Implementation strategy of total quality management and quality culture to increase the competitiveness of contractor companies in Indonesia

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Abstract. When compared to the manufacture industry, the construction industry is being a concern because of their poor quality produced. For this reason, many contractor companies adopted and implemented management strategies to improve their quality. One of management strategy approaches used is Total Quality Management (TQM). Implementation of TQM requires a fundamental change by changing the culture, processes, strategies, and beliefs in a company. This quality orientation is the key to fulfill customer satisfaction and business practices. Quality Culture is a part of organizational culture related to habits, beliefs, values, morals, and behavior to improve quality of the product. In Indonesia, contractor companies are generally weak in many ways. This will cause contractor company in Indonesia have great difficulties to be competitive with foreign contractors. This increasing global competition makes contractor companies in Indonesia have to adopt TQM and Quality Culture as one of the strategies to always make improvements continuously so as to provide competitive advantage and increase company performance. For Indonesian contractor companies to compete with foreign contractors, the alternative strategy is needed. Framework of the alternative strategy is the result of the implementation of TQM and Quality Culture, because they can be seen as a strategy that improves economic conditions and helps companies achieve competitive advantage.

1. Introduction
When compared to the manufacture industry, the construction industry is being a concern because of their poor quality produced. This is not only seen from the final product produced but also in terms of process, workers and material. For this reason, many contractor companies adopted and implemented management strategies to improve their quality. One of management strategy approaches used is Total Quality Management (TQM). [10].

TQM is believed to be able to increase customer satisfaction, increase the involvement of company employee, strengthen suppliers relationships, and create an continuous quality improvement [10]. TQM has been widely adopted by many contractor companies to fix their quality problems, and to meet the customer’s wants and needs. Also, TQM has other goal in the construction industry that is to reduce production costs, and increase competitiveness value of the company [7].
Quality Culture is a part of organizational culture related to habits, beliefs, values, morals, and behavior to improve quality of the product. Quality Culture also can be defined as an organizational culture with great quality oriented in every activity undertaken.

TQM and Quality Culture have a concepts that is a holistic approach to project developing that involves continuous improvement, customer satisfaction, top level management support, and employee training to create products without defects and without doing additional work [10]. Data from the Ministry of Public Works and Housing (PUPR) informs that the total number of national contractors in Indonesia up to 2016 based on data from Bina Konstruksi is 108,852 that consisting of individual 29 contractors, 95,014 small contractors, 13,225 medium contractors, and 584 large contractor. Data in 2015 shows that 85% of Indonesia's construction market value is controlled by large contractors while the remaining 15% of the construction market value is contested by medium and small contractors. This situation causes business competition become very tight between the middle and small qualification construction market. Also, this has become a matter of how to increase the class of medium and small construction service business contractor companies to become large qualified business entities in order to be competitive and survive in this highly competitive era.

Increasing global competition makes contracting companies in Indonesia should adopt TQM and Quality Culture as one of the strategies in meeting customer satisfaction [6]. An alternative strategy is needed for Indonesian contractor companies to compete with foreign contractors [11]. Framework of the alternative strategy is the result of the implementation of TQM and Quality Culture, because they can be seen as a strategy that improves economic conditions and helps companies achieve competitive advantage [13].

2. Literature review

2.1 Total quality management

TQM is an approach method to increase the competitive advantage, effectiveness, and flexibility of an company by utilize all aspects such as plan, organize, and deepen all of the activities. Also, TQM can be interpreted as a process that improving aspects of the quality in terms of processes, human resources, products, and services in a company, with the main goal is to increase customer satisfaction through continuous improvement in processes and systems [2]. Aspects that included in TQM [4] [1] [12] are:

1. Leadership and Top Level Management’s Commitment
   Commitment from top level management is very important. It is very important to change the company environment to achieve changing staff behavior and improve the quality. The company’s efforts for TQM will fail without this fundamental cultural change. This fundamental change cannot be achieved unless top level management has an obsession to focus on quality and continuous improvement.

2. Training
   Each training program in the company have to include the orientation to the basic concepts and procedures of TQM. TQM requires participatory, disciplined, and organized approaches, so team training is also very important. The training program have to cover many topics such as analysis, problem solving, interpersonal communication and interaction, statistical methods, cost of quality measurement, and collection-evaluation of quantitative information.

3. Communication
   Good communication and a good system are important so that employees convey ideas to top level management and to provide the necessary changes. The effective strategy is an open communication line that allows direct access for every employee, at any level, to connect top level management to ideas for specific improvements or problems. Top level management reaction of employees' concerns and ideas is very important.

4. Teamwork
In achieving company’s goals, teams are very important. Work together in teams is generally more effective to achieve common goals than work alone. The team approach is not only to internal organizational teams, but also include external vendors and customers.

5. Customer Satisfaction
The main goal of TQM is to achieve customer satisfaction whether the customer is internal (such as: department in the company) or external (such as: the consumer). Defining customer needs and desires is the first step to achieve customer satisfaction, then translating these needs and desires into a standard. Customer satisfaction have to be limited to meet customer expectations, but still have to try to exceed through continuous improvement. To meet customer expectations, company should conduct the information gathering programs that can measure customer satisfaction level. The program will help the company to identify the customer dissatisfaction, so the company can directly take the corrective action.

6. Continuous Improvement
Continuous improvement requires a focus on processes so they can be changed to be more efficient. By comparing progress against certain criteria, the level of success can be determined. The process of measuring and comparing success rates against predetermined criteria is known as “benchmarking.” Benchmarking is a systematic search for best practices that lead to superior performance.

7. Process Management
Process improvement has a relationship with continuous improvement. Process improvement is a statistical method and process control, because data measurement and analysis are very important for process improvement. Accurate data is very important for employees and management to take better decisions. A quality improvement team can be formed in any company to check the process.

8. Focus on Employees
TQM views employee satisfaction as an important factor in increasing the contribution in company. Employee is the company’s internal customers to exchange information and services. Top level management should encourage advice and open the work environment, so that employees can share the honest comments without fear of punishment. Recognition and appreciation should be extended to valuable suggestions for the company.

9. Supplier Management
The quality of each stage in a process depends on the quality of the previous stage. There should be careful identification of each other’s needs. TQM pays attention to suppliers or vendors of labor and materials. Maintaining close and long-term relationships with suppliers gives an economic achievement and the best quality. One of the strategies to improve relations between suppliers and companies is by conducting regular visits and regular communication. Also, it helps the supplier to have a good understanding and feel the needs of the company.

2.2 Quality culture
Quality Culture also can be defined as an organizational culture with great quality oriented in every activity undertaken. Company need the focus of each individual to be able to utilize all resources to improve quality [3]. Here are the forming aspects of Quality Culture [3] [8] [5]:

1. Leadership
One of the main determinants of the successful implementation of Quality Culture is Leadership. Most of the quality problems are related to top level management. This shows that successful quality management is highly dependent on top level management. Top level management should have the philosophy that the quality will receive priority higher than cost or schedule, so in the long run, consistent and superior quality will lead to increased performance.

2. Customer Focus
Emphasis on customer satisfaction or quality driven by customers is considered by many experts and proposed as the great success of the quality management effort. Strategic concepts of customer satisfaction with withdrawals such as customer retention and market penetration.
3. Teamwork  
Teamwork allows many various parts of the company to meet customer needs in ways that cannot be done by individual work. The teamwork provides more mixed of skills in thought and process in company management and those who hold employee supervisory roles.

4. Employees Involvement  
Employee involvement as a process of transforming company culture to gathers the creativeness of all employees for problem solving and to make improvements. Top level management should adopt the Taoist teachings of people-based management. They recognize the importance of daily interactions with all employees and solve the problems together.

5. Employees Empowerment  
The impact of human resources in an company depends on the type of empowerment given to them. The employee empowerment program can be seen as an opportunity for company in the current competitive environment. Some experts consider employee empowerment and commitment as a condition for successful implementation.

6. Motivation  
It takes huge determination and desire for continuous improvement in the very long term in forming Quality Culture. So that the motivation is needed in making continuous improvements.

7. Communication  
Effective communication is important in the process of empowering employees. The complicated management structures cause the communication problem. Effective internal communication in the company is important for achieving quality success because it can provide ongoing customer satisfaction.

8. Relationship with Supplier  
Establishing relationships with suppliers is an important aspect of establishing Quality Culture because materials and parts purchased are often the main source of quality problems. Poor supplier product quality results in additional costs for the buyer. Therefore, most quality problems will be caused by suppliers. For both parties to succeed and their business to grow, a good relationship between the two parties is needed. Companies should treat their suppliers as long-term business partners.

9. Organization’s Structure  
The organizational structure is also an important part in the process of improving the process. This is closely related to the lines of communication, leadership, teamwork, and employee involvement. An efficient organizational structure can produce good communication, good teamwork, and good employee involvement, so as to improve the quality of work.

10. Recognition and Reward  
Another important aspect of quality improvement program is recognizing every individual, section, and department in the company as an increase in performance. Recognition is one of the most important steps in the quality improvement process, because it is the basis for increasing the involvement of all employees in business operations. Recognition and also reward should stimulate employee commitment to quality improvement effectively.

11. Strategy and Policy for Quality  
The integration of quality problems and customer satisfaction into operational plans is needed to conduct strategic quality plan. Also, the important factor for success in quality management is the policy development because the best company use the policy development process to ensure employee understanding of company goals and how to contribute.

12. Power Distance  
Power Distance is a culture where employee in a company do not have power unless there is an injustice in the distribution of power to the company. The inequality power depends on social, educational, or occupational levels. Countries with high power distance have superiors who can use their power and create high gaps between superiors and subordinates. So, subordinates are
reluctant to question or disagree with their superiors. In the other hand, countries with low power distance show an equal relationship between superiors and subordinates.

13. Uncertainty Avoidance
Uncertainty Avoidance relates to employees who feel uncomfortable dealing with an unknown or uncertain future. The essence of this factor is how a society reacts to the fact that time only goes one direction and the future is unknown and whether it tries to control the future or leave it alone. Countries with a culture of high uncertainty avoidance tend to be more emotional. They try to minimize the occurrence of unknown or unusual circumstances. When changes occur they undergo them carefully, step by step with planning and implementing applicable laws and regulations. Whereas a country with a culture of low uncertainty avoidance accepts and feels comfortable in unstructured situations or environments that are often subject to change. They try to have some rules in their activities. Employees in this culture tend to be more pragmatic, they are far more tolerant of change.

14. Individualism
Individualism is the company’s tendency to pay attention to themselves and those closest to them (spouse, children, parents). Culture of individualism shows more selfish tendencies and emphasizes individual goals. The culture of individualism emphasizes work success and achievement or wealth and career advancement. In contrast, collectivism is the company’s tendency to join groups and then look after one another with the consequences of exchanging loyalties between employees. Collective culture places greater emphasis on groups.

15. Masculinity – Femininity
Masculinity culture values the value of work performance and firmness. Feminity culture has a submissive value and supports social life, which is more respectful of others and sympathy for the needy. Masculinity culture is considered more in line with the male character who is assertive, more ambitious, and brave to compete. Feminity culture is very balanced between the sexes and accept parenting between women and men and is more focused on the quality of life.

16. Short Term – Long Term Orientation
This is related to the choice of focus for human effort: the future, present, or past. Long-term orientation and short-term orientation describe the focus and culture of values that concern the mindset of the company. A long term orientation is more concerned with the future. They encourage pragmatic values oriented towards respect, status, saving attitude, including perseverance, savings, and adaptation capacity. A company with a dimension of short-term relationship orientation related to the past and present, including stability, respect for tradition, always maintaining the public appearance, and fulfilling social obligations.

17. Indulgence – Restraint
Indulgence reflects a company which in its social order is very tolerant of expressing desires and feelings, especially those related to the use of free time, seeking entertainment with employees, purchasing goods, consumption, and things that smell sexual. While the restraint reflects on the company that holds back the pleasures mentioned earlier on indulgence. Employees who fall into this condition tend to be less able to enjoy life.

2.3 Contractor competitiveness
In this research, the competitiveness of contractors will be considered as the company's ability to meet products, services, values, experience demands and abilities [2]. Contractor competitiveness has six parameters [9]:
1. Company’s Image
2. Technology and Innovation
3. Financial Ability
4. Project Management Ability
5. Marketing Ability
6. Human Resource and Company
3. Research methodology
This research flowchart can be seen in the following figure.

![Research flowchart](image)

**Figure 1.** Research flowchart.

4. Analysis and results

4.1 Pilot Survey
In this research, a pilot survey was conducted on 10 respondents with each background. From the pilot survey obtained several suggestions in writing sentences on the research questionnaire.

4.2 Respondents questionnaire
In this research, there were 49 respondents. The questionnaire was distributed to various contractor companies in Indonesia, both with BUMN or private ownership. The respondents were also obtained from various ages, educational backgrounds, and experiences. It is hoped that this respondent will be sufficient to represent many contracting companies in Indonesia.

4.3 Homogeneity test
Homogeneity test is used to determine the variance of data populations whether between two or more groups of data have the same or different variants. This homogeneity test will use the Kolmogorov-Smirnov Z Test and the Kruskal-Wallis H Test. In the Kolmogorov-Smirnov Z Test, the data group is said to be homogeneous if the significance value (Asymp.Sig.) > 0.05, while in the Kruskal-Wallis H Test, the data group is said to be homogeneous if the significance value (Asymp.Sig.) > 0.05 and the chi-value square <chi square table value. This test is carried out with the help of SPSS software.

4.4 Validity test
Validity test is used to find out how accurate a data is in measuring a study. Data is said to be valid if there is a correlation to the total score. In this study the validity test uses the Pearson Correlation method, which uses a correlation of data scores with total data scores. Then, the significance test was carried out with the criteria using r table at the 0.05 significance level with a two-tailed test. If the value
is positive and \( r \) count > \( r \) table (with \( N = 49 \), then \( r \) table = 0.282), the data is declared valid, otherwise, the data is declared invalid.

**Figure 2.** Table results of validity test.

### 4.5 Reliability test

Reliability Test is used to find out the consistency or consistency of measuring instruments that usually use questionnaires. The method often used in research to measure the scale of stretches is Cronbach Alpha. Following are the results of the reliability test conducted in this study.

| Var. | \( R \) Hitung | Hasil |
|------|----------------|-------|
| X1   | .407**         | Valid |
| X2   | .728**         | Valid |
| X3   | .685**         | Valid |
| X4   | .654**         | Valid |
| X5   | .589**         | Valid |
| X6   | .607**         | Valid |
| X8   | .663**         | Valid |
| X9   | .668**         | Valid |
| X11  | .739**         | Valid |
| X12  | .731**         | Valid |
| X14  | .640**         | Valid |
| X16  | .706**         | Valid |
| X17  | .653**         | Valid |
| X18  | .694**         | Valid |
| X19  | .720**         | Valid |
| X20  | .717**         | Valid |
| X21  | .582**         | Valid |
| X22  | .686**         | Valid |
| X23  | .712**         | Valid |
| X24  | .661**         | Valid |

| Var. | \( R \) Hitung | Hasil |
|------|----------------|-------|
| X25  | .682**         | Valid |
| X26  | .778**         | Valid |
| X27  | .614**         | Valid |
| X28  | .845**         | Valid |
| X29  | .799**         | Valid |
| X30  | .789**         | Valid |
| X31  | .703**         | Valid |
| X32  | .786**         | Valid |
| X33  | .734**         | Valid |
| X34  | .751**         | Valid |
| X35  | .664**         | Valid |
| X36  | .592**         | Valid |
| X37  | .657**         | Valid |
| X39  | .829**         | Valid |
| X40  | .717**         | Valid |
| X41  | .766**         | Valid |
| X42  | .732**         | Valid |
| X43  | .634**         | Valid |
| X44  | .739**         | Valid |
| X45  | .639**         | Valid |

| Var. | \( R \) Hitung | Hasil |
|------|----------------|-------|
| X46  | .768**         | Valid |
| X47  | .708**         | Valid |
| X48  | .738**         | Valid |
| X50  | .724**         | Valid |
| X51  | .792**         | Valid |
| X52  | .727**         | Valid |
| X54  | .792**         | Valid |
| X56  | .783**         | Valid |
| X57  | .658**         | Valid |
| X58  | .660**         | Valid |
| X59  | .606**         | Valid |
| X60  | .497**         | Valid |
| Y1   | .659**         | Valid |
| Y2   | .632**         | Valid |
| Y3   | .604**         | Valid |
| Y4   | .759**         | Valid |
| Y5   | .631**         | Valid |
| Y6   | .820**         | Valid |
| Y7   | .819**         | Valid |
| Y8   | .762**         | Valid |
| Y9   | .780**         | Valid |
| Y10  | .751**         | Valid |
| Y12  | .733**         | Valid |
| Y13  | .642**         | Valid |
| Y15  | .726**         | Valid |
| Y16  | .659**         | Valid |
| Y17  | .656**         | Valid |
| Y18  | .868**         | Valid |
| Y19  | .774**         | Valid |
| Y20  | .838**         | Valid |
| Y22  | .770**         | Valid |
| Y23  | .770**         | Valid |
| Y24  | .637**         | Valid |
| Y25  | .714**         | Valid |
| Y26  | .714**         | Valid |
| Y28  | .599**         | Valid |
| Y29  | .720**         | Valid |
| Y30  | .699**         | Valid |

Based on the table above, the Cronbach’s Alpha value = 0.986 is obtained. So it can be concluded that the instrument used in this study has a very high reliability value.

### 4.6 Correlation test

In this research, correlation testing was performed using Pearson Correlation. In the calculation of the Pearson Correlation coefficient will be obtained which shows the closeness of the relationship between variables. The correlation coefficient values range from 0 to 1 or 0 to -1. If it approaches 0, then the relationship between these variables gets weaker, and vice versa. Here is a table of Pearson correlation test results.
Table 2. Result of correlation test.

|     | X1  | X2  | X3  | X4  | X5  | X6  | X8  | X9  | X11 | X12 | X14 | X16 | X17 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Y   |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Y   |     |     |     |     |     |     |     |     |     |     |     |     |     |

4.7 Relationship model
The following is a model of the relationship between TQM and Quality Culture to increase the competitiveness of contractors in Indonesia.

Figure 3. Relationship model.

4.8 SWOT analysis
SWOT analysis is the systematic identification of various factors to formulate a company's strategy. This analysis is based on logic that utilizes Strength, Weakness, Opportunity, and Threats. SWOT analysis compares between external factors, Opportunity and Threats, and internal factors, Strength and Weakness.
The research variables are then grouped so that they become input from the SWOT matrix in this study. The grouping process is done based on the correlation coefficient value that was done before. The SWOT variables that are input in the SWOT Matrix below are the dominant variables (correlation coefficient value > 0.7).

**Table 3.** SWOT matrix.

|          | Strength                                                                 | Weakness                                                                 |
|----------|---------------------------------------------------------------------------|--------------------------------------------------------------------------|
| SWOT     | 1. top level management is committed to upholding quality.                | 1. communication is not going well                                       |
|          | 2. the team works well together                                           | 2. employees are not given the opportunity to develop themselves         |
|          | 3. the company makes continuous improvements                              | 3. companies choose suppliers based on cheaper prices                    |
|          | 4. the company has a clear and efficient organizational structure         |                                                                          |
| Opportunity | 1. always focus on high quality both in the quality of work and the quality of employees | 1. not only focus on the customer, but also enhance employee self-development |
|          | 2. improve good relations with stakeholders                               | 2. pay attention to the quality of the suppliers so that they always produce the highest quality products |
|          | 3. manage lesson learn appropriately                                       |                                                                          |
| Threats  | 1. perform employee self-improvement so that they can always improve the quality of themselves and their work | 1. perform value engineering. it aims to reduce costs with better results. |
|          | 2. with high human resources, customers' expectations of quality, cost, and schedule will be met | 2. certainly increase the ability of employees. improve employee quality, don't focus on quantity. |

5. Conclusion and recommendations

5.1 Conclusion
The following conclusions obtained in this research, in accordance with the research objectives that have been submitted previously.

1. Dominant factors influencing TQM and Quality Culture to improve the competitiveness of contractors in Indonesia are determined by correlation coefficient values > 0.7. So it can be concluded that the dominant factors in TQM variables are Communication, Continuous Improvement, Process Management, and Supplier Management. While the dominant factors in the Quality Culture variable are Employee Engagement, Organizational Structure, Recognition and Rewards, Quality Strategy and Policy, and the Use of Power.

2. The relationship model between TQM and Quality Culture to increase the competitiveness of contractor companies is obtained by knowing the correlation coefficient value > 0.7. The Relationship Model can be seen in figure 3.
3. The strategy for implementing TQM and Quality Culture to improve the competitiveness of contractors in Indonesia is as follows.
   a. Always focus on high quality both in the quality of work and quality of employees
   b. Improve good relations with stakeholders
   c. Manage lesson learned appropriately
   d. Not only focus on customers, but also enhance employee self-development
   e. Pay attention to the quality of the suppliers so that they always produce the highest quality products
   f. Perform employee self-improvement so that they can always improve the quality of themselves and their work
   g. With high human resources, customers' expectations of quality, costs and schedules will be met
   h. Perform value engineering. It aims to reduce costs with better results.
   i. Certainly, improve the ability of employees. Improve employee quality, don't focus on quantity.

5.2 Recommendation
The following are suggestions for this research so that they can be used as input in further developing this research.
1. The TQM variable is considered too often used. In subsequent studies, the authors suggest that one of the independent variables used is Six Sigma.
2. The limitations of the writer cause the respondents found not in accordance with expectations. The questionnaire should be made concise and attractive, and be prepared for more time to obtain the optimal number of respondents.
3. The authors' limitations also lead to the formulation of strategies using literature study and SWOT analysis. The author hopes for further research the formulation of strategies can be done by means of case studies.

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