Design and Implementation of the Software for Ship Design Fuzzy Comprehensive Evaluation based on Computer Aided Method

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Abstract. In this paper, we design and implement the software for ship design fuzzy comprehensive evaluation based on computer aided method. Scientific evaluation and is often the right decisions at the same time the basis and foundation. Fuzzy comprehensive evaluation in determining the index weight generally uses the novel method or the expert empowerment, objectively comprehensive empowerment. Visible, how to establish scientific and reasonable comprehensive evaluation method for comprehensive evaluation of the performance of manipulation is essential. Our designed system provides us with novel paradigm for designing which will obtain special meaningful and necessity.

Keywords: Software Development; Fuzzy Comprehensive Evaluation; Computer Aided Method.

Introduction

With the high-speed development of the shipbuilding industry, ship design unit to intensifying competition, human resource as important resources of the development of ship design unit has been widespread attention and become the design unit is the core competitiveness of an important strategic resource. Ship is a complex system, its control performance index is numerous, the maneuverability and stability and mobility, they are contradictory to each other. Therefore, ship maneuvering performance evaluation, not a single index evaluation, a comprehensive evaluation problem. Because of, can't simply to control standards and specifications to determine various performance indicators, and should adopt a scientific and reasonable comprehensive evaluation method for comprehensive evaluation. Scientific evaluation and is often the right decisions at the same time the basis and foundation. Visible, how to establish scientific and reasonable comprehensive evaluation method for comprehensive evaluation of the performance of manipulation has important practical significance. State of the design process and design the diversity of product design tend to have multiple design, even for the same design, different users have different views, so the design scheme optimization problems. Again due to the design process of gradation and iterative, will make the design for other design modification or solve need to rethink, therefore, existing products overall design aim, and the coordination and unity between the local design problem [1].

The solution of these problems depends on the scientific product design evaluation. There are a lot of methods used in comprehensive evaluation of, because the starting point of all kinds of evaluation method is different, the train of thought to solve the problem is different, have different applicable objects, these methods have their advantages and disadvantages. Design index, some parameter values is to use quantitative numerical description, such as some predictive indexes such as reliability, and some qualitative language is always used to describe, such as processing technology, structure

complexity, there need to be blurred. The index attribute value quantification method varies with the type of evaluation index. The principles of the agile manufacturing system resources is a dynamic system which is one of the most obvious characteristics of marks is to be able to according to the changes in the market, through information exchange network to different regions, different company production resources combination produced in the form of the agile product demand in the market.

Fuzzy comprehensive evaluation in determining the index weight generally uses the method or the expert empowerment, objectively comprehensive empowerment. Power refers to the experts rely on their own experience, give the corresponding weights, this method has a great deal of subjectivity, sometimes may be completely wrong. Objective the method is to use mathematical tools for analyzing the derivation and calculation, get the weight of each index, but this method is simple from index to calculate the weight, sometimes may not correspond with the actual situation. Comprehensive empowerment method combined with the former two methods, but still can't very well reflect the relation between the weights of evaluation indexes and the corresponding artificial neural network has very good learning ability and adaptive capacity, can handle both quantitative and qualitative knowledge, distribution characteristics which could be used to determine the index weight value of comprehensive evaluation [2]. Using the forward artificial neural network, using the improved back propagation algorithm training the network, fixed network connection weights gradually, make the fuzzy comprehensive evaluation is also gradually close to the actual situation, the weight of each index value ultimately get the best weights, and the method was applied to the design evaluation. In the following figure one, we demonstrate the standard steps of the software development.

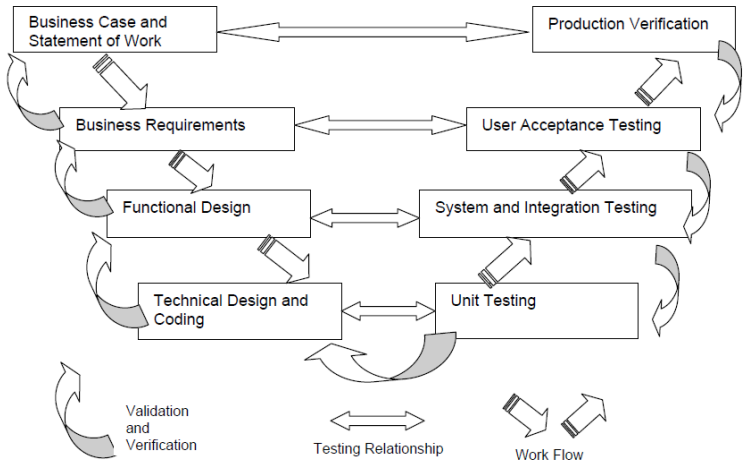

Figure 1.The Standard Steps and Procedures of the Software Development

In this paper, we conduct research on design and implementation of the software for ship design fuzzy comprehensive evaluation based on computer aided method. Fuzziness is one of the characteristics of human thinking, fuzzy set theory about dealing with fuzzy phenomenon is an effective tool, and comment is a perception of things, with fuzzy thinking determines the nature of their properties, thus the fuzzy mathematical method in recent years has been widely used in the field of system evaluation. In the following sections, we will illustrate the detail.

The Design and Implementation of the System

The Fuzzy Comprehensive Evaluation. Fuzzy analysis model of the ultimate goal is to pass the

preliminary selected risk enterprise for further and more perfect assessment. A lot of risk factors involved in the process of the measurement further, the establishment of the index system should have the gradation. In addition, risk characteristics of the enterprise itself caused many evaluation index are fuzzy. Evaluation index of fuzziness of uncertain factors will cause we are difficult to determine whether the evaluation object meet certain standards, to enterprise credit risk evaluation method to deal with these relatively complex features already cannot meet the requirements. To some extent, it can solve the risk in the investment stage [3]. High and new technology enterprise of importance technology and other issues and secondly, based on membership as, optimal scheme is relatively optimal size and target concept, and establish mathematical model. Finally, with the index system and membership degree two concepts as the foundation, established the general fuzzy optimization model of venture capital. The evaluation formula is expressed as the follows

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$$\left(\prod_{f=1}^{M} f_j\right)\left(\sum_{i=1}^{nME} P_{ME(i)} + SFC_{ME(i)}\right)+\left(\prod_{f=1}^{M} f_I\right)\left(\sum_{J=1}^{nME} P_{ME(i)} - SFC_{ME(i)}\right) \quad (1)$$

Knowledge management is not a technology and is more of management, but its implementation is also inseparable from the technology. Knowledge management information system is one of the enterprises to implement knowledge management platform, which uses computer technology, and other information technology help enterprises to improve the work efficiency of knowledge management, better realize the goal of knowledge management, therefore, the maturity of knowledge management information system is the general foundation of knowledge management performance. Knowledge management is a change to a certain extent, its successful implementation needs the support of the corresponding organization structure. Knowledge-based organizational structure refers to the existing organizational structure of knowledge management maturity of cooperate degree which can generally from the set of knowledge management organization, organization flattening, organization flexibility and decentralization, and the employee communication general mechanism consummation and the setting of team structure for evaluation.

The Principles of the Software Development. Functional programming method and the design method of procedural similarity is multiple subroutine is also the whole software system, but its operation process and process design method is different, between each subroutine is layered it work, do not need interaction between subroutine. Thus, when faced with a large program design, because the link between each subroutine and the dependency is not strong, is good for daily maintenance and error detection. In the face of the principle of object programming method is to the whole software system is decomposed into a series of objects communicate with each other, to these objects contain data and operation method, and can very good hidden data between each object, achieve privacy, to avoid unnecessary mistakes. Different objects and the interaction and influence which are not large, in the design and maintenance easier when there is the internal error can find the problem timely.

Object-oriented program at runtime, send each other between different objects is information, and then each object response, through its own execution method in the process of operation, each object is not only needs to contain the data also need data operation, the

method of sending a message object called client, accept the message object called a server. In the process of sending a message, the client object doesn't need to know the detailed internal details of the server, just need to send a particular message. In actual application, the programmer is often modifying the page or program, to check its execution effect. The development of component assembly and deployment is an iterative process, the fragmentation of inconvenience to the programmer. In a lot of compatible products, application deployment tools are independent of the development environment, which increased the application development for the inconvenience. In the world of computer systems, it is not allowed to the any errors in the program, the computer can accurately perform each task in the program, the subtle errors are likely to cause great disaster and the use of the program design method is of vital importance.

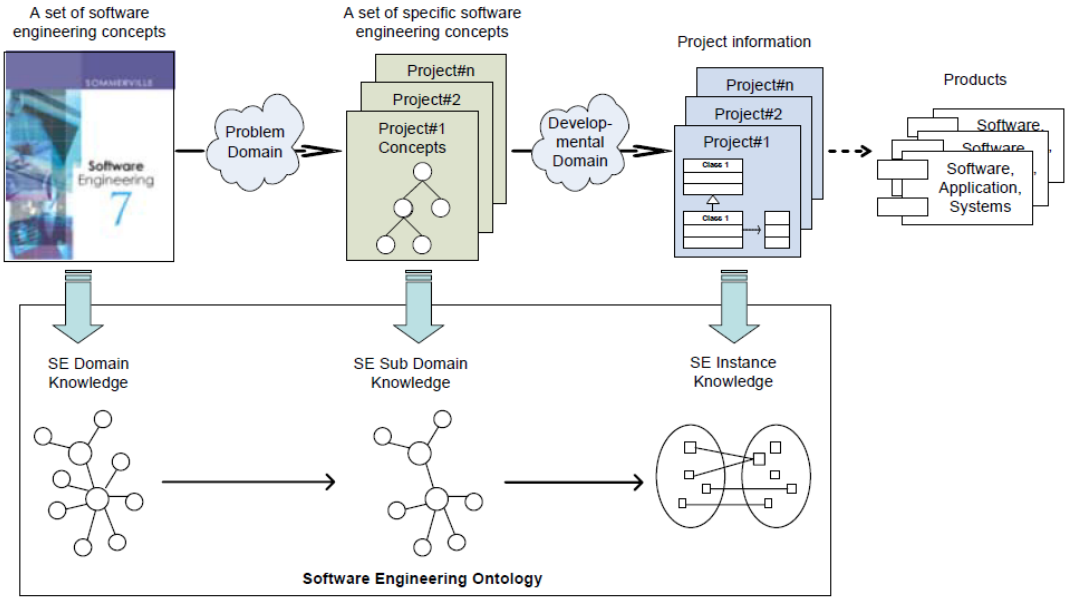

Figure 2.The Principles of the Computer AidedSoftware Development

The Core Code Blocks of the Proposed System. Component-based development paradigm and the gap between common object-oriented development paradigm and label based language and the gap between the traditional programming languages. The development of complex system structure to the program debugging is necessary. Maintainability is bring about negative impacts for users choosing web-based application development is inevitable while debugging and maintenance of web application will be much complicated traditional applications and complexity is a reflection on the complexity of the web application. In order to increase the application into the same component technology is the development speed of improve the maintainability of the program.

```
public abstract class CUserBean implements EntityBean {
    public abstract Integer getObjectID();
    public abstract void setObjectID(Integer objectID);
    public abstract int getN();
    public abstract void setN(int N);
    public abstract HashMap getUsers();
    public abstract void setUsers(HashMap users);

public Integer ejbCreate(Integer objectID, int N) throws CreateException {
    setN(N);
    setObjectID(objectID);
    setUsers(new HashMap());
    return null;
}

public void createUser(POJOUser user) throws DuplicateKeyException, CreateException {
    HashMap allUsers = getUsers();
    int p = getN();
    if (Integer.abs(user.getUserID().hashCode()) % p != getObjectID().intValue())
        throw new CreateException("Cannot store user in this CEJB.");
    if (allUsers.get(user.getUserID()) != null) throw new DuplicateKeyException();
    allUsers.put(user.getUserID(), user);
    setUsers(allUsers);
}

public POJOUser getUser(String userID) throws FinderException {
    HashMap allUsers = getUsers();
    POJOUser user = (POJOUser) allUsers.get(userID);
    if (user == null) throw new FinderException();
    return user;
}

public void setUser(POJOUser user) throws FinderException {
    HashMap allUsers = getUsers();
    if (allUsers.get(user.getUserID()) == null) throw new FinderException();
    allUsers.put(user.getUserID(), user);
}

public void changeUser(String userID, String firstName, String lastName)
    throws FinderException {
    HashMap allUsers = getUsers();
    POJOUser pUser = (POJOUser) allUsers.get(userID);
    if (pUser == null) throw new FinderException();
    pUser.setFirstName(firstName);
    pUser.setLastName(lastName);
    allUsers.put(userID, pUser);
}
```

Figure 3.The Core Code Blocks of the Proposed System

Conclusion

In this paper, we design and implement the software for ship design fuzzy comprehensive evaluation based on computer aided method. Human resource in the process of ship design is broad, the internal relationship is complex and the rational allocation of use has become the key to the success of collaborative design of the ship. Different with other resources, human resources has the initiative, sociality and incremental and liquidity, and human resource management are more difficult to be competitors to imitate. Therefore, through to obtain the competitive advantage of human resource management is easier to maintain. Our designed system deals with the issues well which will not only enhance the design but help to manage the human resources as well.

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