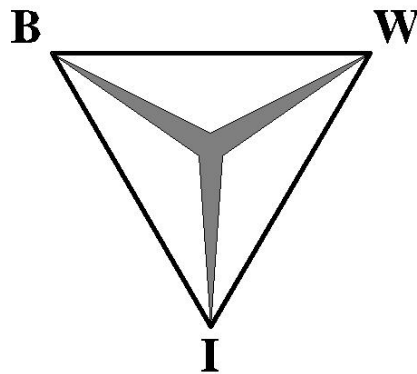


Mass Customization

How is it possible?



Essay
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Executive Summary

When a market strategy is created, the first question is: "What is it?". The next question is: "What for?". But these two answers are not enough to get insight in a subject. We would also like to know how this strategy has arisen, what its effects are, what it can do and how we can use it too.

A new phenomenon has arisen and its name is Mass Customization.

What is Mass Customization and what makes it so special? What did we have before and why is that not enough any more? What effects does Mass Customization have on our society and how is it possible?

I tried to answer these questions as clearly as possible in order to give my readers a clear insight of this new market strategy.

This essay not only gives a definition of Mass Customization, but will also describe how Mass Customization has arisen, what its effects are in daily life and how Mass Customization could and should be 'implemented' in a company.

This essay can be considered as a piece of information about Mass Customization or as a direction in how to use Mass Customization, but it is especially written for people who are just interested in this subject, like the author herself.



Preface

For my study Business Mathematics & Computer Science I have to write a paper about a subject that is related to my study. This study is a combination of three fields: Economics, Mathematics and Computer Science.

I chose a subject in the field of economics, because I want to write about an occurrence in real-life. I do not mean that subjects in the fields of Mathematics and Computer Science are not related to real-life, but I realized that many people around me are not interested in these abstract theories. And those are the people who I would like to write this essay for.

The subject of my paper has become Mass Customization. This subject attracted me, because I am a supporter of this new market strategy. I do not like to be like everybody else and I like to see people and/ or things differentiating from all the rest. It might not be possible for everybody to be unique, but it is possible to be individualistic and Mass Customization makes this idea realizable.

As a reader of this paper you will first get a short introduction to Mass Customization in Chapter 1, in order to give you a picture of this subject in your environment, followed by its definition in Chapter 2. Then I will write about a subject that causes confusion with Mass Customization in Chapter 3. Chapter 4 gives you a picture of the history of market strategies and Chapter 5 describes the industries that are affected by this new system. The basic differences with the current system will be given in Chapter 6. After some knowledge about the history and some basic differences with the current system, it is time to describe the necessary changes for Mass Customization in Chapter 7. Finally, Chapter 8 describes the steps that have to be taken and Chapter 9 provides you of the ‘finishing touch’ of this strategy. This paper will end with a conclusion in Chapter 10 and a short look into the future in Chapter 11.

I would like to thank my supervisor Prof. Dr. A.E. Eiben from the Free University (Amsterdam, the Netherlands) for his time, advice and critics, which encouraged me to write this essay. I would also like to thank Drs. B. Beks and A. Chabaline for giving me the inspiration that helped me to finish this essay.



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1 Introduction

Once I asked my mother why she did not buy fruit yogurt for me because as a little child I used to throw up after I ate natural yogurt. She told me that fruit yogurt did not exist. I was a little bit surprised that 20 years ago people could only buy natural yogurt, while nowadays there are a hundred different kinds of yogurts! I am really happy that now we can choose the yogurt we like.

It is obvious that people are different. Every person is unique and so are his or her preferences. That is why people like to decide by themselves what to buy. Who likes to be ‘pushed’ by the producer to buy something everybody already possesses? In poor times we did not have a choice, but in a wealthy economy like in these days the customer is the one with power. The customer decides what has to be produced and they are able to ‘pull’ the wanted products out of the producers.

A new phenomenon has arisen and its name is Mass Customization. It is also called ‘The New Frontier in Business Competition’, because this is the new way to produce:

In this new frontier, a wealth of variety and customization is available to consumers and businesses through the flexibility and responsiveness of companies practicing this new system of management. [1, page 7]

Just take a look around you and you will see the results of Mass Customization: If you need shampoo, first discover if your hair structure is weak, strong or just ‘normal’ (what is normal?). Then you have different ones for colored, curled, long or short hair. You can also take one included conditioner or you can buy it separated. But even the matching conditioners have differences! Do you prefer one that has to be washed out or not? All these choices... Just to wash your hair. Another well-known phenomenon is the sanitary towel. Thick or thin, with or without wings, panties or string AND even WHITE or BLACK! How about the babies? Boys and girls are different, so we need different kind of diapers for boys and girls. Then you can choose different kinds of diapers every quarter of the year (1-3 months, 4-6 months, 6-9 months and so on). And when the child can urinate by him- or herself, you can buy the “up-and-go’s®”!

All these choices... Are we happy with that? Most times we are, but where are the limits? On the other hand, do we need a limit? Isn’t every person unique, which means that choices are unlimited?

This is what I am interested in: how could Mass Customization be possible and will it end?



2 What Is Mass Customization?

One thing is clear: Mass Customization is about choices. Since Mass Customization exists, consumers are able to create their unique end product any time they want. But there is another important thing: Mass Customization should be affordable. Mass Customization is not only meant for the rich, it is meant for a great public that has a growing desire for product personalization.

A short definition of Mass Customization is:

A delivery process through which mass-market goods and services are individualized to satisfy a very specific customer need at an affordable price. [2]

Mass Customization has arisen from two directions:

1. The demand for customization in the market. Customers want choices and are not content with mass products any more.
2. New insights and concepts in production and logistics, which make wider product differentiation possible, without extra costs, and in many cases even cheaper.

The first direction is the reason for the existence of Mass Customization, and the second direction is the possibility for Mass Customization. These directions will be described more detailed in the next Chapters.



3 What Is Mass Individualization?

Mass Customization and Mass Individualization, isn't that the same?

The answer is no. Although they are related to each other, it is important to know the differences between them.

Imagine a production process in the shape of a value chain with the beginning connected to the producer/ firm and the end to the customer:

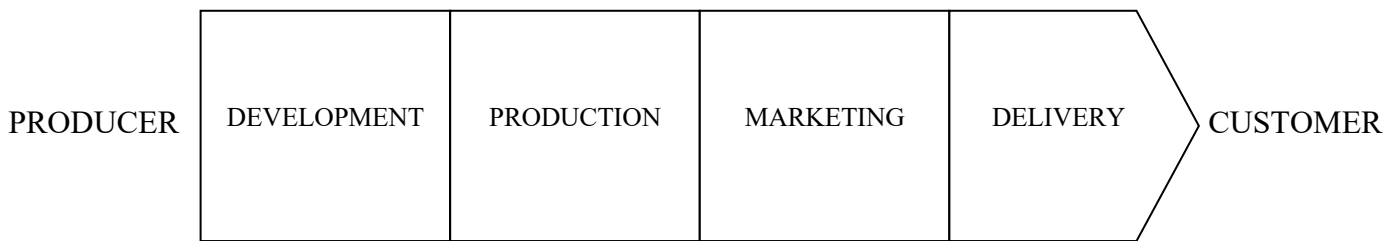


Figure 3.1 Value Chain [1, page 173]

If we talk about Mass Customization, we talk about customizing at the end of the chain, which is connected to the customer. This means that customizing a product happens in the last phases of the production process. If we talk about Mass Individualization on the other hand, we talk about the customization of the whole production process.

Another big difference is that in Mass Customization it is about customizing products and services, but in Mass Individualization it is about customizing processes.

The differences might seem small, but the essence is that Mass Individualization is much broader than Mass Customization, since Mass Customization happens in a part of the production chain and changes the output of it (the product and services), while Mass Individualization happens in the whole chain.

Van Asseldonk has put the differences in a table:

<i>Mass Individualization</i>	<i>Mass Customization</i>
<i>Implications for every chain process</i>	<i>Implications especially for assemblage and logistics</i>
<i>Process modularity</i>	<i>Product modularity</i>
<i>Individualization in the whole supply chain</i>	<i>Individualization only in the last processes of the supply chain</i>
<i>Interactive, self-organized supply chains</i>	<i>Existing supply chain with postponement of production</i>
<i>Networked organization forms necessary</i>	<i>No forms necessary, will arise by itself</i>

Table 3.1 The differences between Mass Individualization and Mass Customization [3, page 61]



4 What Was Before Mass Customization?

To understand the future, we have to know about the present. To understand the present, we have to know about the past. Let's take a look at the past to understand the existence of Mass Customization:

4.1 Until the Industrial Revolution

Until the Industrial Revolution, consumers were catered one at a time. Every product had to be handmade, because machines did not exist at that time. The result was that every product was almost unique and thus very expensive. Only wealthy people were able to afford luxury products like a suit, a pair of shoes or furniture. People who made the products were not known as producers, but as craftsmen or even artisans. Even nowadays their products are valuable, because now they are called antique.

4.2 The Industrial Revolution

Between 1750-1900, industrialization replaced hand tools with machinery and machinery became the primary instrument of production. Machines began to make our clothes, shoes, furniture and many other new products.

There were two basic advantages of using machines instead of hand tools:

The first was that if machines replaced the craftsman's skill, the worker could spend his time in creating even more varied products.

The second was that machines were cheaper than human skill. Machines could produce for a longer time and that resulted in more products. It made the costs per product much cheaper and products could be sold for a much cheaper price.

Goods were made in factories and sold in department stores. Contact between producer and customer disappeared. More consumers could afford the products because it was so cheap.

4.3 The American System of Manufactures

By the middle to the nineteenth century, America invented a new production system that is known as the American System of Manufactures. This system, which was extremely successful and in which the United States grew as an economic power, was based on the production of interchangeable parts.

Parts of a product had to be produced in such a way that they were interchangeable. This was a time-consuming job (every part had to be made, tested, refined, tested etc.), but it had major advantages. Interchangeable parts simplified the production process, because parts were smaller and easier to produce than a whole product and they were also easier to repair and to be replaced than a whole product.

These parts had to be made by specialized machines because producing them was a job with great accuracy. That was why specialized machines were developed with systems of



gauges and fixtures as key components, which increased quality, uniformity and productivity.

But building specialized machines was a task that could be better done by the machine tool industry, because it enabled producers to focus on their production system. This meant that organizations became dependent on each other.

It also caused division of labor. Workers should be focused on producing one part of the product instead of the whole product, which resulted in a greater efficiency.

Because of the great variety of the interchangeable parts, companies did not have to stick to old ideas or processes any more and became flexible.

Finally, in the American System it was important to continually improve their products by technological inventions. Technological inventions changed the world so much, so to keep on improving the economy, technological improvement should continue.

4.4 Mass Production

After successful years there came an end to the American System in the twentieth century. The factors of the American System were not enough any more to satisfy the constantly increasing economy. Competition had also grown and a new system had to be developed to support a new economy.

This new system came and it was known as *Mass Production*. It was also based on *interchangeable parts*, but there were some essential differences:

The American System was based on high quality and high output and resulted in high costs and prices. Mass Production, on the other hand, was based on low costs and low prices. To reach low costs and prices, workers had to produce more in the same amount of time. Labor time had to be decreased and creating an automatic flow of work to the worker was a solution. Another way to lower the costs was economies of scale, which meant increasing the throughput of the machines and the productivity of the workers.

Lower costs caused lower prices, lower prices caused greater sales, greater sales caused greater production and this on its turn caused even lower prices and so on. A cycle has arisen and led to product standardization. Every little difference from these standardized products would break the production cycle by creating higher costs.

Mass Production was also called Fordism, because it was implemented under leadership of Henry Ford. Ford had big successes with Mass Production, which was clear by this slogan:

“The customer can have any color he wants so long as it’s black” [5]

Mass Production was responsible for the enormous growth in American industry. People had enough money to buy as many products as they wanted, because it was cheap. They did not care if the products were unique or not, as long as they possessed them:

In the world of Mass Production, consumers accepted standard goods; their acceptance facilitated the extension of the market and the reduction of prices, through increasing economies of scale; and the growing gap between the price of mass-produced



goods and that of customized goods further encouraged the clustering of demand around homogeneous products. [1, page 25]

4.5 Nowadays

The world has changed. Not only is the market practically saturated after so many years of Mass Production, population has strongly changed as well. The market is no longer stable and homogeneous, but is demographically different now. People do not want similar products any more, but quality and especially uniqueness. The differences between incomes have increased and so did the differences of needs. Fashion and style are also becoming more important, because it almost seems to be a ‘must’ to spend as much as you can. Spending money used to be ‘materialistic’, but since this phenomenon is called ‘hip’, nobody will be blamed for it any more.

A new trend has arisen and that is the trend to individualization. There are many reasons for this phenomenon, but one of them is definitely the increasing prosperity. This can be described with the help of Maslow’s pyramid of needs:

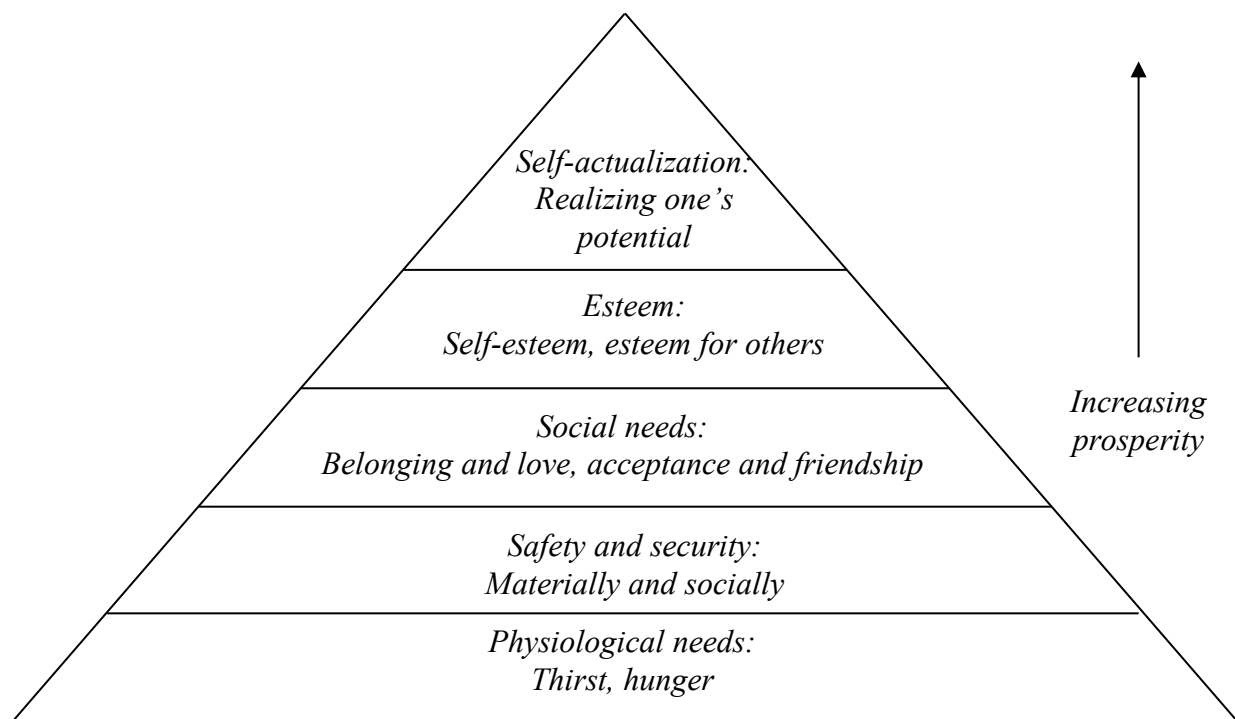


Figure 4.1 Maslow’s pyramid of needs [4, page 80]

More prosperity means that people are able to climb up in this pyramid and their needs will arise to a higher level, which has consequences on buying behavior.

First of all it is noticeable that the two bottom levels are related to the functional aspects of life, like the things people need just to survive or to stay alive. People on these levels are for example already satisfied if they have food and do not care if it is tasty or not.



The upper levels, on the other hand, are more related to the emotional aspects of life, like quality and luxury. People on these levels buy things because they like them and not because they necessarily need them.

Nowadays many people are getting to higher levels, which make it worth to mass customize.

Another important fact is that the number of competitors has grown, which made it hard for companies to charge high prices. Products (and services) should be custom-made (-delivered) and affordable as well.

Pine described a number of events and changes during the 1960s and early 1970s that affected consumers, producers, markets, and societies in ways that influenced the nature of industrial competition:

- *Great social unrest, including Vietnam War demonstrations and the civil rights movement;*
- *The first of the baby boomers became adults;*
- *Rising affluence and, perhaps, growing separation of socioeconomic classes;*
- *The acceleration of technological change;*
- *The end of the fixed exchange rate system;*
- *The first oil shock;*
- *Disintegration of the nuclear family (itself a disintegration of the extended family), with increasing rates of divorce, unwed mothers, absent fathers, and crime;*
- *The first generation raised on TV;*
- *Saturation levels among consumer durables like appliances and automobiles;*
- *High inflation combined with high unemployment; and*
- *The ecological and consumer rights movements.*

[1, page 78]

Companies should shift to another economic system that could satisfy all the different needs of the customers at an affordable price: A system that could customize products. This new system is created and it is called Mass Customization.



5 Industries in Which Mass Customization Is Active

This new system has influenced different industries. To have an overview of the changes caused by Mass Customization, we take a closer look at some industries in which this new phenomenon is active:

5.1 Automobile Industry

Ford's slogan:

“The customer can have any color he wants so long as it's black” [5]

was an indication that the automobile industry was once prototypical of Mass Production. People used to be happy if they possessed a car, now it is almost unthinkable not to have one. Since most people can afford it now, more demands are placed on the cars. As Pine described:

A short list of recent major product innovations includes all-wheel drive and all-wheel steering, air bags, synthetic engine materials, microprocessors controlling more functions, minivans, and automatic overdrive transmissions. Soon to be fully available commercially are heads-up control displays (as in fighter jets), electric cars, infrared night vision displays, and navigation systems. [1, page 35]

If you want to have a car now, it is not only a matter of choosing the color you like, but you can wish for every little detail you prefer: Leather chairs, sun roof, electrical windows, air conditioning... Anything on any type of car! The only disadvantage is that the delivery time is much longer now, because the production of these cars still has to be finished...(which, you will read later on, is one of the changes for Mass Customization)

5.2 Information Technology Industry

As with cars, it used to be special to possess a personal computer. Nowadays, many households have at least one and laptops are not only meant for businessmen any more. Look at the different colors of Mac's that were produced or the wide varieties of software the customer can choose to compose their ideal computer. And not to mention the broad selection of hardware: different sorts of mice, monitors, keyboards, modems, video cards, speakers, and so on.

5.3 Telecommunications Industry

Who does not remember the 'old-fashioned' telephones with their rotary number plates? It was already distinguished if you possessed one that was black instead of ivory. Now we can choose any color or shape we can think of. The services also expanded with Call Waiting, Call Forwarding, Caller Identification, Caller ID blocking, multiple phone lines and voice mailboxes. Another huge difference with the past is, of course, the mobile phones. Even children on primary school 'need' one!



5.4 Beverage Industry

One of the first inventions was the 'diet'-series of every soft drink. Then came the 'caffeine-free', 'extra vitamins', 'fizzy/still'-series and so on. Even mineral water has a whole series of flavors now.

A nostalgic poem indicated the uniqueness of beer:

Ah, good old days. If you wanted a beer, you had a simple variety of types from which to choose.

If it was hot, you might ask for a cold beer.

If it was somebody else buying, you might ask for a free beer.

If it was Ohio, you might ask for a near beer.

[1, page 39]

Unfortunately for Greg Prince, the writer of this poem, we now have regular, light, nonalcoholic, malt, dry, holiday and lemon beer, just to name a few.

5.5 Fast-food Restaurant Industry

We used to go to McDonald's for a burger and French fries, and now I do not remember the taste of a burger any more. The assortment is broadened with Big Mac, McChicken, McFish, McNuggets, McBacon, McCroquette and many other variations, because McDonald's regularly have different themes for their menus that change every week.

5.6 Financial Services Industry

Financial services like insurance and banks are also affected by demographic change and market fragmentation, so they cannot offer standardized products and services any more. They have to adapt their services more to the wishes of their clients.

As Pine described:

*The industry is learning that the product isn't the product, it is the complete package of information, education, advice, attitude and ongoing service **plus** the actual product that the customer evaluates. [1, page 43]*



6 Mass Customization Versus Mass Production

It is clear that a lot of companies have to make a switch from Mass Production to Mass Customization. To be able to make this switch a success, companies first have to understand the main differences between these two economic cultures:

First of all, Mass Production was about producing as much as possible and led to a lot of identical products for a mass population. Mass Customization is about variety, about different kinds of products that are made for different kinds of people. It is not about stability or control like in Mass Production, but about flexibility and quick responsiveness.

Second, the main goal in Mass Production was low costs. As long as the costs were kept low, the prices were low and the sales would increase. In Mass Customization, the main goal is to satisfy customer's needs. If a company is able to understand the customer's requirements, more variety can be produced according to their wishes and sales will increase as well.

And third, Mass Production is successful in a homogeneous market with long products life cycle. Mass Customization is meant for a heterogeneous market in which products have to be replaced regularly.

The differences between Mass Production and Mass Customization in a table:

	<i>Mass Production</i>	<i>Mass Customization</i>
<i>Focus</i>	<i>Efficiency through stability and control</i>	<i>Variety and customization through flexibility and quick responsiveness</i>
<i>Goal</i>	<i>Developing, producing, marketing, and delivering goods and services at prices low enough that nearly everyone can afford them</i>	<i>Developing, producing, marketing, and delivering affordable goods and services with enough variety and customization that nearly everyone finds exactly what they want</i>
<i>Key Features</i>	<ul style="list-style-type: none"> • <i>Stable demand</i> • <i>Large, homogeneous markets</i> • <i>Low-cost, consistent quality, standardized goods and services</i> • <i>Long product development cycles</i> 	<ul style="list-style-type: none"> • <i>Fragmented demand</i> • <i>Heterogeneous niches</i> • <i>Low-costs, high-quality, customized goods and services</i> • <i>Short product life cycles</i>

Table 6.1 The differences between Mass Production and Mass Customization [1, page 47]



7 What Has to Be Changed?

Many industries are undergoing this fundamental shift. What has to be changed to make Mass Customization work? Many companies have tried to use Mass Customization but a lot of them did not succeed. It seems hard to produce end products that are unique for customers **and** at an affordable price as well. Especially because many industries have been so successful with Mass Production for so many years, it makes it very difficult to shift to another system. What has to be changed to operate successfully on the market again? How can a company produce variety on the one hand and save costs on the other hand?

Nowadays companies have to deal with problems like extreme heterogeneity and unpredictability. In Mass Customization, the way of finishing the products/ services should be customized. Before they can do this, they first have to understand the principles of economic value creation and the evolution of business processes. First, because economic value creation is what every company wants and second, because business processes realize this economic value creation.

7.1 Principles of Economic Value Creation

Economic value creation is the result of operational cash flows and can be divided into three groups:

1. *Volume (the relative size and growth of the market)*
2. *Efficiency (avoiding complexity costs)*
3. *Differentiation (the value seen by customers by comparing with competitor's products/ services)*

[3, page 21]

The best way to increase the operational cash flow is increasing the volume, improving the efficiency and raising the degree of differentiation. This is not possible because the three elements are conflicting in a certain way:

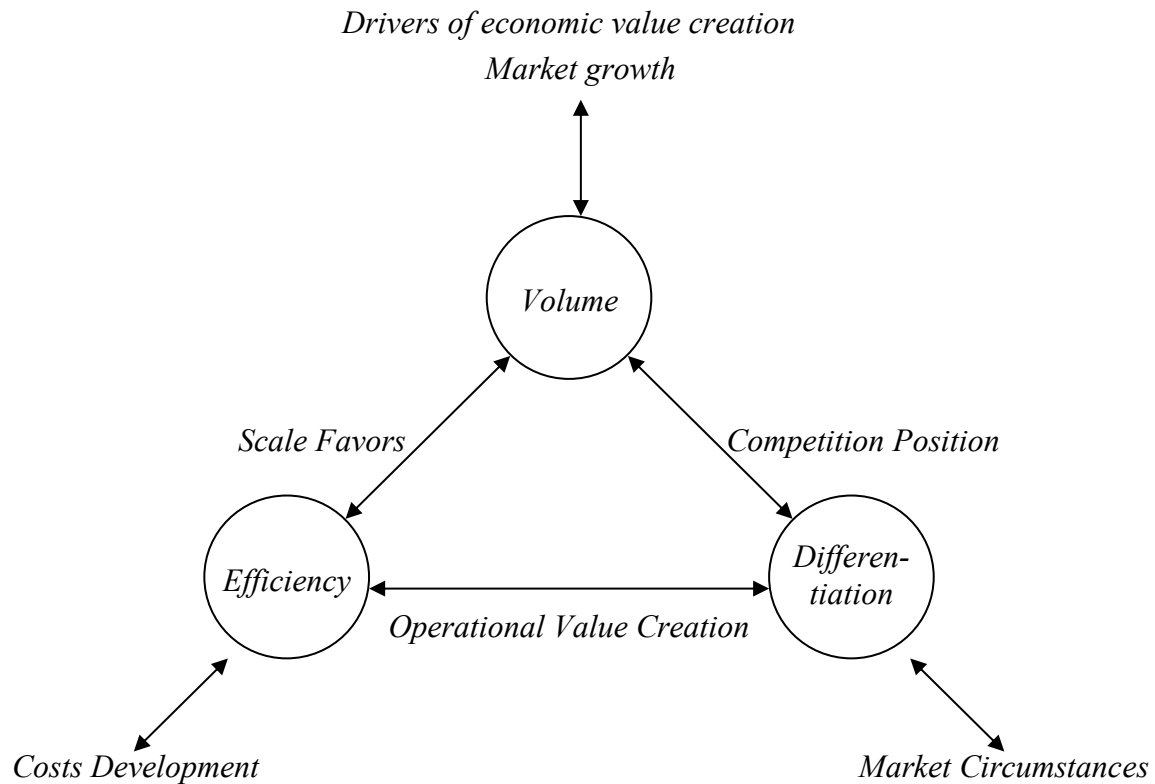


Figure 7.1 The drivers of economic value creation [3, page 22]

Companies are different and have to emphasize the component that is the most important for their company. Companies that are strongly expanding will emphasize their volume, because this is their driver to create value. Companies that have specified goals, like growing with a certain percentage, will choose efficiency as their driver to reach these goals and thus creating value. And companies that want to be different from their competitors will emphasize differentiation, because they want to create value by creating specialized products.

7.2 The Evolution of Business Processes

A business concept is the vision on the construction of business processes and is operated on the organization and design of the company: marketing, logistics, communication and organization. If a company notices it cannot satisfy the market requirements any more, it has to change its business concept and this also affects the business processes. The evolution of business processes can also be divided into three phases:

1. *Capacity thinking;*
2. *Product/ market thinking;*
3. *Mass customization;*

[3, page 24]



A company has to find the right business process that fit the component it has chosen to increase its operational cash flow:

The business process that can increase the volume is capacity thinking, because what counts is capacity, the ratio of demand to supply. With capacity thinking the company can make sure that its supply is smaller than the demand for its products.

The business process that fit the efficiency is product/ market thinking. By defining a couple of standard products and by delivering them into specific segments of the market, a company will reach the optimal efficiency of its products. And efficiency will result in a growth in industrial productivity.

And the business process for differentiation is customizing. Since customers compare companies with each other, a company should find a method to make itself exceptional. By mass customizing its products, it can come closer to customer's needs, which is preferred.

7.3 The Principle of Mass Customization

It is not difficult to conclude that the component *volume* does not count that much any more to create economic value in these days. It is not about the number of products, but about *efficiency* and *differentiation*. As Asseldonk described:

The trade-off is either an efficient, industrial organization of business processes (efficiency) or the optimal feeling for the heterogeneity and unpredictability of the customer (differentiation). [3, page 26]

The principle of Mass Customization is thus optimizing both differentiation and efficiency.

7.3.1 Differentiation

Differentiation is the result of differences in the value of a product/service, seen by customers. If the company wants to attract customers to buy their products, they have to know what the customers want; otherwise they will go to its competitors.

The first thing that influences the customer is the value of a product/service. The question is: 'Which value does the customer prefer?', since value is a relative conception. One person might think that glasses for 250 EURO are not expensive, while someone else might not even want to spend 100 EURO on the same glasses. The value of a product/service is not only based on its costs any more, but more on the requirements of the customers and this is where a company should focus on to gain profit out of its products/services. It is a matter of knowing the right definitions of value for different types of customer and then making your products worth that value. An example: Most students do not spend much money on a pen, so produce simple pens and sell them for low prices in cheap bookstores. Businessmen on the other hand, do pay attention to a good and nice looking pen, so produce luxury pens and do not be afraid to sell them for high prices. The 'right' customers will buy those products, because that is what they are looking for!

Another thing that influences the customer is the availability of what they want. Nowadays, customers have become freakish and sometimes their requirements seem to



be irrational comparing to the traditional customers. For instance, they do not think about ‘what to eat for diner tonight?’ but they will see what they are going to eat when time has come to have diner. And this is a phenomenon that should be offered by producers. If a company gives the customers the feeling that anything they want is possible, they can influence them to buy their products. If the consumers want to have simple, but healthy meals, produce meals that satisfy these criteria’s. A good example is the way Albert Heijn sells its products: thousands of fresh meals, juices and bread in handy packing, ready to be consumed. The customer can have **anything, anywhere** and **anytime** they want, without any effort.

7.3.2 Efficiency

Efficiency is the extent in avoiding complexity costs. Complexity costs are ‘extra costs’ for producing and selling products and services, like stocking, delivering and technology costs. They can be created in departments like administration, preparation, management, production, purchase and sales. In times with unpredictable customer requirements products cannot be made in advance and this means high stocks, long delivery times and high technology and this results in high complexity costs. The essence of Mass Customization is thus reducing complexity costs and therefore we first take a look at the development of these costs in a ‘normal’ production process:

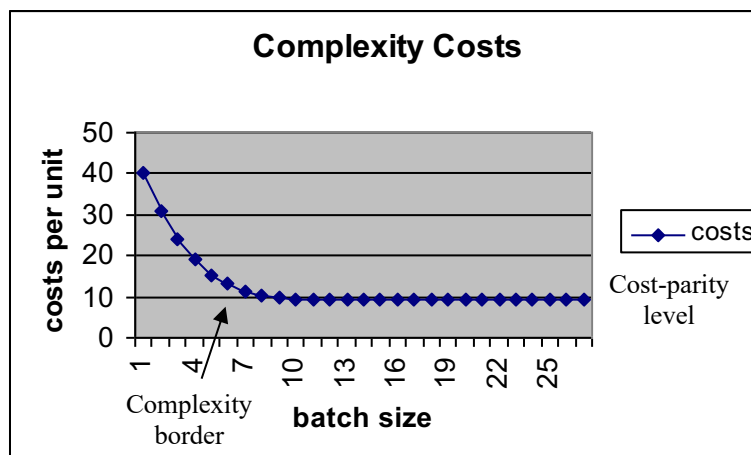


Figure 7.2 The development of complexity costs [3, page 33]

It is clear that these complexity costs become constant at a certain batch size and this point is called the complexity border. From this border it is the cost-parity level, which is the level of the cheapest offers in the market.

One way to reduce the complexity costs is to reorganize the assortment. Companies with a lot of variation are selling a little amount of every variety and this results in high complexity costs. If they deplete their assortment, the batch size per sort will increase and this will decrease the complexity costs on its turn. But of course this is not the solution in a heterogeneous market. The trick is to decrease the complexity costs without increasing the batch size per product.



Another solution is to move the complexity border to the left, which means that the constant costs will be reached at a smaller batch size. In reality, it is not easy to realize this, because the formula for costs per unit is:

$$\frac{\text{Total Costs}}{\text{Total Units}}$$

And how is it possible to reduce the costs per unit when the denominator reduces as well? The answer is to reduce the Total Costs ‘faster’ than the Total Units. This is not impossible to solve, but it needs the newest technology and thus even more extra costs. Eventually, the constant costs after the complexity border will be higher, because the used methods and techniques were so expensive.

The best solution is neither to decrease the variation nor to move the complexity border, but to reduce the costs at the left of the complexity border, which results in no border at all. This actually means *reorganizing the foundations of the whole business process*.

7.4 Changing Business Processes

In Chapter 3 a distinction is made between Mass Individualization and Mass Customization. If a company is changing its whole business process, we talk about Mass Individualization. When we talk about Mass Customization it actually just concerns changes in the part of the process that is the closest to the customers, the products and services. However, a real distinction between the methods of Mass Individualization and Mass Customization is hard to make, because one method might need another or the other follows one method. In practice, companies do not really make this distinction, because their effects hardly differ from each other. Companies will just use the methods that is the best to realize their goals. Many companies use a combination of or even all the methods, in order to get the optimal effects.

That is why I will describe five methods to produce customized products and services at low costs, which do not only concern Mass Customization but also Mass Individualization:

7.4.1 *Customize Services Around Standardized Products and Services*

The easiest and most common way to customize products and services is in the end of the Value Chain:

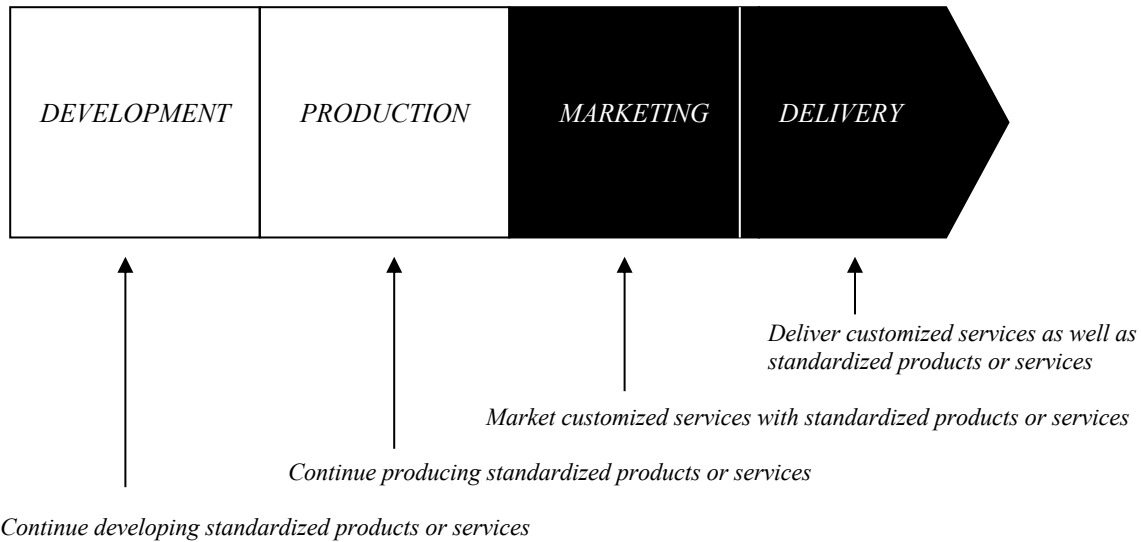


Figure 7.3 Customize services around standardized products and services [1, page 173]

Customization starts in the marketing phase where products/ services with their possibilities are introduced. The customized products/ services will be finished in the delivery phase.

This method is easy because it is focused on the last two steps of the Value Chain and it does not affect the first two steps. Combining end products and services with each other, adding features to it or simply make little changes can create customized products and services. Because these little changes do not need the newest techniques nor the best-educated people to be created, this is a typical method for Mass Customization.

Examples:

If travel companies want to give every customer a customized service they could make special flights for every customer and let them fly by their own plane to their destination. But this is not realistic for custom people of course. What they also can do is offering standard flights, but customize in the last ‘phases’ of the flights. They can let customers choose between business- or economy class, the desired row in the plane or the different kinds of services available during the flight (like different kinds of meals, drinks, radio headphones, magazines etc.). This is an example of customizing their services, which will cost a little bit more, but will not be unaffordable.

Hotel chains also use this method to mass customize the rooms they rent. Customers can book a room and make choices in (non-) smoking rooms, corner or side rooms, one or two persons bed, different kinds of floors, with or without bath, with or without air-conditioning etcetera.

7.4.2 Create Customizable Products and Services

Instead of customizing standardized products and services in the last phases of the Value Chain, they could also be created in the first phase of the Value Chain:

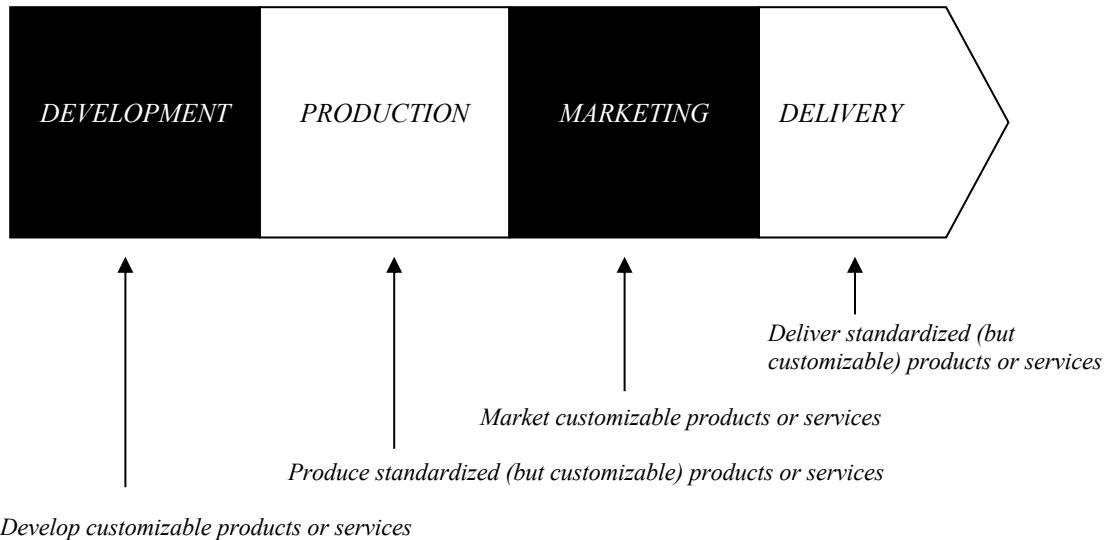


Figure 7.4 Create customizable products and services [1, page 180]

Because of the techniques nowadays it is possible to mass-produce products and services with the specialty that they can be customized by the customer self! These products and services seem to be all the same, but the difference is that they will change at the moment they are used. Customizing already starts in the development phase where these new kinds of products are designed. The customization will be finished in the marketing phase, in which these special products are introduced and explained to the customers how to customize by themselves.

To use this method producers will have to invest more money in research and new techniques, but because the new products and techniques are mass-produced, it will not cost too much. This method takes more techniques than the first one and can be seen as a method close to Mass Individualization.

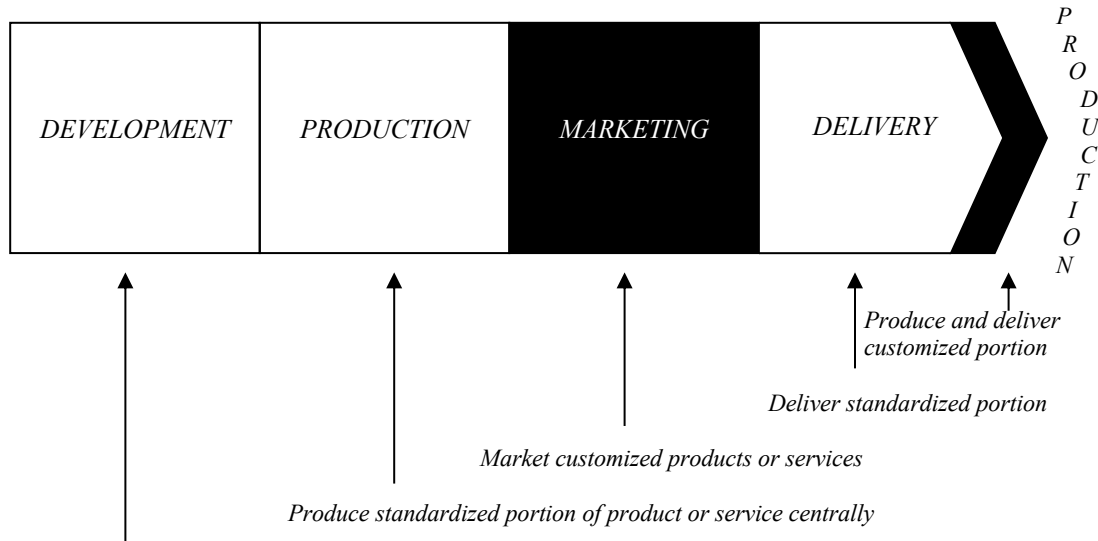
Examples:

A lot of sport shoes producers produce sneakers with the possibility to pump them up with air. The amount of air depends on the shape of the customers’ foot. So although people buy the same shoes, they all have a different feeling in them because all feet are different.

A lot of office furniture is designed so they could be set up in the way the users prefer. Office chairs are produced to be set up in every position the user wants and office desks can be build in any shape that fits the office rooms.

7.4.3 Provide Point-of-Delivery Customization

In Chapter 7.3.1 I wrote about the importance of knowing customers’ wishes. The best way to figure this out is simply to ask them and then produce the desired products and services at the point of sale and delivery:



Continue developing standardized products or services

Figure 7.5 Provide point-of-delivery customization [1, page 184]

Like in the first method, customization starts in the marketing phase as well. However, it will not be finished in the delivery phase but after it. In the delivery phase, there is still a matter of standardized products/ services, but this product/ service will be customized after the customer bought it.

The point is that in this method, a mass of standardized ‘not finished’- products are produced and will be completed on the places where customers buy these products. In this way, production costs will be low because there is a matter of mass production and customization will be realized at the moment the product is sold.

This method will usually only work on products and services that are simple in nature, so it is possible to make customized changes in a short time. It is very important that the customization-time will not exceed an hour, otherwise it will not be point-of-delivery any more.

Examples:

This method is very popular in sporting goods manufacturers: bowling balls are delivered to the shops without the finger wholes. These wholes will be drilled in the shop, proportioned to the customers’ fingers.

Another example is the photo-service of some photo-shops. They could make T-shirts, mouse pad, puzzles and other stuff with your personal picture on it. Most times the delivery time will exceed one hour, but sometimes the products can be finished in one hour, which makes this service a part of this method.

7.4.4 Provide Quick Response Throughout the Value Chain

An important factor to meet customers’ requirements is providing quick response. This method can and should be used in every process of the value chain. It actually has a chain



reaction, because fast delivery needs fast marketing, which demands for fast production and eventually asks for fast development:

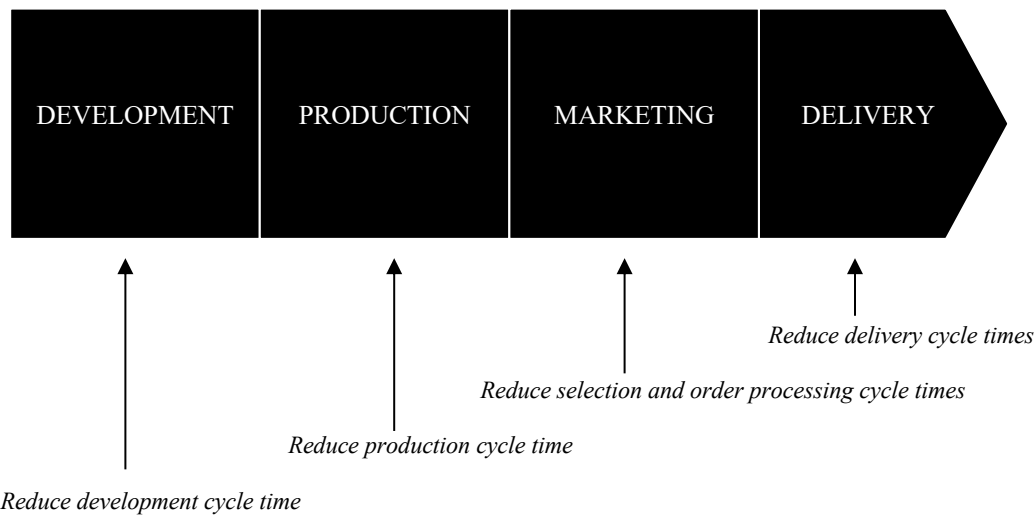


Figure 7.6 Provide quick response throughout the value chain [1, page 189]

The vision of this method is:

To have the “right product at the right place at the right time at the right price.”
[1, page 191]

These ‘fast changing’-cycles allow companies to refresh their styles constantly to match their customers’ needs at any given time.

To make this method work, companies have to be concentrated on the most important value-added activities of the processes. They should be careful with wasting time and use every second they have to deliver quick responses. A good preparation is also necessary to work faster. Good measurements should be done, enough people should be hired and the right systems and technologies should be available.

Examples:

Fashion stores are changing their collections not twice a year, but three, four or more times, in order to satisfy the different tastes of their customers. It also attracts people to buy more, just because there is more!

Supermarkets are also ‘refreshing’ their products more often in order to deliver fresh food to all their consumers, no matter what time they do their shopping’s.

7.4.5 Modularize Components to Customize End Products and Services

Creating modular components that can be configured into a wide variety of end products and services is also a method for Mass Customization (individualization). This method is very similar to the American System of Manufactures (Chapter 4.4.3).



The difference is that in the American System interchangeable parts were produced to make the production process easier, but in this method interchangeable parts are supposed to make customized products/ services.

Another difference is that the American System was not based on low costs and this method is.

This method involves the entire value chain:

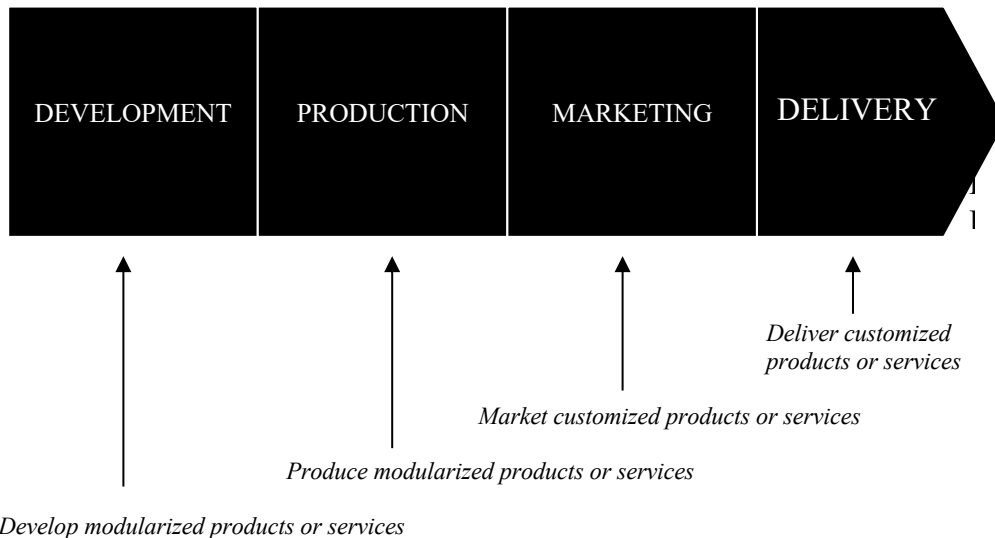


Figure 7.7 Modularize components to customize end products and services [1, page 197]

The customization starts with the development of modular components, which will be combined in the production process, to produce customized products/ services. These customized products/ services are introduced in the marketing phase and delivered in the last phase.

This method saves costs because it is not about producing whole products/ services, but about their components, which are just a few, but can result in many combinations.

Examples:

In the information technology industry a lot of modularize components (like mice, monitors, keyboards, modems, video cards, speakers, etcetera) are produced and each of them have the same connections, which make them fit every computer. If you take a closer look at your laptop you will see many sorts of ‘wholes’ that are meant for these different kinds of components and all of them will suit your laptop.

The automobile industry is also using this method by producing modularized components (such as different kinds of doors, chairs, radios/ CD-players, wheels, etcetera), which will be combined to the car the customer wants. This explains the delivery time of many cars, because these cars still have to be ‘built’.



8 The Steps for Mass Customization

After knowing *what* we have to change, we have to know *how* to change. A company has to take certain steps to shift successfully. A company also has to realize that this journey to Mass Customization is not just a matter of one change. It is a constantly changing process, because in Mass Customization we have to search for the constantly changing requirements of individual customers. These customers can also be divided into two groups: current customers with their constantly changing needs and new customers whose needs still have to be met. Further, the more you give to the customers, the more they want. As Tom Pietrocini, cited in [1, page 160], of Bally Engineered Structures says:

The journey never ends. You can enter this frontier, but you cannot settle in it.

According to Pine, the next four steps best achieve sustained success:

- *Gain knowledge of the shift and the desire to change*
- *Create a vision that excites and energizes*
- *Develop a strategy on how to proceed*
- *Execute well*

[1, page 160]

Let's take a closer look at these steps:

8.1 Gain Knowledge of the Shift and the Desire to Change

Before someone decides to change something, he or she has to be convinced of the need to change. The top-management has to be sure that the old system is not working as it was supposed to and that this change is necessary. Then it has to gain as much information as necessary to be approved of this shift and to convince others as well. If the management has enough knowledge about Mass Customization and is sure that this might be a solution for the problems, the desire to change will come by itself. This desire has to be instilled, even if that means that the organization has to go through a crisis before any successes might appear.

8.2 Create a Vision That Excites and Energizes

After the knowledge and desire exist, a vision of what to do and where to go has to be created. This has to happen at two levels: first, the vision of top management that has to underline the importance of the shift and second, the vision to point the firm into the right direction.

The first level has to deal with matters like understanding and meeting the individual's needs and desires, finding ways to keep low costs and staying alert for market turbulence. The second level actually has to make the matters mentioned above happen. There are many ways to find the appropriate directions for a firm, but the first thing to do is to make clear which goals a firm tries to reach with Mass Customization. These goals



should be presented with directions to reach them and to prevent a messy list of ‘things to do’, these directions should be divided into six dimensions the firm has to focus on: who, what, where, when, why, and how.

An example how to use these dimensions:

Take a simple little Chinese take-away restaurant started 15 years ago when Mass Production was their way to make this restaurant a success. They only sold standard food like fried rice, noodles, egg-rolls and always in the same proportions and people never seemed to get enough of it.

Then, about 10 years ago, competition started to grow. More restaurants came and they started to take over customers with their newer and bigger location, but more importantly, with their bigger variety on the menu. This little restaurant realized time has changed and was pushed to change itself as well. They did not really start to use the six dimensions mentioned above, but these dimensions could be placed in the strategy they did use.

They asked themselves ‘*Who are our customers?*’ and they realized, since they were the oldest and smallest restaurant, their customers were the ones who were living in the village for a long time and have been visiting them for years already. So if they wanted to attract the new residents, they had to do a research on these people’s lifestyle. These people were for example younger and often working and not all of them were married or having partners. These factors affected the food they wanted to buy.

But *what* did these new people want? For instance, they wanted smaller proportions, more variety, lower prices (because they did not cook by themselves and thus would buy food more often) and environmentally friendly materials to pack the food.

Another new phenomenon was that people wanted to be served at home. The ‘*where*’-dimension was that people not only want to be served in the restaurant any more. This little restaurant started to find possibilities for a ‘home-delivery’-service.

The fact that people only ate a hot meal in the evening also changed. People started to eat Chinese in the afternoon, in the evening or even at night. Considering the ‘*when*’-dimension, the opening hours had to be readjusted.

The dimension ‘*why*’ was not difficult to answer: this restaurant owner wanted to keep on running the business because he had a family to take care of.

And finally, it is noticeable that the ‘*how*’-dimension could be easily answered while researching the other five dimensions.

The example given above is to show that any company can use the six dimensions to help analyzing how its goods and services can be customized. A sign for a company that it has begun the shift to Mass Customization is whenever this company starts using words like *whatever*, *wherever*, and *whenever*, or *anything*, *anywhere*, and *anytime*.



Pine has made a table of the six dimensions for Customizing Products and Services:

<i>Dimension</i>	<i>Sample Questions to Ask</i>
<i>Who</i>	<ul style="list-style-type: none"> • <i>Who needs my product/ service?</i> • <i>What about it is inherently personal so that it can differ for each individual?</i> • <i>How do my customers differ?</i> • <i>How can I satisfy whoever wants my product/ service?</i>
<i>What</i>	<ul style="list-style-type: none"> • <i>What do customers do differently with my product/ service?</i> • <i>What different forms can I take?</i> • <i>How can I satisfy whatever customers want from my product/ service?</i>
<i>Where</i>	<ul style="list-style-type: none"> • <i>Where do customers need my product/ service?</i> • <i>How do customers differ in where they buy, receive, and use it?</i> • <i>How can I provide my product/ service wherever customers want it?</i>
<i>When</i>	<ul style="list-style-type: none"> • <i>When do customers need my product/ service?</i> • <i>How do customers differ in when they buy, receive, and use it?</i> • <i>How can I provide my product/ service twenty-four hours a day?</i> • <i>How can I provide my product/ service the instant customers want it?</i> • <i>How can I provide my product/ service whenever customers want it?</i>
<i>Why</i>	<ul style="list-style-type: none"> • <i>Why do customers need my product/ service?</i> • <i>How do customers differ in why they buy, receive, and use it?</i> • <i>Is my product/ service a means or an end, or something in between?</i> • <i>How can I add more value to help my customers completely meet their true desired end?</i>
<i>How</i>	<ul style="list-style-type: none"> • <i>How do customers need my product/ service delivered to them?</i> • <i>How do customers differ in how they buy and use it?</i> • <i>What can I do to provide my product/ service however my customers want it?</i>

Table 8.1 The six dimensions for Customizing Products and Services [1, page 167]

8.3 Develop a Strategy on How to Proceed

When the goals are presented a strategy to proceed can be developed. The most important thing in this strategy is not to describe it as comprehensive or detailed as possible, but to emphasize flexibility because that is essential in a turbulent market. Strategies should be capable to deal with rapid environmental changes immediately without the need to set up a new strategy before these circumstances can be handled. As Pine described:

Just as product development and the production floor should be flexible and able to respond instantly to changes in customer needs, so too should strategic initiatives be flexible and able to respond to changes in the firm's total business environment: products, markets, technologies, life cycles, competition, financials, economic conditions, and so on. [1, page 168]



If the market is changing constantly, strategies cannot be made for a long period. Production processes are pushed to change with the market turbulence and managers have to improvise constantly to be able to handle the different situations. On the other hand, it is also crucial to keep on focusing on the goal that was determined in the previous step. Otherwise it would become very difficult for a company as a unit to work in the same direction. The ways to reach a goal should be flexible, but the goal itself should be stable. As Pine described:

Each new strategic thrust must be tested against the current business environment, potential future scenarios, and the firm's vision for Mass Customization. [1, page 168]

8.4 Execute Well

With a clear, well-defined goal and a flexible strategy, the final thing to do is to execute well to reach this Mass Customization. This seems logical and unnecessary to mention, but a successfully executing organization is not a role model for another organization.

Organizations are different and should execute differently as well. Some organizations see Mass Customization as a *paradigm* for readjusting the firm to the present market and for creating new rules to handle these new situations. Others treat Mass Customization as a well-defined *system* for developing, producing, marketing, and delivering goods and services that are individually customized. And there are also organizations that see it as a *program*.

To which kind an organization belongs depends on the position of the firm in the market. An organization that was always using Mass Production and came into a crisis, would rather see Mass Customization as a *paradigm*. Organizations that are not yet in a crisis would see Mass Customization as a well-defined *system*.

It all depends on the organization how to implement Mass Customization. There are standard steps and rules to point out the right direction, but there are hundreds of ways to execute them.



9 How Can Mass Customization Be Established?

Although many companies know the necessary changing methods for Mass Customization and have figured out how to ‘implement’ this system in their process, it is still not enough to make it work. Products/ services have different lives, because you do not buy a washing machine every year, but you might buy new trousers every other month. You also will not take out a mortgage every month, but you might use the ‘ATM’ (Automatic Teller Machine) every week. Companies have to take a look at the market turbulence of their products/ services, the behavior/ moves of their competitors and their own capabilities before they decide at which speed to shift to Mass Customization. This speed can be divided into three basic groups:

9.1 Move Incrementally

If you notice that your old system is not working as well as it used to be, but your market is still solid, your market turbulence is low and is not increasing dramatically, then your competitors are often not changing to Mass Customization either. It could be a risk to change the old system completely and step into a world that is not certain. The risk for failure might be too big for managers to make a decision for a dramatic change.

If this is the case, managers could decide to move incrementally to this new system. Since your competitors are not changing yet, you will not have to be afraid that you are moving too slow and the chance for a big fiasco is also small. Your company should be focused on a few changes at a time instead of a change of the whole system. It is the small improvements that give directions in how to make bigger changes to shift to Mass Customization successfully.

9.2 Transform the Business

But if your old system does not work at all any more, your market turbulence is increasing extremely and your competitors are shifted to Mass Customization already, moving incrementally is like digging your own grave.

In this case, managers have to decide to go with the flow or just to stop the whole business. If managers choose for the first one, time has come to transform the whole business and fast! One important thing is that this transformation can only work if the top-management is totally behind this idea. If the management has any doubts or uncertainty at all, they would be reserved to take big risks, which is significant for a successful shift.

9.3 Create a New Business

The last group of speed to shift to Mass Customization is for companies who have just started or want to get off the ground. This group is not influenced at all by any old system and has not experienced successes yet. That is why they are open for newly created systems and they base their businesses on new, flexible technologies. It seems that these new organizations can build up their systems without any help of other experienced



organizations, since they have to be based on new developments. This is not really true, because if young companies are able to find the right partner, they could become an even more successful unit they both ever dreamed of.



10 Conclusion

A new phenomenon has arisen and its name is Mass Customization.

Mass Customization is a new market strategy in business competition.

Mass Customization is the ability to customize products literally in quantities as small as one, while producing them at mass-production speeds. [6]

The specialty is that it contains a contradiction: Order-delivered products used to be sold at high prices, because they were produced separately. Mass Customization makes it possible to sell order-delivered products (customization) at an affordable price by not producing it separately (mass).

Before Mass Customization we had Handmade Products (very expensive), Industrialization (very cheap), the American System of Manufactures (expensive) and Mass Production (cheap). A lot of industries cannot use these strategies any more because of the changes in society. People do not want either very cheap (and thus all the same) or very expensive (and thus very unique) products any more. What most people want now are customized products at an affordable price and this is what Mass Customization can deliver.

The effects of Mass Customization can be seen anywhere: in the supermarket, in a restaurant, in a travel agency and even in a bank or insurance company. Many people do not realize it yet, but Mass Customization is growing every day. Just take a look around you and think about all the choices you have when you want to buy something. You will realize it takes much more time to make a decision these days (which, of course, also depends on your character...).

Mass Customization is possible because of the newest techniques and the changes in business processes. But the most important reason for a success in Mass Customization lies in human's actions. There are many techniques and methods available, but it still has to be realized by people themselves. In 'implementing' Mass Customization in your company it is very important that you understand your customers and your market very well. Knowing the principles of economic value creation and Mass Customization are also good bases that will lead to a successful ending.

Another important fact is not to copy your competitors. Changing business processes can be done in various ways, but every company is different and thus has to deal with things differently. A company should try to be focused on its own area and try to follow the steps in a way that fits.



11 Future

After Handmade Products, Industrialization, The American System and Mass Production, Mass Customization is the leading market strategy now. What will be next? This is actually an answer on a question I asked myself in Chapter 1 (Introduction, page 3): Will Mass Customization end?

People want to be different now and I do not expect this to decline. I think that this differentiation will remain and will turn to *personalization*. People will not only have the desire to be individual, they will get the desire to be personal as well. They will want to have things that are only meant for them and also will give the rest of the world a message of the person in question.

It will not just be a matter of being different and fashionable, because fashion will go away and this means that people have to change themselves every time. Eventually, people will forget who they are in fact, because they are too busy to be exceptional all the time. The desire to know who they are will arise and this will lead to a new economic strategy: *Mass Personalization*. I expect organizations in the future to study their clients so thoroughly that they not only will serve them exceptional products and services, but also ones that fit their personalities.

How this desire can be realized depends on **if** it can be realized. If we look at the market carefully, we can already notice some companies looking for personalization [7]. The next question is: "Will this be **generalized**?"
If you'd ask me? Time will tell...



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