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About intelligent software system and development method for the intelligent interface

Shafagat MAHMUDOVA[1*]

[1]Institute of Information Technology of ANAS, Baku, Azerbaijan, (ORCID: 0000-0003-1817-0756),
shafagat@gmail.com

Abstract

An intelligent software system refers to any software using artificial intelligence to analyze and interpret data or to communicate with systems and people. The article substantiates the relevance of the issue and highlights existing problems. The following factors are taken into consideration when assessing the problems of intelligent software system designing: easy data collection, low cost of developing intelligent systems, availability of experts and necessary resources (computers, program developers, software, etc.). A model is developed for the intelligent interface. The competency of the expert group is formed and evaluated, and experiments are conducted. The results obtained are satisfactory. The developed method can be beneficial for everyone.

Keywords: Software system, Intelligent, Intelligent interface, Expert group.

1. Introduction

Intelligent System (IS) is a creative hardware or software system capable to skillfully solve problems related to a specific subject area, so that knowledge is stored in the memory of such systems. Intelligent systems are explored by a group of scientists called "artificial intelligence". However, many researchers, namely psychologists, educators, point out the negative features (for example, cyber-addiction, etc.) of the application of intelligent systems; they believe that a different type of personality, i.e., a person belonging to the cyber world, is formed being affected by intelligent systems [1].

Intelligent systems also suffer from the security issues of a person's private life and provision of data security. Based on the above, it is possible to draw appropriate conclusions in accordance with the study of theoretical and technological intellectual systems. The purpose of this work is to study the stages, components and technological aspects of intelligent software systems, to analyze the application aspects of intelligent systems. The stages, components, trends, etc. indicated in the conceptual model for the design of intelligent software systems are studied and the characteristics of each of them are determined [2].

Synthesis refers to coordination and construction. The term was first introduced in 1845 by the German scientist Kim Adolf German.

The issue of synthesis in decision-making becomes its part when the alternative variants have a complex multi-element structure; and in this case, the combination of different subdivisions of certain elements occurs in a single variant. Synthesis involves procedures for analyzing solutions. These issues can be classified for many traits [3].

Available approaches to the development of decision support software system are grouped as follows:

- Approaches based on the mathematical methods of decision-making theory and the artificial intelligence;
- Systems building with expert data, mathematical modeling and data structure based on mathematical methods [4].

2. Materials and Method

Creating intelligent systems is a complex process. It consists of many stages. One of the main stages here is the design of intelligent software systems.

Designing intelligent software systems is an iterative and evolutionary process involving a group of experts. This includes creating a system on the subject area, involving specialists with knowledge in the field of artificial intelligence, high-level engineers, analysts and programmers with engineering knowledge. Depending on the size and complexity of the work, the group may involve three to six people [5].

The following factors should be considered when assessing the problems when designing intelligent software systems: easy data collection, the cost of developing intelligent systems, the availability of experts and necessary resources (computers, programmers, software, etc.).

Following the analysis of the problem area and determination of the feasibility of implementing an intelligent system in this area, the system is designed directly [6].

There are different views on determining the number of stages in the design of intelligent systems. This is particularly associated to the functions of future intelligent system, the scope of use, the availability of advanced tools, and so forth.

One of the ways to increase the technical efficiency in solving problems arising when studying the features of software systems is the use of artificial intelligence methods in the design and synthesis of the Intelligent Information Measurement System (IIMS). Optimization of the intelligent decision-making procedures in accordance with the selected criteria to choose the optimal mode parameters of measurements depending on the measurement situation refers the efficiency and accuracy of measurements [7].

The general theory of the basic methodological systems for solving the synthesis problem of the IIMS structure includes the artificial intelligence and fuzzy set methods.

The main goal of solving the synthesis problem of the IIMS structure is to develop a universal structure of the intelligent system and achieve a reliable result, increase the efficiency of the system functionality [8].

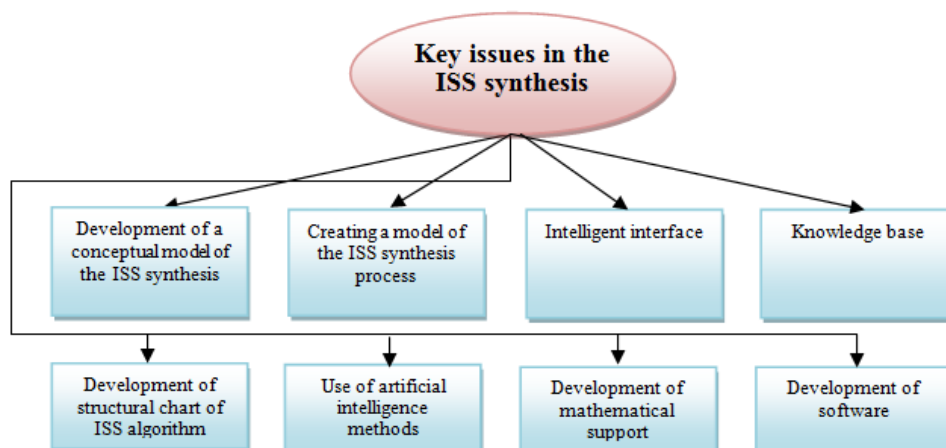The main issues in the ISS synthesis are as follows (Figure 1):

Figure 1. Key issues in the ISS synthesis

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3. Conclusions

Designing intelligent software systems is one of the most important issues. The article developed a conceptual model for designing intellectual software systems. The novelty of this work was that the stages required for design and their characteristics were concentrated in the developed model. The synthesis of ISS was concluded to be one of the most pressing issues. The creation and use of such systems saves costs and makes the program run faster and more efficiently. In the future, more efficient results can be achieved using newer technologies.

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