SHOULD TURKISH INDUSTRY APPLY TQM OR NOT: A DYNAMIC MODEL

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Summary: *This study examines whether Turkish Industry is ready to apply Total Quality Management (TQM) or not by using Analytic Network Process (ANP). Our database is based on a survey realized among the one hundred big size companies in Turkey. Those companies have been randomly selected for the study from the list of "Five Hundred Biggest Companies in Turkey." A specific questionnaire with 25 questions has been sent to those one hundred companies. We used the questionnaire responses in our pairwise comparisons of criteria and alternatives. We have considered advantages, disadvantages, risks and opportunities of implementing TQM under current Turkish industry structure. This study shows that "Applying TQM" is 59% preferable, yet "not applying" is 41% preferable. "Applying TQM" alternative is not as highly preferable to "not applying" as we expected. We attribute this result for TQM's high risks and disadvantages considering the current status of Turkish Industry.*

1. Introduction

The term total quality management (TQM) refers to an organization-wide effort to achieve quality. It can accurately be described as a philosophy that is intended to involve everyone in the organization in a quest for quality. TQM stresses three principles: customer satisfaction, employee involvement, and continuous improvements in quality (Krajewski and Ritzman, 1999). It extends to suppliers as well as to customers. In fact, in TQM, the customer is the focal point, and customer satisfaction is the driving force. This is a new form of the golden rule: Those who have the gold make the rules (Watson, 2001). Total company involvement is important. Everyone, from the chief executive officer on down, must be involved and committed.

TQM is a new approach for the majority of the companies in Turkey. Although not many companies are currently practicing TQM, it is promising that most of them are very ambitious to introduce TQM. So in this study we examined whether Turkish Industry should apply TQM or not by using Analytic Network Process (ANP).

We have organized our paper into six sections. In section two we briefly explained the traditional and TQM approaches into quality management. Methodology of the study has been summarized in section three. Section four introduces ANP model of Turkish Industry from TQM implementation point of view. Section five summarizes the results. Overall conclusion has been described in section six.

2. Traditional and TQM Approaches into Quality Management

In traditional quality management, as more and more outputs are inspected, the costs of scrap, rework, and detecting defects increase while the costs of defective products to customers decline. What is fundamentally wrong with this traditional view of quality management is that is implies quality can be inspected into products. In other words, acceptable product quality can be achieved by discarding defective products that are found during inspection while continuing to produce shoddy products with sloppy production practices. The idea is that if there is enough inspection, the defective products will be identified and discarded, leaving only good products to be shipped to customers.

We define TQM as "managing the entire organization so that it excels on all dimensions of products and services that are important to the customer." (Chase, Aquilano, and Jacobs, 2001) TQM is evolving to the point where emphasis is on preventing mistakes rather than on finding and correcting them. Quality is the responsibility of everybody in the organization. And suppliers are being treated less as adversaries, and more as partners.

There are a number of other elements of TQM that are important, including:
Continual Improvement: The quest for quality and better service to the customer should be a continual, never-ending one. Competitors will seek to provide better service, and customers will come to expect better service. Hence, to cease improvement efforts will very likely lead to loss of competitive advantage and a decreased level of customer satisfaction.
Employee Empowerment: Giving workers the responsibility for improvements, and the authority to make changes to accomplish them, provides strong motivation for employees, and puts decision making into the hands of those who are closest to the job and have considerable insight into problems and solutions.
Team Approach: The use of teams for problem solving, and to achieve consensus, takes advantage of group thinking, gets people involved, and promotes a spirit of cooperation and shared values among employees.
Knowledge of Tools: Everyone in the organization is trained in the use of quality control and improvement tools.

The differences between traditional and TQM organizations are summarized in table 1.

Table 1. Comparing the Culture of TQM and Traditional Organizations

Aspect	Traditional	TQM
Overall Mission	Maximize return on investment	Meet or exceed customer satisfaction
Objectives	Emphasis on short term	Balance of long-term and short term
Management	Not always open; sometimes inconsistent objectives	Open; encourages employee input; consistent objectives
Role of Manager	Issue orders; enforce	Coach; remove barriers, build trust
Customer Requirements	Not highest priority; may be unclear	Highest priority; important to identify and understand
Problem-solving	Not systematic; individuals	Systematic; teams
Improvement	Erratic	Continual
Suppliers	Adversarial	Partners

3. Methodology of the Study

This study examines whether Turkish Industry is ready to apply TQM or not by using ANP model. The database is based on a survey done among one hundred big size companies in Turkey. Companies have been randomly selected for the study from the list of "Five Hundred Biggest Companies in Turkey" which is determined by Istanbul Chamber of Industry. A specific questionnaire with 25 questions has been sent to these randomly selected companies. The questionnaire responses were used while evaluating criteria as well as alternatives. We have used ANP since there are dependency among some of the criteria. Not only the importance of criteria influences the preference of alternatives; but also the importance of alternatives has impact upon the importance of criteria. No attempt in this paper has been made to explain the Analytic Network Process because of page limitations. Interested readers may refer to the unabridged version of this paper (Karpak and Bayazıt, 2001), and/or (Saaty, 2001).

4. ANP Model Turkish Industry

In this model, the control hierarchy consists of advantages, risks, opportunities and disadvantages in which each of them have several sub criteria. We also have two alternatives. First alternative is "Turkish Industry should apply TQM." The second one is "Turkish Industry should not apply TQM."

4.1 Subnet of Advantages

We have five clusters in the subnet of advantages: a) Advantages to customers, b) Advantages to workforce, c) Operational advantages, d) Financial advantages, and e) Alternatives. We also have several nodes in these clusters. Figure 1 shows the subnet of the advantages.

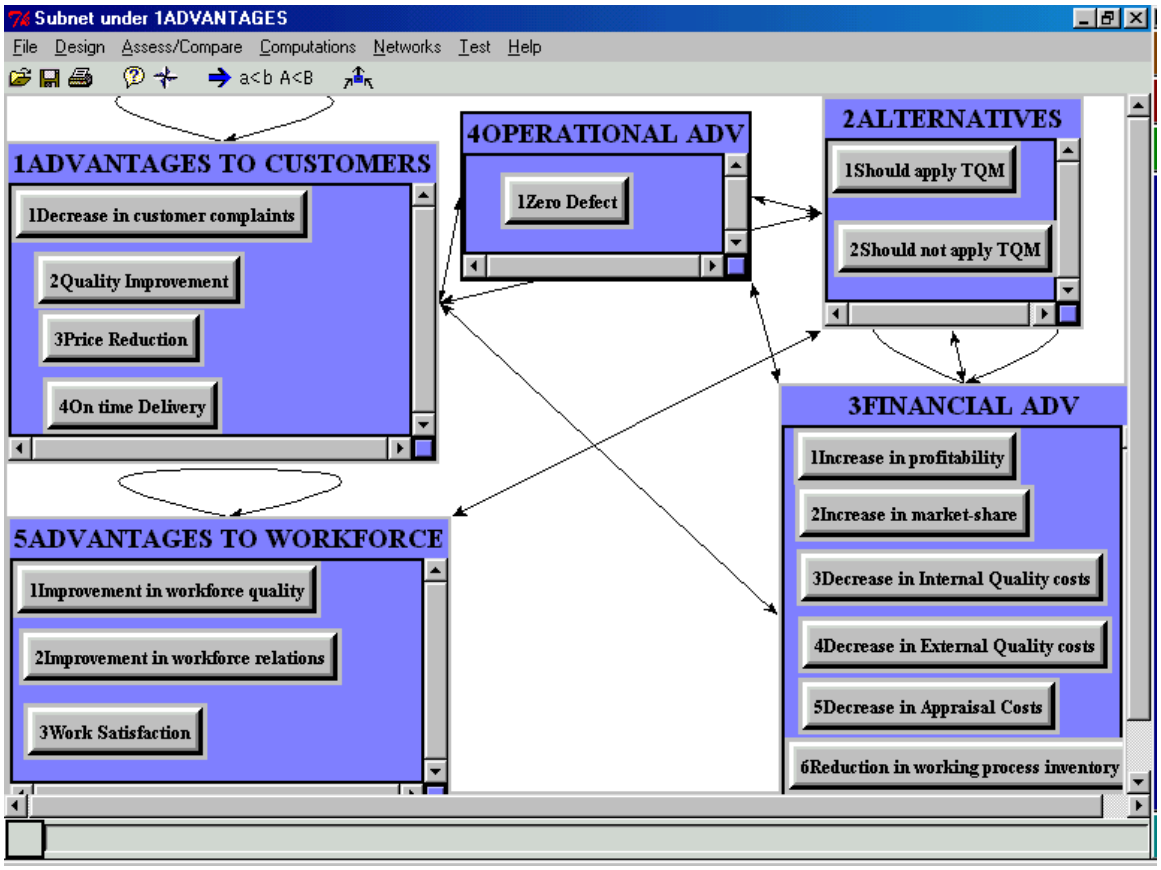


Figure 1. The Subnet of the Advantages

4.2 The Subnet of Risks

We have three clusters in the subnet of risks. These are a) managerial risks, b) technical risks, and c) alternatives. We have several sub criteria in this subnet. Figure 2 shows the subnets of risks.

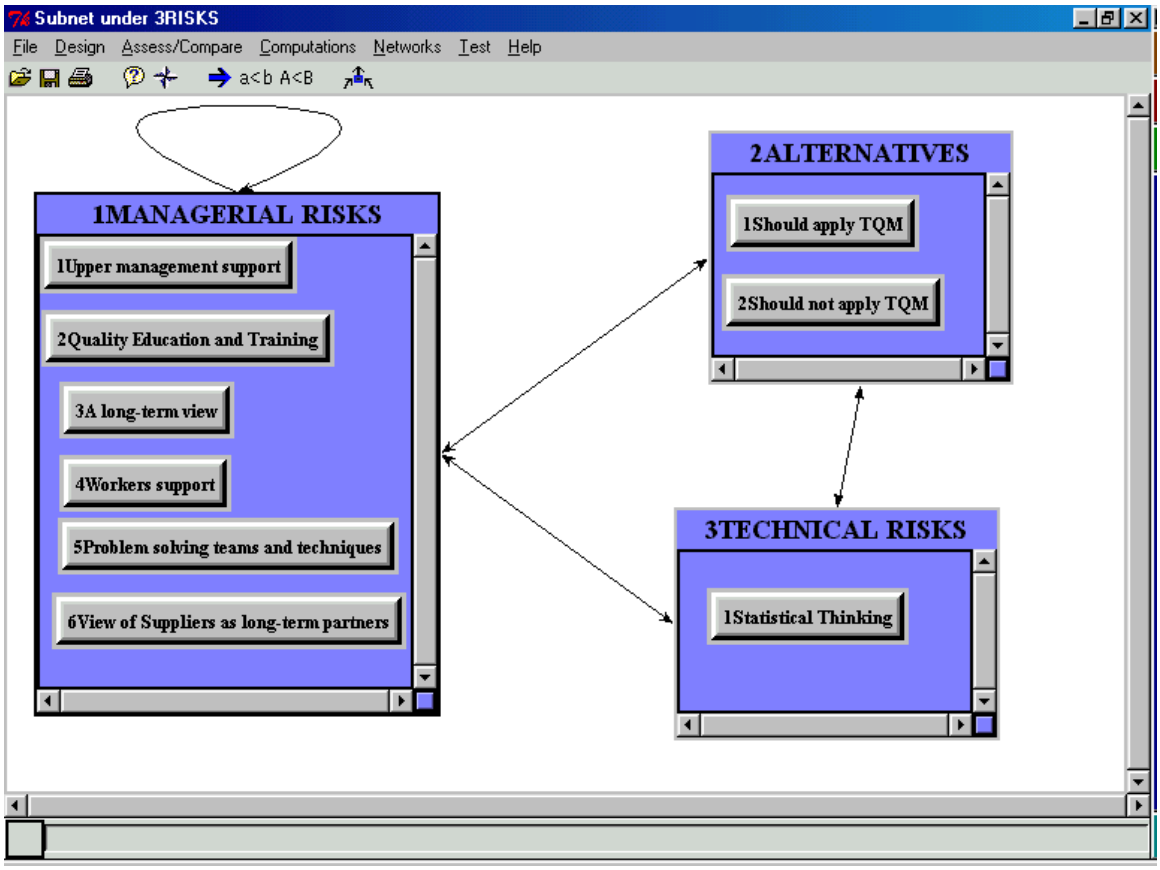


Figure 2. The Subnet of the Risks

We have similar subnets for disadvantages, and opportunities. These subnets were not given for page limitation reasons. All clusters and criteria within each cluster are listed in table 2.

Table 2. List of Clusters and Nodes

Alternatives	• Should apply TQM • Should not apply TQM
Advantages	
Advantages to customers	• Decrease in customer complaints • Quality improvement • Price Reduction • On time delivery
Advantages to workforce	• Improvement in workforce quality • Improvement in workforce relations • Work satisfaction
Operational Advantages	• Zero defects

Table 2 continued. List of Clusters and Nodes

Financial advantages	• Increase in profitability • Increase in market share • Decrease in internal quality costs • Decrease in external quality costs • Decrease in appraisal costs • Reduction in working process inventory
Risks	
Managerial risks	• Upper management support • Quality education and training • A long-term view • Workers support • Problem solving teams and techniques • Lack of view of vendors as long-term partners
Technical risks	• Statistical thinking
Disadvantages	
Inherent to TQM	• Costly and a long-term study • Difficulty of developing country specific models
Originates from current Turkish Industry status	• Conflict between Turkish management structure and TQM • 90% of the companies in Turkey are family partnership • Considering TQM expense unnecessary • Lack of industry culture and cooperation between main and side industry • Confusion of the concepts TQM and ISO 9000 • Lack of associates and specialists giving quality education • Lack of teamwork
Opportunities	• Long-term competitive power • Workforce harmony • Achieving quality culture in the organization

Node definitions are given in the working paper (Karpak and Bayazıt, 2001).

4.3 Feedback Relationships

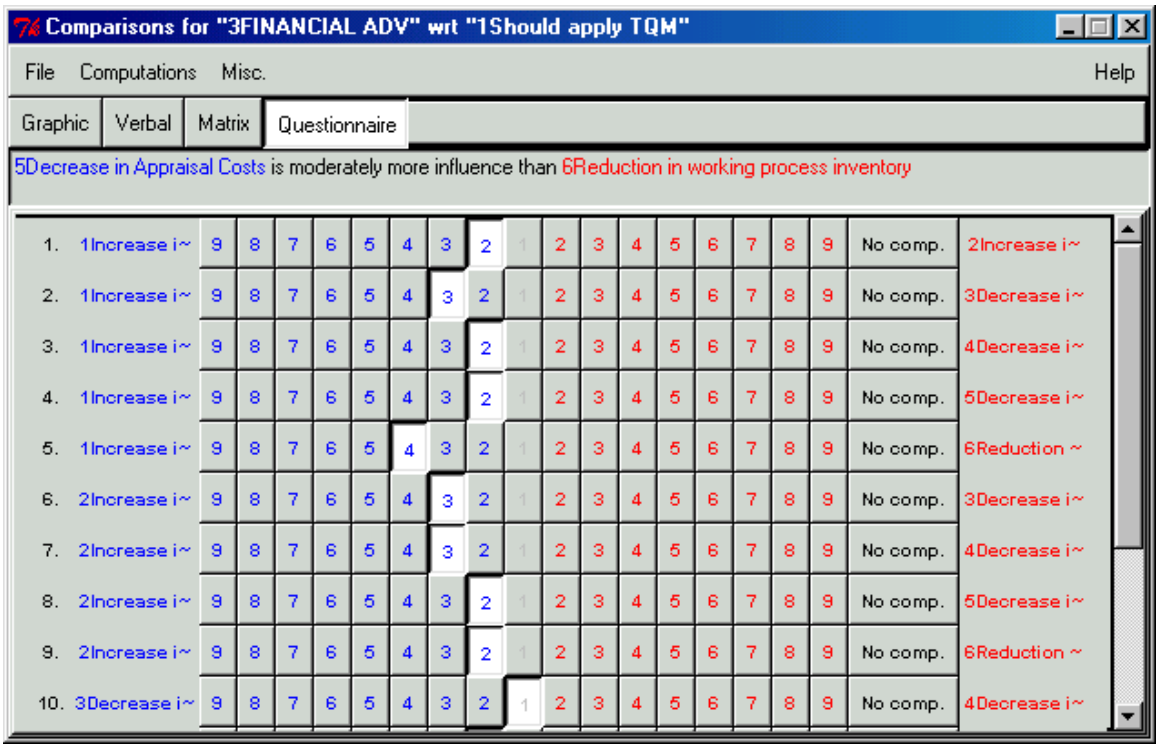
The next step in formulating the model was deciding which clusters/nodes have direct influence on which others. Since the elements in the cluster of advantages to customers are linked to elements in its own cluster, there is an inner dependence. For example, since the element of decrease in customer complaints is linked to quality improvement, price reduction and on time delivery, we say there is an inner dependence. Also since the elements in the cluster of advantages to customers are linked to elements in the clusters of operational advantages, financial advantages and the alternatives, there is an outer dependence. We made pairwise comparisons systematically to include all the combinations of elements/cluster relationships. The question asked when formulating these relationships be: *When considering a given sub criteria, with respect to a specific cluster/node, which of a pair of clusters or nodes more influenced?* For example, when considering advantages to customers, with respect to decrease in customer complaints, which is more influenced, quality improvement or price reduction, quality improvement or on time delivery?

4.4 Judgments

Judgments were made about the influence of elements/clusters in relation to each other. When considering an element with respect to alternatives, we used the data from the survey. Table 3 shows the pairwise

comparisons for considering financial advantages, with respect to "should apply TQM," which are more influenced.

Table 3. Pairwise Comparison Table



As shown in table 3, when considering financial advantages, with respect to "should apply TQM," for example decrease in appraisal costs is moderately more influential than reduction in working process inventory.

5. Synthesis of Judgments

When we synthesized subnet of advantages we found that within the cluster of advantages to customer, the most important element is "decrease in customer complaints"; within the cluster of advantages to workforce, the most important element is "improvement in workforce quality;" and within the cluster of financial advantages, the most important element is "decrease in internal costs."

When we synthesized subnet of risks we found that within the cluster of managerial risks the most risky element is "lack of quality education and training". When we synthesized subnet of opportunities we found that the most important element is "long-term competitive power". When we synthesized subnet of disadvantages we found that within the cluster of inherent to TQM the most important element is "costly and long-term study" and within the cluster of "originates from Turkish management structure" the most important element is "considering TQM expense unnecessary."

After the judgments were completed for each subnet we rated each of the four merits: advantages, disadvantages, risks and opportunities, in terms of intensities for each assessment criterion by using AHP Ratings Model. These intensities were themselves prioritized in a matrix as to how much each is preferred over each of the other intensities. We then assigned the appropriate intensity for each merit on all the

assessment criteria. Priority ratings for advantages, disadvantages, risks, and opportunities are .321, .195, .195, and .288 consecutively.

To obtain the final results we are going to use these priorities. The priorities for each subnet are shown in the Table 4 below.

Table 4. Local Priority for Each Criteria

	Advantages	***Disadvantages***	***Risks***	***Opportunities***
Weights	0.321	0.195	0.195	0.288
Should Apply TQM	0.894	0.885	0.834	0.855
Should Not Apply TQM	0.106	0.115	0.166	0.145

Overall results are obtained by using these weights. We found that "Should Apply TQM"(with 59% overall preference rating) is the overall best alternative for Turkish Companies. This alternative is not overwhelmingly preferable to "do not apply TQM" as we expected prior to our study. In our judgment the main reason for this result is, in spite of the numbers of advantages and opportunities there are several risks and disadvantages of the decision.

6. Conclusion

Total Quality Management on the one hand serves great opportunities and advantages to the companies who are applying this method but on the other hand could create many risks and disadvantages too. That is the main reason why the results of "should apply TQM" decision is not much more preferable to "should not apply TQM". Many companies in Turkey will be able to practice TQM if some risks and disadvantages that faces the companies during practicing TQM decrease. In our days, the companies are facing increasing competitive pressures. To deal with pressures the companies must adopt and practice TQM. The quality is a life-style; so all companies adopt this model and settle the understanding that cost and competition advantages will be provided by quality in the long-term.

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