

# **The Study of Standardization and Continuous Improvement Process of Organizational Culture Model - The Effect of ISO9000 Implementation on Organizational Culture and TQM**

**Ming-Tzong Wang<sup>1</sup>, Sophia S.-C. Wang<sup>2</sup>, Simon W.-C. Wang<sup>2</sup>, Pei-I Jen<sup>2</sup>, Hsu-Hua Lee<sup>2</sup>, Alex S.-M. Wang<sup>2</sup>, Tony Huang<sup>2</sup>, and Mary Chen<sup>2</sup>**

## **Abstract**

In this research, seven companies with ISO9000 certification and TQM implementation in Taiwan are studied to know the relationship of ISO9000, TQM, and organizational culture by using LISREL (linear structural relation) method. The effect of the implementation of ISO9000 on organizational culture is significantly different, and then is beneficial for TQM. The support and involvement of high level managers are crucial for ISO9000, TQM, and organizational culture. The quality concept and the value of the employee can be improved through the educational training, quality activity, and cross-functional communication.

**Key words:** ISO 9000, organizational change, organizational culture, organizational culture model, LISREL

## **Introduction**

Business operation standardization is the basis of business management. The effect of business operation standardization can include: (1) reducing process variance, (2) reducing management and operation cost, (3) improving process performance, (4) enhancing product quality, (5) reducing in cases of nonconformity, and (6) keeping safety of operators and equipments, etc. The international quality standard ISO 9000 is a widely accepted definition of the basic features of an effective quality management system. The ISO 9000 certification can be set up as the model of internal quality management system to strengthen the competition of companies and implement the standardization of organization.

The activities, value, and operational objectives of companies can be continuously implemented through the organizational culture. The new management model is needed due to the high competition, the changing expectation of the customers, and the development of technology and law (Mohrman, 1989). The relevant managerial

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1 Associate Professor, Graduate Institute of Industrial Engineering, National Taiwan University, No. 1, Sec. 4, Roosevelt Road, Taipei, 10617 Taiwan (R.O.C), Tel. +886-233663366 ext. 69502, e-mail: mtwang@ntu.edu.tw

2 Graduate Student, Graduate Institute of Industrial Engineering, National Taiwan University, No. 1, Sec. 4, Roosevelt Road, Taipei, 10617 Taiwan (R.O.C)

performance can be improved by quality management and the increase in quality perception, and then the relevant cost/ benefit model can be established. The continuous organizational learning, self innovation, high performance, relevant beneficial group, and effective interface management are included in the new management model. The strategies of organizational change include technological change strategy, political change strategy, and culture change strategy (Tichy, 1983). The change of organizational culture is critical for organizational change. The standardization of organizational system, Total Quality Management (TQM), and learning organization can enhance the organizational structure, competition, and global management change.

Most of the large companies with TQM implementation in Taiwan have the ISO 9000 certification. However, most of the companies with ISO 9000 certification do not implement TQM. In this research, the companies with ISO 9000 and TQM implementation are studied to obtain the effect of ISO 9000 on organizational culture change and value. The critical factors of TQM implementation are analyzed on the process of implementing ISO 9000. In this research, the effect of the critical factors of ISO 9000 certification for seven large companies on the success of TQM is evaluated. The relationship between organizational culture change and TQM is also analyzed.

## **Literature Review**

### **ISO 9000 Quality Assurance System**

ISO 9000 is the international standard of quality management system to produce high quality products by using document control and reasonable procedures. ISO 9000 is not used to certify the products, but establish the quality system and implemented agreement with the documented operational procedures (Chynoweth & Mullin, 1992). The quality system is set up for quality management based upon the ISO 9000 standards, and then the documented procedures of operations are obtained for practical implementation and process, process assurance, and conforming products to the customers. The management concept, management function, and practical operations are then combined together. The customers' requirement and market segregation are also presented to assure total quality management system for the employee and the customers (Liu and Wang, 1994).

### **Total Quality Management**

Quality management, customer-oriented concept, and management and technology for quality activities are the management responsibility of production, marketing, engineering, financial, customer service, and public relation departments in TQM (Feigenbaum, 1991). TQM is a system of new management concept as the basis of continuous improvement and practical implementation of using human resource and quantitative methods to improve the supplied material, quality of service, process quality, and conforming results (Lin, 1996).

Based upon the conceptual theories of Deming, Crosby, Juran, and Ishikawa and the investigation of 162 managers in 20 companies, the critical factors in TQM can include (1) the role of high level managers, (2) quality data and report, (3) training, (4) employee, (5) process management, (6) design of product and service, (7) quality management of suppliers, and (8) the role of quality department (Saraph, 1989). The other research shows that the critical factors of TQM after investigating the managers in 371 companies include (1) promise of high level managers, (2) quality management of suppliers, (3) customer-oriented, (4) statistical process control, (5) benchmarking and learning, (6) the application of internal quality information, (7) authorization, (8) the involvement of employee, (9) training, and (10) management of design quality (Ahire, 1996).

### **ISO 9000 Quality Assurance System, TQM, and Organizational Culture Model Transfer**

TQC, TQM, 5S, QCC, and other quality activities are implemented ahead of ISO 9000 quality assurance system, but ISO 9000 has much impact on global management due to the required certification. The certificate can be given if the documented procedures are conformingly set up and practically implemented by the employee and there is no major nonconforming result.

However, the effect of ISO 9000 certification on organizational culture is not significant because the first and the second documents are established and the certification is requested by the high level managers. The employee may just focus on the quality and ignore the improvement of the efficiency related to the processes or the production flow. Hence, the organizational culture should be transferred to the quality improvement processes for all employees, and then become their value. The perception of quality responsibility regarding the employee should be strengthened by implementing TQM.

Implementing the ISO 9000 standards is necessary to supply the satisfactory products to the customers, but it may not satisfy the customer. The quality assurance through ISO 9000 certification is just the lowest quality requirement, and it is not obvious to increase the competitiveness. In order to reimburse the deficiency of documented standardization and quality oriented system in ISO 9000, TQM implementation can conform to complete customer satisfaction, growing marketing benefit, enhanced humanity management, culture change, and improved work attitude of all employees.

## **Methodology**

### **Research model**

In this research, the effect of ISO 9000 implementation on organizational culture factors, the effect of organizational culture factors on TQM implementation, and the relationship among ISO 9000, organizational culture, and TQM are analyzed, and the research structure

can be shown as Figure 1. The questionnaire can have three parts including (1) critical factors of successful ISO 9000 implementation, (2) TQM implementation factors, and (3) organizational culture factors. The Likert measurement method of seven scales is used, so the answer 「1」 means “strongly disagreed or nonconforming”, 「7」 means “strongly agreed or conforming”, and so on.

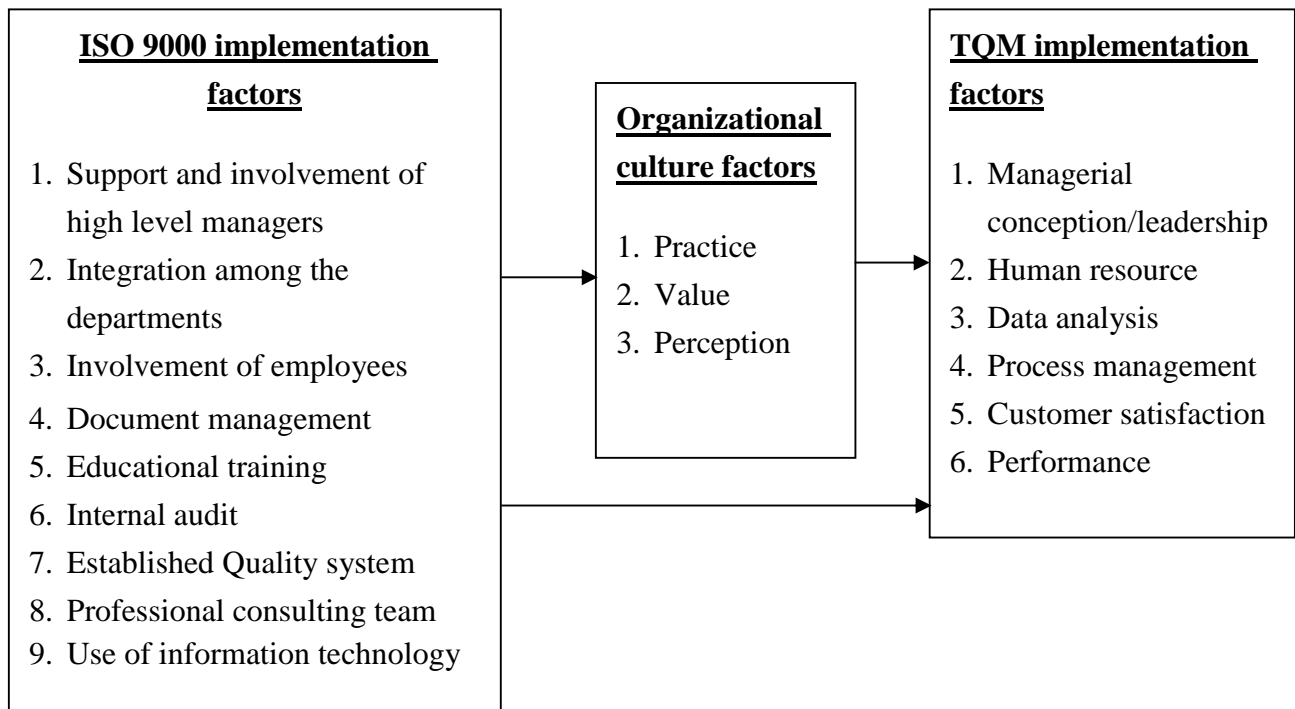


Figure 1. Conceptual structure in this research

The hypothesis in this paper is that the conforming ISO 9000 implementation can result in positive organizational culture change, and then be beneficial for TQM implementation. Hence, seven companies with ISO 9000 certification and successful ISO 9000 implementation are chosen for the case study, and are shown as Table 1. The company A, B, and C are the manufactures of steel products. The company D, E, F, and G are the companies of pump, transportation, high-technological chemical products, and logistics respectively.

### **Hypothesis**

All organizational processes with product design, production process design, maintenance, finance, delivery, environment, marketing, strategic planning, employee involvement, training, and research and technology processes are included in ISO 9000 quality system (Anttila, 1992). ISO 9000 can change the organizational function into quality assurance oriented organization, and the critical factors in ISO 9000 will set up specific organizational culture. In this research, the first hypothesis can be presented as the following:

*Hypothesis 1:* ISO 9000 implementation affects organizational culture change.

People, system, and management are included in TQM to provide the suppliers with high quality products and service and satisfy the customers (Pike and Branes, 1993). The attitude, behavior, involvement, and proper authorization of all employees are the fundamental factors of TQM. The strategies, leadership, and promise of the managers, and the resource given by effective organizational structure are the critical factors for TQM implementation. Hence, the organizational culture can produce proper resource, and then make TQM implementation succeed. The second hypothesis can be presented as the following:

*Hypothesis 2:* Organizational culture change is the critical factor for TQM implementation.

ISO 9000 and TQM are beneficial for each other. ISO 9000 is a measurable standard and structure of quality system, and can be the basis of successful TQM implementation (Corrigan, 1994). Hence, ISO 9000 can benefit TQM (Samuel, 1994), and the third hypothesis can be presented as the following:

*Hypothesis 3:* ISO 9000 implementation can successfully affect TQM implementation.

## **Results and Findings**

### **Sample**

The first part of people with high level managers (department manager or deputy manager), middle level personnel (section manager or engineer), and basic level employee (operator or technician) in the company are included in the questionnaire. One high level manager, one or two middle level personnel, and one or two basic level employee at each department are sampled. More than 30 samples are selected to know the feeling at different position. The second part in the questionnaire is to investigate the managers and the quality assurance personnel responsible for the ISO 9000 and TQM implementation.

There are 335 questionnaires issued to seven companies. The effective receptive rate is 66.87% with 224 effective questionnaires. The number of high level managers is 16 with 7.14%. The number of middle level personnel is 103 with 45.98%. The number of basic level employee is 105 with 46.88%.

### **Variables**

In this research, critical factors of ISO 9000 implementation are analyzed by using component analysis. The factors with the eigenvalue  $\lambda > 1$  are given after the principal

component analysis, and then five critical perspectives for ISO 9000 with the support and involvement of high level managers, computerization and documentation, quality control system, the involvement of employees, and internal audit are obtained.

The factors with the eigenvalue  $\lambda > 1$  are given after the principal component analysis, and then five critical perspectives for TQM with the leadership and performance, encouragement and improvement, and product and service process are obtained.

The factors with the eigenvalue  $\lambda > 1$  are given after the principal component analysis, and then five critical perspectives for organizational culture with the practice of organizational culture, organizational value, and organizational perception are obtained.

### **Critical Factors of ISO 9000, Organizational Culture, and TQM**

The relationship among the critical factors of ISO 9000, organizational culture, and TQM are studied by using LISREL (linear structural relation) method.

#### *Model development*

In this research, the critical factors of ISO 9000 can affect organizational culture in the hypothesis. The organizational culture change can then become the condition of TQM implementation in a proper environment. ISO 9000 can also directly affect TQM implementation without the moderate factors of organizational culture. Hence, the critical factors of ISO 9000 can directly affect the factors of organizational culture and TQM, and the factors of organizational culture can directly affect the factors of TQM. The internal audit of ISO 9000 and the product and service process of TQM are deleted due to the low internal reliability and illustrated proportion before using LISREL.

#### *The cause and effect matrix and the estimated parameters*

In the LISREL model, there are two kinds of latent variables including (1) the latent independent variables,  $\varepsilon$ , which are for the causes, and (2) the latent dependent variables,  $\eta$ , which are for the effects. The observed variables of the latent independent variables are denoted by X variables. The observed variables of the latent dependent variables are denoted by Y variables. The simplified LISREL model can be shown as Figure 2. The values,  $\lambda$ , denote the relationship among the factors of ISO 9000, organizational culture, TQM implementation, and the observed values. The values,  $\gamma$ , denote the effect of critical factors of ISO 9000 on the factors of organizational culture and TQM implementation. The values,  $\beta$ , denote the relationship among the factors of organizational culture or the effect of organizational culture on TQM implementation.

#### *The results of analysis and the meaning of management*

The communication among the departments can make the employees discuss the problems freely at the meetings. Hence, the attitude of high level managers toward the

leadership and performance of TQM has direct effect after the ISO 9000 implementation.

The involvement of high level managers can also affect the organizational value. The support and the involvement of high level managers can increase the quality perception of employees. The employees can know the management consistent with the practice.

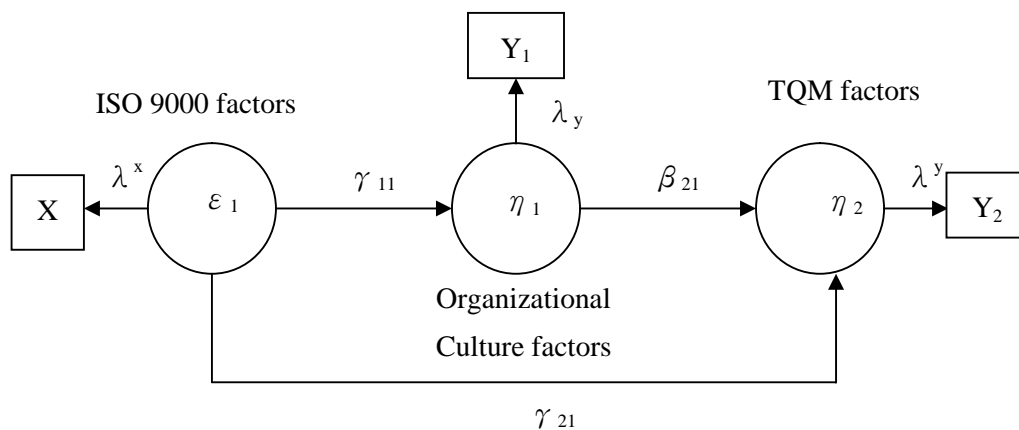


Figure 2. Simplified LISREL Model

The computerization and documentation can affect the organizational practice and organizational value in organizational perspective, and the encouragement and improvement in TQM perspective. The computerized quality control and computer-aided making and managing documents make the employees obtain the problems rapidly and improve the performance continuously. In the organizational practice, the computerization can strengthen the suggestion system of the employees, and then the factors of problems and the defects of process design can be analyzed and improved continuously.

The basic quality control can positively affect organizational practice and organizational value, and can be beneficial for TQM implementation and the relationship improvement among the employees, the customers, and the suppliers before ISO 9000 implementation.

The involvement of employees can affect three perspectives of organizational culture since the training of ISO 9000 is to educate the employees concerning the importance of quality, the meaning of quality policy and implementation principles. ISO 9000 becomes the common language in the enterprise. The involvement of employees affect the organizational culture very much due to the organizational culture is resulted from organizational behavior model of employees. The thought of employees can change organizational value, and then affect the organizational practice. Based upon the results above, critical factors of ISO 9000 can affect organizational culture and the critical factors of TQM, and the first and the third hypothesis are verified in this research.

The relationship of organizational culture and TQM is shown as Table 4. With respect to the relationship among the perspectives of organizational culture, the organizational

value can affect organizational practice and organizational perception and the organization can also affect the organizational practice. The results are conforming to the organizational culture model in this research by using LISREL method.

The organizational practice can affect the leadership and performance and the encouragement and improvement. The suggestion system for the employees can authorize them to improve the performance.

The organizational value can affect the leadership and performance. As the high quality and customer satisfaction are the main management perception, the involvement of the high level managers in the planning and auditing of management objectives can give the employees the innovation and improve the performance by using cross functional team.

The organizational perception can affect encouragement and improvement. The employees can know the slogans such as integrity and cooperation, continuous innovation, customer satisfaction, and clean environment at the company A, B, and C. The reduction of defect rate, penalty, the number of customers' complaint, and the increase of customer satisfaction can be used to encourage the employee for project improvement and satisfy the requirement of organization at the company E. Hence, the second hypothesis that the organizational culture can affect TQM is verified.

## **Discussions**

*Hypothesis 1:* The ISO 9000 implementation can positively affect organizational culture change

The critical factor of ISO 9000 with the involvement of high level managers and the communication among the departments can affect the factors with the organizational practice and the organizational value of organizational culture. After the interview with the high level managers at seven companies, the support and the involvement of the high level managers can make the employees know the importance of quality and increase the perception of TQM, and then the attitude of working is changed and new organizational value is achieved. In the organizational practice, the employees are encouraged to have a good relationship with the suppliers and the customers and focus the requirement of quality. In addition, the high level managers at the company F emphasize the communication among the departments. The quality issues or other topics can then be freely discussed and the problems can be solved through the support by each other.

The critical factor of ISO 9000 with the computerization and documentation can affect the organizational practice and the organizational value. The documentation of operations and management procedures related to ISO 9000 results in the standardization and the consistency of quality system, and hence the managerial conception and the practice can be consistent. The computerization can be used to control the quality, establish



and manage the documents effectively. The problems can be also rapidly detected and solved by the employees. Hence, the computerization and the documentation can affect the operational model of employees, and affect the organizational practice and organizational value. For example, the company E which is the first logistics company with certified ISO 9000 had the problems about the computerization problems for documentation and the operational performance was affected before the ISO 9000 implementation. After the ISO 9000 certification is completed, the practical performance is improved and the new operational model of employees is set up.

The critical factor of ISO 9000 with fundamental quality control ISO 9000 can affect the organizational practice and the organizational value related to organizational value. The results show that TQM activities are beneficial for the relationship improvement for the employees, customers, and suppliers, the suggestion system becomes better, and the employees are highly authorized. The teamwork is also emphasized in TQM to make the communication among the departments easy and integrate the relevant tasks. Most importantly, quality oriented and customer satisfaction become new organizational value of employees. For example, the managerial conception of the company A, B, and C is base on the Japanese company as the learning benchmarking. The TQM conception is widely used in all departments. Hence, the ISO 9000 can be easily implemented and the employees are willing to establish and innovate new operational practice.

The critical factor of ISO 9000 with the involvement of the employee can affect all three perspectives related to organizational culture. The employees can have deeper understanding of managerial conception after a complete educational training in all seven companies. The involvement of employees in ISO 9000 activities can result in good communication in a cross functional team, and then the employees know the reason why quality certification is needed for the company. The ISO 9000 implementation also increases many slogans which can become the common language in the enterprise. The involvement of employees affect the organizational culture since the organizational culture is resulted from the organizational behavior model of employees. The involvement of employees affects the behavior and the thought of employees, and then the organizational value and the organizational practice are changed.

*Hypothesis 2:* The organizational culture change can result in good TQM implementation.

The organizational practice related to organizational culture can affect the leadership and performance and the encouragement and improvement related to TQM. In the practice, the proper innovation projects with improved performance can be established through the suggestion system of employees, relationship management with the customers and the suppliers, high authorization of employees, and increased communication among the departments.

The organizational value related to organizational culture can affect the leadership and performance. The managerial conception with quality oriented and customer satisfaction can make the high level managers emphasize the importance of quality and involve in the planning and auditing of managerial objectives. The high level managers also lead the employees to focus on the process improvement and quality perception, and the operational performance and the enterprise's performance are improved. The leadership and the evaluation of operational performance are crucial in all seven companies.

The organizational perception related to organizational culture can affect the encouragement and improvement. The quality learning benchmarking and relevant awards can increase the perception of organizational behavior, and the benefit of encouragement and the improvement from the employees are resulted.

*Hypothesis 3: ISO 9000 implementation positively affects TQM implementation.*

The critical factor of ISO 9000 with the involvement of high level managers and the communication among the departments can affect the leadership and performance related to TQM. The high level managers need to play an aggressive role in the leadership, performance improvement, and the proper resource providing. The high quality is pursued due to the quality requirement. As for the enterprise's performance, the customer satisfaction, the performance of suppliers, financial performance, and the quality of products and service meet the required standards. Hence, ISO 9000 implementation affects the attitude of high level managers toward the leadership and performance improvement.

The critical factor of ISO 9000 with the computerization and documentation can affect the encouragement and improvement related to TQM. The computerization can be used to evaluate the nonconforming of process design and continuously improve the quality. The standardization of the documents can also make the evaluation of operational performance transparent.

## **Conclusions**

Paradigm is a defined or undefined principle or rule, which identifies the scope of human thought and behavior and the way of success. The paradigm shift is to change old rules and solve the problems, and new competition and new rules are produced. In this research, the effect of the critical factors of successful ISO 9000 implementation and critical factors of TQM on the organizational culture is studied at seven companies. The support and involvement of the managerial levels such as the involvement of high level managers concerning ISO 9000 and the leadership and performance related to TQM are crucial for organizational change. The attitude of the high level managers toward organizational change is critical factor for the leadership responsibility, the communication with the

employees, the organizational perception, and the organizational paradigm shift.

The hypothesis test shows that the attitude and behavior of the managerial levels and the employees are the fundamental items of organizational culture. The organizational value and the organizational practice can be affected through the procedures and the processes of changing employees such as various activities of ISO 9000 and TQM. The communication of employees is also strengthened to take part in the activities and be interested in the organizational change.

The organizational practice and the organizational perception of employees need to be improved in the developing countries so that all employees can have consistent consensus for organizational culture, know the managerial conception, and like to propose the suggestion for improvement. The educational trainings and multiple TQM activities can increase the involvement of all employees by emphasizing the importance of employees in the enterprise.

The ISO 9000 and TQM activities are crucial to improve the performance and competitiveness, and new paradigm shift with respect to organizational culture can be implemented. ISO 9000 can be applied to TQM implementation by training the internal auditors as the evaluators for continuous improvement. The organizational culture can be innovated by the continuous improvement and customer oriented process related to TQM.

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