DEFINITION AND CHARACTERIZATION OF MASS ART CUSTOMIZATION

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Abstract: With the emergence of new manufacturing technologies such as computer numerical control (CNC), 3-D printing and the emergence of business-to-consumer (B2C), and customer-to-customer (C2C) electric business platforms, the mass production and mass sale of personalized art products has been possible. This paper introduces the historical background of mass art customization and establishes a formal definition for mass art customization. It goes on to characterize mass art customization by comparing this with personalized art and mass production. The paper classifies different levels of mass art customization systems. It concludes with a proposed methodology for building a mass art customization system.

Keywords: Mass customization, Art product, 3-D printing, Traditional handicrafts

1. Introduction

The concept of mass customization emerged in the late 1980s [1]. According to Jochen Gros (2003), the mass customization can overcome the basic contradiction between art and industry [2]. With the advent of new manufacturing technologies such as computer numerical control (CNC) and 3-D printing, mass customization of art products has become possible. The concept of mass customization can be viewed as a natural follow-up to processes that have become increasingly flexible and optimized in terms of quality and cost [1]. Mass customization is regarded as increasing customer satisfaction by adding variety and customization, with an emphasis on economies of scope [3][4][5]. However, in terms of mass customization, the existing related researches mainly focus on the industry. The products discussed in this article are artistic products, those individual, aesthetically pleasing but functional, craft products considered by artists, such as decorations, ornaments, jewelry, etc. These artistic products’ value in form is more significant than in function.

In addition to user needs and production conditions, the artist's performance is also a part of the design process can not be ignored.

Applied arts could embody the highest degree of expressing individualism and personality. In today’s digital age, the applications for art have no longer to be found only in the realms of handicrafts (or in industrial processes) but could derive out of the conditions of a mass customization system, that is, the generation of art customization [4]. There are many art customization services on the market based on new manufacturing technologies, such as computer numerical control (CNC) and 3-D printing. However, up to now, there is no method for mass art product customization. Mass customization based on industrial design theories and methods can neither meet user needs nor solve the conflict between artist expression and production conditions.

To summarize the methodology of art product customization, we must first fully understand that the difference between mass art customization and mass
customization lies in the difference between art and design. The differences between art and design, mainly from the different evaluators. Art is considered as “the evaluators can be artist himself, or the user, or the third party”, while design is considered that “the evaluators are users” and “the evaluators of design are a part of the whole set of the evaluators of art” [6]. Furthermore, two important characteristics of artists as enterprises distinguish them from other companies in the economy [7]. One is that creativity is an indispensable input in their production process, and the other is that the main incentive for innovation may be non-financial [8].

Therefore, in the following chapters, the paper will first discuss the history of the relationship between goods and art, and then we will give the definition of mass art customization by comparing mass customization with mass art customization. Then, the hierarchy of mass art customization and the method of constructing mass art customization system will be discussed. Finally, two projects applying the theory of mass art customization will be presented.

2. Modern history of relationship between goods and art

Industrial design history reflects a historical change of relationship between goods and art. According to history of goods and art, the author divides the relationship between goods and art into five stages (Figure1). Figure 2 Shows the historical events during handmade era to the present.

Before the Industrial Revolution, art was closely linked with objects through applied art. Philosophers and artists had long debated the definition of art. In the memoirs of Xenophon, he wrote about that Socrate once had a conversation with the great sculptor Kleiton (later researchers speculated that it was Polycrate), When the great artist said that “beauty” is based on the ratio of number and quantity, the philosopher doubtfully asked: “the task of art is probably to show the content of the soul, right?” [9]. The scope of artistic expression includes spiritual perception which is rarely mentioned in design theories. The applied arts are all the arts that apply design and decoration to everyday and essentially practical objects in order to make them aesthetically pleasing [10]. When looking back the metalworks, ceramic art and furniture in the 17th and 18th century, we can still feel the artist's interesting, witty, gentle and lovely emotions through gorgeous colors and smart shapes, but from today's art products, it is difficult to feel the same degree of emotions. With workshop production mode, handmade goods were produced for individuals or small-scale markets (Figure1.1, Figure 2 Stage 1).

The Industrial Revolution brought significant social changes, it had its huge impact on art field over the past two centuries. The advent of industrial society and the growth of mass production inevitably lead to the decline of handicraft industry. The sprouts of modern design are the objection to the rough and sameness manufactured goods after Industrial Revolution, the opposition to the cumbersome decoration of Victorian style, the argument about the relationship between applied art and mass production.

After the Industrial Revolution, goods were produced in large number by standardized, but the design of goods was inadequate, the application of applied art needed to adapt new manufacturing technologies and large-scale market. New manufacturing technologies hindered the continuation of handicrafts and traditional applied art. Therefore, art was in opposition to industry. Designers started several arts movements to try to solve the contradiction between art and industry. Representatives of Arts and Crafts, William Morris, Mackintosh, etc., proposed that design needs to serve most
people. Designers of Art Nouveau discarded historicism, promoted new forms of design. Artists and designers in Art Nouveau believed that nature and technology were not antagonistic. Therefore, they tried to find a way to reconcile art and industry, such as the entrances of the Parisian metro. They believed that the function of object should be expressed through decorative forms. At this time, the relationship between art and goods was the creation of applying applied art to adapt new manufacturing technologies. Goods were designed for most people, produced by machine (Figure 1.2, Figure 2 Stage 2).

With the economic expansion, market began to abandon tailor-made products. Until the emergence of postmodern design, products were designed for large-scale market. The Bauhaus had a revolutionary agenda: to create a new aesthetic appropriate for a modern industrial society. The school would use technology to improve quality of people’s life. More specifically, the Bauhaus taught a combination of fine arts and design theory, in order to produce artists that were equipped to create both practical and aesthetically pleasing works that catered to the increasingly industrial world [11] (Figure 1.3, Figure 2 Stage 3).

Before the advent of postmodern design in 1978, market was full of commercial products that designed for most people. The post-modern movement in design claimed to have the critical attitude toward functionalism that was still prevailing. Postmodern design products reflected the material and cultural needs of people in modern times and designed for small-scale market. Philippe Starck is often seen as the postmodern product designer "par excellence". Consistent with that position he is often mentioned in connection with that critical attitude toward functionalism. Most postmodern design products were produced in limited quantities for specific markets or individuals [4]. Later, with the emergence of User-centered design (UCD), products became more and more user-friendly and designed for different needs of different consumer groups. User-centered design (UCD) was coined in Donald A. Norman's research laboratory in University of California, San Diego. The concept became widely popular after the publication of the book "User-Centered System Design: New Perspectives on Human-Computer Interaction" in 1986. The chief difference from other product design philosophies is that user-centered design tries to optimize the product around how users can, want, or need to use the product, rather than forcing the users to change their behavior to accommodate the product [14] (Figure 1.4, Figure 2 Stage 4).

Since 2000, computer numerical control (CNC), 3-D Printing and other new manufacturing techniques were popularized, low-cost custom manufacturing became possible. At the same time, Business-to-Consumer (B2C) and Consumer-to-Consumer (C2C) E-Commerce had grown enormously in the last decade, they made life more convenient for consumers and opened up all kinds of new opportunities for those artists who wanted to start art customization business online.

Figure 2. Modern history of relationship between goods and art
Mass Customization production technologies make design no longer serve a group of people who have the similar requirement but serve the individual. They are used by a range of artists in a variety of unique practices. It makes the relationship between consumers and art closer, allows consumers to enjoy the charm of personalized art just like handmade era. The relationship between form and function becomes more flexible and freer (Figure 1.5, Figure 2 Stage 5).

Through the history of modern design, it can be found that the contradiction between art and industry is constant run-in, compromise and deepening reconciliation. The voices of artists and designers reflect not only the relationship between art and industry, but also the relationship between advanced technology and human beings. When the production technology was updated, the new production technology could not achieve artistic expression temporarily. At that time, whether the designers advocated performing art under limited production conditions or gave up art to attach importance to functions, they all considered people’s needs and brought beauty to consumers as much as they could. The distance between art and product could be determined by the production conditions, thinking of designers or artists, and consumer’s needs.

3. Definition of mass art customization

By comparing several examples of mass customization service and mass art customization service, it can be found that there are significant differences between mass customization and mass art customization (Table1):

1) On the relationship between form and function: form is superior than function or function superior than form? As we know, “form follows function”, a famous principle, has been wildly used in the modern design field. The products of mass art customization are artistic products, those individual, aesthetically pleasing but functional, craft products considered by artists, such as decorations, ornaments, jewelry, etc. These artistic products’ value in form is more significant than in function. In most examples of mass customization, consumers prioritize the function of products, while in all the examples of mass art customization, consumers are more concerned with form.

2) The product development of mass customization is led by designers, while mass art customization is led by artists. As mentioned earlier, the difference between art and design is that the difference of evaluators, the evaluators of design is users, while the evaluators of art can be artist, user, or the third party [6]. According to this theory, it can be speculated that the value of designer’s work lies in whether designer can accurately meet the needs of users. On the one hand, the value of artist’s work does not only lie in whether they can meet the needs of users accurately, but also lies in whether the artistic work is attractive. In the cases of mass customization, product managers give users more options to meet their individual needs. The options set by the designer are the collection of most user requirements, at the same time, cost of production is also considered. For example, in the case of vans shoes, vamp, squares, heel counter, binding and other parts of shoes can be changed into more than 20 colors. That is to say, the design style of shoes can be very ordinary or unique, which reflects the value of mass customization product lies in whether they can meet the needs of users accurately.

In the case of mass art customization product, the main value of the product is about form. In the other words, if product doesn’t have form value, it is hard to be competitive. So, artists do not only consider that whether the form of product can meet the needs of users, but also

Table 1. Comparison of mass customization examples and mass art customization examples.

<table>
<thead>
<tr>
<th>Items</th>
<th>Leader</th>
<th>Decision maker</th>
<th>Design purpose</th>
<th>Function &amp; form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bicycle</td>
<td></td>
<td>Designer</td>
<td>Balance consumer’s requirements and conditions of production.</td>
<td>Function priority</td>
</tr>
<tr>
<td>Shoes</td>
<td></td>
<td>Consumer</td>
<td></td>
<td>Form priority</td>
</tr>
<tr>
<td>Computer</td>
<td></td>
<td>Designer</td>
<td></td>
<td>Function priority</td>
</tr>
<tr>
<td>Houses</td>
<td></td>
<td>Consumer</td>
<td></td>
<td>Function priority</td>
</tr>
<tr>
<td>Eyeglasses</td>
<td></td>
<td>Designer</td>
<td></td>
<td>Function priority</td>
</tr>
<tr>
<td>Car</td>
<td></td>
<td>Consumer</td>
<td></td>
<td>Function priority</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Items</th>
<th>Leader</th>
<th>Decision maker</th>
<th>Design purpose</th>
<th>Function &amp; form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Necklace</td>
<td></td>
<td>Artist</td>
<td>Balance consumers' requirements, artists' expression and conditions of production.</td>
<td>Form priority</td>
</tr>
<tr>
<td>Portrait</td>
<td></td>
<td>Consumer</td>
<td></td>
<td>System</td>
</tr>
<tr>
<td>Light</td>
<td></td>
<td>Consumer</td>
<td></td>
<td>System</td>
</tr>
<tr>
<td>Carpet</td>
<td></td>
<td>System</td>
<td></td>
<td>System</td>
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<tr>
<td>Figurines</td>
<td></td>
<td>System</td>
<td></td>
<td>System</td>
</tr>
<tr>
<td>Trophy</td>
<td></td>
<td>System</td>
<td></td>
<td>System</td>
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</table>
consider that whether they can express their creative ideas though the customization service system correctly. For example, in the case of necklace customization service, the system provides service that make text modeling necklace according to the text input by the user. However, the font of the text cannot be changed which means the design style of product is set. The system needs to correctly convey the artist's concept through the service.

3) With regard to the final decision makers in the order process, in the case of mass customization, consumers are final deciders. However, in some cases of mass art customization, which provides custom service via choosing options and combining parts, the final decision makers are customers, for example: the customization services of necklaces and modular decorative lights. In some examples regarding mass art customization, which customizes art products according to photographs or words provided by consumers, the final decision makers are system which represent artists’ concepts, for example: to customize a portrait, a figurine, or a carpet based on personal photographs.

4) The design purpose of mass customization system is to balance customers’ requirements and conditions of production; while the design process of mass art customization is to reach a balance among customers’ requirements, conditions of production and artists’ expression.

Therefore, the methodology of mass art customization should be different from that of mass customization. It should pay attention to the value of form, ensure that the artist's concept can be correctly conveyed, adjust strategy when final decision maker is different, balance consumer’s requirements, conditions of production and artists’ expression. Compared with mass customization, mass art customization is closer to art. In the following chapter, art product customization will be described, which applies the new manufacturing technology (such as computer numerical control (CNC) and 3-D printing, etc.) through a controllable service system called “mass art customization”.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Personalized art</th>
<th>Mass production</th>
<th>Mass customization</th>
<th>Mass art customization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stakeholders</td>
<td>Artist, craftsman consumer</td>
<td>Designer, engineer, consumer</td>
<td>Designer, engineer, consumer</td>
<td>Artist, engineer, consumer</td>
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<tr>
<td>Consumer participation</td>
<td>High</td>
<td>Low</td>
<td>High</td>
<td>High</td>
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<tr>
<td>Cost</td>
<td>High</td>
<td>Low</td>
<td>Middle</td>
<td>Middle</td>
</tr>
<tr>
<td>Solution</td>
<td>Create according to the individual Requirements.</td>
<td>Mass produce according to the common needs of most consumers.</td>
<td>Mass produce according to the individual choices.</td>
<td>Mass produce or create according to the individual choices or requirements.</td>
</tr>
<tr>
<td>Service planning stage</td>
<td>Artist leading</td>
<td>Designer leading</td>
<td>Designer leading</td>
<td>Artist leading</td>
</tr>
<tr>
<td>Custom stage</td>
<td>Artist leading</td>
<td>Consumer leading</td>
<td>Consumer leading</td>
<td>Artist leading or consumer leading</td>
</tr>
<tr>
<td>Individualization degree</td>
<td>High</td>
<td>Low</td>
<td>Middle</td>
<td>High or middle</td>
</tr>
<tr>
<td>Primary value</td>
<td>Art value</td>
<td>Use value</td>
<td>Use value</td>
<td>Art value</td>
</tr>
<tr>
<td>Markets</td>
<td>Small-scale markets</td>
<td>Large-scale markets</td>
<td>Large-scale markets</td>
<td>Large-scale markets</td>
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</tbody>
</table>
4. Characteristics of mass art customization

Since the Industrial Revolution, art has been impacted by mass production, and personalized art has become a luxury in the modern life ultimately. Due to the popularity of new manufacturing technologies, such as CNC and 3-D printing, mass art customization can bring such a luxury into people’s life in a low-cost and efficient way, increasing the artistic experience of consumers. Therefore, mass art customization comes from art, which delivers the fundamental difference among traditional custom art, mass art customization, mass customization, and mass production. Table 2 illustrates the differences among the following: personalized art, mass art customization, mass customization, and mass production.

Personalized art is completed by artists independently in high cost. In a traditional personalized art service, artist creates artwork according to the individual requirements and leads every step of custom service, sometimes working with craftsmen. When the custom service is finished, consumer can not only receive the artwork materially but also experience the face-to-face communication with artist as well as the process of sublimating his or her requirements into art.

A mass production system focuses on producing a single product to meet the common demands of a mass market [3].

Mass customization is appropriate to the products mainly based on use value. In other words, if the products lose their use value, they will not be established. The planning of mass customization system is to categorize varied requirements of consumer and set the requirements that conform to economic interests of production and production conditions as options for users [1].

Mass art customization is appropriate to art products with high aesthetic requirements from consumers. It provides mass produce or create service according to the individual choices or requirements. Compared with traditional custom art, mass art customization is cheaper and can be ordered conveniently. Apart from that, it focuses on providing art value as same as traditional custom art, it also provides create service such as the customize service which customize carpet based on photographs. The planning of mass art customization system is led by artist to ensure that the final art product can express artist’s concept. In addition, artist needs to decide the system service contents based on the understanding of different consumer requirements and the conditions of production.

5. Levels of mass art customization

When build a mass art customization system, managers should examine each type of system to consider which type of system is best to serve customers. In some cases, a single type will be applied in the system. However, usually more than one types are be applied in one system. In order to give a theoretical reference to the managers who build the mass art customization service system, in this part, the mass art customization service system is classified, and the characteristics of each category is explained.

The degree of customer involvement is considered as a standard to evaluate a mass customization system is capability-oriented or product-oriented, it also influences product volume [3]. Through an investigation of current mass art customization examples, the author also noticed that the degree of consumer involvement influences the system establishing. Furthermore, for artistic product, creativity is an indispensable input in their production process [8]. When art is applied to products, the product market is further segmented and the degree of product personalization increases [12]. Compare with mass customization products, mass art customization products are more unique because of high creativity. In the cases of mass art customization mentioned below, the more customer involvement the system has, the more unique the

<table>
<thead>
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<th>Table 3. 4 levels of mass art customization</th>
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<tbody>
<tr>
<td><strong>Level</strong></td>
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<td>-----------</td>
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<tr>
<td>Create</td>
</tr>
<tr>
<td>Transform</td>
</tr>
<tr>
<td>Assemble</td>
</tr>
<tr>
<td>Recommend</td>
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</table>
product is. Therefore, according to the degree of customer involvement and individualization, art customization service systems can be divided into four levels (Table 3):

**Recommend:** In the Recommend level, a large number of multiple-specification, mass-produced products are prepared in advance. The options are established according to the consumer’s requirement categories. Recommendation level is helpful to guide users to input their needs layer by layer. It is also appropriate for businesses which customers cannot easily articulate what they want. It leads consumers to regard their product selection as one that was expressly produced for them. Another advantage is that the system allows products to be mass produced first, and then wait for users to buy them, which can reduce costs, but cannot avoid the problem of goods hoarding caused by some options are chosen by few users. For example, the art prints website offers numerous options such as holiday, gifts, stationery, art, home, digital, and many other sub-options.

**Assemble:** In the Assemble level, the product is presented by assembling the parts selected by the consumer. In order to reduce costs, the system will provide various modular parts. Assemble level has higher flexibility and consumer involvement than recommend level. For example, in custom decorative-painting service, consumer is required to select multiple options such as frame, mounting method, hook, package, etc. In 3-D printing service of necklaces, consumer selects size, material, modular decoration, and combination method. This type of customization service typically utilizes an online 3D-interactive interface to simulate the 3D image of customized products. The diversity of combined parts and combination methods helps satisfy the individuating demands of user. In the assemble level customization, consumers realize that they participated the process of designing.

**Transform:** In the Transform level, the consumer inputs the required content by typing text, uploading pictures, and uploading 3D models. Afterwards, the system will transform the consumer’s input into art work. Simple content such as text and patterns can be transformed and simulated in the 3D interactive interface in real-time. However, complex content requires more time for transformation. For example, some art apps use artificial intelligence (AI) to match historic paintings with modern photos. To generate an image, it takes approximately three to five minutes to complete. In this level, user is required to input more information, which means higher consumer involvement. Furthermore, the final decision maker of product design is system, which also adds some uncertainty to customization. This level requires system to have the ability to control the quality of design in the process of transform, which means it can make any input have good results.

**Create:** In the Create level, the product design is usually executed manually. The required content provided by the consumer to the artist can be text, photo, 3D models, or other forms. In the Create level, artist is the one who selects the content according to his artistic concept. For example, in custom family portrait services, system may change the background color used in family photos to according customer’s needs. At this level, the way of input required content can be diverse, so consumer involvement could be higher than the formers. System is more flexible in dealing with input, not only transform according one rule, but also create according a complex rule. This is more like a process of cooperation relationship between consumer and system, so this level has the highest degree of individualization.

Figure 3 illustrates how the four different levels relate to each other, depicting different degrees of individualization and consumer involvement at each level. The Recommend level has the lowest degree of Individualization and consumer involvement. The Assemble level has a higher degree of individualization and consumer involvement than the Recommend level. These two levels provide options for consumer selection. In essence, consumers make their choices from the established range of options presented by the system. They cannot express additional requirements or preferences. The Transform level allows users to input more complex requirements actively. The system then transforms the consumer’s requirements according to the artistic concept of the artist and the conditions of production. In the Create level, the consumer will have difficulty imagining what product will be presented by the artist according the requirements they inputted. A Create system provides a certain charm beyond...
the other levels because it can guide consumers to experience unpredictable art. In this regard, the relationship between the Create level and traditional custom art is the closest.

6. Methodology of mass art customization system construction

In the previous chapters, the author discussed the main differences of mass art customization and mass customization. All the researches about the methodologies of mass customization consider the two elements which are customers’ requirements and conditions of production. However, the methodology of mass art customization system construction needs to solve the contradictions among customers’ requirements, artist’s expression, and conditions of production. For example, some artists' works are popular but hard to be customized by the production equipment such as CNC or 3D-printer. Some artists’ works will be more popular if they can be customized according to the needs of consumers. Therefore, it is necessary to consider the above three elements when develops a mass art customization system.

The functional contents of mass art customization system should meet artistic expression (creative theme, artistic style, artist view, etc.), customer requirements (size, placement, user instructions, preferences, convenient maintenance, etc.), and conditions of production (cost, process, yield, etc.). Figure 4 illustrates mass art customization product parameters (P) as the intersection of artist’s expression (A), customer requirement (R), and conditions of production (C).

![Figure 4. Mass art customization system construction](image)

A: Artist’s expression
R: Customer requirement
C: Conditions of production
P: Mass art customization product parameters

7. Mass art customization system construction of Chinese lantern handicraft

Qinhuai Lantern Festival is a popular cultural event of Nanjing city from the Southern Dynasty (420-589) to the present. Beyond that, Qinhuai Lantern Show has been listed in the first national masterpiece list of Intangible Cultural Heritage. With special form and contents, Qinhuai Lantern handicraft light fully expresses people’s longing for truth, goodness and the beauty. Meanwhile, it reflects people’s belief, interest and concept in their original experience of fire as well as their kinship with traditional culture [13]. However, the industrialization changes the lifestyle and customer’s needs. As a result, handicraft products lose the market gradually. Currently, the Qinhuai lantern industry is facing the situation of “low quality, low technology and low return” due to the high cost of manual processes, low level of automation and low quality of new product development.

We launched two projects to increase consumer involvement and improve user experience of Qinhuai Lantern products (Figure 5). To be specific, one is the home decoration project for adults and the other one is the handmade project for children. By investigating the process of producing Qinhuai Lantern, we found that the most time-consuming and difficult step is making frame. If mechanized production can be realized, the problem of high cost of manual processes and unstable quality can be largely solved. After learning the artistic features of the Qinhuai lanterns from craftsmen, we considered that 3-D printing technology is very appropriate for Qinhuai Lantern with complex frame. Apart from that, we helped craftsmen to produce and sell the Qinhuai lantern products, observed and interviewed customers, and then realized that traditional Qinhuai lantern is not appropriate for present home environment.

Based on the results of this investigation, we decided on a strategy and level of customization. In our investigation of the home decoration project, we discovered that adult consumers were very sensible in purchasing decorations. When they decide on customizing a product, it means that they recognize the artist's concept. If they are dissatisfied with the customized products, they will not pay. Consumers desire customized products to express their own artistic tastes, but most consumers have no professional training. The Assemble level is suitable for this project because the consumer involvement is not high, and consumers don’t require a high degree of art individualization in this project. The system provides four kinds of 3-D printing product parts for consumer selection and combination according to their home environment. In the investigation of the children handmade project, we discovered that children were eager to create their own unique lanterns and parents wanted to develop their children's creativity. Therefore, the Transform
Because current mass art customization services have not yet built a certain scale of industry, future developments in this industry have not yet been finalized. The theory proposed in this paper is probably only appropriate in the early development stages of the mass art customization industry. In the future, we hope to use this theory in the field of inheriting and developing traditional handicrafts.

Acknowledgments
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References

Figure 5. Two project of Chinese lantern handicraft mass art customization
level is appropriate for this project. At first, the system requires a child to draw an animal. Afterwards, the system customizes material packaging according to the pictures drawn by the child. Finally, the child finishes the lantern by himself. Both projects passed user testing and received sponsorship from investors.

8. Conclusion
This paper has reviewed the history of art individualization of goods and the changing relationship between goods and art from the handicraft era to the present. It has proposed the trend of future consumer needs for personalized art products, defined “mass art customization”. Moreover, it has discussed the differences among the following: personalized art, mass production, mass customization, and mass art customization, and has also classified the different levels of mass art customization. Furthermore, this paper has proposed a methodology of mass art customization system construction. Finally, this paper shows us two projects of Chinese lantern handicraft mass art customization using the methodology of mass art customization system construction.

