

MASS CUSTOMIZATION: Challenges and Limits

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Abstrak

Strategi berproduksi massal dan distribusi massal tidak lagi fleksibel dan responsive untuk melayani pasar saat ini. Teknologi informasi turut bertanggung jawab atas perubahan ini. Banyak perusahaan sekarang mempertimbangkan untuk beralih dari produksi massal ke kustomisasi massal. Kustomisasi massal adalah strategi untuk menawarkan produk dan jasa sesuai dengan keinginan individu dalam skala besar. (Pine, 1993) mengatakan bahwa kustomisasi akan memberikan pelayanan yang lebih relevan terhadap keinginan dan kebutuhan pembeli dan membedakan penawaran dari pesaing, sehingga akan meningkatkan nilai penawaran. Namun demikian, kustomisasi massal bukanlah hal yang sederhana. Tidaklah mudah beralih dari produksi massal ke kustomisasi massal. Permintaan terhadap kustomisasi massal juga terbatas, yang mana tidak semua produk dapat dikustomisasikan dan tidak semua konsumen menghendaki kustomisasi. Kesiapan perusahaan untuk menerapkan strategi kustomisasi massal akan menentukan sukses tidaknya dalam bersaing. Kustomisasi massal tidak selalu merupakan strategi terbaik dalam segala situasi. Interaksi antara produksi massal dan kustomisasi massal bahkan bisa menjadi alternatif untuk bersaing. Produksi massal mungkin dikatakan kuno, tapi produksi massal masih tetap merupakan strategi yang efektif untuk kondisi tertentu.

Kata kunci : kustomisasi massal, produksi massal.

MANY organizations believe that mass customization will be the new paradigm (Sanderlands, 1994). The mass production era where manufacturing standardized products was very popular as it provides much faster and more efficient production system as well as costs can be kept down with economies of scale can no longer provide competitive advantages (Taylor & Lyon, 1995). Firms competing in industries characterized by turbulent environment and intense competition find that they can no longer compete on the basis of standardized products and services alone (Kotha, 1995). The mass production system can no longer fulfill the nature of today customer's demand where customers are shifted to the requirements of increasing product varieties, more features, and higher quality (Kotler,

1989). Moreover, Sanchez (1995) argues that an increased pace of technological change and the simultaneous shortening of product life cycles also have led to an increased proliferation of product varieties. According to Edosomwan (1996) as cited in Radder & Louw (1999), many firms today are responding to this turbulent environment by tremendous changes to create environments where every one can contribute their best, where customer requirements are not only met but exceeded and where efficiency, effectiveness, productivity, quality, customer satisfaction and competitiveness are taken seriously as critical success factors.

Mass customization is the capability to offer individually tailored products or services on a large scale. Zipkin (2001) points out that mass customization offers a premier way of achieving the best method to deliver variety to customers. Levi-strauss (An apparel manufacturer), for instance, sells custom-fitted jeans in order to offer a closer match to the personal need of customer's best fitted-

jean (Zipkin, 2001). There also many personalized information services for others from financial service to travel guidance proliferate on the internet. Zipkin also contends that the reasons for the transformation from mass production to mass customization are that mass customization offer strategic alternatives which match the need for continuous performance improvement in this turbulent environment. Mass production is believed to be inflexible in fulfilling products and processes that meet the requirement of an increasingly turbulent competitive environment (Pine, 1993). Instead, Pine suggested that companies must mass customize their goods and services to create offerings more relevant to the wants and needs of individual buyers, differentiate their goods and services from the sea of look-alike competitors, and thereby increase the value provided - and thus the price charged - to users and clients.

Mass customization is not a simple strategy. Determining what customization to implement is not an easy task. Several questions arising before firm is embarking mass customization strategy such as: which features or benefits of the offering should be customized, and which should be left standard? where across the value chain would buyers most prize customization? how is the industry and competitive environments? are firm's resources and capabilities available? how is organizational readiness? These questions arise because the movement towards customization affects on demand, which making it more unstable and uncertain. Products in mass customized market have short life cycles as products are customized based on customers' preferences. In addition, it creates strong consequences for the manufacturing function which has to devise means to cope with an environment much more unstable than the one characteristic of the mass production model (Saisse & Wilding, 1997). Mass customized industries are usually struggle to improve manufacturing flexibility. Manufacturing flexibility can be very complex, and should be supported by appropriate management tools. Mass customization requires unique operational capabilities. Levi-

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Levi Strauss for example has adopted the technology that can produce custom-fitted jeans. It should be noted that Levi Strauss has developed the technology and strategy for over decades, while other products are likely to be very slow in their evolution to customize even though e-commerce and technologies will ease some constraints in some cases (but not all) (Zipkin, 2001). More importantly, demand for customization is limited. Zipkin reported that current technology can support large-scale customization at reasonable prices with reasonable response times for only a few attributes of a few products. For mass customization to deliver real value, product's attributes must be one on which people's preferences differ sharply – one that are easy to discern. Certain industry met this conditions such apparel, sports equipment, and computers. However, it is clear that mass customization is not for every industry.

There are many challenges for the firm to adopt mass customization. Firms cannot just simply leap from mass production to mass customization. Adoption to mass customization is usually done through evolution where firms have previously response to improve their positions through rightsizing, TQM, Just-in-time, reengineering, and time-based competition (Saisse & Wilding, 1997). Thus, before embarking on the decision for mass customization, the firm should evaluate the degree of firm's readiness for coping with so many challenges possibly emerged. Mass customization has its challenges and limits. Several elements have to work well to make mass customization a plausible business strategy. It is important to consider that there are several ways to deliver variety, and mass customization may not always be the best. Mass customization is an option only for the companies which already implemented evolution such as effectively implemented TQM programs (Hart, 1995). Mass customization is not a strategy to replace mass production. As cited in Radder & Louw (1999), a study by Kohta (1995) in one of the Japanese bicycle industry found that the interaction between mass production and mass customization can be a source of knowledge creation and in the process

create a strong competitive advantage to reap superior performance benefits. Most importantly, firms must understand that mass customization itself is a highly customized strategy. We cannot imitate someone else's successful mass customization strategy. At every level, mass customization must be customized to our particular organization's needs, customers, production capabilities, competitive situation and the new technology available to our firm. Mass customization is not a one-size-fits-all strategy.

This article explores any challenges that firms must pursue when embarking mass customization strategy. It also discuss that mass customization has limits that it is not a strategy that makes mass production obsolete. First, the meaning of mass customization is delivered to provide a better insight. Next, why mass customization is important, its benefit and its demand are discussed. The main part will be focused on challenges and limits. The last part is conclusion to reap the whole discussion.

What is Mass Customization

Mass customization is a term to describe a trend towards the production and distribution of individually customized goods and services for a mass market (Davis (1987) as cited in Ahlstrom & Westbrook (1999)). The concept of mass customization was first fully expounded by (Pine, 1993), based on a survey of US firms. The term mass customization is then manifested in a Nissan Corporation's pronouncement: "Any volume, any time, any body, anywhere and anything" (Pine & Maskell, 1998). The pronouncement is essentially consists of two interrelated parts.

1. Visionary approach. The ability to profitably provide customers with anything they want, any time they want it, any way they want it and anywhere they want it.
2. Practical approach. Flexible process and organizational structures geared to producing varied and individually customized products and services at the low cost of standardized, mass production system.

According to Pine & Maskell (1998), the first approach may be hard to realize, even by the most dedicated customizers. The second approach implies that customization is provided within a pre-determined variety, where the goal is to ascertain, from the customer's perspective, the range within which a given product or service can be meaningfully customized or differentiated for that customer, and then to facilitate the customer's choice of options from within that range. The ultimate is, however, the ability to provide uniquely individualized products and services satisfying any requirement, but in a cost-effective way.

Mass customization is associated with greater variety, flexibility and lower prices, a continued focus on faster and faster processes and procedures to turn customer requests into products and services required. To make mass customization a sound strategy, personal and electronic integration of the value chain through instant communication linkages, common data-bases, and multi-functional as well as cross-organizational teams are required. Established mass production technologies can be used for manufacturing efficiencies, but new information technologies and a different managerial perspective are needed to bring mass customization to fruition (Connell, et.al., 2002). Mass customization requires agile manufacturing processes that are both flexible and diverse (Mohammed, 2001). Product modularity, the manufacturing of products in multiple finished modules that can be combined in various permutations, is the key to achieving mass customization (Mohammed, 2001). Low cost is reached through economies of scope rather than scale. Economies of scope are realized by applying a single manufacturing process to a greater variety of products and services, cheaply, and quickly.

Why Mass Customization

In a situations of unstable environments and markets that are fragmented into many niches consisting of customer needs which are not only harder to generalize but also more and more prone to changes and shifts, a strategy of mass customization is said to make more

sense (Hart, 1995). In today business environment, ongoing systematic changes within companies are mandatory. Hart (1995) argues that there are many reasons for this, but the most important one is the breakdown of the stable mass market of yesterday, the mass market that give birth to the concept and system of mass production in the first place. The following statement should make clear for the need to shift to mass customization.

"The fragmentation of the mass market is an ongoing, inexorable phenomenon, breaking down with it the previously smoothly running production system that was based on efficiency, stability and control. Not only are customers harder to generalize, with homogeneous markets increasingly a thing of the past, but the individual wants and needs of any one customer are more and more prone to change and shifts. Mass market breakdown has been further abetted by technology. Product life cycles have become shorter and shorter, while keeping up with technological change has become increasingly difficult for both manufacturers and customers. What is more, the changes that have created such upheaval in the marketplace are accelerating. Faced with these new market realities, yesterday's approach to the production and delivery of goods and services appears inflexible and unresponsive at best, if not completely doomed to failure. Companies stuck in a mass-production system cannot grasp the nature of the upheaval and cannot ascertain a proper response (Hart, 1995)".

Several benefits are associated with mass customization (Pine (1993) as cited in Radder & Louw (2000)).

1. A premium price can often be charged because new products more closely meet customers' desire. This extra profit margin offsets any loss of efficiency due to the lower volumes of production.
2. Lower costs can be achieved through economies of scope. i.e. the application of a single process to produce a greater variety of products or services more cheaply and more quickly.
3. Economies of scope and economies

of scale can be achieved. The latter could result from standard components that are combined in myriad of ways to create economies of scope.

4. Mass customization is associated with advances in management such as lean production techniques, lime-based competition and cross-functional teams which can enhance flexibility responsiveness and therefore the ability to increase variety and customization without the parallel in costs.

The Limits for Demand of Mass Customization

So far, demand for mass customization is limited and there is only limited evidence available for products with the potential for 'largescale' customization demand (Zipkin, 2001). A mass market requires many people willing to pay for special, unique features. Clothing is a good example. Customers demand variety when they differ sharply in their preferences for certain attributes of a product (Zipkin, 2001). People have different shapes, and they care deeply about a garment's fit. When products require matching different physical dimensions - customization may truly add value. However, Zipkin identifies that there is an indication of candidates for mass-customization from the customized (but not mass customized) products available today. Research for 'custom' by Zipkin in Yahoo's business section yielded the following categories: apparel, construction and home furnishings, computers (many companies in each category), publishing, and printing. Those are examples of products that can be a candidate for mass customization. Furthermore, Zipkin studied that an internet company called 'digiCHOICE' also pronounces thousands of custom products in hundreds of categories. The major categories, with examples of sub-categories, are as follows: apparel (clothing, footwear, jewelry, accessories), home and office (furniture, artwork, computers, carpets), media (music, television, books, photographs), personal care (cosmetics, vitamins, soap, bath items), services (vacations, training, mortgages, parties), sports (golf, base-

ball, soccer, bicycles, skis) and other (vehicles, gifts, food, pet items, boats). Many of the items above are merely customizable along physical dimensions that they do not always offer solutions for customers' unique needs and customers' sacrifice (customers' unique needs and customers' sacrifice will be discussed shortly). Zipkin (2001) argues that many custom products above are essentially novelties, that they do not warrant for mass customization. Parties, artworks, carpets, soap, boats, etc are only novelties that they do not warrant to call for mass demand. However, prerequisites of "mass" customization can't be seen only from product's physical dimensions. It is beyond that, that it should also consider aspects such: elicitation (digging customer's information so that product is actually designed by customers not producer), customer sensitivity which will determine numbers of demand, delivery/logistics and process flexibility (all of these aspects will be discussed later). Bear in mind that we need to fully understand the different between offering mass customized products or services and varieties of product or services.

Mass Customization Is Not For Everyone

Customization strategy is applicable to many product fields, but it is not applicable to all product categories. If customers are not willing to pay the additional costs for customized products, demand will not warrant firm's manufacture and distribution (Goldsmith, 1999). This view strengthen the opinion that mass customization is limited. Sometimes customization also requires customer to reveal personal information in order for the process to work. If customers resist doing so, they will not be able to join the customized segment. Some products resist for being customized. A number of companies have already run into problems while trying to make the leap to mass customization (Pine, 1993). Finding from Pine (1993) indicated that when Nissan reportedly had 87 different varieties of steering wheels and most of which were great engineering feats, customers did not want many of them and disliked having to choose from so many

options. It is thus important that firm ensures that its customers really desire customized products or services and that it has access to the required processes, procedures and capabilities before embarking to the shift to mass customization. Some products benefit from mass production, so in this case the most attractive product offering is an identical copy off all the others (Goldsmith, 1999). Mass production may be outmoded, but it is still the most viable strategy in some instances.

Challenges of Mass Customization

On embarking a program of mass customization, Organizations face challenges and limits. Hart (1995) acknowledged that there are five major areas regarding challenges that organizations have to tackle before pursuing mass customization strategy. The five major areas are customer customization sensitivity; marketing; technology, design, production and distribution; competitive environment; and organizational readiness.

a. Customer Customization Sensitivity

As customers today are more demanding of affordable customization, firm must determine whether customers care that firm offers more customization (Hart,1995). Hart further argues that if customers do not care, the mass customization potential in particular arena may be limited. There are two basic factors indicating customer care which usually called customer customization sensitivity (Hart, 1995):

- **The first** is the uniqueness of our customers' needs.

For example, customers for 'salt' with customers for 'investment counselling'. There are salt for table and for industry. Customers may not have needs more differentiated than those two kinds of 'salt'. With regard to 'investment counselling', it is obvious that each customers needs are absolutely unique. No customers in 'investment counselling' would be willing to settle for anything not perceived as tailored precisely to their needs.

- **The second** factor is customer sacrifice.

This refers that the firm must look at 'the gaps' between the product or

service benefits desired by customers and the product or service benefits actually provided by the suppliers in the market. These gaps are usually called "customer sacrifice". Customers of all kinds often put up (up set) with all kinds of sacrifices: hassles, inconveniences, discomfort, long waits, product or service deficiencies, high cost, difficulty of ordering, lack of fulfillment options, and much more. A high level of unique needs and/or customer sacrifices will produce a high customization sensitivity level. The higher the customer customization sensitivity, the better customization strategy fits in.

There are some lists need to be asked for organization willing to adopt mass customization. A 'yes' answer should indicate that customization strategy will be worthwhile.

- Do the customers really have unique needs?
 - Do the customers really care about more customization of their products / services?
 - Do they really want more choices or will they be overwhelmed by a large variety?
 - Are the customers prepared to accept certain sacrifices in order to buy from the specific organization?
 - Will they be prepared to pay more / to wait?
 - Is there a positive growth potential in the customized market?
- (Source: radder & Louw, 1999)

Regarding to the third question, Pine (1994) as cited in Hart (1995) argues that it is axiomatic in mass customization that "customers do not want choice; they want what they want". While the attraction in the customization process is to give customers many options (sometimes too many), too much offering may lead to psychological shutdown (Wind & Rangaswamy, 2001). The key is just to offer the right amount of variety so customers are presented with the right choices without being overwhelmed. Study by Wind & Rangaswamy (2001) showed that customers were overwhelmed by the choices when 'CD Now'

offers customized CD that can be assembled by selecting single tracks from a CD library, it provided customers with a search engine. The company had better success when it used a banner advertisement to offer a customized Christmas CD during the holiday seasons. Sales increase when customers were presented with a more manageable set of options or more specific set of option.

However, also bear in mind that mass customized products do not always command a premium price. Levi's personal pair and CD Now found that they could not charge a large premium for their customized products. In fact, a recent study shows that customers actually paid about 9 to 16% less when purchasing CDs and book online as compared to offline purchases (Brynjolfsson & Smith, 1999). This creates a challenge for companies who have to make additional investments to support mass customization. A mass customization strategy should offer opportunities for marketers to find creative ways to bundle products and services

b. Marketing and Strategy

Marketing competence within the organization is always a crucial matter. Does the marketing department have access to the level of detail regarding customer needs required for mass customization, and are the people there capable of analysing such information? In serving mass customization strategy, the overall structure of the firm's industry can have an impact, especially when it comes to the number of intermediaries who may exist between firms and customers. The more intermediaries and steps in the needs-assessment process, the greater the possibility that some element of "customer sacrifice" will occur. Customer sacrifice can be minimize by gaining the required level of knowledge about customer need and preferences. Collaborative relationship with customers, involving highly interactive, virtually "one-to-one" dialogue should be an alternative to carry out. Collaborative relationship among supply chain participants also critical to ensure that orders are properly met. Another opportunity from information age to support marketing competence is a possibility

that not only product could be personalized, but also product delivery, pricing and promotion if these proved to be profitable strategies. In some degree, customization of the other elements of the marketing mix may be possible even though the product itself is not (Goldsmith, 1999). Thus, marketers should be aware that information technology change the way firms compete in the market.

c. Technology, Design, Production and Distribution

The essence of mass customization lies in maximizing the congruence of the manufacturer's capabilities with the window of customers' needs related to target market niches in a timely manner, that is, a manufacturer has to perceive and capture hidden market niches and correspondingly develop its technical capabilities to meet diverse customers' needs (Tseng & Jiao, 1998). Without the technologies that have enabled to access and analyse individual customer needs and tailor products or services in direct response to these needs with the efficiencies of a mass-production system, mass customization is impossible (Hart, 1995). Firm must assess whether it has access to information concerning individual customer needs and, whether it has the ability to understand these needs. Creating 'customer advantage' today begins with understanding what customers' want (Galbreath & Rogers, 1999). One of the ways to assess information is elicitation. Elicitation is an artful means of leading customers through the process of identifying exactly what customers' want (Paul Zipkin, 2001). Elicitation reduces the costs associated with customers' laborious searching. The internet (e-commerce) in this case has a tremendous impact on exchanging information and on optimizing business process (Savoie & Raisinghani, 1999). The difficulty of eliciting customer-specific information varies with information required. To give customers exactly what they want, firms have to first learn what that is. It sounds simple but it is not. Customers often have trouble deciding what they want and then communicating or acting on their decisions. For example, many mass-customization systems are

also eliciting information about physical measurements in order to fit a garment to a body (Zipkin, 2001). So far, nearly all of those systems still limited or still use expensive manual methods. In certain cases, automation is replacing such manual methods, for example, Levis is trying an optical body scanner at one store. This automated body measurement, nevertheless, remains at the experimental stages, and its development is turning out to be demanding and slow.

In reality, customized products often fail by focusing on the product itself rather than on the customer perceptions and preferences for desired product and service attributes and their associated benefits. One of the reasons for the failure of 'Custom foot', which offered mass customized footwear, is the subjective nature of fitting shoes (Wind & Rangaswamy, 2001). Two customers might be measured for a size 10 shoe, but one might prefer a tight fit while the other prefers a loose one. Some aspects of the styling and feel of the fit may not be captured by simply measuring foot size. Identifying intangible dimensions is essential. In a shoe store, the customer tries on several pairs to find the right 'feel' using measurements only as a starting point.

Regarding to many technical challenges and difficulties in matching between technology and customers' preferences, there are questions need to be considered before embarking on mass customization strategy.

- Does the organization's process technology allow it to tailor its products/services to individual customer needs, or could such technology be easily incorporated?
- Is the organization's design conducive to and flexible enough to translate consumer's needs into specific specifications?
- How extensive an overhaul is required to incorporate this technology into firm's existing processes?
- Would the impact on the cost structure of incorporating and maintaining such technology be reasonable?
- Would the increases cost still allow a competitive price for the customized products / services?

- How much investment will be required? In general, the greater the investment, the greater the risk, but a successful, well-capitalized company might find a greater investment requirement to be well worth it if it is thereby able to be the first in the market with mass customization. There is a huge "first-mover" advantage to mass customization.
- Are substantial in-house engineering expertise and manufacturing capabilities available?
- Are the intermediaries that the organization has to depend on part of and supportive of mass customization?
- If there is no direct contact with final consumer, are there sound collaborative relationships with customers involving highly inter-active communication?
- Are the organization's suppliers located strategically and can requirements be supplied frequently and reliably, so that minimum inventory can be carried?
(source: Fladder & Louw, 1999)

Based on survey that has been done by Ahlstrom and Westbrook (1999), the top four barriers to increased customization are found in subsequently these areas: Inflexible factories, Products will be too costly, Information technology, and Change management. The item inflexible factory is ranked as the top barriers to increased customization. This means that advances in manufacturing function are the greatest importance in achieving mass customization (Spira & Pine, 1993). The second item 'whether products will ultimately too costly or not' is also related to the performance of the operation function whether it is flexible enough to cover economies of scope. The third item 'information technology' indicates the need for integrating information systems (matching between customer's needs and production capabilities) to enable customized products meet their demands. The readiness of firm's information technology is vital to support mass customization strategy. Information technology will support the need for improved dialogue between marketing and manufacturing to find

proper elicitation from customers as well as to handle firm's supply chain management (distribution system), logistics, and production processes. The fourth item, Change management will be discussed within organizational readiness.

Regarding logistics, even though readiness in information system has been a great help, but still this is a tricky job especially for the firm which is moving from mass production to mass customization. Finding from Zipkin (2001) indicates that, at Levi-strauss, after the product is fabricated to include customer specific information, then, there are additional processing and transportation tasks. Fitting and cutting is only an early stage of a multistage process; subsequent steps include sewing, washing, packaging and shipping. It is necessary that some information (at least the customer's identity) move along with the physical product through all the stages so that the right product ultimately reaches each customer. Delivering a bulk product from mass production industry might be efficient and more simple, nevertheless delivering individual customized product certainly involves much more complex activities. Direct distribution to customer is quite different from the conventional kind (mass production's distribution system), and switching from one to the other (conventional distribution to direct distribution) has proved difficult.

d. Competitive Environment

The first factor to ponder regarding competitive environment is economic uncertainty. The greater the uncertainty and the market turbulence, defined by such things is instability and unpredictability of demand and homogeneous versus heterogeneous customer demand, the greater the potential need for variety and customization (Hart, 1995). Uncertainty and market turbulence is commonly characterized by a continuous change and increasing customers' demand which is then responded by firms through increasing product proliferation and new product introductions. The second factor to concern focussed on customers. Is there a viable group of customers who can be persuaded to value customization? As has been dis-

cuss above, do customers really care with customized products / services? If the answer is 'yes' the firm should engage in further step by developing a true learning relationship with their customers. Firms will see the lifetime value of those customers increase as the relationship deepens and as mutual learning takes place. Obviously, the "customer share strategy (sharing information with customers)" is a profoundly different approach than traditional mass marketing, which focuses on winning market share through anonymous transactions with "targeted" market segments (Hart, 1995). The third is competitors focus. Are there a high potential for new competitive rivalry? Are there well-entrenched competitors in the industry who are already pursuing mass customization? How long would it take for competitors to react, and which ones might react most quickly and how? The competitors' customers also have to be considered: how will they react? How loyal are they to firm's competitors—even if their mass-customization needs are not yet being met? Apart from competitors, the firm must consider possibility being a first-mover. Would the firm be the first in the market with a mass-customized product? Hart (1995) states that at this stage, a huge benefit accrues to the first company truly able to track and fulfill individual customer needs, to engage individual customers in dialogue, and to build a "one-to-one" relationship based on knowledge and trust. He further points out that companies that do this have a good chance of garnering a "100 per cent customer share", where the company's products and services are the only products or services of their types that the customer purchases during his or her lifetime.

e. Organizational Readiness

Organizational readiness for mass customization requires a tough and honest assessment of organization's attitudes, culture, and resources (Hart, 1995). In addition, Hart states that management's job now is to discover the degree of fit between the business opportunity inherent in mass customization, on the one hand, and the organization's ability (attitude, culture and

resources) to capitalize on the opportunity, on the other. Business readiness is dependent on deep self-knowledge regarding core capabilities. Related to this is a concurrent understanding of the capacity for organizational change. Here are some lists to evaluate the readiness of organization whether attitudes, culture and resources are ready to change.

- Is there a high degree of fit between the opportunity inherent in mass customization and the organization's ability to capitalize on these?
- Are there leaders committed to mass customization?
- Is the organization ready to change?
- Is change consistent with the organizational culture?
- Does the organization's culture focus on knowledge creation and the development of manufacturing capabilities ?
- Is there a shared vision throughout the organization?
- Does top management institute organization mechanisms that foster interactions among focused plants?
- Is there integration across functions while maintaining excellence within each function?

(Source: Radder & Louw, 1999)

Then, of course, there are inevitable financial issues. Corporate leaders must be able to assess the monetary costs, as well as associated opportunity costs inherent in pursuing a mass-customization strategy (Hart, 1995). The company must then be able to fund it. Hart (1995) suggests that it is not necessary to have a lump sum of cash on hand at the beginning of such change. A firm can move forward with a mass-customization strategy step-by-step, provided that the plan is carefully constructed and financial capabilities at each step are precisely monitored. Similarly, companies will need to strike a balance between focusing on the development of mass-customization capabilities and maintaining immediate cash flows.

Conclusion

Many organizations are now going through tremendous change from mass production to mass customization. In encountering the increasing market tur-

bulence and uncertainty, mass customization has been broadcasted as the premier way of achieving the best way to deliver individual customer needs and tailor products or services in direct response to these needs. Understanding that today's customers are more demanding and that the nature of today's competition (supported by technology) is shifted to deliver more personalized strategy, many organization are moving to mass customization. However, it is not easy to make such a move. There is nothing simple about mass customization. It is not a simple strategy to undertake organizationally. It is not even a simple concept to comprehend. Commonly, firms engaged in several evolutions before they are ready for mass customization, such as improving their positions through rightsizing, TQM, reengineering, time-based competition, etc. Firm cannot simply leap from mass customization to mass production.

Mass customization calls for a change in the view from standardized product to product variety and manufacturing flexibility. Historically, both variety and flexibility have been seen as problems that have impacted on the production system's ability to perform efficiently. Therefore, a number of means through which this problem could be handled have been developed. However, even though technologies are always developed (either information technology or production process), it seemed that so far remain expensive and slow. Only particular products or services mass customization does work. Demand for mass customization is still limited. Generally, we can easily find customized products around us, but there are not many evidences for mass customization. Many customs products are essentially novelties and the value of such products is by nature transitory, for example, customized gift, customized furniture, customized car, etc. This indicates that there still a big challenges and limits for mass customization to work in the market. The technology is developing rapidly and hopefully will solve recent problems and make mass customization (not only 'customization') possible in the future.

Mass customization should be an option only for the companies which al-

ready exist in particular sphere of operations. A mass customization strategy cannot be followed blindly. True commitment to mass customization requires an explicit mass customization strategy. An explicit mass customization strategy is unique to the company developing and implementing it. We cannot copy any other organization's methods. Our singular strategy is the only means by which we can manage innovation to every part of our organizational products. The most important mass-customization prerequisite is the understanding that mass customization itself is a highly customized strategy (Hart, 1995). We cannot imitate someone else's successful mass-customization strategy. At every level, mass customization must be customized to our particular organization's needs, customers, production capabilities, competitive situation, and the new technology available to our firm. Mass customization is not a one-size-fits-all business concept.

Mass customization may not always be the best strategy. As has been studied by Kotla (1995), He found that interaction between mass production and mass customization could also be a source of knowledge creation and in the process create a strong competitive advantage to reap superior performance benefits. Mass customization and mass production should not be viewed as incompatible opposites (Radder & Louw, 1999). When these following questions arise: when a company should pursue a mass customization strategy? should it partially or completely shift? should both mass customization and mass production simultaneously implemented? The answers depend on the readiness of the company to commit to mass customization requirements. Five major areas 'customer customization sensitivity; marketing; technology, design, production, and distribution; competitive environment; and organizational readiness' can be a guidelines to evaluate the readiness towards mass customization strategy. Thus, it is clear that mass customization is very promising strategy especially in this turbulence environment, however mass production remains an effective strategy that offers alternative competitive advantages. ■

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