ABSTRACT

Mass customization (MC) achieves both volume and cost efficiency of mass production and customization capabilities at the same time. The challenge for manufacturing managers is to find ways to cope with the market and increase product variety through MC without affecting lead-time, cost or quality. This paper investigates three critical managerial practices, advanced manufacturing technology (AMT), flexible layout and process plans (FLPP), and the establishment of learning relationship (LR), and their impacts on MC in a manufacturing company. It also examines how the market segment favorableness influences the relationship between mass customization and firm performance.

KEYWORDS: Mass Production, Mass Customization, Organizational Performance, Managerial Practices

INTRODUCTION

Mass production (MP) is concerned with producing standardized goods in large quantities and at a low cost. Having been the dominant concept in the U.S. manufacturing industry since the 1800s, MP reached its peak in the 1960s (Fralix, 2001; Duguay, Landry, & Pasin, 1997). Over the past few decades, however, MP has faced challenges by new competition, including input instabilities (Pine, 1993), dynamic demographics (Duguay et al., 1997), changing needs and wants (Kaplan, Scholder, & Haenlein, 2005), market turbulence (Pine, 1993), economic cycles, and uncertainties (Selladurai, 2004; Pine, 1993), as well as product and process technology shocks (Hart, 1995; Gooley, 1998). As a consequence, a new paradigm is called for in which a wide spectrum of individually customized goods and services are created cost-effectively. Such a transition from MP to MC not only has led to higher customer satisfaction but also becoming a competitive advantage in the global market place in the 21st century (Pine, 1993). MC is concerned the ability of a firm to produce a variety of customized products quickly, on a large scale, and at a cost comparable to mass production (Pine, 1993). While industry adoption of MC is spreading around the world, theory development in this area is lagging. The existing literature reports three major streams of research on MC. The first group of researchers focuses on comparison of MC with MP (Duguay et al., 1997; Fralix, 2001; Kotha, 1995). They view MC as a new paradigm in which variety and customization replace standardized products, heterogeneous and fragmented markets are generated from once homogeneous markets, and a more flexible, dynamic organizational structure replaces the previous stable one. The second group focuses on the relationship between the enablers of MC and MC capability. Tu, Vonderemse, and Ragu-Nathan (2004) suggest that specific manufacturing practices such as re-engineering set-ups, pull production, and preventive maintenance facilitate MC. In the view of Duray, Ward, Milligan & Berry (2002), modularity is a key to achieving MC. Hart (1995) identifies four pillars for MC: customization sensitivity, process amenability, competitive
The present study looks both the antecedents of MC and the influence of MC on firm performance. The purpose of this paper is to attempt to answer questions regarding a successful MC, specifically: (1) why the high expectations of MC have not yet been met on a large scale? Will the pursuit of MC be successful? What critical managerial practices are important to support the implementation of MC? (2) How MC influences the firm performance. How important is the market, the needs of individual consumers, in moderating the relationship between MC and firm performance. The proposed study contributes to the MC literature by conceptualizing and identifying the three important factors of MC and examining how the MC capability might influence firm performance. The most important, it attempts to fill the gap in this field by testing the moderate impact of market segment favorableness. Previous research on MC mainly focuses on the supply side (Davis, 1987; Zipkin, 2001), i.e. the technological progress and supply shock, which appears to be under control. However, research and practice today focus on the dynamic demand side. The markets, which are characterized by demanding consumers, are not under control. This paper examines the impact of market segment favorableness to emphasize the importance of the dynamic demand side. In addition, it answers the call for increased empirical research in the area of MC (Tu et al., 2001; Duray, 2002).

THEORETICAL FRAMEWORK

As illustrated in the theoretical model in Figure 1, three factors, AMT, FLPP, and LR, are proposed to have direct and positive impacts on the ability of the firm to achieve MC. The MC capability is proposed to positively associate with firm performance. It is also suggested that the level of market segment favorableness affects the strength of the relationship between MC and firm performance. The following subsections introduce the background literature of each variable in the model.
Mass customization

The phrase “mass customization” was coined by Davis (1987). It means that firms have entered a new era in operations management. More specifically, MC combines the best of the craft era, where products were individualized but at high cost, with the best of MP, where products were affordable but highly standardized (Fralix, 2001). Pine (1993) brings MC into the production and operations management arena. He defines MC as the use of flexible processes and organizational structures to produce varied and often individually customized products and services at the price of standardized, mass-produced alternatives. MC is also characterized by a high intensity of information that every transaction implies information and coordination about the customer-specific product design and is based on a direct communication between the customer and the supplier (Zipkin, 2001).

Based on a thorough review of MC research, this paper defines MC as the ability to produce individualized products or services quickly, on a large scale and at a cost comparable to mass-production through technology and managerial methods. The company has a higher level of MC means that this company has a higher ability to produce highly differentiated products without increasing costs significantly, a higher ability to increase product variety without diminishing production volume, and a higher ability to reduce the time required to deliver customized products and to reorganize production processes quickly in response to customization requests. MC is not just adding a few new technological wrinkles to an already existing organizational framework; adopting a MC strategy implies considerably more. It represents a major paradigm shift in the way business is conducted and is destined to have enormous ramifications in industry after industry (Pine, 1993; Kotha, 1995). Many firms have attempted to achieve MC through automation alone, but they often have been unsuccessful because their management practices and procedures. The producer must interact with both the customer and the retailer to configure their product (Kakati, 2002). In other words, the customers should be involved in specifying the characteristics of the product during design, production, assembly, or use. The whole process involves flexible production, which requires a dynamic company to improve learning about market trends and quickly adjust to the market changes (Hart, 1995; Kotha, 1995; Gerwin, 1993).

Advanced Manufacturing Technology

AMT is defined as a broad spectrum of computer-controlled automated process technologies (Zammuto & O’Connor, 1992). It involves new manufacturing techniques and machines combined with information technology, microelectronics, and new organization practices in the manufacturing process. Sun (2000) defined AMT as computer-aided technologies used in manufacturing companies. Another description about AMT is more specific. Beaumont, Schroder, & Sohal (2002) describe it as a group of computer-based technologies, including computer-aided design (CAD), computer numerical control (CNC) machines, direct numerical control (DNC) machines, robotics (RO), flexible manufacturing systems (FMS), automated storage and retrieval systems (AS/RS), automated material handling systems (AMHS), automated guided vehicles (AGV), bar coding (BC), rapid prototyping (RP), material requirements planning (MRP), statistical process control (SPC), manufacturing resource planning (MRP II), enterprise resource planning (ERP), activity-based costing (ABC), and office automation (OA).

Organizations start thinking of investment in AMT when they recognize that current processes and procedures are inadequate to meet their current or future customer needs (Silveira et al.,
Based on the needs of different areas, AMT can be classified into direct, indirect and administrative AMT (Dangayach & Deshmukh, 2001). According to Dangayach and Deshmukh, direct AMT refers to a technology used on the factory floor to cut, join, reshape, transport, store or modify materials, such as CNC, DNC, and robotics. Indirect AMT refers to technologies used to design product and schedule productions, such as CAD, MRP, and MRP II. Administrative AMT refers to technologies used to give administrative support to the manufacturing and operations in the organization, such as ERP, ABC, and OA. This classification is supported by Adler (1988), who categorized AMT into three variables, namely design technology, manufacturing technology and administrative technology.

This study takes a subset of Dangayach and Deshmukh's concept and primarily focuses on design and manufacturing technology. AMT here is defined as a key enabler to help manufacturers meet the productivity, quality, and cost reduction demands of competitive global markets. AMT creates a linkage between the customer's preferences and the ability of manufacturer to produce the products based on those preferences (Silveira et al., 2001; Fralix, 2001). AMT such as flexible manufacturing systems can manufacture assorted products with the same group of machines that are linked by automated material handling systems (Schoder, Sick, Putzke, & Kaplan, 2005). AMT collaborating with the right skills, experiences, and expertise, can drastically reduce the development time while increasing the effectiveness. One example is the virtual reality system called CAVE (for Cave automatic Virtual Environment) used by companies like General Motors, Caterpillar, and Levi's. CAVE enables people to walk around, without bulky headsets, three-dimensional representations of products. It helps the company to do many activities that could have never been done before, and allows activities that could be done to be completed much faster, more efficiently, and more effectively (Pine, 1993; Kaplan et al., 2005; Kakati, 2002). It is a tool that firms can use to share different kinds of technical and business information, to support globally dispersed development teams, to test and display product designs and engineering drawings, to manipulate data and create new knowledge, and to manage advanced product development.

Flexible layout and process plans (FLPP)

The layout design methodology will influence both the flexibility and dynamic adjustability of a manufacturing line. Usually, relatively static layouts are designed based on a deterministic demand; thus cells or lines can be created and the flows between these cells or lines can be determined at the design stage and used for layout optimization. However, in an environment that the market demands are uncertain, it is important to create an adaptable layout and process plan to enable such flows change regularly as needed.

To build the FLPP, it is important to develop a generalized production line platform to support reconfiguration (Gooley, 1998). This includes movable and re-configurable workbench modules, as well as flexible transportation equipment. Production lines are usually considered to be relatively rigid and unable to keep up with changes in product design, and a generalized production line is devoted to change this situation. A generalized production line platform makes the reconfiguration possible from the physical standpoint. It allows a company to produce multiple versions of its products with a single assembly line (Gooley, 1998). Tu et al. (2004) also suggest using a cellular manufacturing approach to design the FLPP, that is, to cluster the parts with common design characteristics and processing requirements into families of parts so that they can be produced on the same equipment. The cellular manufacturing approach streamlines the flow of production in the facility, thereby reducing the time and cost of handling materials.
Based on the review of the literature, this study defines the FLPP as a method grouping and producing families of products, a process flow that enable companies to add product variety quickly without sacrificing overall production volume and increasing cost. The FLPP should consist of multiple modules in one or more assembly lines. These reconfigurable workbench modules with mobile capability serve as part of a manufacturing platform. Equipped with FLPP, the shop data file that contains resources, layout, and process information can be exchanged effectively across various hierarchies in a system, and can be modified easily by changing the element based on customer order.

**Learning relationship (LR)**

While many argue that management’s primary goal should be the creation of shareholder value, shareholder-value creation clearly is driven by customer-value creation (Hart, 1995; Grenci & Watts, 2007). Without satisfied customers, the sophistication of a company’s quality effort is irrelevant (Pine, 1993; Schoder et al., 2005). The exchange between a customer and the organization becomes mutually beneficial, as customers give information in return for personalized service that meets their individual needs. Collaborative dialogue between the company and the customer grows smarter and smarter with each successive interaction. This interaction builds the base for LR (Fournier, 1998; Grenci & Watts, 2007).

LR have less to do with creating a fondness on the part of a customer for a particular product or brand, and more to do with a company’s capability to remember and deliver based on prior interactions with a customer (Fournier, 1998). A company that engages in a LR creates a bond of value for the customer, a reason for an individual customer to want never to deal with a competitor again, provided that the company continues to deliver a product and service quality at a fair price and to remember and act on the customer’s preferences and tastes.

Customers contribute to the LR by providing feedback, which in turn allows the company to provide customers with greater value in the form of a more precisely customized service at no increase in price (Chen & Dubinsky, 2003). For example, a magazine company continuously identifies its customers’ changing preferences through a weekly feedback survey. Customers rate each article received during the previous week according to its degree of relevance. The company then uses technologies to enhance the capability of determining customers’ needs more precisely. After a period of time, customers’ ratings of article-relevance generally rise from approximately 40 percent to 80 or 90 percent. This is an example of a LR process in which companies and customers engage in a series of interactions that serve as a continuous feedback loop, allowing each party to learn about the other needs, preferences, responsiveness while at the same time learning about themselves.

When it comes to understanding customers, many managers simply do not. They make the mistake of viewing their company’s interaction with its customers through their own eyes rather than through the customers’ eyes. They believe that certain things are likely to drive satisfaction among customers, when in fact those customers are interested in quite different things. Customers do not deliberately set out to create such relationships; the relationships simply evolve (Fournier, 1998). Relationships take time to develop and must be nurtured, but once they develop, customers feel a genuine, long-lasting sense of loyalty to the company or brand (Kasanoff, 1998). Genuine relationships exist when customers go back to companies again and again because they want to, not because there is an external incentive to do so or because they will receive a price discount (Fournier, 1998).
Firm performance

Firm performance comprises the actual output or results of an organization as measured against its intended goals and objectives (Devaraj & Kohli, 2003). A firm’s performance includes multiple activities that help in establishing the goals of the organization, and monitor the progress towards the target. It is also used to make adjustments to accomplish goals more efficiently and effectively (Kaplan et al., 2005). The literature of firm performance shows that there are a number of major movements and methods that could increase the performance of an organization. For example, researchers find that time-based manufacturing practices like TQM or Just-in-time (JIT) can improve company’s flexibility and responsiveness (Tu et al., 2004; Shah & Ward, 2003). Effectively using information technology to integrate customers and suppliers can increase customers’ value and help the company to achieve competitive advantage (Idris, Rejab, & Ahmad, 2008; Grenci & Watts, 2007). Numerous research efforts investigate relationship between firm strategies and performance (Ansolff, Avner, Brandenburg, Portner, & Radosevich, 1970; Cavusoglu, & Raghunathan, 2007).

The literature concerning firm performance evolved through two phases (Ghalayini & Noble, 1996). The first phase started in the late 1880s was characterized by the cost accounting orientation to help a company to evaluate the relevant costs of operating the firm. This approach then was modified in an attempt to incorporate some financial measures such as profit and return on investment. Both of these approaches received considerable criticisms that this financially-based performance measurement tends to encourage short-term thinking and fails to measure and integrate all the other factors such as clients and their needs, critical to business success (Banks & Wheelwright, 1979; Hayes & Garvin, 1982; Kaplan, 1983). The second phase was started in the mid 1980s. This phase was associated with the growth of global business activities and the changes brought about by such growth (Kaplan, 1983). The better integrated performance measurement in the second phase focuses on measuring continuous improvement rather than minimization of variance. As discussed earlier, a successful MC will greatly help companies to improve customization cost/volume effectiveness and customization responsiveness. The most important thing in MC is that customers play a critical role. For this reason, this study combined both financial and non-financial measures in order to be consistent with concept of MC in this paper.

Market segment favorableness

Market segmentation is a process used to divide a market into different groups that have common requirements and to group the marketing actions related to the market segments (Kerin, Hartley, Berkowitz & Rudelius, 2006). MC sees each customer as a segment and treats each customer separately by fulfilling his/her needs and desires (Wiggins, 1995; Pine et al., 1995).

The market demand environment can be classified into two categories based on different needs of customers: make-to-stock (MTS) environment and make-to-order (MTO) environment (Guerrero, 1991). In the MTS environment, the customer goes into the shop and buys products from the available stock. The company does not ordinarily provide customer promise dates. Since finished goods are stocked, the customer is most often served from inventory. If there is insufficient inventory for a specific request, the customer must be told when more will be available or, if there is partial allocation of the order, told what portion of the request can be satisfied. In this case, the customer decides which product to buy and when to buy it. The
company decides what products to make and when to make them (Heikkila, 2002). The level of customers’ favorableness of MC in the MTS environment is low. Customers are not likely to invest time and money in a configurable product. Instead, they will prefer to go for an off-the-shelf product.

In contrast, in an MTO environment, customers look over the catalogs of products, choose one, and request the company make a specific design. In the MTO environment, the primary activity is to control the progress of customer orders to meet the promised delivery dates (Heikkila, 2002). Any engineering or manufacturing changes must be related to the master production schedule to determine their impact on the final delivery to the customer. In this environment, there’s communication from the customer (a request for a product) and to the customer (a delivery date) through the demand management module (Andel, 2002). Later there may be additional communications with the customer to respond to order status requests (Guerrero, 1991). In the MTO environment, customers have a high level of favorableness of MC and thus would likely to provide information, seek views of the company, and be involved in making decisions on the products.

Not all customers want individualized products. Companies should first analyze the heterogeneity of customer needs and the rate of change for those needs to define whether customers are favorable to customization (Hart, 1995). The final outcome of MC depends on the level of favorableness of each market segment (Schoder et al., 2005). This study integrates Guerrero’s (1991) concept and investigates the market segment favorableness created by customers’ willingness to spend time designing the product, pay the price premium, and wait to receive the finished products.

RESEARCH PROPOSITIONS

It is expected that each of the three managerial practices, the use of AMT, the use of FLPP, and the establishment of LR, has a positive and direct impact on the firm’s ability to achieve MC. With a high level of MC capability, a company can enhance its ability to satisfy customized demands and improve performance by involving customers at early stages in their product design and manufacturing processes (Kaplan et al., 2005; Schoder et al., 2005). The following discussion describes how each relationship is developed.

AMT plays a key role in MC. It enables firms to provide digital content and services customized to individuals on the basis of knowledge about their preferences and behaviors. It creates a linkage between the customer’s preferences and the ability of a manufacturer to produce the products based on those preferences (Silveira et al., 2001; Fralix, 2001). Communication and network technologies such as CAD and CIM enable direct links between work groups for improvement of response time to customer requirements (Kotha, 1995). The benefits of AMT can be classified into two types (Ariss, Ragunathan, & Kunnathar, 2002): tangible and intangible. The tangible benefits are easily quantifiable, including inventory savings, less floor space, and reduced unit costs. The intangible benefits which are difficult to quantify, including increased flexibility, improved product quality, and quick response to customer demand (Zammuto & O’Connor, 1992; Sun, 2000).

AMT can also support the required channels for communication and collaboration between organizations and their suppliers (Silveira et al., 2001; Schoder et al., 2005). It is a tool that firms can use to share different kinds of technical and business information, to support globally dispersed development teams, to test and display product designs and engineering drawings, to
manipulate data and create new knowledge, and to manage advanced product development (Pine, 1993). AMT creates and ensures the efficiency of MC by integrating the organizational networks. It eliminates delays when processing orders and managing product information (Kakati, 2002). Further, it provides efficient means for exchanging product requirements between customers and manufactures and between manufacturers and suppliers (Silveira et al., 2001; Schoder et al., 2005). Customers specify their needs, likes, and dislikes, and this information is translated into the manufacturing specifications through AMT. AMT reduces the cost through standardized networking technologies and the creation of entirely new relationships by interconnection of companies with their customers. Therefore, it is hypothesized that

**Proposition 1: The use of AMT is positively associated with MC.**

The use of FLPP enables companies to reduce material handling cost and delays (Duray et al., 2002; Duguay et al., 1997). It allows a company to group products that have similar characteristics, and therefore, can reduce set-up times and costs, reduce work-in-process inventory and shorten throughput time. Optimal customization allows customization to take place at the manufacturing stage. The essential point of this implementation strategy is that FLPP can provide a large number of pre-designed, standard options to customers to configure their final products. Accordingly, manufacturing processes and delivery services must be customized too. The two important ideas under FLPP are: (1) a company cannot accurately predict who their customers will be, and (2) a company has the ability to provide the services that these customers demand. The layout design will influence both the flexibility and dynamic adjustability of a manufacturing line, so it is important to create an adaptable layout and process plan.

In MC, demand varies because of different natures of the products; and therefore, the manufacturing system should be flexible to produce and adapt to diverse customers' requirements (Ahlstrom & Westbrook, 1999; Kasanoff, 1998). The use of FLPP can help a company to increase equipment utilization and streamline management (Tu et al., 2004). It also enables companies to reduce set-up and change-over times, which allows for having a smaller run size and reduces the cost of variety. With FLPP, companies can produce all the products by the same process without having to change the set-up for different parts. In addition, they can produce multiple versions of products with a single assembly line (Gooley, 1998). Therefore, companies are capable of switching between products in a fast-paced and cost-efficient manner. Hence, it is hypothesized that

**Proposition 2: The use of FLPP is positively associated with MC.**

A company that has a strong LR between itself and customers investigates the consumption frequency of products over time to better understand customers’ wishes. At the same time, the company continuously improves production methods to achieve the manufacture of low-cost and high quality goods and services (Baird & Griffin, 2006). Customers contribute to the LR by providing feedback, which in turn allows the company to provide customers with greater value in the form of a more precisely customized service at no increase in price (Fournier, 1998). The more a company learns from its customer, the better it can provide exactly what the customer wants, as well as when, where, and how he wants it. Because customers invest their own time educating the company about their interests, they are far less likely to cancel or defect to a competitor (Jones, 1990; Kakati, 2002). The LR results in a significantly higher degree of customer service, creating customer switching costs and defection barriers.
A strong LR represents the efficiency when a company gains a deeper knowledge about its customers and establishes value processes that reduce waste on all levels (Fournier, 1998). First, a strong LR enables companies to reduce uncertainty and prevent costs due to imprecise planning information (Pine, 1993; Hart, 1995). Second, a strong LR allows companies to access more precise customer information and aggregate this information to market knowledge; therefore, it can increase the efficiency of market research and product development activities (Ahlstrom & Westbrook 1999, Duray, 2002). Third, as companies get to know their customers, they become committed to understanding and meeting customers’ needs. At this time, a strong bond is forged between companies and their customers. This stable relationship, or strong LR, allowing a better utilization of their customer base, like the re-use of existing customers for additional sales. Thus, costs for marketing activities and customer acquisition can be decreased (Pine, 1993, Kakati, 2002; Kaplan et al., 2005). Therefore, it is hypothesized that

**Proposition 3:** The establishment of learning relationship with customers is positively associated with MC.

In the traditional mass production paradigm, firms take advantage of economies of scale arising from long production runs and large orders (Duguay et al., 1997). However, a number of firms have learned that the application of this strategy results in excessive costs associated with demand uncertainty (Duray et al., 2002). Companies can improve their ability to satisfy demand by designing products upon request. MC is a new paradigm (Kotha, 1995) based on creating variety and customization through flexibility and quick responsiveness (Pine, 1993). It moves the focus from buying based on price (because all products and services appear to be similar) to one of buying based on satisfied needs and wants, at a competitive and affordable price. A company engaged in MC actually seeks to fragment the market through economies of scope. This is in contrast to a mass producer who seeks to consolidate and reduce choices through economies of scale.

A company that successfully implements MC has the greater ability to tailor products, services, and the transactional environment to individual customers. Adopters of MC can differentiate a product while simultaneously reducing the costs associated with the avoidance of product obsolescence (Pine, 1993). The literature of MC suggests that MC effectively eliminates the traditional trade-off between customization and other competitive priorities (Pine, 1993; Tu et al., 2004). In other words, “companies can have it all (Pine et al., 1993, p.111)”. MC combines the best of the craft era, where products were individualized but at a high cost, with the best of mass production, where products were affordable but highly standardized (Fralix, 2001). By catering to the unique needs and wants of individual customers and by providing the right product to the right customer at the right time, MC provides companies with better customer service, improved customer satisfaction, improved loyalty, and increased retention. The ultimate purpose of MC is to create higher customer value (Pine et al., 1993; Kotha, 1995). Companies gain benefits as long as the customer is happy. MC is a powerful competitive advantage to increase company’s sales growth, shorten production throughput times, and maximize its investment (Hart, 1995; Pine, 1993). The higher the MC capability, the better the performance of the firm. Therefore, it is hypothesized that

**Proposition 4:** MC capability is positively associated with firm performance.

The market environment is an important contextual factor that helps to determine firm performance (Silveira et al., 2001). This paper examines the impact of MC on firm performance
when the market segment has high and low favorableness of MC. When market segment has high favorableness of MC, customers in this market segment are looking for individualized products or services, customers would like to provide information and seek views of the company, and they are responsible for making decisions on the product service. In addition, high favorableness represents customers’ willingness to spend time designing the product, to pay the price premium, and to wait to receive the finished products (Bardakci & Whitelock, 2005; Hart, 1995). Companies learn from the customers to better understand their desires. Therefore, companies are able to capture important market trend from their customers and have much higher retention rates for their customized products than the competitors. Consequently, companies could enhance the customers’ loyalty.

On the other hand, when the level of market segment favorableness of MC is low, customers are not likely to invest time or money in a configurable product. Instead, they will prefer to go for an off-the-shelf product. It is a waste for companies to put efforts in increasing products variety, or improving its flexibility or responsiveness. Implementing MC in those market segments with low favorableness of MC will not only increase unnecessary costs, but also create customer relations confusion (Huffman and Kahn 1998).

Proposition 5: The effect of MC on firm performance is stronger for firms operate in market with high market favorableness than for firms in market with low favorableness.

CONCLUSIONS AND LIMITATIONS

The existing study on MC did a lot research on how MC can be improved through advanced manufacturing practices and what kind of benefits can be achieved through implementation of MC. However, most of the studies ignore the effects of managerial practice and fragmented markets on MC.

This paper combines previous studies and looks both the antecedents of MC and the influence of MC on firm performance. The antecedents examined in this study comprise three factors, AMT, FLPP, and LR. The paper also investigates the relationship between a company’s MC capability and firm performance depending upon the level of market environmental favorableness MC.

This study contributes to extant MC research by examining the impacts of technology, flexibility, and learning relationship between firm and customers on MC. To successfully implement MC, a firm must emphasize the integration of all internal activities with its potential customers. This integration process is crucial for the success of MC strategy. Most importantly, it attempts to fill the gap in this field by investigating how the market segment favorableness affects the strength of the relationship between MC and firm performance. This part is usually treated as an uncontrollable factor and largely ignored by existing literature. This paper provides a comprehensive understanding about MC and increases the understanding of how people evaluate MC implementation. This could be used for managers to identify whether there is support for the move to MC.

However, this paper only provides the testable propositions. Consequently, further research is needed to examine whether these propositions are valid. Clearly, there are some limitations. First, the factors identified in this framework may not be complete. There may be some other factors that need to be included. Second, market segment favorableness is a new concept developed in this study and needs to be empirically tested to decide whether it can exist as
moderator for firm performance. The third limitation to the study deals with the issue of response bias and reliability that may occur with the use of self-report surveys. However, to minimize these effects, the survey questionnaires will be proofed by academicians and practitioners and distributed to manufacturing managers who have comprehensive knowledge about their companies.

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