

A Pursuit of Strategic Alignment between Manufacturing Strategy and Organizational Culture

**James Jungbae Roh, College of Business, Penn State Brandywine, Media, PA 19063,
Phone: 610-566-0656, E-mail: jjr24@psu.edu**

ABSTRACT

Organizational culture plays a critical role in successful manufacturing strategy implementation [1]. Employee empowerment and their willingness to make suggestions for improvements can make critical role in implementing manufacturing strategy. Despite the acknowledgment of the role of organizational culture in manufacturing strategy formulation and implementation, however, little attention has been paid to the relationship between manufacturing strategy and organizational culture [2,3]. This paper aims at establishing a conceptual model which attempts to link manufacturing strategy and organizational culture based on competing value framework [4,5]. The study identifies four types of ideal combination between manufacturing strategy and organizational culture. As well, presented is the evolutionary path of the change in organizational culture, corresponding with the change of manufacturing strategy. Theoretical and managerial implications are discussed.

Key Words: manufacturing strategy, organizational culture, competing values framework, and evolutionary path

1. Introduction

Since Skinner's work (1969), manufacturing strategy has been recognized as an important component of business strategy [6]. One of the key concepts in manufacturing strategy is alignment between manufacturing structure and infrastructure. In response to order-winning and qualifying criteria, a firm has to build up process technology and capacity aligned with its infrastructural issues such as quality management, human resource management, and organizational culture [7]. Among structural issues, organizational culture is one of the long-term factors and yet has a powerful impact throughout business process. Cameron and Quinn (1999) argue that the most successful U.S. firms in the last 20 years could stand on their ground not because they had obtained Porter's six conditions but because they built up "distinctive, readily identifiable, organizational culture [8]". The difficulty in imitating organizational culture and yet its powerful impact have been recognized especially in comparisons with Japanese and Western manufacturing companies [9-11]. Scholars like Kitazawa and Sarkis (2000) affirm that organizational aspects such as employee empowerment and their willingness to make suggestions for improvements are playing critical role in successful manufacturing strategy implementation [1]. Despite the acknowledgement of the role of organizational culture in manufacturing strategy, however, little attention has been paid to the relationship between manufacturing strategy and organizational culture [2,3]. This paper aims at establishing a conceptual model which attempts to link manufacturing strategy and organizational culture based on competing value framework.

2. Literature review

2.1. Manufacturing strategy

There has been an extensive research on manufacturing strategy configurations and the basis of various strategies. Some examples are "low-cost, technology-driven and marketing intensive strategies" [12], "internally neutral, externally neutral, internally supportive, and externally supportive strategies" [13], "new product centers, custom innovators, cost minimizing

job shops and cost minimizers” [14], and “high performance product groups, manufacturing innovators and marketing oriented” [15]. After extensive research review, Cagliano et al. (2005) summarized various strategies into four types: the market-, product-, capability-, and price-based strategies [16].

A firm may pursue price-based strategy when a market is mature and competitive advantage can not be obtained through differentiation. The main purpose of taking this strategy is to produce efficiently and to provide reliable service to customers. Capability-based strategy is employed to improve the product quality and the performance through adopting new manufacturing technology or operations skills such as just-in time, computer-aided design, flexible manufacturing equipment and the like. A firm that adopted product-based capability competes in the market by offering a variety of product with high quality and performance through product innovation and improvement. Market-based strategy is the most advanced strategy. It is adopted by a firm that is sensitive to market changes and responds to external situations through a variety of products with high quality and performance and customer service. All these manufacturing strategies are utilized in creating competitive advantage.

Outcomes of manufacturing strategy have been reported in a number of studies [20]. showed that manufacturing flexibility increases customer satisfaction [21], recount that manufacturing strategy is positively associated with managerial performances such as quality of work, accuracy of work, productivity of the group and also operational performance. Total quality management is related positively to product reliability and customer satisfaction [22,23]. Cost leadership strategy is shown to lead to market share increase [24,25]. These researches contend that manufacturing strategy has direct relationship with operational and managerial and financial outcomes.

2.2 Organizational culture

Culture can be broadly defined as “a set of basic tacit assumptions about how the world is and ought to be that a group of people share and that determines their perceptions, thoughts, feelings, and, to some degree, their overt behavior” [26][27]. indicates three main factors that affect a person in the workplace: national culture, occupational culture, and organizational culture. These three factors influence a person to some different degree, and the focus of this paper is on organizational culture [26]. defined organizational culture as “the basic tacit assumptions about how the world is and organization to be that a group of people share and that determines their perceptions, thoughts, feelings, and their overt behaviors.” This paper adopts the competing value framework (CVF) as the organizational culture framework. CVF was first developed to comprehend organizational effectiveness [28], and attempts to explain competing values that an organization tries to pursue [29]. For example, an organization has different attitudes toward organization itself and market situation, and propensity toward stability and change. Although it desires to achieve both resource acquisition and formal communication and both stability and flexibility, those values are competing and conflicting each other [30] This is why it was called CVF.

CVF has been widely used from leadership development to organizational change, and was extended to examine organizational culture [31], and received much attention when the state of New York adopted it for major management and professional organizational change process along with the Ford Motor Company [32]. Al-Khalifa and Aspinwall (2001) based its TQM analysis on CVF and stated that CFG was “a useful model for organizations to adopt in taking a system’s perspective of their businesses and to plan and manage major change [33]”. Implementing manufacturing strategy requires an organization to change its business process and align it with each other for a long time. In other words, launching and maintaining manufacturing strategy entails assumption change and share of new vision and attitude toward certain strategic business goals. In this sense, CVF can be a useful framework to examine the relationship between manufacturing strategy and organizational culture.

CVF is mainly composed of two dimensions. The vertical axis reflects the extent to which an organization has a control orientation. “A flexibility orientation reflects flexibility and spontaneity, while a control orientation reflects stability, control, and order” [34]. The horizontal axis reflects the extent to which an organization is inclined to external or internal operation. “An internal orientation reflects an emphasis on the maintenance and improvement of the existing organization, while an external reflects an emphasis on competition, adaptation, and interaction with the external environment” [34]. The combination of these two dimensions produces four types of culture: hierarchical, rational, group, and developmental.

Group culture underscores flexibility and strong human relations, affiliation, and a focus on the internal organization supports the culture. Developmental culture underlines flexibility and yet is externally oriented. Growth, resource acquisition, creativity, and adaptation to the external environment are stressed in the culture. Rational culture is externally oriented but an emphasis is given to control and stability. Firms with rational culture accentuate productivity and achievement, and have well-defined objectives and encourage external competition. Hierarchical culture emphasizes stability, but the focus is on the internal organization. This orientation is characterized by uniformity, coordination, internal efficiency, and a close adherence to rules and regulations. These culture types are, however, not mutually exclusive but modal or dominant [33]. It is unlikely that an organization consists of only one type of culture. Rather, an organization comprises of a mixed set of the four cultures and one type of culture may dominate as time goes on [4]. The framework is described in figure 1.

2.3 Manufacturing strategy and organizational culture

Using CVF, researchers have examined the relationship between a manufacturing practices and organizational culture. Stock and McDermott (2001) found that advanced manufacturing technology has positive association with flexibility and external focus. Panayotopoulou et al. (2003) defined new human resource management (HRM) model based on CVF and found that the alignment of HRM with the competitive strategy enhances financial performance [35]. They also found that HRM flexibility is passively linked to market performance but HRM control is negatively related to it. Their empirical test reveals statistically strong relationship has been found between HRM flexibility and differentiation strategy as well as between HRM control and cost leadership strategy. They also report strong negative relationship between financial performance and the combination of differentiation strategy and HRM control orientation, which indicates the importance of the fit between HRM and strategy in achieving financial performance. Al-Khalifa and Aspinwall in 2000 contend that many published studies acknowledge the importance of cultural aspects in successfully implementing total quality management (TQM), and they identified the ideal types of culture for TQM based on CVF. Group and developmental culture are reported as the ideal cultures for TQM. In 2001 study, they also reports that even though the participating firm has a mix of culture types in CVF, TQM is to succeed in the more flexible and customer-oriented culture and the change of organizational culture toward group or developmental culture is desired for successful TQM execution. Recently, Prajogo and McDermott (2005) explored the relationship between TQM and organizational culture from CVF point of view and found that different practices of TQM contain different types of cultures, implying that the coexistence of seemingly conflicting elements of culture and TQM practices does not necessarily undermine the other [36]. These findings are consistent with other researchers' findings [37,38,29]. In a context of time-based management practices, however, Nahm et al. (2004) report that group and developmental culture represented by flexibility, innovation, creativity, teamwork, and employee empowerment have significantly positive impact on sales growth, ROI, and market share growth. Although there have been researches about specific type of manufacturing practices, there are concurring findings that organizational culture is affecting manufacturing strategy formulation, implementation, and performance, and yet scarce attention has been given to discovering if

there is ideal type of organizational culture over specific type of manufacturing strategy in a general sense. For this reason, this paper attempts to answer the following research questions:

- Is there an ideal type of organizational culture for different manufacturing strategies? If so, does the alignment make any difference in performance? It is expected that manufacturing strategy affect the business outcomes to a different degree under different organizational culture context.
- Is there evolutionary path for organizational culture change when it comes to a firm's changing manufacturing strategy? If so, does a lag or misfit between manufacturing strategy and organizational culture cause underperformance?

3. Research framework

There have been two arguments regarding the fit between manufacturing practices and organizational culture: the unitarist and pluralist approaches [36,39]. A unitarist views that a certain practice (say TQM) performs the best when it corresponds to one specific type of culture [40,41,34,5,2]. In contrast, a pluralist believes that a certain manufacturing practice (say TQM) can be associated with multidimensional cultures that could include conflicting elements such as the coexistence of both control and people-oriented cultures to support TQM [42-46]. The unitarist view could be supported by the strategic fit theory and the pluralist approach by contingency theory studies. These two perspectives are seemingly conflicting each other; however, Youndt et al. (1996) argue that these two views could work complementary together if one considers the fit theory [47] as “an operationally main (direct) impact” and the contingency theory [48] as “an operationally interaction (or moderation) effect.” In this paper, the complementary view on manufacturing strategy and organizational culture was adopted. Namely, although an organization is unlikely to be comprised of only one culture, overtime one type of culture may come forward as the dominant and readily identifiable one [4]. Depending on the combinations of organizational culture and manufacturing strategy, the outcome of organization will differ. Therefore this presents the research framework as follows (Figure 2).

3.1 The link between manufacturing strategy and organizational culture

Manufacturing strategy is defined as “a pattern of decisions, both structural and infrastructural, which determine the capability of manufacturing systems and specify how it will operate to meet a set of manufacturing objectives which are consistent with overall business objectives” [49,13]. Depending on emphasis, manufacturing strategy could be classified into different types and some examples are “caretakers, marketers, and innovators” [15] or “cost, quality, delivery flexibility, and scope flexibility strategies” [39]. Cagliano et al. (2005) argue that despite different terminologies, manufacturing strategies could be summarized into four categories and this study adopts the four strategies as the main classification: the market-, product-, capability-, and price-based strategies (table 1 and 2).

Following the CVF, organizational culture could be divided into four cultures (figure 1). It is reasoned that the four types of manufacturing strategy have the best corresponding organizational culture. The link between manufacturing strategy and organizational culture is the competitive priorities that each MS emphasizes. This is because manufacturing strategy consists of competitive priorities such as cost, quality, flexibility and delivery [50], and a firm would conform to a certain type of organizational culture as it strives to achieve its own order winning and qualifying criteria.

To illustrate, the order winning criteria for the price-based strategy are low cost and reasonable quality. Low cost strategy is adopted usually in a predictable and mature market where the manufacturing process is characterized as emphasis on rules and regulations, standardization and repetition to maximize the economy of scale. To attain this goal, an organization would attempt to minimize the impact of individual differences and increase the

internal effectiveness the most by developing hierarchical and inorganic culture [2]. These features of the stability and control emphasis through internal efficiency go along with hierarchical culture. The capability-based strategy is adopted to improve the quality and the performance of the products. Rather than competing through innovation, a firm with capability-based strategy competes by providing customers with high quality and flexible products. To reach this goal, a firm would usually adopt new manufacturing technology such as JIT, computer-aided design and manufacturing, and flexible manufacturing equipment [17].

For the production of high quality and flexible products and for operations of new manufacturing technology, a firm may encourage employees to do knowledge/work sharing, skill acquisition, teamwork and continuous improvement [39,51]. The flexibility orientation and internal efficiency are compatible with the group culture. The product-based strategy aims to compete through offering a variety of innovative products to customers with affordable price [52,16]. To be innovative, a firm must be sensitive to the external environment and foster creativity, adaptation, continuous learning, and autonomy [8]. However, to provide customers with products with affordable price, an organization may emphasize productivity, goal achievement and competition, which are similar to the features appearing in rational culture. Organizations with emphasis on the market-based strategy try to differentiate them by pursuing excellence on multiple fronts such as quality, product design and performance, deliveries, and after-sales service [52]. The orientation demands quick adaptation to external changes and stresses growth, creativity stimulation, resource acquisition, and innovation. Therefore it is similar to developmental culture. This discussion is summarized in table 3 and figure 3.

Proposition 1. Manufacturing strategy has the ideal type of corresponding organizational culture.

P1a. Price-based strategy corresponds best to hierarchical culture.

P1b. Capability-based strategy corresponds best to group culture.

P1c. Product-based strategy corresponds best to rational culture.

P1d. Market-based strategy corresponds best to developmental culture.

3.2 Dynamics of manufacturing strategy and organizational culture

Greiner introduces “the evolution and revolution as businesses grow [58]”. As an organization expands in size over time, it faces several crises such as crisis of leadership, autonomy, control, and red-tape and overcomes by changing management focus and organizational culture and structure. This article suggests the dynamics of organizational culture. In addition, it is reported that firms have been changed their manufacturing strategies in response to dynamic environment [52,16]. For instance, over the period of 1992-2000, 20% of firms changed from capability-based strategy to product-based strategy; 29% from capability-based strategy to product-based strategy; 25% from product-based strategy to price-based strategy. It is not surprising that a firm has to adjust itself to changing environment and accordingly modify or alter its manufacturing strategy.

The question that arises is this: Is organizational culture changing in accordance with MS? Since organizational culture is a more long-term factor than manufacturing strategy, one can anticipate a possible lag (or misalignment) between manufacturing strategy and organizational culture when one modifies manufacturing strategy. If the right fit between manufacturing strategy and organizational culture exists, a firm misaligned with organizational culture may underperform than a firm aligned with it does. Thus, the following proposition is derived.

Proposition 2. A firm with manufacturing strategy misaligned with organizational culture will underperform than a firm with the same manufacturing strategy aligned with organizational culture.

4. Summary and Conclusion

According to Cabrera et al. (2001), "Whether or not the organization is able to achieve its strategic objectives will depend on whether it can deploy the right kinds of processes and behaviors, which are in turn determined by the organization's architecture [59]". Despite the acknowledgement of the essential role of organizational culture in manufacturing strategy formulation and implementation, there have been sparse researches on the relationship between them. This study develops a research framework that establishes the link between manufacturing strategy and organizational culture.

Theoretical contribution of the study is three-fold. First, the study establishes the relationship between manufacturing strategy and organizational culture. Based on the unitarist view and the strategic fit theory [39], it is construed that a certain type of manufacturing strategy is ideally associated with a certain type of organizational culture. Hinged on the competitive priorities that an organization seeks to achieve, the features of manufacturing strategy and those of organizational culture were examined, and four types of ideal combination were identified: price-based strategy and hierarchical culture, capability-based strategy and group culture, product-based strategy and rational culture, and market-based strategy and developmental culture [4,16].

Second, the study found that organizational culture plays a moderating role between manufacturing strategy and business outcomes. A number of researches validated the direct impact of manufacturing strategy on business outcomes and that of organizational culture on performance. Yet the relationship between manufacturing strategy and organizational culture is yet to be established. Based on the four types of ideal relationship between manufacturing strategy and organizational culture, it was postulated that a firm with the right fit between them would outperform a firm with the misfit between them. This is moderating impact because the organizational culture has both direct and indirect effect on business outcomes [60].

Third, evolutionary paths for manufacturing strategy change were introduced. The dynamic nature of organization in response to the changing environment and business fluctuation entails a firm to adjust itself to new circumstance through constant modification and alteration of strategy and organizational culture adaptation. Since it takes more time to change organizational culture, a lag or misalignment between manufacturing strategy and organizational culture takes place and probably become a factor that makes the firm underperform its competitors. The typology formulated in the study presents how to align manufacturing strategy change with organizational culture. This path shows a roadmap for researchers and practitioners to identify where they are and how to change its cultures. To the best of the author's knowledge, this is the first attempt to conceptualize the link between manufacturing strategy and organizational culture and open a way for validation and in-depth study.

Reference is available upon request.