

ORIGINAL CONTRIBUTION

## A Study on Designing the Identity of a Product

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**Abstract**— This study aims to explore how enterprise designers use their techniques to shape identity products that can be linked with the brand efficiently to fill in the hole in this area. This study uses qualitative research to analyze and interpret the thesis data. The literature research, content analysis method, in-depth interview method and focus group method are used to compare and summarize the data and construct with rooted theory. We found that we can shape the identity product by designing the identity product through specific rules. Product identity consists of product composing factors and product shaping factors. Only when we develop key product identifying features and characteristics of the group can our products be recognized, on which the strategic thinking elements to identify the product are based. An amalgamation of these factors while designing the product will help in creating products that are alluring for customers, beneficial for brands and profitable for the business.

**Index Terms**— Product Identity, Archetype, Product Design, Form

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### I. INTRODUCTION

#### A. Background and Motivation

Most of the enterprises in Taiwan belong to the type of professional OEM, and there is no complete and detailed planning for the design of the company and product image. On the other hand, in the past, local companies have always established product styles based on consumer demand, and did not establish a consistent product image. Therefore, in the face of product competition in the global market, although the product types of Taiwan's enterprises are diverse, they lack systematic product identity design, which causes consumers to blur the image of the company's brand, and it is difficult to grasp the characteristics and connotation of the company and generate deeper awareness.

Since the product is the carrier of the corporate image and the medium conveyed by the designer's idea, if the corporate information revealed by the product (carrier) is weak, vague or even contradictory, it is difficult to attract consumers' attention, and the brand impression of the company will be deepened. It's even harder.

Product identity is a close interlocking link between the product and the brand. By consistently designing products, products can be identified to produce specific product images, which can improve the speed of consumers' differentiation and understanding of the company's brand, and have a good contribution to the link between products and brands.

In recent years, Taiwan's academic circles have discussed many aspects of corporate identity, including brand identity, personal identity, activity identity, environmental identity, visual identity, etc., but there is insufficient design research on product identity. Therefore, this study wants to further make up for the gap in this field and look forward to provide designers with a reference guideline for product identity.

### II. LITERATURE REVIEW

#### A. The Shape Identification Theory

There are many arguments about how humans recognize objects. Selfridge proposed template-matching theories in the pattern recognition by machine [1]. It is considered that there are templates for various patterns in the human brain. After the graphic information enters the brain, the template is compared in the brain by means of matching, and if it is consistent, it can be recognized. The argument for prototype-matching theory is that humans store images in long-term memory in an abstract way, and that abstracts have the same effect as archetypes [2]. Those who hold feature-matching theory think that things or graphs have their own constituent attributes or features. Therefore, to identify these things or graphs, you first need to analyze their attributes and then identify them by the quality of the attributes. The doctrine considers that the comparison is based on some of the characteristics of the graph to check one by one [3]. Biederman [4] argues that human stereotypes of space can be decomposed into several basic types of geometry, which he calls geons (geometric ions: geometrical ions), which are cubes, cylinders, cones, basic geometry such as pyramids, which are deformed according to certain conditions, become a lot of "geons". He proposed the mechanism of "Recognition-By-Components", which states that when people recognize the three-dimensional structure, they first decompose the whole form into the most basic elemental level (geon), and then perform the identification comparison. Each item has its basic structure, so people can use this mechanism to identify items that they see everyday, such as tables and chairs.

This study believes that the above doctrines are all converted into abstract storage data of the brain to provide comparison, but still do not explain the perception of human beings after object comparison, therefore

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in the following discussion, it will be proposed supplement.

### B. Product Identity Definition

The Oxford Dictionary of Contemporary English explains the identity of identity as identical and consistent. A person can discriminate to the existence of a pattern, discriminate one pattern from another, and identify what it represents or what it represents. This is the identification of patterns [5]. Product Identity (PI) is a systematic tone that is extended by the shape, color, material or function of a product. Consumers can identify the product, product brand or manufacturer with these key tones [6]. "Product identity, which is the sum of the formal and functional characteristics of the product, helps the user to establish a psychological image of the product manufacturer [7]. "Product Identity" is a specification used to maintain product image consistency in recognition. It can effectively convey the information that companies want to give customers and play a communication role [8]. Chen and Zhang defines product identity as the conformity specification of products, which allows the appearance of products to be diversified while maintaining some uniformity [9]. The role of product identity is to convey the core identification of the brand (i.e., the concept or idea of the brand), to maintain the consistency of product image and to convey the product image, to help identify or differentiate the brand of product. Product identity includes both tangible and invisible parts, which can be expressed in terms of product style, product image, and product semantics.

Combining the definitions of product identity by the researchers, the external performance characteristics of the products are the performance of the shape, the system to maintain the characteristics of the product, through the material, shape, color, structure and function, establish a consistent image of the product design. The intrinsic performance characteristics belong to the influence of the consumer's psychological level. It is the designer's design method to maintain the same product image of the consumer and easy to identify its products. It mainly contains four intrinsic factors, consistency, distinguish-ability, continuous stimulation and easy association to achieve the role of discrimination and understanding.

### C. Characteristics of the Group

"The formation of style is based on the selection and reuse of design features and design techniques. When certain features are repeated in an individual's or group's work, we naturally attribute it to the same style [10]. "Apple's iPod MP3 from the first generation in the 2001s to the second and third generations of 2003, until the fourth generation of 2004, the fifth generation of 2006, has changed the design three times in the shape, but still continues the rectangular outline, circular turntable, middle circular button, arrangement of the button group, position of the screen, and other feature groups have the advantage of identifying features. Therefore, when all the series of products can find a certain feature group, it can form the "Critical Common Features" created by the company or designer. After the definition of "Set of Common Features", objects with the same feature group will have the same style. In some cases, some objects will have more common feature groups than other objects. For example: the design with 10 items will be more representative of the style

than the five items. Therefore, the number of common features appearing on the object will affect the degree of recognition of the style, which is the concept of "cognition". In other words, the amount of features that exist in an object changes the perception of style [10].

As shown in Figure 1, there are products such as p1, p2, p3 ... pn, with p1(a,b,c,e,f,g), p2(a,b,c,e,h,i, j), p3(a, b, e, f, i, k); where a, b, and e are common features of the product, and the three common features are the common feature groups of the series of products. Therefore, when the series of products continue to appear the same feature group, the same style is easy to appear. Similarly, if the company's products repeatedly carry the same unique characteristics, so that the series products have the characteristics of consistency, it can enable consumers to enhance the recognition of the product line, and differentiate from other enterprise products.

Product identity feature group refers to the same type or different types of products with common morphological features, such as product material, color, shape, inverted R angle design, surface treatment, block surface joint design or button arrangement combination method.

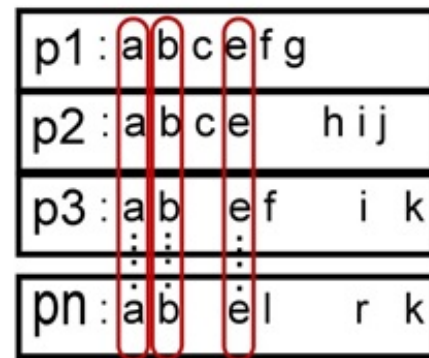


Fig. 1. Set of common features

### D. Relationship between Product Identity and Product Image

The technical process of message communication often requires "multiple coding", and the communication process requires the conversion of complex symbology into a less complex symbology [11]. Among them, the encoding process is identified as the designer's intentional delivery. Intention means that when a designer receives a design theme task, he translates his abstract thinking, thoughts, and feelings into symbols, and transmits the message through a language or non-verbal medium. If the product is conveyed, it will use the characteristics of the product to make a conscious combination to form a specific coding system, so that consumers can naturally produce similar perception images. Figure 2 shows that the larger the intersection of the recognition and the image after the object is perceived by the product, the higher the degree of connection between the various features and the same image produced, and the higher the consistency of the transmitted message, the recognition of the product. The higher the degree, the lower the opposite [12, 13].

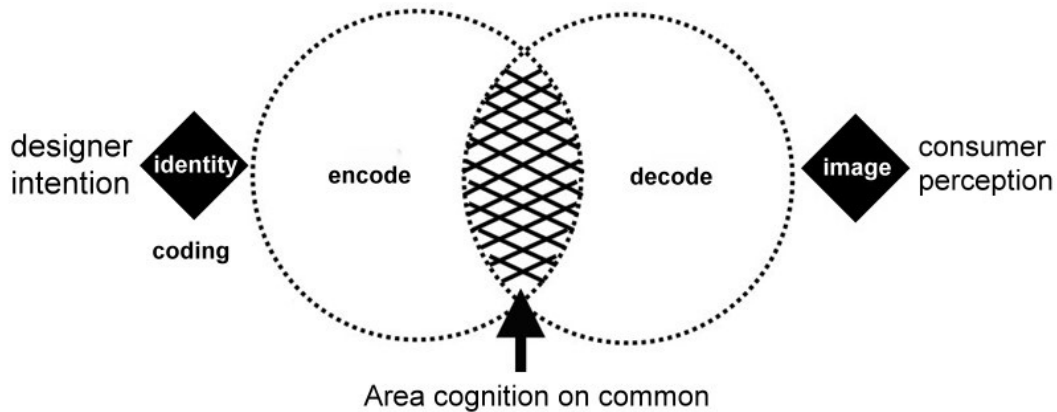


Fig. 2. Design communication system diagram

When designing a product with a identity point of view, the designer will follow the similar experience in the past, copy, change, adjust the original product form, and continue the trajectory of the previous series of product features. Guide consumers to visually interpret product information and decode it (for products containing many symbols, through the shape, color, structure, material, graphic, operation interface function, culture and other factors to make a perceptual feeling, product symbol interpretation, to become an understandable information), to deconstruct product features (this whole process is known as decoding, which is the process of interpreting the decoded information that you have obtained and recalling past related image information, such as: the shape of the product, the past Usage, experience with similar products...), then the perception image is stored in memory, the analysis of other products is com-

pared, the differences in homogenous products are detected, and the differences in products are identified [12, 14]. Figure 3 is an explanatory diagram of feature comparison, which is divided into three products of pa, pb, and pc. The small circle in the left half of the figure represents the product features previously given by the three designers, and belongs to the code given by the feature. In the box on the right side of the graph, when the user sees three products, there will be three circular features with different sizes from the pa, which are compared with the circular features of pb and pc, and the alignment results do not match. When pb and pc are blurred, they are ignored. After a specific product image is generated for the comprehensive composition of each feature of pa, when the product image or the product's various shape features are consistent with the user's past memories, the product will be recognized and differentiated.

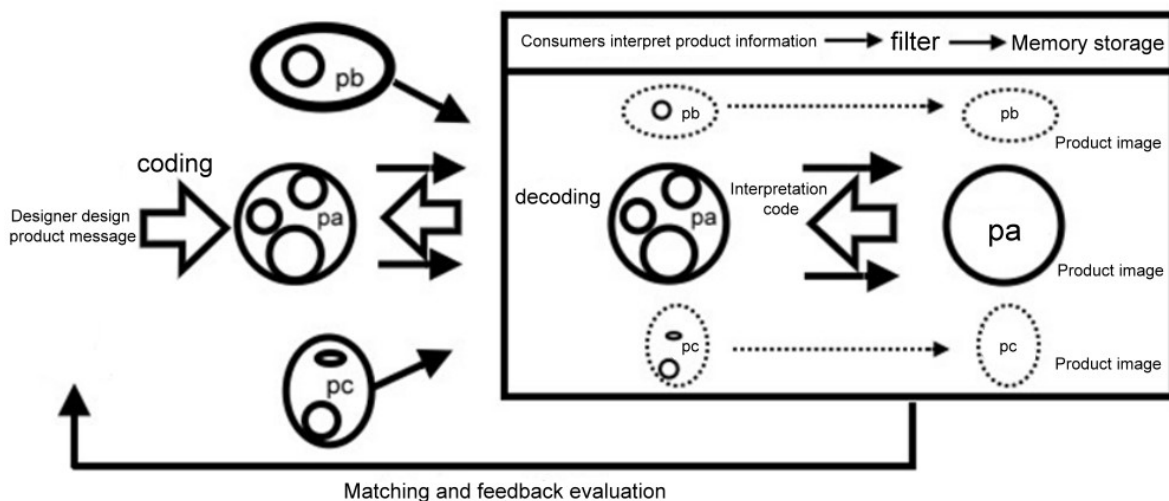


Fig. 3. Cognitive process of product message identification delivery

**E. Design Case for Identifying Products**

"The basic elements of a product are formed, including the three-dimensional composition of the product itself, any image on the surface, the material, color and structure used in the construction [11]." To facilitate the analysis of identifying products This study disassembles the

three-dimensional composition of the product into shapes, colors, materials, structures, and graphics.

**Shape identity:** In the book "Industrial Design Trends" by Lin, a case was mentioned [15]. In the 1980s, Swiss SMH introduced a series of watches (swatches) made of plastic and other man-made materials,

rewriting the impressions of people on watches. Through popularized innovative design and marketing strategies, it has become popular around the world and has successfully captured the market for young people. Its design features master the uniform shape of the watch, with a variety of artistic patterns, through a simple and clear basic outline, can run through thousands of patterns, forming a uniform silhouette, graphic styles of different swatch watches, such as Figure 4. The study also found that the use of design symbols in the design of the swatch watch, the overall shape and color of the surface, is an important part of consumer interpretation, deeply affecting the aesthetic judgment and emotional resonance [16].



Fig. 4. Swatch watch shape [15]

#### Color identity:

1. *Identity design with a single color as the main axis:* Lenovo Group acquired the IBM brand in the United States in 2004, and still strives to maintain black color in the identity design of product colors. In terms of design concept, the group believes that this color can be kept for an infinite amount of time, thus providing superior visual effects. Focusing on the color of the product is to increase the aesthetic value and enhance the function, thus improving the usability, so the design of the product family continues IBM's past style, keeping the black product design. In the color tone, it is mostly decorated with dark gray and dark blue, and a reddish mouse red dot will be created at the keyboard, which becomes the key to the recognition of the computer product.

2. *Identity design with two colors as the main axis:* Colors often convey the emotions that the brand expresses by brand or packaging. In general, it is the color that is most easily associated with your product. The traction machines introduced by John Deere (American agricultural machinery tool manufacturer) are all green. Green means nature [17, 18]. In 1870-1880, many American companies established their own brands. In order to consolidate the brand reputation of the strong deer company, in 1910, the green and yellow brand image was established and became a brand new brand name. In the design strategy of color recognition techniques, the company selected green and yellow as the identification color of enterprise identity and product identity, and expressed the limited color in the design of agricultural machinery products and various extended peripheral products, which filled the green color. The agricultural machinery shell is decorated with horizontal yellow strips. In addition, yellow color is added to the axle to form a common identification feature of the agricultural product family, as shown in Figure 5.



Fig. 5. John Deere agricultural machinery products. Data Source: John Deere official website [19]

3. *Multi-color identity design:* Taiwan's international ceramic brand "FRANZ" products in the establishment of glaze color, maintain the consistency of chroma, brightness, color, and the successful glaze, made a representative color, become a series of color tickets, can also be used until Other product lines evoke consumer memories with glaze. As shown in Figure 6.



Fig. 6. Ceramic products of FRANZ. Data Source: FRANZ official website [20]

#### Material identity:

1. *The same series of products with the same material design:* All kinds of materials have their special physical properties and application orientation, and the texture and image are different. For some companies, the product identity design of the company will be carried out with specific or special materials (eg metal, plastic...), for example: "In SONY companies, the design of flat-panel TVs will appoint designers or customers. To implement, the products are in the same style. This style emphasizes the border of the screen and the silver metal image to separate from other competitors [21].

2. *The same series of products are designed with different materials:* Taiwan's ASUS notebook computer focuses on the research of materials in the design method, and integrates the natural materials different from plastic into the electronic products to form the identification of materials. The company's designers use natural materials such as "leather" and "bamboo", which are integrated into the design of the notebook computer. The touch characteristics of the leather are integrated into the position of the hand under the keyboard, which is reminiscent of the contact. The soft texture highlights the recognition characteristics of the company's notebook computer, and incorporates the craft material into the material category used by Asus. It also separates the general notebook computer market, forming a unique identification and strengthening consumers' products for the enterprise.

**Structure identity:** (Shao, 2001) proposed the type of component, joint relationship, detail processing, use of materials, color processing, surface texture and other factors to reproduce the main factors of the company's product style, the combination of each factor becomes the overall shape is recognized by people ingredient. This is an overall identification of the product. Apple's iPod MP3 has changed design three times in shape. In order to enable the consumer to continue to recognize the product, the rectangular feature contour, the circular turntable, the middle circular button, the arrangement of the button group, the position of the screen, and the like are still used, and the original feature structure is retained, and only the structure is made. The replacement of the area size maintains the original identification features and maintains the positional relationship between the shape and the structure. The round turntable has been the first generation of the iPod since 2001, and the iPod nano series of the second to fifth generations has continued this design, and the recognition features of the iPod MP3 Walkman series have been established [22].

**Pattern and text identity:** By arranging the same line style of text, images, and textures on the product, you can directly brand the product, which is a simple and easy to identify design method. NIKE is a US sporting goods manufacturer. It mainly produces sports shoes, sportswear and other sporting goods. It sells under its own brand, including Nike, Air Jordan, Nike Golf, Team Starter, etc. It also includes wholly-owned Brands Umbro, Cole Haan, Converse and Hurley International. Whether it is sneakers or sporting goods equipment, the totem of the product will be emphasized on the shape characteristics of the product. As the design of the identification, the brand image of NIKE is also successfully established.

**Identity of product semantics:** Product semantics is to establish the nature of product communication through in-depth discussion of the product use environment and how to make the product work, so that users can easily understand the characteristics and functions of the product [23]. The five hundred consumer products designed by OXO International can illustrate the concept of "combining shape and function to realize dreams" [24]. Its shape and structure maintain an elliptical black rubber matte grip, and the handle will be arranged with a neatly arranged

skid-proof line along the direction of the grip force. The metaphorical anti-slip effect provides visually operable symbolic hints." Propaganda Design Team, established in 1994 in Thailand, seeks humorous design by humorously seeking its uniqueness in international design. Its well-known design Mr. P series will bring new functions and functions in new product development. The concept of styling incorporates humorous emotions [25]. The Mr. P series develops dozens of shapes that mimic human facial expressions, postures, limbs, organs, movements, etc. through the product in context. The design of the operation and the physical expression of the human body shape a special humorous image, and give the product name or story background, causing the user to reverberate in the life experience, bringing a sense of joy in a clear or two-tone way. The user is very impressed. The fixed use of MR.P's shape also promotes the user's continuous identification of the series, as shown in Figure 7.



Fig. 7. Series of products of Mr. P. Data Source: Propaganda official website [26]

**Complete replication of classic product identity:** This type of identity design often appears in museum collections, historical artifacts or personal classic works of art. In order to preserve the original shape, the original works will be reduced and designed into various functional daily necessities, although in design The creativity is difficult to carry out indefinitely, but it can completely retain all the identity features and become the most complete identity product. The Jadeite Cabbage of the National Palace Museum in Taiwan completely retains all the characteristics of recognition and becomes the most complete identity product, as shown in Figure 8.



Fig. 8. Jadeite Cabbage cultural products of the National Palace Museum in Taiwan. Data Source: National Palace Museum official website [27]

### III. METHODOLOGY

This paper uses qualitative research to analyze and interpret the papers. Using literature research, content analysis method, in-depth interview method and focus group method, the paper compares and summarizes the data, and constructs the theory of product identity with grounded

theory.

In the selection of cases, select enterprises or design companies that have developed identification products at home and abroad, analyze how enterprise designers design differentiated products, and conduct in-depth interviews with some case enterprise designers, open decoding based on interview content. This research is divided into three parts in

the collection of research data. The first type is a brand enterprise with transnational capabilities and developing identification products. The second type is the designer of the design company. The main interviewee is a series of products that have been designed for brand enterprises with product identification. The third type of graduate students with backgrounds related to industrial design conducted focus group interviews to identify factors that affect product identification design.

#### IV. DATA ANALYSIS

This study explores how to design a product that is identifiable. Based on the analysis of the above literature and cases, specific techniques and principles can be found. The following is explained:

##### A. Establish a typical prototype

The typical prototype is the first prototype of the designer to design a identity product. From the above case, it can be found that when a new typical prototype appears, the viewer will immediately establish the characteristic memory of the object. As stated in the previous identification theory, it will be branded in various possible ways. In your brain, contain the initial memories of the characteristic images and other morphological features that you think are most distinctive. Therefore, when the next object is seen next time, the image of the typical prototype will appear. This image has the characteristics of the original product and the sensory image generated at that time, and then recognizes the product and recognizes the difference of different shapes. The sensory stimulation of the original shape is the key to the success of subsequent product comparisons. If the typical initial stimulus is not enough at the beginning, it will not be able to enter the short-term memory in the brain. For example, the swatch watch is simple, simple and concise in the design of the watch. It is different from the exquisite route of the watch design at that time, and then attracts the young people's eyes and establishes a strong recognition. Philippe Stark's alien juicer, the shape subverts the impression of the average person on the juicer, and becomes a classic example of breaking through the past impressions. After understanding the function, it can be deeply remembered and become a typical prototype. Known by people. Even if it is counterfeited, it is considered to be the product of Phillips Stark. If you want to launch a series of products, it will be easy to be identified.

##### B. Key Product Identifying Features

Products that can be identified have strong, unambiguous features that highlight product features and create a unique charm. The key product identifying features is the place that best emphasizes the focus of the product, and can design a series of products with the continuation of features. Such as: IBM's black and red dot mouse, ipod's rectangular outline and round turntable, Mr. P series humorous product semantics and ASUS leather notebook computer, these features have become the key identification features of the product, but also because These strong features and consistent design can continually evoke memories of consumers. From the above cases, it can be found that any product, as long as it grasps a primary key identity feature and continues to develop, can naturally become a common product identity feature of the series of products, and can also respond to "the formation of style is based on design features and design. The choice and reuse of techniques. When certain features are repeated in an individual's or group's work, we naturally attribute it to the same style [10]. Perhaps even an inconspicuous "point", such as the red dot mouse design in the middle of the IBM notebook keyboard, can be the key to product identification. The establishment of the primary key identi-

fication features may be unique shapes, specific colors or special materials, structural patterns, specific forms of expression (application of graphics, color representation, techniques...), product-specific semantic expressions or fusion of the above. The design of each factor can be the primary key identification feature of the product. a, b, c, d, and e are the identification feature groups of the p products, which are pulled to each other and affect the degree of recognition. The primary key to a is the unique feature, which is the key to the identification of the p product (Figure 9).

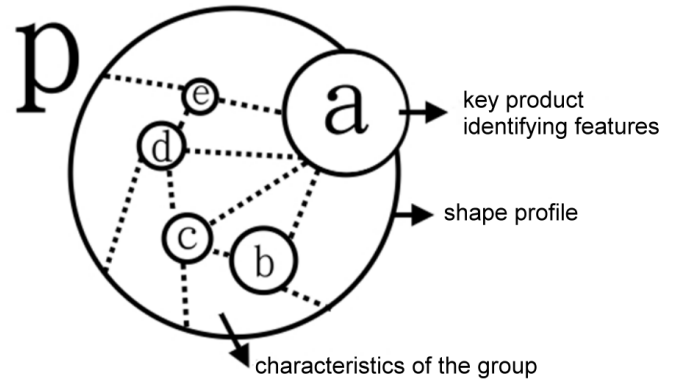


Fig. 9. Key product identifying features

##### C. Create Meaningful Identity

A typical prototype that is excellently identifiable has a unique focus feature that forms a visual clue that can be noticed. These focal features may appear in the shape, color, material, structure, graphics, or in the context of all forms of product morphological elements. According to previous case studies, the assignment of features is not meaningless, shape, color, structure, The use of graphics or materials.

The more recognizable features have functional meaning and implicit metaphor, deepen the association between visual and morphological features, and achieve the connection between vision and cognition. For the key product identifying features and characteristics of the group of typical prototypes, if sufficient Express the meaning of product features, form visual clues, and use the characteristics of prototype constituent factors in the shape-making features, giving clear, logical, analogous, rational, guiding, easy-to-associate metaphors and avoiding the use of semantics. It may become a key identification feature with good recognition, which can make the recognition feature meaningful, and establish a product with high recognition intensity, so as to facilitate consumers to interpret product information and achieve cognitive and memory effects. (The identification of the product is proposed here: to establish a strong connection between the key identification features, feature groups and design language external to the product, to promote the product to be highly self-explanatory, and to differentiate from other homogenous products.)

Creating a new meaning as the first beginning of product identity will help users understand the language and the meaning of the shape, and establish the guidance of function use to deepen the impression and become a typical prototype of strong recognition.

In addition to mastering the basic shape, the above-mentioned cases, in terms of color, graphic lines, materials, structures, product semantics, classic product shapes and graphics, are at least grasped by a feature that can be continuously identified. Become the source of the "image trace" after the user has identified it.

The key features of creativity are the opportunities to develop serialized identification products. For example, a German designer cleverly

printed the fly pattern in the urinal, but unexpectedly erected the bathroom model. Although it did not continuously launch a series of graphic designs, it also became an alternative way of identification, as long as it continues to grasp. The metaphor of "to the fly and the urine", in the endless stream of energy to launch a series of urinals with this function, can become the point of product identification and connection enterprise brand.

**D. New Typical Prototype of New Technology Products**

Some industrial technologies in Taiwan have made great progress, making the process materials extend the scope of application, creating a new product appearance and forming identity. For example, Taiwan Bamboo company "Bamboola" is made into a large-scale sheet metal due to the industrial manufacturing method of high-pressure rubberizing. It can only be used in the design of bamboo weaving, bamboo basket and mother-of-pearl chair, and transformed into a solid bamboo box and bamboo board to form a unique The bamboo art recognition also extends the range of applications of bamboo crafts. In the case of bamboo, in the past, due to the limitations of the technology on the process, bamboo can only be applied to specific practical products, and the shape is also limited. But Bamboola Bamboo presented the bamboo in another way, and then broke through the traditional impression of bamboo craft in the past. This example can provide a new direction for product identity. Combining industry and technology, and strengthening the application development of process materials, it is possible to create identification products that are different from the market impression (Figure 10). After the anodizing treatment of aluminum alloys, the Taiwan craft brand ZAMAMA uses dyes to produce various colors, which make the materials change and special texture. Through the innovation of industrial technology and the application of technology, it can help the products to create novel texture performance.



Fig. 10. Bamboola craft products. Data Source: Bamboola official website [28]

**E. Factors Affecting Shape**

Establish a typical prototype, in addition to considering the morphological elements of the product, such as: product shape, color, material, structure and graphics, according to the results of the previous induction and integration focus group analysis of the identification product, It is necessary to cope with the factors that influence the shape, and consider the individual intentions of the designer (that is, the intention of expressing the beauty), the purpose of the product, the culture, the story, the technology and the materials. The required identification design is simulated to create a unique key product identifying features and characteristics of the group to become a discerning product (Figure 11).

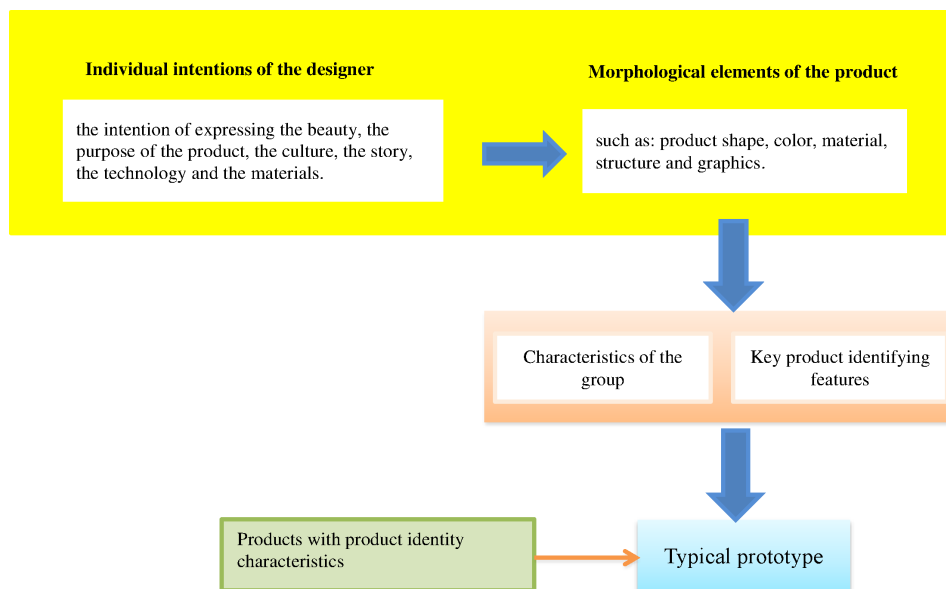


Fig. 11. Product identity design program

## V. RESULTS

Establishing identification features in products is a strategic guideline that guides consumers to recall production sources. To establish a clear, meaningful and systematic product identification feature, we can deepen the consumer's impression and be seen from many homogeneous products. The research conclusions are as follows:

1. The product can be shaped to identify products according to specific identity design rules. Product identity design is the product composition, including shape, color, structure, material and graphic and influence factors, including the designer's own personal intention (that is, the way of expressing beauty), product use, culture, story theme, Technology and materials, the development of key product identifying features and characteristics of the group, can become a discerning product, this is a strategic thinking element to establish identity products.
2. When designing a discerning product, seeking the latest industrial manufacturing technology and material technology, and applying the design, may enhance product identification.

## VI. CONCLUSION AND IMPLICATIONS

A product is the representative of the corporate image and the embodiment of its creator's idea. But if the product does not convey the corporate information clearly then it faces difficulty in attracting customers as well as harms brand impression. Hence it is crucial to create a firm product identity. Products that can be identified have robust, definite characteristics that highlight product features and create an exceptional appeal for the customers. This research investigated product identity formation and highlighted that a number of factors play role in shaping product's identity. These factors include product design, shape color, material, structure and graphics. An amalgamation of these factors while designing the product will help in creating products that are alluring for customers, beneficial for brands and profitable for the business.

### Declaration of Competing Interest

The authors declare that they have no conflict of interest.

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