

Putting Customer in Charge of Design: Opportunities and Challenges

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Abstract: Involving customer in value creation to fulfill individual requirements has been popular for several years under the domain of mass customization and personalization. Not all manufacturers adopted the concept succeeded in its execution process. It is possibly because the value generated by manufacturer does not meet the value demanded by customers. Discussed in this paper is the identification of several important additional values that can be generated by incorporating customers in product creation in order to help designers to have better understanding on current trend of personalization. New roles of the designers due to paradigm shift about customers from one market to market of one are also discussed to get some idea about future directions.

Key words: design by customer, value creation, customer involvement, personalization.

Introduction

Customer satisfaction has been identified as the most important factor determines the long-term success of a company. It can be achieved when customers perceive that the value of products and/or services they received is as (or exceed) what they expected. In order to create a premium value for customers, manufacturers should focus on the total customer experience, related to (1) superior solution to the need, (2) fair price, (3) treatment with respect, (4) emotional connection and (5) convenience (Berry, 2002).

While the last three deal with the quality of services (customer experience in transaction processes), the first two are more related to the quality of product (customer experience in using the product). Focus on superior solution to the customer need may sound simple but in fact it is very complicated. Manufacturer must understand what people need and how to fulfill the need better than competitors. A key challenge will be how to ensure that the need manufacturer perceived is the real need customers demanded because it will differentiate between a successful product and a fail one. It is important to note that understanding customer need is not a trivial task especially in this era of personalization where the extent of market-of-one has been foreseen as a prospective driving force for the next transformation of global economy (Pine, 2009).

The difficulty in understanding customer need is due to the large range of individual, cultural and physical difference among people. In the past, when competition is still low, the concept of "voice of majority" could be successfully adopted to define product specifications in order to fulfill mass market need. Later on, in order to face the increased competition due to technology advancement, the concept of "market segmentation" was adopted. The manufacturer must know the audience for whom the product is intended. A mobile phone manufacturer, for example, might produce many models and series for different target (segment) to acquire wider market share. Manufacturers tried to use technology to generate variety in products and to manage the way the products evolve. The concept of platforms, family, generation, add-on, version, models, option, etc. have been well recognized and in turn, these are becoming the bases of mass customization.

Under the system of mass customization, the market is re-segmented further into smaller group of customers with similar preference (market niches). Hence, in product development process, not only "voice of majority" but also "voice of minority" is taken into account. Product variety is not predefined by final product in terms of model, version and series, but instead it is handed over to customer preference. Customers can involve themselves to specify their own variety by choosing predefined components and assembly them to get the final configuration.

Furthermore, in this inevitably high competitive environment, where companies are trying to focus more on customer satisfaction to win in the market place, treating customer as a personal (so-called personalization) is

becoming a trend. Its adoption in service industry faces less challenge than in manufacturing sector due to their different natures. While it is not difficult for a mobile phone services provider, for example, to offer personalized phone number (where customers can choose their own unique number) or to offer personalized ring tone, it will be a very hard task for a mobile phone manufacturer to personalize the phone itself. Mass production is still the best way in this regard.

Personalization means treating all customers individually based on each personal preference. For designers, it results in a very big challenge to define product specification since the well-established general procedure in product design and development could not be directly employed. This is because the customers as one market have evolved gradually into segment market, niche market and finally into market of one (figure 1).

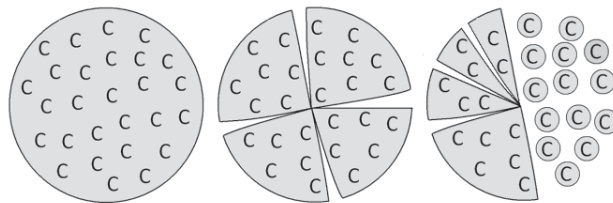


Figure 1. From one-market to market-of-one

It is important therefore to discuss how companies offer their customers a personalization experience and then to characterize some of its values which are considered significantly able to improve customer satisfaction. Those will be comprehensively discussed in this paper.

Putting Customer in Charge of Design

It is a nature that customers usually purchase products (goods or services) for a reason; they have a problem (a need) and expect manufacturer or service provider to come up with a solution (to fulfill their need). Their utmost satisfaction will be achieved when they get exactly what they want without compromising any requirement. As each customer may have her/his own preference, a rigid predictive-based product specification will be difficult to compete. As an alternative, a flexible responsive-based one should be adopted. Involving customers in value creation is believed as a way to achieve this purpose

Design

There is no generally-accepted definition of “design” exists (Ralph and Wand, 2009) and the term has different connotations in different fields. In this discussion, design refers to a process of establishing the basic parameters of a product. It comprises activity to initiate, to select, to combine, to arrange, to modify and to manipulate things in order to meet intended requirements. Sketching, where the lines (including straight line, arc, circle, curve, etc.) are selected, arranged and combined together with the colors, is an example of design form. In practice, the term design is often used by manufacturers engaged in mass customization, for example “design your own watch”, “design your special shoes”, “design your own shirt”, etc. However, when customers come to utilize the offered option, they will know that the meaning of design here is “to mix and match” predefined available components to get final desired configuration. Hence the activity of selecting and combining things to make a new form in practice is also known as design activity.

Design and Value

Basically, customers spend their money not simply because of the product itself, but more likely because of the value within it. The value may come from many sources, including physical value and emotional value. While physical value is related to the experience of using the product and usually obtained from the quality of behavioral (functional and kinesthetic) or visceral design, emotional value is about the feeling of satisfaction resulting from emotion rather than realism when owning or displaying the product (Norman, 2004).

Depended upon customer’s individual preference, the important level of the value may differ from one

customer to others. Some might place physical value higher so that they will be satisfied enough to own a good quality product from general brand, while others might put their interest on emotional value so that they prefer to spend more money to own the branded product even though the quality does not differ much.

Many companies are competing in the area of physical value as it is easy to evaluate. However, it is worthy to note that the successful product should excel in both values. Involving customers in value creation has potential to improve those values as it can result in better product fitness (physical value) as well as in emotional bond between the product and the customer (emotional value).

Customer in Design

There is a paradigm shift of customer’s role in design; from passive audience in the era of mass production (Design for Customer) into active player in current age of mass customization and personalization (Design by Customer). The paradigm of “closed innovation” (in which the innovation is taking place just within the boundary of manufacturer) has shifted to “open innovation” (cooperation between manufacturer and customers or users). As a result, designers’ task is shifted from designing a final product to designing a system that enables customer involvement in value creation. Customers are then placed as designers (or sometimes called as co-creators) of their own final product specifications by using design tool provided by manufacturer. Table 1 exhibits these fundamental changes. This trend should be anticipated by manufacturer in order for them to survive in the business competition.

Table 1. Fundamental changes in product design

	Design for Customer	Design by Customer
o Source of design	voice of majority	voice of niches or individual customers
o Customer’s role	as object (passive)	as subject or co-creator (active)
o Product development task	to design a final product	to design a system that enables customer involvement
o Supply for demand	anticipative (forecast-based demand)	responsive (real demand)
o Type of innovation	closed innovation	open innovation
o Assessment	focus on quality and low cost	focus on quality and personal emotion
o Value creation	manufacturer oriented	customer oriented

Point Of Customer Involvement

Putting customer in charge of design does not mean that customers are given free hand to design in a blank space. Instead, they are guided to define the fittest alternative that meet the cost, schedule and the product requirements through the capabilities of a company. Depended mainly on the type of product, the point where customer can involve in production chain may vary, from simple involvement of skinning personalization to total design by customer (figure 2).

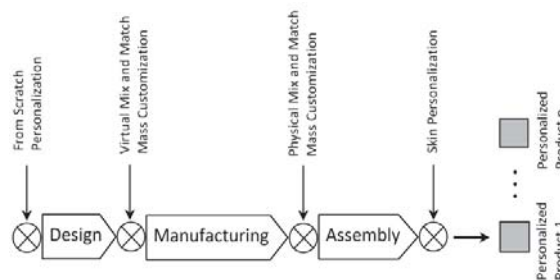


Figure 2. Points of customer involvement

Skin Personalization

This type of personalization is the simplest one in term of manufacturing complexity. In this system, the general product has been manufactured while the differentiation is postponed by letting customer to personalize final skin of product (skinning process). In other word, customers are allowed to design “the skin” of a predefined standard product to add emotional value on it. The offered personalization is usually in terms of selecting color, adding self-elected name, word, number or picture.

Skinning personalization can be considered as a successful example of current implementation of customer involvement in value creation. It improves product uniqueness and creates emotional value of self expression without significantly increases production cost and time. Mugs, tissue box, t-shirt, hat, jacket, shoes, paper folder, photo frame, etc. are examples of its products while printing, embroidering and engraving are the technologies typically used for this application. In addition, the advancement of internet technology makes the process becoming easy and efficient. Figure 3 shows an example of personalized mug designed by using online design tool provided by www.yourdesign.co.uk. Customers are guided to personalize the product by selecting one of predefined standard mugs and then to add picture and text either on the front, back or full wrap.

Personalized packaging which is adopted by many food and beverage industries is also in this category. Customers, for example, are now able to have personalized label on a wine bottle or on a cereal package based on their design. The product is then becoming unique and personal, even though the contents do not differ from others. Customers are willing to pay additional cost for the emotional feeling resulted from this personalization experience.



Figure 3. Skin personalization example

Mix and Match Mass Customization

Mass customization aims to provide products or services that serve individual customers' personal needs with near mass production efficiency (Pine, 1993; Tseng and Jiao, 1996). The popular one is by configuration design where a wide variety of components are provided and customers are allowed to mix and match different components to configure final product according to their preference.

Based on the state of its components, mass customization can be categorized into two types; physical and virtual, which both can be done by using online or offline system. Physical mix and match happens when all components have been pre-designed and physically pre-produced to provide fast response. No inventory for final product but for components is needed as assembly process is postponed until customers complete their selection. However, since the components are made according to forecast demands, this method is very risky as not all components will be selected by customers. Hence, setting its optimum solution space will determine the success of the company. The example of this customization can be found easily in personal computer industry, automobiles, food, etc. Figure 4 shows the implementation of this concept by Harley Davidson Company using its H-D1 Bike Builder application.

On the other hand, virtual mix and match happens when manufacturer only provide virtual components for customers to select and the physical ones will be made after the order is confirmed. This replaces the limited physical inventory by unlimited virtual inventory which will significantly reduce the cost. As a consequence, the response time will be longer due to its made-by-order system. In customized clothing industry, for example, customers are allowed to select the style (collar, cuff, pocket, placket, button, etc) change the fabric (material, color, and motif), to personalize brand, and to adjust the size. When customers have finished the customization process,

manufacturer will start to cut raw material and then stitch the shirt accordingly. Hence, there is no risk of overstock finished product but managing the response time will be the most challenging task in this system. The other examples can also be found in jewelry industry, furniture, cake decoration, etc.



Figure 4. H-D1 Bike Builder by Harley Davidson

From Scratch Personalization

This type of personalization places the point of customer involvement in the most upstream of the value chain in which customers will have full control to define their product specification at earlier stages. Based on its characteristic, the adoption of this concept in real business is mainly for products that by their nature are individually crafted under made-to-order system. The advancement of internet and manufacturing technology are becoming enabler to make the interaction between customers and manufacturer easier and to produce the products much faster. EGO3D, for example, allows customers to upload their designs in the form of photograph to make personalized bust (sculpture in 3D) or in the forms of CAD model or graphic designs for personalized vases, cups, picture frames, bookends, money boxes, pen stand, 3D medallion, etc. Additive layer manufacturing is employed to create the physical products in which artificial stone is used as raw material. To improve the quality, a hardener liquid is utilized to imbue the products so that they become later hard as chinaware but not as fragile. Figure 5 shows the example of a photograph-based personalized bust from EGO3D. Personalized ceramic mosaic decoration is also categorized in this group.



Figure 5. Example of a photograph-based personalized bust from EGO3D

Discussion 1 : Gaining Value by Customer Involvement

A study by Hippel showed that for mass produced products, about 10-40 percent of the customers engage in modifying their products to meet their specific requirements after purchasing (Hippel, 2005). This group of customers is willing to pay additional cost and to wait for a while to get their product modified (Blecker and Abdelkafi, 2006). Hence, it can be seen as good opportunity for manufacturer to offer before-purchase modification by involving customers in production stage.

In order to adopt the concept of customer involvement in specifying their own personalized product, it is important for manufacturers to analyze the significant of additional values that will be generated. The higher the value gained the higher the possibility to success will be. Based on a comprehensive observation on successful story of customer involvement in value creation, there are several additional values that customers look for, including: (1) better product fitness, (2) feeling of accomplishment, (3) uniqueness, (4) self expression of personal identity, and (5) source of memory. The first is related to physical value, while the rest are all related to the emotional value.

Value of better product fitness

As aforementioned, the concept of one-size-fits-all in mass production is difficult to fulfill the need of all customers. Customers only have “take it all or leave it” option. Modification after purchase is commonly adopted by customer when they could not get the product that fit to their requirements. Therefore, the first value that customer will gain when they are involved in production stage is the better product fitness. Personalized sizing for clothing, ring, shoes, hats, furniture, apartment, etc and personalized dietary food and beverage are example of this value creation. Coke Freestyle from Coca-cola, for example, offers personalized service where customers are freely design their own coke by using a zesty touch-screen system to mix selections from over 100 choices into a custom beverage to meet their individual requirement.

Value of feeling of accomplishment

Consider the booming of electronic kits in the early of 1980s, where built your own radio, your own audio system, your own tape recorder, and your own television set were becoming a trend. People constructed the kits and they felt immense pride in their accomplishment as well as a common bond with other kits builders. The experience of building kits is a personal feat; the less skilled the kit builder, the more the special feeling. The experts did not feel pride in their kits; it was those who have no expertise felt so satisfied. It is important to note that the kits were not much cheaper than the finished one. People bought the kits for the feeling of accomplishment, not to save money. The similar case can be found in the current cook-your-self restaurant, personalized cake decoration, built your own robot, etc.

Value of uniqueness

Everyone, by nature is unique and psychologically has tendency to differ from others. According to a study by Risdiyono and Koomsap (2009), for several types of products, uniqueness plays a significant role in customer buying decision. Souvenir and gift were identified as common products demanded by customers to be unique. The aforesaid photograph-based personalized bust from EGO3D can be considered as a good example of personalized unique gift in this matter.

Value of self expression of personal identity

Rooke and Ouadi (2009) stated that the true luxury is when we are able to express ourselves as we like. Self expression is a need for most of people with different ways of fulfillment. The Wall Street Journal, for example, reported that the personalized license plates for automobile in the US is now becoming a trend and during this budget crunches, states are raising surcharges or proposing annual fee hikes for custom plates due to its potential market is indicated very huge. Based on the investigation, thing that drives people to take a personalized license plate is a self expression of personal identity. This value has been becoming a starting point to offer personalization for many other products, including personalized car's audio system, t-shirt, stickers, tattoos, etc.

Value of source of memory

Based on a study by Norman (2004), when people are asked about what the most valuable things they own, their answer will not always refer to the most expensive thing. Many refer to a simple thing but having emotional value of memory. Based on this value the product is then considered as “a token of remembrance”. Self-experience in a process of making things can be a source of memory that boosts high value for customers.

Discussion 2: New Roles of Designers

Based on the previous discussion, it appears that there are big opportunities to create additional product value by involving customers in the creation process. However, there are also big challenges faced by manufacturer and designers interested in this area, including their new roles in:

1. Value added identification.
Identifying what values of the products that demanded by customers will be the most crucial initial step to take. Inaccurate justification in this step will results in unwanted product failure. Type of products and customer preference should be characterized properly.
2. Value added generation.
Designers should analyze whether the demanded value can be generated by involving customers in product creation. If yes, where the best position for the point of their involvement is should be.
3. System development and optimization.
Developing products based on individual customer preference means developing a complicated system that does not only be able to respond to customer's personal need individually, but also has a stability to provide a dynamic flow of products. Value creation for personalization should be within a system that is able to stably deliver high variety of goods. Analyzing product attribute to define solution space is very crucial in the system optimization. Identifying factors to classify which parts customers are allowed or not allowed to involve in the creation is another important thing to handle.

As the roles of designers are becoming more complicated, a new comprehensive method in product design and development process is needed. It will be one of important challenges for the future work.

Conclusion

The opportunity and challenge to add value on products by putting customer in charge of design have been discussed in this paper. Putting customer in charge of design does not mean that customers are given free hand to design in a blank space. Instead, they are guided to define the fittest alternative that meet the cost, schedule and the product requirements through the capabilities of a company. This means the new roles of designers will be more complicated in the future competitive market. New method to develop personalization-based product and system is needed to help designers accomplishing their new task.

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