Evaluation Scheme for Quality Culture of Military Enterprises

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Abstract. The evaluation of quality culture in military enterprises is an important work in the quality culture construction of military industry, which is conducive to accurately understanding the weaknesses in the culture construction, horizontal comparison, inspection, and supervision, and can also be used for the outcome evaluation and work improvement of culture construction. The quality culture evaluation of military enterprises needs a set of scientific and feasible evaluation schemes, which mainly includes the establishment of an evaluation team, data evaluation, and on-site evaluation. The evaluation indicators system in the data evaluation phase includes process indicators of quality culture construction and outcome indicators of quality culture construction. The evaluation key points in the on-site evaluation phase mainly include leadership and staff quality, the protection of cultural construction resources, process control and product quality, infrastructure and cultural carrier, etc.

Keywords: culture · quality · evaluation · indicators

1 Introduction

Quality culture refers to the integration of spiritual activities that are quality-centered and based on material culture and are closely related to quality awareness and quality activities. It is a combination of values, beliefs, consensus, and norms shared by all employees in the aspect of quality. Chinese military industry quality culture is an important component and characteristic content of military industry culture construction. It is the ideology, behavior mode, and materialization token of the quality of weapons and equipment as the core. For more than half a century, military enterprises have always adhered to the policy of "quality first for military products" and gradually accumulated and formed a quality culture with military characteristics in the long-term practice of national defense construction and the quality activities of military products. The construction of military quality culture is an important part of the quality construction of military enterprises. An objective and scientific evaluation of the construction process and results of the quality culture of military enterprises is the beginning and the closed loop of the quality culture construction. It is of great significance to accurately recognize the current status of quality culture construction, identify weaknesses, set up benchmarks, and improve the quality construction level of military enterprises.

2 Literature Review

There is much research on the evaluation indicators and methods of organizational culture and quality culture. Quinn and Cameron [1] constructed an organizational culture assessment instrument (OCAI) based on the Competing Values Framework (CVF). The six dimensions of measuring organizational culture are dominant characteristics, organizational leadership, management of employees, organization glue, strategic emphases, and criteria of success. Daniel Denison [2] has constructed the OCQ scale and shows that the four cultural characteristics of adaptability, mission, involvement, and consistency are significantly related to the effectiveness of enterprise management through the statistics of more than 1,000 organizations and 40,000 individuals. Chatman [3] regards organizational culture as a value shared by members of the organization. And constructed the Organizational Culture Profile (OCP) from the vision of fit. The seven dimensions of the OCP scale are team orientation, detail orientation, aggressiveness, result orientation, respect for people, stability, and innovation.

The most of research on the quality culture of Chinese scholars is evaluation indicator systems. The common construction methods can be divided into two categories. The first category is to construct a primary indicators system according to the "hierarchical theory of quality culture". For example, domestic scholars such as Zheng Liwei, Li Mingxue, Zhang Shilin, etc. [4–6] have constructed quality culture evaluation indicators systems with primary indicators as a spiritual layer, institutional layer, behavioral layer, and material layer for different research objects. The second category is to construct the primary indicator system according to the "process-outcome principles". For example, Lin Ye proposed the evaluation dimension from three aspects of cultural identity, cultural implementation, and cultural feedback. Gang Hao proposed the indicator system with primary indicators such as management style, organizational growth, and benefits compliance [7–10].

The above researches shown in Table 1 are of great reference significance for establishing the core evaluation indicators of evaluation schemes for the quality culture of military enterprises. However, there are a few characteristics of the military industry field in the research. Further adjustment of indicators and the combination of two construction methods are necessary. Therefore, it is necessary to put forward a set of comprehensive, objective, and effective implementation procedures, evaluation indicators, and key points that reflect the characteristics of the military industry.

3 The Implementation Procedure of the Evaluation Scheme

The implementation procedure of the evaluation Scheme for the quality culture of military enterprises mainly includes the establishment of an evaluation team, data evaluation, and on-site evaluation.

3.1 Establishment of the Evaluation Team

The establishment of the evaluation team is important in the preparatory phase of quality culture evaluation. The members of the evaluation team are generally composed of

Table 1. Summary of quality culture evaluation indicators in China.

Research	Primary indicators	Indicators
Quality Culture Construction in 716 Research Institutes (Zhang Shilin, China Shipbuilding Industry Corporation NO.716 Research Institute)	(1) quality spiritual culture (2) quality institutional culture (3) quality behavioral culture (4) quality material culture	Include 17 secondary indicators such as concept system construction and enterprise system, and 42 tertiary indicators such as employee training and promotion of advanced technology.
Evaluation of Quality Culture Construction (Factory 5719 of the People's Liberation Army of China)	(1) cultural elements (2) implementation evaluation (3) outcomes of culture construction	Include 17 secondary indicators such as Organization and leadership and 25 tertiary indicators such as education and training.
Research on the Construction of a Quality Culture Evaluation System (Li Mingxue)	(1) spiritual layer (2) institutional layer (3) behavioral layer (4) material layer	Include 21 secondary indicators such as quality organization, evaluation, and incentive.
Evaluation Indicators System of Aviation Enterprise Quality Culture (Zheng Liwei)	(1) spiritual layer (2) institutional layer (3) behavioral layer (4) material layer	Include 21 secondary indicators such as Quality strategy and customer satisfaction.
Construction of Evaluation Indicators System for Military Culture Construction Exemplars (He Yalan)	(1) leadership and organization (2) implementation of military culture construction (3) achievements of military culture construction	Include 10 secondary indicators and 28 tertiary indicators
Research on Evaluation System of Enterprise Quality Culture Maturity (Lin Ye)	(1) cultural identity (2) cultural implementation (3) cultural feedback	Include 11 secondary indicators such as quality policy, values cognition, quality cultural atmosphere, quality culture consciousness identification, etc.

Table 1. (*continued*)

Research	Primary indicators	Indicators
Research on Quality Culture Evaluation of Manufacturing Enterprises (Gang Hao)	(1) management style (2) organizational growth (3) benefit compliance	Include 11 secondary indicators such as the involvement of top management, the participation of members, quality system, organization structure, working procedures, etc.

experts in the field of quality management and quality culture determined by the competent department of evaluation considering the professional background, expertise, time, energy, professional experience, and other aspects. After the establishment of the evaluation team, the team leader and deputy team leader are appointed and the responsibilities among the expert members are clarified. The specific technical evaluation (including data evaluation and on-site evaluation) will be implemented according to the evaluation indicators and requirements, and the evaluation conclusions will be given by the evaluation team.

3.2   Data Evaluation

The data evaluation is a preliminary evaluation of the quality culture construction level by the evaluation team concerning the existing technical data and supporting documents of military enterprises. The data evaluation can not only efficiently and comprehensively grasp the basic situation of quality culture construction but also obtain quantitative data for judgment. During the data evaluation, the advancement, systematicness, and innovation of the quality culture are evaluated by the evaluation team according to the indicator system of data evaluation, and the scientificity and achievements of the quality culture construction process are scored.

3.3   On-Site Evaluation

An on-site evaluation is a further inspection of the quality culture construction level of military industrial enterprises through on-site visits, on-site observation, inquiries, employee interviews, etc. As an important supplement to data evaluation, the advantages of on-site evaluation are inspecting the quality culture atmosphere of the enterprise and obtaining more information. According to the key points of the on-site evaluation, the quality culture atmosphere, the conformity of the actual situation with the data, the achievements of the quality culture construction, the infrastructure and basic resources, and other things are evaluated by the evaluation team.
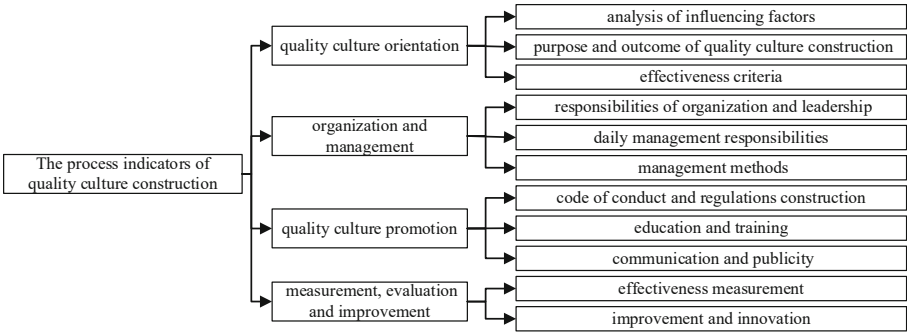
Fig. 1. Process indicators of quality culture construction.

4 Data Evaluation Indicators

The quality culture evaluation indicators system of military enterprises includes process indicators of quality culture construction, which is used to evaluate the scientificity and effectiveness of the quality culture construction mechanism, and outcome indicators of quality culture construction, which is used to evaluate the quality culture construction effect of military enterprises, namely the advancement of quality culture construction outcome.

4.1 Process Indicators of Quality Culture Construction

The process indicators of quality culture construction to evaluate the quality culture construction mechanism of military enterprises are determined by the construction elements of military quality culture. The method of quality culture construction includes four modules: quality culture orientation, organization, and management, quality culture promotion, measurement, evaluation, and improvement. The construction elements included in each module serve as measurable lower-level indicators. The four modules of military quality culture construction are interrelated, which is the basis for continuous refinement, promotion, and improvement of quality culture. The process indicators of quality culture construction are shown in Fig. 1.

4.2 Outcome Indicators of Quality Culture Construction

The outcome indicators of quality culture construction to the effect of quality culture construction are determined from the four-layer of military quality culture. The outcome indicators of quality culture construction are shown in Table 2.

5 On-Site Evaluation Key Points

5.1 Purposes and Functions of the On-Site Evaluation

On-site evaluation should be implemented after the data evaluation. The purposes and functions of on-site evaluation are as follows:

- Some important information in the data evaluation is verified;

Table 2. Outcome indicators of quality culture construction.

Spiritual layer	Institutional layer	Behavioral layer	Material layer
(1) quality strategy (2) quality values (3) quality policy	(1) the implementation of superior quality laws and regulations (2) quality rules and regulations (3) quality standard system and technical system	(1) quality supervision and management mechanism (2) model quality working mechanism (3) quality reward and punishment mechanism (4) information management and submission mechanism (5) team cooperation mechanism	(1) products and services (2) personnel management (3) quality tool advancement (4) working environment (5) infrastructure and carrier of quality culture (6) military brand (7) research on quality culture

- Important information that cannot be obtained from data evaluation by on-site visits is obtained, on-site observation, inquiries, employee interviews, etc.;
- The quality cultural atmosphere of military enterprises is felt. We can intuitively feel a spiritual outlook and visit the infrastructure and material cultural construction of military enterprises.

5.2 Key Points

According to the purposes and functions, the on-site evaluation should be an important supplement to the final evaluation results, with a focus on the items that cannot be obtained or need further confirmation in the data evaluation. The following four aspects should be evaluated:

5.2.1 Leadership and Staff Quality

During the on-site evaluation, the role of senior leaders in military enterprise and the quality awareness of employees can be directly evaluated through discussions with leaders and interviews with ordinary frontline employees.

- The understanding and views of senior leaders on the quality and cultural concepts, strategic objectives, policies, and values, and the matching degree with the actual situation of the enterprise, military missions and tasks, and future development trends;
- The construction plan, implementation steps and safeguard measures drawn up by the senior leaders of the military enterprise to realize the quality and cultural objectives of the enterprise, and its scientificity and feasibility;
- The level of understanding and approval of the employees on the quality concepts, strategies, and policies of the enterprise;
- The understanding and implementation of the duties and tasks for employees in the quality culture construction;

- Participation and opinions of military enterprise employees on quality education and training and quality cultural activities;
- The opinions and suggestions of military enterprise employees on quality work and quality culture construction.

5.2.2 The Safeguard of Cultural Construction Resources.

During the on-site evaluation, the regulations, organization, personnel resources, finance, and other aspects of the quality and cultural construction resources safeguard can be inspected by on-site visits and interviews with employees.

- The detailed implementation of superior quality rules and regulations is verified;
- The construction and implementation of rules and regulations system and standard system are checked;
- The quality management department and post setting of the enterprise, the division of responsibilities, post setting and team building of the quality culture management department or the quality culture management team;
- The personal responsibilities, professional titles and positions, and business capabilities of the enterprise culture management department and the quality culture management team;
- The usage and original documents of funds for quality cultural activities, quality rewards, and punishments are verified.

5.2.3 Process Control and Product Quality

During the on-site evaluation, the process quality control and final product quality of the military enterprise can be investigated by observation, on-site visits, discussions, interviews with employees, etc.

- Related quality supervision and management documents and operation records;
- Verifying model quality work mechanism which covers personnel, work interface, work requirements, etc.;
- The intelligent and automated level of quality management on the production site and the application of quality tools and quality control methods on the site;
- Checking if the working environment meets the "5S" management requirements;
- The degree of knowledge and implementation of post-quality conduct codes for frontline personnel;
- Investigating the enterprise quality information management system, quality data repository, quality management software, etc.;
- Asking military representatives for their opinions and suggestions on products and services.

5.2.4 Infrastructure and Cultural Carrier

During the on-site evaluation, the construction of cultural infrastructure in the military enterprise can be verified by on-site visits, participation in demonstrations, and observation to intuitively feel the richness of cultural carriers.

- Observing the layout of bulletin boards, news, websites, exhibition boards, and slogans of the military enterprise;

- Verifying the technical materials such as courses, lecture notes, standards, guidelines, case collections, and compilations of the quality culture;
- Visiting exhibition venues, conference venues, exhibition halls, and other venues that can be used for quality culture demonstration and activities;
- Participating in the tour routes, cultural courses, and communication processes;
- Verifying and evaluating the configuration of hardware facilities such as places, network resources, computer equipment, printing, and supporting logistics services for demonstration, communication, and activities.

6 Conclusions

In this paper, an evaluation scheme for the quality culture of military enterprises is studied. The research on the evaluation indicators and methods of organizational culture and quality culture are systematically sorted out. An evaluation scheme for the quality culture of military enterprises including the establishment of an evaluation team, data evaluation, and on-site evaluation is designed. The evaluation indicators system in the data phase is given based on the previous research on evaluation indicators. And the evaluation key points in the on-site evaluation phase are given. The research results of this paper are expected to provide an evaluation method and promote the development of quality work. In further research, the connotation of evaluation indicators will be refined.

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