Research and Design of Sheet Metal Information Management System

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Abstract： By mean of classification for sheet metal information,2D image,3D model, data sheet and design graph for technology are recognized as information element, file information auto extracted and supplement interactive entered are two method of describing element by meta data, then meta data is stored in database record, record quire and keyword search are used as inquiring approach. information database are designed for four structure, element define, meta data storage, information inquiring and encoding &classification, integrated with engineer application, system requirement and functional module are designed, then , interface for sheet metal expansion are implement. The system can be used for enhance enterprise design and manufacture and information management capability.

Keywords： Sheet Metal, Information Database, Meta Data

Introduction

In the modern industrial production, parts constituted of sheet metal, with high efficiency, low cost and technological advantages of simple, has increasingly larger proportion in chemical, machinery, metallurgy, light industry and other industries[1]. With the development of digital design and manufacturing technology, accompany sheet metal industry development, it produces a large amount of digital information, such as text, graphic display of sheet metal components, form explanations, formulas and programming module and other, much of this information to expressed by the files managed by the related design and manufacturing staff, then obsolete, redundant information substantially increased, engineer work in a lot of trouble. Sheet metal parts have variety and complex shapes, varied selection, high technical requirements, determines the process design of sheet metal are particularly dependent on experience and database information[2]. To improve efficiency of professionals, this design has for sheet metal industry of engineering repository management system, will save digital design and manufacturing in the of related information to file and database of forms, and query and extraction, achieved smart design based on information of products, to made strong pointed, and highly efficiency, and rapid response of design effect, for sheet metal of autonomous design and manufacture provides integrated environment and tool.

1 Technology development

Information is important for enterprise resource repository to store related to the use of knowledge, draw conclusions, summarized and expanded, impact directly on the efficiency and practicality of the design system, reasonable construction of the repository relies on reasonable categories. According to the order of process information, task information, product information, and most of the current information base-oriented

organization model of information problem solving. Common sheet metal engineering repository includes sheet metal parts, and layout, process design libraries, and so on [3]. Part library realized by parametric design and character design, and layout system by design algorithm libraries, repositories and repository of raw materials constitute a product structure. Sheet metal information management system mainly has three class: first class is specifically designed for sheet metal manufacturing industry development of sheet metal expand resources management system, but currently domestic of software has also not matured, most production enterprise are introduced abroad of sheet metal CAD software[4]; second class is to has some general CAD software platform and customize for development, the customized software has more single features, pointed strong, is only good for meeting user a objective needs, difficultly achieved industry share between data resources[5]. Third class is nested in the mainstream professional CAD software for sheet metal CAD modules for sheet-metal resource management systems, these software are more expensive for the majority of small and medium enterprises. According to the producing process of sheet metal digital information, this article put forward a design-oriented repository for industry-oriented problem solving to realize information resources sharing.

2 System architecture

To meet needs of digital design, system used two dimensional drawing, three dimensional model, parameter form, description metafile and so on, static meta-information for description sheet metal information, uses database/file storage data, combines classification and coding technology organize various information according to professional area coding, constructed tree type levels shaped classification, index uses by key word on classification, formed-oriented application of material selection, shape design, technology design, and manufacturing repository. It can add, modify, delete information on each layer, because of the classification, coding is based on the underlying data,

so that underlying data can affect the completeness and correctness of the classification and coding of the upper level, be associated in the system design of unified management. When the information base is created, such as modeling sheet metal, expending and layout operations, can has keyword search repository of relevant reference information. It can build structure classification for sheet metal, more intuitive and professional labor to develop repositories and contact sheet metal category. The overall structure of the system, such as in Figure 1.
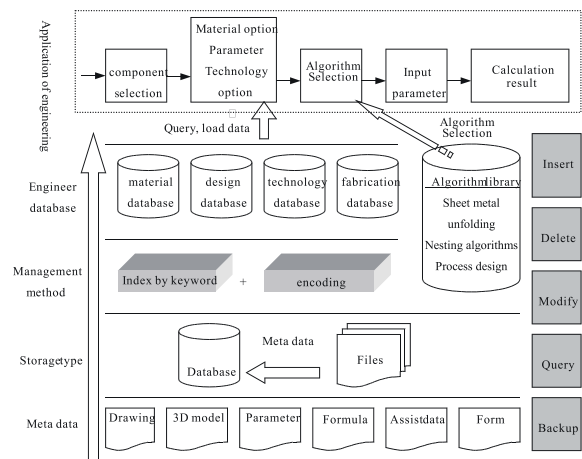

Figure 1 structure of sheet metal engineering database management system

3 Library storage strategy

Databases, files with the use of the system approach to the information store. Sheet metal digital design, manufacturing processes, a common message has a two-dimensional vector drawing, three dimensional solid model, associated data tables, diagrams of process design, process description, which is produced by a different application of separate files, in General, information cannot be see and cannot be retrieved without application, so using file storage. To these file for management, can used meta-data to be descript, Meta data mechanism support four class management features: ① description which data in data file; ② defines to entered data file in order of data and from data file in the produces of data; ③ records according to business event occurred and with of data extraction work time arrangements; ④ records and detection system data consistency of requires and

Executive situation. Data are stored in the database about Meta data information associated with a variety of resources, and establishing the text, keywords, description, Meta data retrieval and manipulation of the contents, later into the search for text description. The overall library storage strategy shows as in Figure 2.
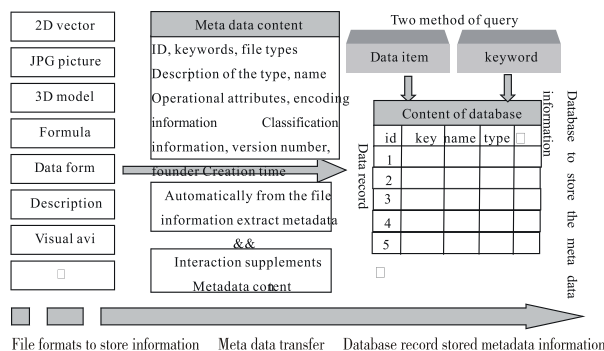

Figure 2 file information through metadata stored in the database record

4 System requirements and functional module

After analysis, the system has roles: information collected by staff, buyers, designers, process, manufacturing personnel and data maintenance. Information collected through the system can get all the information about sheet metal components, including plate type, chemical properties, three–dimensional models, drawings, diagrams, connection and feeding instructions, and more. Procurement staff according to system assigns type, chemical, machinery, mechanical properties and corrosion resistance, procurement of materials, designed for later processing. Designers of sheet metal components in the system diagrams, descriptions, three dimensional models, calculation formula of design, it can reduce the design effort, high efficiency. Staff processes queries with software programs in sheet metal fabrication of components, to improve production and efficiency. Data maintenance personnel can have all of the information in the system to modify, add, delete, back up all information, so as to achieve the updating and effective use of information. This information consists of information classification, information coding module, the module Meta data management, data entry, information module, the

module information maintenance module. roles and functions are designed as Figure 3.

5 User interface implementation

Based on the above results, this article uses the Windows programming interface and the Access database technology, design sheet metal unfolding to figure information management system interface, containing the product structure display, information retrieval, information management, metadata management, setting algorithm parameters and calling functions. Code input interface is the key man–machine interface of visual flexible coding, the design quality direct impact on software applications. Software interface must have characters, such as simple information, integrity message, smooth input, clarity content and so on, in order to facilitate non–coding professionals quickly achieve specific coding. The graphical interface module is divided into five regions, namely: Coding results display area, Code tip area, Code results zone, By–bit encoding results prompt area, Command button operation area.
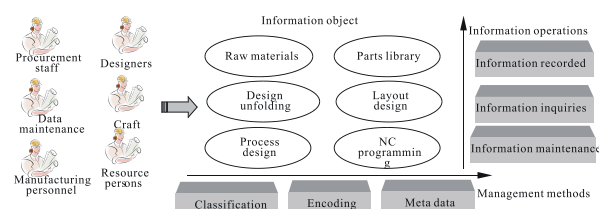

Figure 3 system functions, modules, and methods of information objects

6 Conclusion

Sheet metal database management system to implement difficult and labor–intensive, involving raw material repository and process knowledge base management, design, complexity and diversity. As sheet metal common information management platform, collect information, communicate, learn, share and as a whole, all categories of personnel for the sheet metal industry provides powerful information management support services, technical staff and managers have access to a standard, efficient, professional information resources, is the ability to design, manufacture, an effective tool for

enhancing information management capabilities.

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钣金信息库管理系统研究与设计

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摘　要：通过对钣金数字化信息分类，归纳出二维图，三维模型、数据表格、工艺设计图表等信息元，采用文件信息自动提取和交互补充的方式实现信息元的元数据描述，并以数据库记录方式加以存储，提出数据记录查询和关键字检索两种查询方法。工程信息库系统设计成定义信息元、元数据储存、检索、信息编码和分类4个层次，结合工程应用对系统需求和功能模块进行设计，实现钣金展开系统界面。该系统是钣金企业提高设计、制造能力，增强信息管理能力的有效工具。

关键词：钣金；信息库；元数据

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学生的动手能力，激发学生的学习兴趣，充分体现了本课程的理实一体化特点，实践证明，教学内容学生容易接受，教学效果良好。

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"Cost Software Application Technology GLD" Curriculum Development and Research

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Abstract: Aiming at the current market position requirements for construction project costs,We have developed the course of "Cost Software Application Technology GLD" to conform to the market demand.The course reflects the characteristics of the integration of theory and practice.It is also consistent with the training goal of vocational applied talents with high skills.

Keywords: course development ; integration of theory and practice; cost software