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Research on Design Information Management System for Leather Goods

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Abstract

The idea of setting up a design information management system of leather goods was put forward to solve the problems existed in current information management of leather goods. Working principles of the design information management system for leather goods were analyzed in detail. Firstly, the acquiring approach of design information of leather goods was introduced. Secondly, the processing methods of design information were introduced. Thirdly, the management of design information in database was studied. Finally, the application of the system was discussed by taking the shoes products as an example.

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Keywords: leather goods; design information management system; database

1. Introduction

Leather products industry is one of ancient traditional industry in China. Most of the leather goods companies are developed from small workshops or hand workshops. These companies still follow the traditional method of management, and do not adopt computer management which has a strong information statistics and management capabilities. However, leather goods are products of fashion, and there is plenty of information needed in the design process such as information of popular trends, industry conference, customs, works, market, sales and research [1]. Today is the era of information explosion, it is clear that information got by the manual methods is very limited, and can not meet the design

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requirements. So it is necessary to establish a design information management system to help designers deal with a variety of data and information, optimize and support the design process, which will greatly improve design efficiency and quality [2][3].

2. The outline of DIMS

DIMS (Design Information Management System) makes the design information digital, formal and systematic in the process of product design, so that the design activities have a reasonable, comprehensive and integrated support mechanism and environment to achieve information processing and design decisions automating. The essence of DIMS is using computers to manage the information of product design and making all the design information systematic in the design department. It means to establish a man-machine system that cooperated by people and computers to achieve optimal management and utilization of design information, so that designers obtain the information needed rapidly, accurately and efficiently, which will improve design efficiency and company efficiency greatly [4].

Research of design information management mainly focuses on the acquiring, processing, management and maintenance of design information. Its primary means is integrating design information organically with informatization design tools of CAD/ CAE/CAM/PDM, so that the design information resources can be fully utilized.

The framework of design information management system for leather goods is shown in Figure 1. The system is mainly to acquire and manage design information, real-time inspect some key aspects of design, determine whether the design conflict with the basic area knowledge and the design requirements, and generally guide the design to continue.

3. Acquiring mechanism of design information

To create a database, sufficient information must be obtained, and then processed so that the information can directly be applied.

3.1 *Acquiring approach of design information*

Design information acquiring is the basis of DIMS, and the necessary conditions for information-driven design. There are a variety of means to acquire design information, including obtaining design information from the expert experience, from existing design information, from the market, from magazines, exhibitions, network and other media and so on. The acquiring approach of design information is shown in Figure 2.

(1) Experience of expert

It includes ergonomics data, industry guidelines, aesthetic principles and design experience. The design experience is the most crucial information among them. Design experience refers to some experience or intuition of design expertise, such as the decision, judgment, choice, etc. in certain circumstances. These design experience is not known by a new designer, and is difficult to describe in the formal way. Design information of a kind of product can be obtained by gathering its design experience, and design experience can be classified by different types of leather products. Figure 3 shows the design experience of footwear.

(2) Existing design material

It refers to the design information that has already existed and has been stored in company. Domestic leather goods companies mainly store the design information of design styles, design patterns, customer samples, technical documents, production orders, and material consumption. Existing design material can offer reference to design of products.

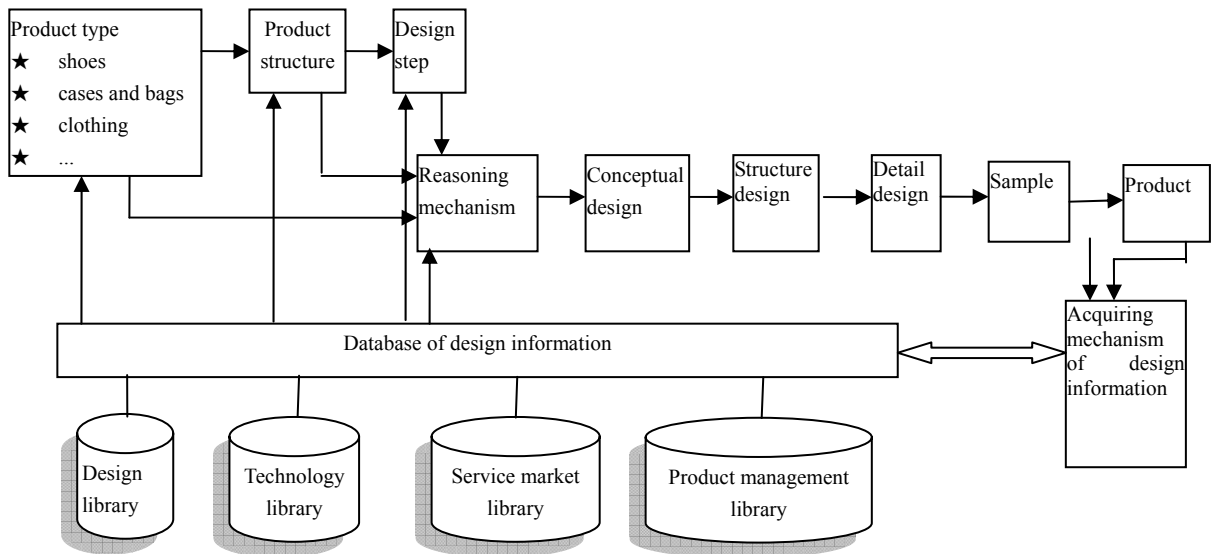


Figure 1. The framework of design information management system for leather goods

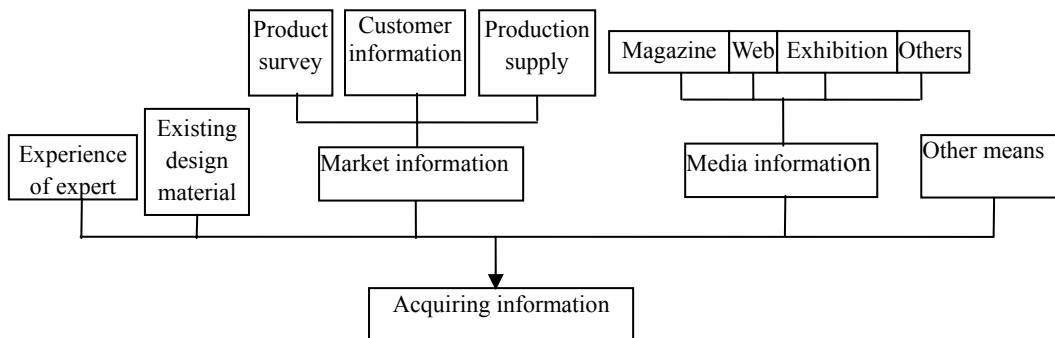


Figure 2. The acquiring approaches of design information

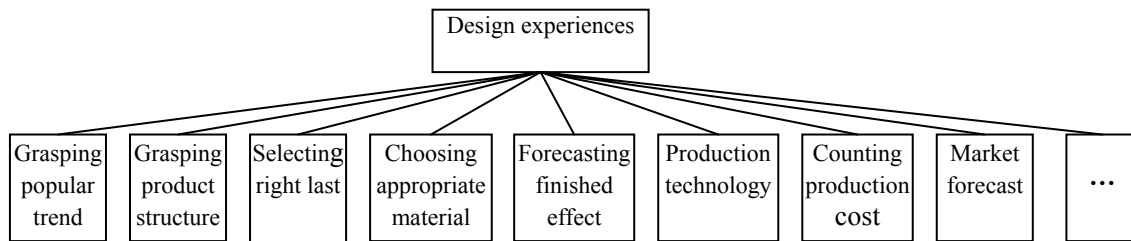


Figure 3. The content of design experiences for footwear products

(3) Market information

It mainly contains information of product survey, customer and production supply. Customer information and supply information of production is for the market, so it also classified as market information. The main contents of market information are shown in Figure 4. The information of consumer preferences, product sale prospects and conditions of competitors needs to be got from the market, so the market information directly affects business decisions.

(4) Media information

Information of magazines, Internet, exhibition and other media has become indispensable in modern life. Media is also an important approach to acquire design information.

(5) Other means

Information related to product design can also come out throughout the production process, such as information of product design plan and task and production feedback.

3.2 The processing of design information

The design information got by means above is miscellaneous and trivial, so it can not be directly applied. It needs to be filtered and classified, and then systematized.

(1) Filtering

Different design process may need different information. The same design information may be useful at some stage in the design process, may also be useless at another stage. So it is necessary to filter the design information when a database is established.

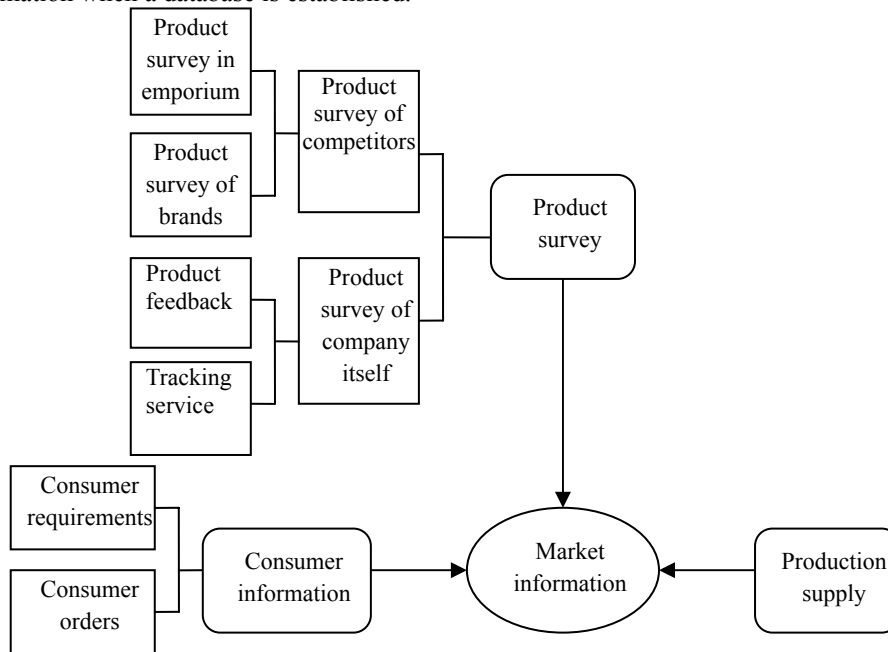


Fig.ure 4. The contents of market information

(2) Classifying

The design information is still incoherent after filtering, and can not be directly applied. It needs to be analyzed and refined. The nature of design information is firstly analyzed, and then it is judged in which stage of design process the design information will work. For example, design experience is used in the

four parts of design. So it needs to analyze the content of design experience, and judge which information can apply to the design and which apply to techniques. Design information need to be classified after being analyzed, in order to establish a database.

4. Management of Design Information System

Design information database for leather goods is created based on collaborative design and information exchange. It mainly has the function of definition and access, data organization, data storage, data management and database management and maintenance. According to the characteristics of leather products industry and B/S mode, web-based database will be created. Design information database system can adopt Sybase, Oracle, FoxPro, Access and other large database systems. In this paper, SQL Server is used. According to actual needs, design information is managed systematically, and divided into design database, technical's database, market database and product management database. All the databases are linked, so the information of one database can be searched from another. At present, design database and techniques database have been preliminarily established.

4.1 Design database

Design database can be further divided into trends database, ergonomics database, product structure database, design experience database and industry standards database.

Popular trends are mainly got from the market trends, show forecasts, various sites and magazines. They are generally classified in a single quarter as a unit, so the database takes the year / quarter as the index. People's physical and psychological needs of products can be solved by the establishment of ergonomics database, such as comfort and so on. Shape design database includes the contents of product type, shape design reference of design experience, existing products, market requirements and consumer requirements, shape modification reference by production feedback. The contents of design experience are the most extensive, which relate to four parts of product design as described above. The industry standards are the conventional industry practices of an industry, and the database is established as the industry guidelines of product design to reduce friction. In the footwear industry, the shoe size has a certain standard, but different countries have different definitions of shoe size, so it is need to build a unified standard for shoe size.

4.2 Technical database

Technical database contains the manufacturing technical database, the cost information database, the material information database and the production equipment database.

The manufacturing technical database contains the management of new technical and the technical management in the production flow. Cost information is summarized from material utilization of production feedback. In the leather products industry, the materials used generally include upper material, lining, accessories and decorative items, etc. Material information database can adopt the format of cost information database, taking the name of material as index. Material equipment database contains the information of production equipment and machinery, which restrict design process in some degree. To make product design reasonable and feasible, relevant production equipment information must be taken into account.

4.3 Market database

Market database includes the market demand information database, sales forecasting database, after-sales service information database and design plan or task management database.

The market demand information database includes product survey and customer requirements database. Sales forecast is a kind of analysis, coming from market survey, design experience, and customer demand. A product' selling out does not mean that product has been successful and occupied the market. The design effect of products should be confirmed through tracking service, that is, a certain degree of market feedback, so the After-sales service information database is built. Design plan or task management database is the overall program of product design the overall business plan

4.4 Product management database

The database manages the product information of the existing design material, so that the information of existing products can be fast browsed. It helps designers make judgments quickly to meet customers' demand, and offers reference for new design. According to the classification of product management, product management database can be divided into single product management database and series products management database.

5. The application of design information management system for leather products

The design information management system mainly applies in the design of products, its main functions are the inquiry, modification, and comparison of design information, and it offers designers a lot of useful information. The design of footwear products is taken as an example to illustrate the application of design information management system for leather goods. The manager of design department searches design demands from the design information database and analyzes, then develops design plans and tasks and hands them over to designers. The designers retrieve the product information that meets the requirements of the design plans and tasks from the design information database. In accordance to the information matching level, the design flow can be divided into three paths, shown in Figure 5.

5.1 Exactly match

It means there is the product fully in line with design program or task in the design information database. The product information can be directly output and applied directly.

5.2 Not match completely

It means there is not any product in the design information database, which is consistent with design projects or tasks. Designers need to re-design, until the product meets the requirements.

5.3 Partially match

It means there is the product in design information database, which is partially consistent with the design programs or tasks. Designers need to modify the design of existing product and make the design meet the requirements.

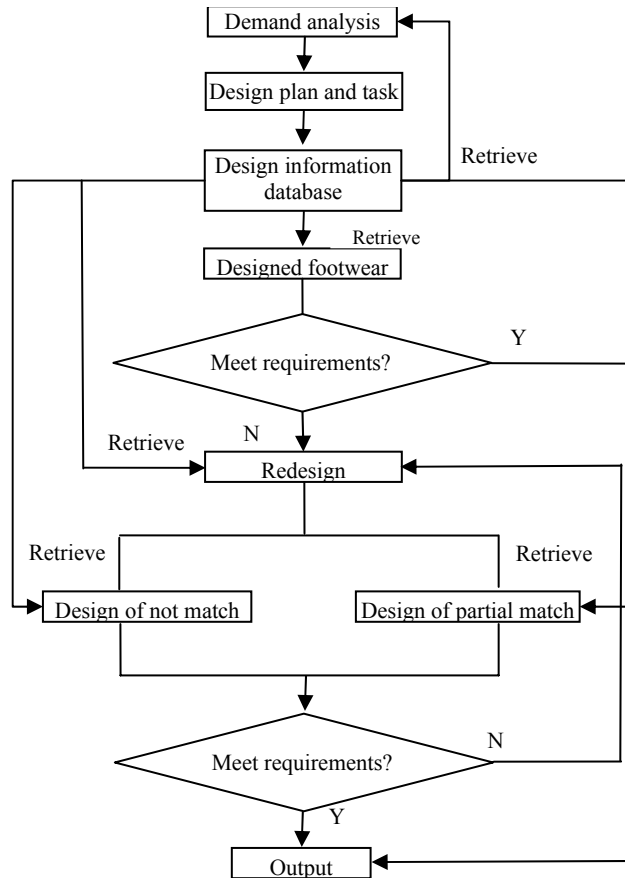


Figure 5. The application flow of footwear design information management

6. Conclusion

Design information management system established in leather products companies can manage the design information of leather goods scientifically, which will improve the utilization of design information, design efficiency and the market's responsiveness of product, enhance competitiveness of products, thereby enable companies to achieve higher economic efficiency.

Faced with the trend of globalization, companies need to understand the global rules, add new management ideas, learn the advanced management concept of design information, and upgrade the design method to design theory which can guide products design in the future. Research and application of design information management system is an emerging issue in China, it will bring the development of leather products industry a major leap forward.

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