

# Chapter 49

## An Information System Framework and Prototype for Collaboration and Standardization in Chinese Liquor Production

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### ABSTRACT

*This paper proposes an information system framework for production collaboration and standardization in Chinese liquor industry, and examines the key implementation issues of information systems in Chinese liquor production. A descriptive single case study is conducted to explore and identify the benefits, challenges, and success factors of information system implementation in Chinese liquor production by taking a famous Chinese liquor producer as the target case company. The case study shows that the proposed information system framework is helpful to improve collaboration and standardization in Chinese liquor production. Some benefits and challenges of implementing information systems are different from those described in previous studies because of various distinct, real-world features of Chinese liquor production. The proposed system framework offers the possibility to improve the Chinese liquor producer's production efficiency and market competition by better production collaboration and standardization.*

### 1. INTRODUCTION

The history of liquor in China spans thousands of years. Chinese liquor (baijiu in Chinese Pinyin) is closely linked to their daily lives and plays an important role in China's economy. Liquor production in China, with profits and tax of over 130 billion in 2012, is characterized by low centralization, fierce market competition, low-level automation, informatization, and standardization. Under the circumstance

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of the Chinese government's fight against corruption, the liquor industry is moving into an era of narrow margin, further intensifying the market competition. Liquor producers have a pressing need to speed up their transformation and upgrading by improving their production standardization and production efficiency.

Liquor production is a key part of the liquor supply chain in China. Compared with other manufacturing industries, Chinese liquor production has many distinct features, such as the low degree of informatization and production standardization, the preservation of traditional liquor-making techniques, and the high dependence on manual operations. Maintaining the quality stabilization of liquor products greatly troubles Chinese liquor producers because technical standards of some key technical operations have not been well-quantified and the production of these operations depends largely on the workers' experience. Moreover, a timely and effective cross-departmental collaboration as well as accurate and timely production analysis and decisions are difficult to achieve because of incomplete production data collected and poor information visibility. The implementation of information systems is known to be capable of bringing various significant benefits, such as more efficient operations, higher information visibility, faster information sharing, and better consistency for improved decision making than that without established information systems (Koh and Saad 2006, Wang, Li et al. 2006, Laudon and Laudon 2012). However, unlike in manufacturing industries such as auto and steel, Chinese liquor companies have a relatively low level of informatization, although better informatization has been developed and implemented in Chinese liquor supply chain operations, particularly in marketing and logistics. The Chinese liquor industry therefore has a pressing demand to improve production collaboration and standardization to enhance the effectiveness of production operations and increase information visibility.

This paper proposes an information system framework for the collaboration and standardization of Chinese liquor production. Specifically, the following questions are addressed:

1. How is an information system framework developed to meet the requirements of production collaboration and standardization of Chinese liquor production?
2. Under this framework, what is the state-of-the-art implementation and applications of information systems in Chinese liquor production?
3. What are the challenges, benefits, and success factors of implementing the system prototype?

## **2. LITERATURE REVIEW**

On the basis of the research questions being investigated, the relevant literature is reviewed from the following aspects: collaborations and standardizations in production; information system frameworks; issues of implementation; and applications of information systems, such as challenges, benefits, and critical success factors. In addition, the adoption of single-case study approach as the methodology of this research is described based on a brief review of case study approaches.

### **2.1. Collaboration and Standardization in Production**

Cross-firm and cross-functional collaboration and information exchange would result in better operational performance (Devaraj, Krajewski et al. 2007), and significantly influence ERP benefits in the

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