reveals that the calculated chi-square value is more than the table chi-square value at 5% level of significance and therefore, relationship between Nature of Exports and Opinion on Quality Control is not significant. Thus the hypothesis is that the relationship between Nature of Exports and Opinion on Quality Control does not hold good. Thus the null hypothesis is accepted.

SUGGESTIONS

The following are the suggestion to follow the proper TQM in an organization

- Committed leadership: a near-evangelical, unwavering, long-term commitment by top managers to the philosophy, usually under a name something like Total Quality Management, Continuous Improvement (CI), or Quality Improvement (QI).

- Adoption and communication of TQM: using tools like the mission statement, and themes or slogans.

- Closer customer relationships: determining customers' (both inside and outside the firm) requirements, then meeting those requirements no matter what it takes.

- Closer supplier relationships: working closely and cooperatively with suppliers (often sole-sourcing key components), ensuring they provide inputs that conform to customers' end-use requirements.

- Zero-defects mentality: a system in place to spot defects as they occur, rather than through inspection and rework.

- Flexible manufacturing: (applicable only to manufacturers) can include just-in-time inventory, cellular manufacturing, design for manufacturability (DFM), statistical process control (SPC), and design of experiments (DOE).

- Process improvement: reduced waste and cycle times in all areas through cross-departmental process analysis.

- Measurement: goal-orientation and zeal for data, with constant performance measurement, often using statistical methods.

CONCLUSION

T.Q.M. is a means for achieving improved organizational performance. It is a product and it must meet the same customer quality requirements as any product in today's world:

It must meet specifications
It must be fit for the use to which it is put by the customer.
It must be low in cost, relative to its benefits.
It must change to meet the latent (unstated) needs of its customers.

Need to determine the "specs" of T.Q.M., to help the customer to use T.Q.M. in accordance with its specs and to improve the tool set to make the tools more user friendly. To understand a new T.Q.M. tool set, the seven management tools. They appear effective for dealing with the Type II medium complexity cross-functional problems that are omnipresent in the middle of our organizations. We need to understand their region of usefulness and assure that they are used thoughtfully, rather than mechanically. They are an extremely costly set of tools (in terms of time). Furthermore, we must always remember that consensus does not always lead to the best answer.

