

**2014**

# BioTechnology

*An Indian Journal***FULL PAPER**

BTAIJ, 10(15), 2014 [8697-8702]

## Application of computer-aided technology in the product packaging design

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### ABSTRACT

Along with the development of computer technology, computer aided technology application in the field of design. Modern designers beyond the constraints of traditional design method, a new generation of design ideas and tools that make the combination of computer technology and art perfect. Computer aided product packaging design has a wider range of contemporary computer and art meaning, it provides designers with a variety of creative ways and make space. Computer digital technology not only in the field of production and life changing people's cognition and its influence on art design way is changing the artistic thinking habits and aesthetic habits. Increasing development of digital technology provides designers with a new interactive platform, so as to get rid of the predicament of low efficiency of traditional means of packaging design.

### KEYWORDS

Computer aided technology; Product packaging; Design; Digital technology.



## INTRODUCTION

### Theories on the field of product packaging design

In the field of product packaging design, the application of digital technology has become an essential tool and means of draft from the packaging of the product of design, production and finished product publicity is inseparable from the digital technology in auxiliary. It also monitor control the entire production process design, to design the output from the draft design, the influence of digital technology is ubiquitous. Our design draft today has to consider not only the standardization of industrial production requirements, at the same time need to take into account the participation of digital technology and the resulting aesthetic demand. It can be said that digital technology has become an integral part of the product packaging design, it not only play the role of a part of it is become an important constitute the design of the soul. Photoshop effects are showed in Figure 1.



**Figure 1 : Photoshop effects**

Computer digital technology in product packaging design, mainly through CAD, Photoshopes, eoreloRAW, Illustrate, the integrated use of mainstream design software and so on 3dmax digital language remote interaction and human-computer interaction. Product packaging and packaging graphics transform, surface modeling and physical modeling of molding and so on. By digital graphics, structure, editor of the displacement, perspective and rotation, scaling, etc. For realizing the overall displacement of packaging structure and local deformation, realize the standardization, serialization of packaging design, systematic design and production, and the result of the design parameters, design for storage, processing, transmission and presentation, such as digital technology with traditional packaging design gimmick irreplaceable advantages. Digital technology makes fast, Efficient and intuitive implementation of stylist to be designed, make the design result and designed to maintain a high degree of integrity.

### The innovation of digital technology

In the development of digital technology and widely, fundamentally abandoned the traditional industry pattern and the way of production, the advantage of its intuitive, convenient and efficient profoundly affects the art design field. Multiple design 2 d and 3 d digital technology platform, its powerful interaction capabilities to build up a complete system design. In a sense, the digital technique not only replaced the traditional design methods, but also subverts the traditional design thinking and aesthetic habit, even replaced the role of the brain and hands. Nowadays not only requires the art designers to grasp the pulse of The Times, understand the cultural interpretation, but also essential to master multiple design software application means of operation, familiar with various design platform of interactive technology and graphics output, etc., to ensure accurate reduction of the original blueprint of design, the most rapid and efficient to realize the design purpose.

Digital technology influence the packaging design of every detail, from the positioning of the design scheme, design blueprint drawing, design graphic production to the final output design. During both the modelling of packaging container, overall architecture structure and the choice of packaging materials and production, the packaging color is beneficial to the

planning and packaging rendering rendering or subject to digital technology. Compared with the traditional design methods of digital technology has obvious advantages, but abandoned the traditional design methods, digital technology also exist, do the design effects tend to lack spirit dynamic and unique temperament, even with thousand times of visual defects. As department stores can be seen everywhere in the design of the finished product, all have a fairly face, but lack the product packaging need most affinity with the performance of the product quality, product culture passed. How to solve this problem plagued by the designer for a long time, is also in this paper, we study the initial cause, hope through analysis about digital design of the packing

### Application of digital technology in the packaging design trends

Digital packaging design technology for the future development trend: (1) design of digital information, to realize the integration of CAD \ CTP platform, make the product to develop in the direction of no drawings; CAD effects is shown as figure 2.



Figure 2 : CAD effects

(2) through the local area network (LAN) to reach the company internal concurrent engineering, through the Internet to establish a cross-regional virtual enterprise, realize the resource sharing, optimize configuration;(3) the digital technology into the traditional product, develop new products;(4) design platform of interactive computer software more powerful and open, 2 d to 3 d conversion more convenient;(5) drawings directly into standard production figure, shape forming more easily and quickly. Future automatic packaging machinery will have the advantage of remote maintenance and evaluation of the production data, the automation technology (AT) and information technology (IT) established under the integration of communications system solutions and through the standard data network, means that information flow from the digital packaging machinery can be used for more effective production. Packaging machinery in the future will be to develop a wireless system, connection

## THE APPLICATION OF PRODUCT PACKAGING DESIGN IN DIGITAL TECHNOLOGY AND PRINCIPLE

### Packaging concept

Product packaging design as its name implies is "package" and "fashion" for product design, the meaning of "packaging" item package and decoration. Here "package" and "fashion" is tied for the two verbs, "package" meant to wrap, from the perspective of design, the "package" is to point to in order to make the products from being damaged, easy to transport and use a certain amount of material to be wrapped, belongs to the concept of material level; And "fashion" in shoe went jibe zip "explanation for also, here also contains the meaning of decoration, referring to the product of decoration and ornament, which is to point to in the function of the parcel at the same time, through the different design methods with adornment beautification effect, with the" package ", by contrast, is belongs to the category of aesthetics, has a certain culture. So good product packaging design is not only the realization of the functional, more should make its have certain cultural characteristics.

With the increasing competition in the market, the phenomenon of product homogeneity is becoming more and more serious, product packaging, as a kind of cultural form, its role is no longer confined to the protection and storage of goods, more to attract consumers' attention, indicate the unique charm of the product, promote the sale of products, win more profits for the enterprise, so we need to product packaging design in the visual system, give full play to the traditional culture and graphic forms of inheritance and innovation, at the same time is blended in among them, the elements of new ideas and create expressive works, artistic appeal and ethnic cultural characteristics.

Packaging is the extension of product, due to the upgrading of products, expanding consumer demand, sales competition intensifies, the development of new materials, new techniques, new technologies, consumer pursuit of beauty, environmental protection and price factors, make the modern packaging with each passing day. In order to adapt to different areas, different consumer groups, need to have a variety of forms of packaging, including ideas, colors, specifications, materials and production methods. Product shape and characteristics and the diversity of the material, also make the morphology and structure of the product packaging. Design methods of packaging design also has a variety of ways, to find a reasonable, effective and fast design method and technology to adapt to The Times development, packaging design to achieve rapid, accurate, save design objectives, contribute to a better work in the design.

### Product packaging design combines plane and modeling design

With the development of The Times, the progress of productivity, packaging has not only protected function, it has other functions such as portability, storage, and beautiful sex is gradually becoming apparent. Packaging design process, first of all, to clear its function and the function of the packaged goods, the diversity of shape and characteristics of packaged goods, and choose the appropriate packaging material. The current product packaging form mainly includes the packaging cartons, boxes, bottles, gift bags, etc., can choose the material are: wood, metal, ceramics, glass, plastic, paperboard, etc. Such as beverage packaging, often with cans, cartons and polyester bottle, respectively occupy a certain share in the market.

Different packing, the designer for the design of performance means. Packing design often contains a form of visual communication, structure, the overall effect and engineering design. Product packaging design is a comprehensive layout and design work, design is often to and fro between 2 d and 3 d changes constantly adjust. Characterized by computer, network information society changed people's way of life, also changed the way designers work, design form and connotation of all changes. The technical development of the information age provides the designer's imagination with advanced design method; the designer's design process is a process of creativity and technology to participate. Different products to the requirements of the packaging design are also different, so need to combine a variety of packaging design CAD software for design.

### Product packaging design of digital design method

Packaging design are introduced in the design process of digital technology, visual communication, morphological structure, the overall effect of packaging and subsequent engineering design with computer aided design software support. Two-dimensional design mainly have CorelDraw, adobe Photoshop, Illustrator, and Freehand to solid modeling of product packaging, you can use Rhino, 3 d studio AX, Maya, Pro/E, UG software, etching a computer virtual space, the designer can take the plane design and modeling design fuses in together, makes the three-dimensional entity model is more likely to reflect the designer's design intention, has the sense of reality of its vision effect could be comparable to the real sample packing.

In the field of current vector drawing, CorelDraw, Freehand, Adobe Illus - tractor neck and neck, all show features. CorelDraw will draw tools, vector illustration, layout, bitmap editor, image editing and other functions into one. Photo shop is currently the most widely used planar image processing software, the images can be arbitrary copy, cut, delete, collage, synthesis process, using tools and filters to make all kinds of wonderful art processing, etc. Two-dimensional graphic design method has been widely used in product packaging design. Figure 3 is a commercial offset printing digital process solution.

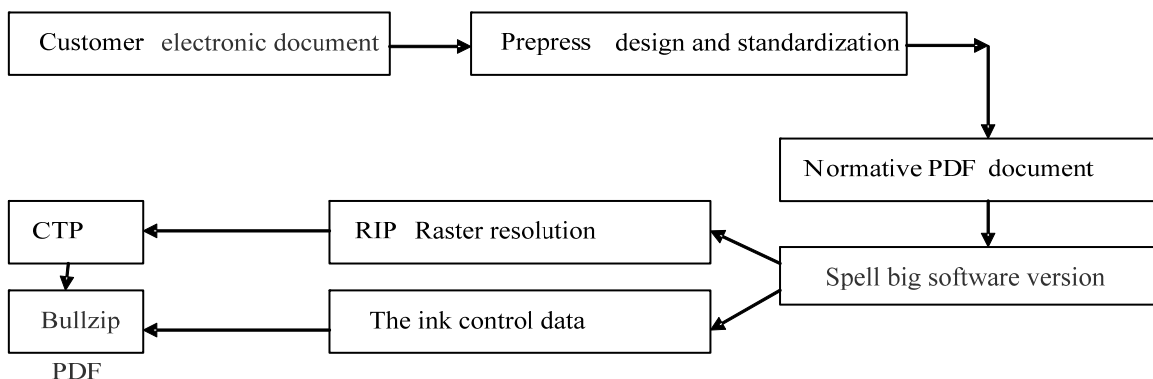
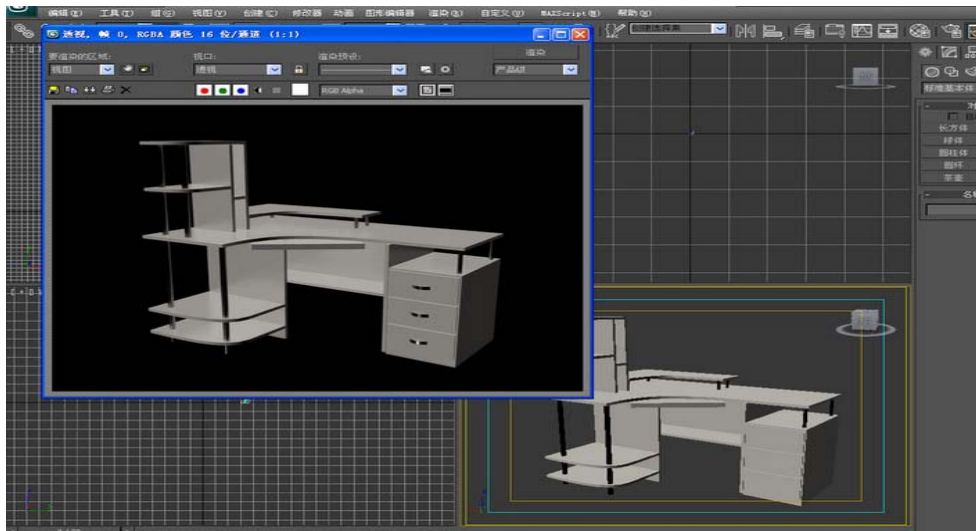


Figure 3 : A commercial offset printing digital process solutions

### 3 D packaging design

The three dimensional modeling software visualization features can more accurately reflect the designer rich creative conception; to grasp the form creation process. Three dimensional visualization technologies can also be very simple to complete real-time graphic edit and modify convenient operation; especially can most directly reflect the designer's creative intention. Figure 4 is 3 on3dmax interfaces.



**Figure 4 : 3 on 3dmax interface**

Packing space itself is a three-dimensional structure; using the 3 d visualization technology to assist in the design is the best choice. A lot of 3 d software on the market at present, Rhino, 3 d studioMAX, Maya, Pro/E, UG, etc., used frequently, such as Rhino, 3 dstudiomax software.3 d studioMAX has many advantages, first of all, it has strong modeling capabilities, secondly it has super material editing function, provide material for 3 d packaging models, rendering product packaging can be obtained after the design renderings.

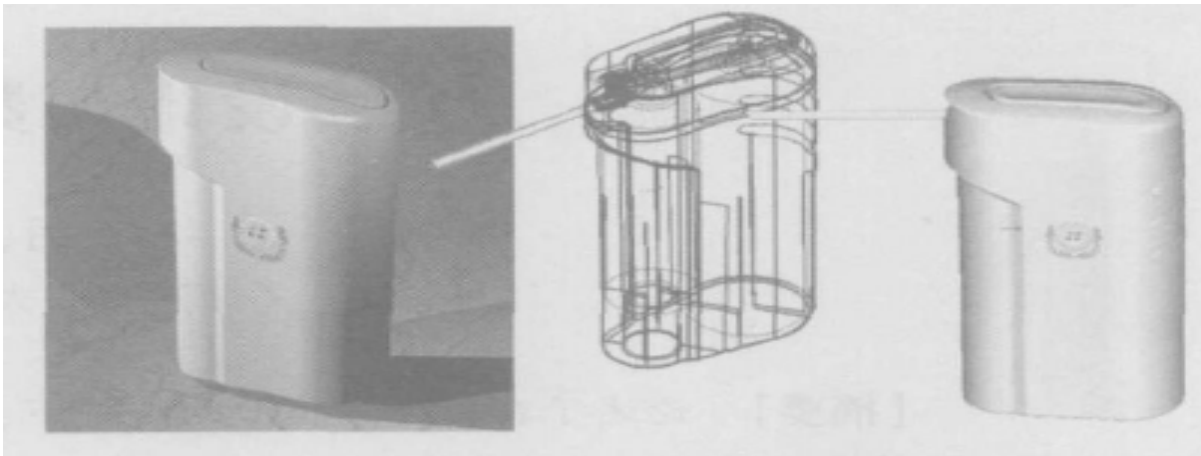
Pro/ENGINEER is one of the most successful CAD software in the world, is a set of CAD software from design to production. Pro/ENGINEER in the structure of the product geometry model based on intelligent characteristics, allow the designer too quickly and easily by sketches, modeling and color concept model is established. Through parametric function definition, the real parts and assembly modeling, three-dimensional entity coloring or wire frame model, can make a design personnel assessment, understanding and improve their performance design of function as soon as possible, marketed to shorten time and reduce development costs. Pro/ENGINEER as an advanced CAD software, and applied in the design, engineering design of more and more widely, in the same way, in the packaging container design, plastic materials are widely used in all kinds of packaging, cosmetics packaging containers, bottles, all kinds of products packing box<sup>[4]</sup>. Using Pro/ENGINEER software design all kinds of structure and shape of bottles, cans, boxes and other plastic packaging container, the parameterized design and modeling of mould design and development of closely linked together, make the design process is more and more simplified, fluent.

### **Packaging design graphic software in the process of practice and the combination of 3 d solid modeling software**

In the practice of the packaging design, the design process is often with 2 d graphic design and 3 d modeling design combination of design. Digital product packaging design of 3 d visualization of general steps: first use of graphic software design sketch plan, use 3 d software for the design of packaging structure and modeling; And then, to map production, to model in the 3 d software model and texture were assigned to the corresponding structural plane; Adjust the output of the Angle of view, rendering render output; To design scheme evaluation and modification. Finally, the design draft for engineering design, determine the structure size and process.

Below with a disinfectant product packaging design practice to explain the process of packaging digital design. The new packaging is designed for container disinfection disinfectant products, in order to speed up the customs clearance, on the premise of not out of the box, using a simple to use, fast disinfection disinfectant products for container. Aluminum pressure bottle storing disinfectant and high pressure gas respectively, disinfectant in high pressure gas driven by internal everywhere arrived in airtight container. The packaging design requirements of concise and beautiful appearance, and press the switch and switch lock function, through a tube to disinfectants aerosol and fuel gas to the container. Considering several requirements, choice of pp packaging materials, the material is light and cheap, and good formability, good strength.

After a rough plan design, the choice modeling scheme after modeling design in Pro/ENGINEER. Design, emphasizing on the combination of the packaging and contents, press the switch at the same time press the two spray bottle and lock, such problems as the packing way of holding. With the help of Pro/ENGI - NEER, better solved the modeling design and design thinking of 3 d visualization, then use Photoshop creation texture mapping, the use of 3 d studioMAX renderings (see figure 5), and finally the use of Pro/ENGINEER to complete the project structure design, and two-dimensional engineering graphics. With the combination of several kinds of software design can play in the process of information tools to their respective advantages, improve the performance and efficiency of design.



**Figure 5 : Rendering and structure drawing**

### SUMMARY

Packing structure, the increasingly diversified, the designer must have an advanced means of rapid, convenient and accurate to design packaging products to the market need. Displays in: digital design method of packaging design advantage design more flexible and open space; Further simplification of design using the materials and equipment; Design data exchange makes designer closer collaboration; Simplicity of design changes and modification and series design is more convenient; Designed to express more simple and higher quality; Design more efficient; Drawings generated more simple and more accurate; Information transfer faster. Designers in improving design originality, but also need to keep learning and use a variety of digital design methods.

### ACKNOWLEDGEMENT

Foundation item: The discussion issues of Tangshan science and technology bureau of the fund program are "package design research on ceramic product in Tangshan in the perspective of low carbon"(13130233z) and "package design research on shadow puppet product in Tangshan in the perspective of low carbon"(12110223b)

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