

# Analysis of the Forming Process of Construction Enterprise Culture Based on the QFD Theory

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**Abstract:** In order to clarify the direction and way of construction enterprise culture, the method of construction enterprise culture based on quality function deployment (QFD) theory is put forward. Firstly, the paper analyzes the QFD theory and the forming process of construction enterprise culture and considers that the two have strong adaptability in the aspects of basic characteristics, implementation process, and logical relationship. Secondly, based on QFD, the basic framework of construction enterprise culture is established, which is divided into three stages: cultural planning, process planning, and implementation planning. Finally, the paper expounds on each link of the cultural planning matrix in detail.

**Keywords:** Construction enterprise; Culture construction; Quality function deployment; Adaptability

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## 1. Introduction

With the advent of economic globalization, the competition faced by enterprises will become increasingly fierce. Recognizing that competitiveness extends beyond management, technology, and talent, more and more enterprises understand the importance of cultivating a unique corporate culture that aligns with market development trends. This emphasis on building a distinct enterprise culture is seen as a crucial element in shaping the core competitiveness of enterprises. Therefore, enterprises must establish a set of core concepts that align with the specific circumstances of the enterprise and the evolving trends in the industry. Many enterprises have recognized the imperative of constructing a corporate culture and are actively striving to create a systematically developed and scientifically grounded enterprise culture. Much research has been done on the construction of enterprise culture. The formation mechanism of the construction enterprise culture has been analyzed and several aspects of the forming process have been emphasized<sup>[1]</sup>. The construction corporate culture status of a large state-owned power company has been researched<sup>[2]</sup>. Most of the studies focused on the construction and evaluation of the index system of construction enterprise culture construction<sup>[3,4]</sup>. It is evident that existing studies on the construction of enterprise culture predominantly focus on emphasizing the importance and subsequent evaluation of such construction. However, discussions on the practical aspects of how to establish enterprise culture construction and ensure the direction of this construction throughout

the establishment process have been limited. The establishment of a construction enterprise culture entails numerous factors within the organization. However, the current establishment process relies heavily on the intuition and experience of managers, as well as the influence of role models to guide it. There is a notable lack of effective and feasible methods to systematically and strategically guide the establishment of enterprise culture.

Quality function deployment (QFD) is a systematic product development method driven by customer demand and has been advocated in many industries and fields <sup>[5]</sup>. Applying QFD principles to construct the culture of a construction enterprise is a valuable area of exploration. This paper proposes a framework for construction enterprise culture based on QFD, after analyzing the adaptability of QFD theory to cultural formation.

## 2. Adaptive analysis

QFD, which originated in the 1960s, was originally produced as a systematic method to support product planning, design, and production processes driven by customer demand. During the QFD analysis process, integrating product planning, component planning, process planning, and production planning necessitates a comprehensive consideration of time, logic, and relevant professional knowledge. These activities are interdependent and closely interconnected, and only by accurately constructing each link can the ultimate goal be achieved.

In the House of Quality (HOQ) analysis process of product development, the vector form is usually used to describe customer requirements, engineering characteristics, component characteristics, process characteristics, production characteristics, etc. The House of Quality (HOQ) is typically represented as a matrix, encompassing key components such as the left wall (gathering customer requirements), the right wall (evaluating the importance of customer requirements), the ceiling (establishing engineering characteristics), the roof (correlating engineering characteristics), the room (aligning customer requirements with engineering characteristics), and the basement (evaluating the importance of engineering characteristics, resolving internal conflicts in conceptual design alternatives, and optimizing conceptual design alternatives). Each HOQ yields outputs like the importance of engineering features and resource allocation, product component configurations, process plans, and process quality control charts, as well as production operation guidelines. Each HOQ completes the transformation from “how” to “what” in matrix form, forming a waterfall decomposition model in the QFD method through successive decomposition and implementation. According to this decomposition model, the product development process can be described in the process of analysis and transformation of the above vectors. Generally speaking, the values of the specific components in each vector can be obtained through thorough investigation, sorting, and analysis.

As described above, the basic characteristics of the QFD theory can be summarized as follows: (1) Through product planning, component planning, process planning, and production planning, a large number of unstructured and qualitative information can be converted into structured and quantitative information that can be measured and calculated. (2) The whole process can be optimized through product planning quality house, parts planning quality house, process planning, and production planning quality house. (3) QFD is a product development and design method based on customer needs, so it can effectively improve customer satisfaction. (4) The application of the QFD method requires full cooperation between customers and product designers.

Construction enterprise culture is usually formed in a specific environment. To ensure the sustainable development of the enterprise, the culture is generally guided, publicized, and implemented by a few influential

figures. Successful shaping involves long-term efforts from relevant enterprise departments for publicity, implementation, and systemic norms. Throughout the entire process of establishing a distinctive construction enterprise culture, enterprises frequently decompose the overall process. They then determine a series of specific analytical processes that combine objective environmental factors and subjective opinions. Therefore, from the perspective of the realization mechanism of the entire construction enterprise culture construction, the fundamental characteristics of the construction process can be summarized as follows: (1) Through the requirement analysis, a large number of unstructured and qualitative information can be transformed into structured and quantitative information that can be measured and calculated through the design of conceptual alternatives, detailed alternatives, and specific implementation processes. (2) The formation of construction enterprise culture involves analyzing the enterprise environment and development trends and determining the objectives and requirements of construction enterprise culture. The planning and development process of construction enterprise culture should be driven by external demands. (3) The construction process of corporate culture entails a range of activities, requiring collaboration and cooperation among various relevant departments within the enterprise.

Based on the above analysis, we can clearly see that the principle of the QFD method and the forming process of construction enterprise culture are driven by external requirements and objectives, and the fundamental characteristics, specific implementation process, and logic relationship before and after the two are very similar. The principle of the QFD method has strong adaptability in the forming process of construction enterprise culture.

### **3. Construction enterprise culture forming process based on QFD theory**

When applying the QFD method to the construction of enterprise culture, the connotation of “customers” in QFD should be appropriately expanded according to the actual situation. Groups or individuals who may come into contact with or be influenced by the construction enterprise culture can be considered as the “customers” of the construction enterprise culture. This may include the management, executive level, customers of the enterprise, and even individuals within specific environments. It also includes relevant government departments. Combining the QFD method and construction enterprise culture, this paper puts forward a construction enterprise culture framework based on the QFD method and divides the process of forming a construction enterprise culture into three stages.

The first stage of forming a construction enterprise culture is cultural planning. Utilizing the cultural planning matrix, the requirements of both external and internal customers for the construction enterprise culture are translated into the defining characteristics of cultural construction. Subsequently, a suitable conceptual alternative is devised. The cultural planning matrix comprises six main components: acquiring the project set of cultural requirements (the “whats”), generating the shaping feature set (the “hows”), determining the importance of cultural requirements and adjustment coefficients, analyzing the functional relationship of the cultural planning matrix, and evaluating the importance of shaping features and conceptual alternatives.

The second stage in the formation of construction enterprise culture is technology planning. Utilizing the technology planning matrix, the requirements of the conceptual design alternative are converted into the process characteristics of construction enterprise culture formation. This process aims to establish norms and standards for all aspects of the construction enterprise culture. The structure of the process planning matrix resembles that of the cultural planning matrix, but its input consists of the “whats” from the cultural planning matrix, and its output comprises the process characteristics of construction. These process characteristics act as the assurance

for realizing the shaping characteristics. The correlation relationship describes the strength of the correlation between the shaping characteristics and the process characteristics. The autocorrelation describes the strength of the autocorrelation between the process characteristics. The detailed design alternative of the construction enterprise culture is based on the process characteristics.

The third stage of construction enterprise culture construction is implementation planning. Through the implementation planning matrix, the construction standard of the implementation plan of the construction enterprise culture construction is transformed into the implementation characteristics in the construction enterprise culture formation, so as to achieve the requirements of external and internal customers of the construction enterprise culture. The structure of the implementation planning matrix is very similar to the structure of the previous two planning matrices, the input (the “whats”) is the output of the process planning matrix, and the output is the implementation characteristics of cultural construction, which is the guarantee of the realization of various process characteristics. The correlation relationship describes the strength of the correlation between the process characteristics and the implementation characteristics. Autocorrelation describes the strength of autocorrelation between implementation characteristics. The implementation plan for construction enterprise culture outlines the tasks to be accomplished during the implementation of the construction enterprise culture formation.

#### **4. Construction of a cultural planning matrix based on the QFD method**

The structure and analysis process of the process planning matrix and implementation planning matrix of the construction enterprise culture construction based on the QFD method is very similar to the construction of the cultural planning matrix. Therefore, this paper focuses on the analysis of the construction of the cultural planning matrix. The specific steps of cultural planning implementation can be summarized as follows:

(1) Cultural requirements

the cultural requirements of construction enterprises are the input information of the cultural planning matrix, which is the “whats” of the cultural planning matrix. In the early stage of reshaping a unique culture, an enterprise must first understand what all “customers” want from its culture.

(2) The importance of cultural requirements

In the development of a construction enterprise culture, customers’ demands for construction enterprise culture are typically diverse. However, enterprises face limitations in terms of resources and construction time that can be allocated. Therefore, during the formation process, emphasis should be placed on the more critical or influential requirements. In the analysis of the cultural planning matrix, the “customer” of construction enterprise culture provides corresponding preference information for each requirement. Subsequently, an appropriate information processing method is employed to determine the importance of these requirements. This allows for a focused approach to shaping the culture based on the most significant and impactful aspects.

(3) Shaping characteristics

Shaping characteristics refer to the straightforward and measurable technical attributes identified by the construction enterprise culture team to fulfill the cultural requirements of the construction enterprise culture, representing the “hows” of the cultural planning matrix. These shaping characteristics are typically derived by the planning and construction personnel in the team from the cultural requirements, to achieve and satisfy the cultural objectives.

(4) Correlation between cultural requirements and shaping characteristics

Determining the correlation strength between cultural requirements and shaping characteristics is one of the difficulties in the cultural planning matrix, which describes the mutual influence and correlation degree between cultural requirements and shaping characteristics. There may be a negative correlation, no correlation, or a positive correlation between the cultural requirements and shaping characteristics of construction enterprise culture.

(5) Autocorrelation between shaping features

The autocorrelation between shaping features describes the mutual influence and correlation degree between different shaping features. In this analysis stage, the construction team needs to select appropriate preference information to represent the influence degree of each shaping feature on other shaping features. Without loss of generality, there may also be three kinds of correlation relationships among each shaping feature, such as negative correlation, non-correlation, and positive correlation. It should be pointed out that according to the autocorrelation between the shaping characteristics, the shaping conflicts in the construction enterprise culture construction can be identified, and these conclusions can provide references for the construction team.

(6) Importance of shaping characteristics

The importance of shaping characteristics describes the importance of all shaping characteristics affected by the requirements of the construction enterprise culture construction. Therefore, the importance of shaping characteristics is the synthesis of the importance of the construction enterprise culture construction requirements, the correlation between the cultural requirements and the shaping characteristics, and the autocorrelation between the shaping characteristics, so as to realize the transformation of the cultural requirements to the shaping characteristics.

(7) Optimal selection of conceptual design alternatives for construction enterprise culture

Based on the importance of shaping characteristics, the construction enterprise culture team can employ relevant theories and methods for selection and evaluation. Serving as an intermediary between cultural planning and the detailed design of cultural construction, the cultural conceptual alternative plays a pivotal role in determining the fundamental characteristics of culture. The selection of a cultural conceptual alternative directly impacts the satisfaction of internal and external customers, and even the overall development trajectory of an enterprise. Therefore, it becomes essential to propose a feasible selection model for cultural conceptual alternatives.

## 5. Conclusion

This paper presents an analysis on the adaptability of the QFD method to the formation process of construction enterprise culture. Subsequently, it comprehensively explores the construction enterprise culture formation process based on the QFD method. Taking into consideration the practical context, the paper introduces the research focus, which is the construction of the cultural planning matrix for construction enterprise culture.

## Disclosure statement

The author declares no conflict of interest.

## References

- [1] Nguyen HT, Hoang TG, Nguyen LQT, et al., 2021, The Influence of Family Culture on the Development of

Corporate Social Responsibility (CSR) Initiative of Immigrant Enterprise: A Case of Korean Business in Vietnam. *Social Responsibility Journal*, 18(7): 1342–1360.

- [2] Zabala K, Campos JA, Narvaiza L, 2022, Moving from a Goods- to a Service-Oriented Organization: A Perspective on the Role of Corporate Culture and Human Resource Management. *Journal of Business & Industrial Marketing*, 37(6): 1197–1207. <https://www.doi.org/10.1108/JBIM-11-2020-0497>
- [3] Koiarová I, Kádeková Z, Starchoň P, 2021, Leadership and Motivation as Important Aspects of the International Company's Corporate Culture. *Sustainability*, 13(7): 2541–2565.
- [4] Chen HA, Francis BB, Hasan T, et al., 2021, Does Corporate Culture Impact Audit Pricing? Evidence from Textual Analysis. *Journal of Business Finance & Accounting*, 49(5–6): 778–806.
- [5] Wang ZQ, Chen ZS, Garg H, et al., 2022, An Integrated Quality-Function-Deployment and Stochastic-Dominance-Based Decision-Making Approach for Prioritizing Product Concept Alternatives. *Complex & Intelligent Systems*, 8(3): 2541–2556.

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