Research and Design of Intelligent Question Answering System

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Abstract: With the popularity of the Internet, online information more and more rich. However, the traditional search engine has a lot of shortcomings, it returns a lot of related pages, rather than the exact answer, the system's precision is very low. In addition, it is only keyword index or full-text search, did not touch the semantic information, it is difficult to really understand the user's intention. In the intelligent question and answer system, the user can use the natural language to ask questions, the system through the analysis and understanding of the problem, directly return to the answer to the user. So the question and answer system to better meet the requirements of users. It can be said, IQAS is a new generation of search engines. Based on the facts of appeals, this paper takes the intelligent question answering system as the research object, and elaborates the problem from the aspects of the design and practical significance of the intelligent question answering system.

1. Introduction

In recent years, the ontology has been widely concerned in the field of artificial intelligence, and has been widely used. In the restricted field, the ontology knowledge base can be used to express the inner relationship between the knowledge, the organization of the knowledge is more reasonable, the redundant storage is reduced, and the semantic-based answer extraction is also beneficial. In essence, the intelligent question answering system is the orderly processing of the complex, non-sequential German information, and then classifies and summarizes the information. And then a similar problem occurs later, the system can be based on the type of problem with the search method to quickly find out the previously used a valid solution. In this way, our society can save a lot of manpower and material resources.Based on the research of mainstream IQAS at home and abroad, this paper introduces the ontology technology into IQAS, constructs a domain ontology for "data structure" course, and uses this ontology as semantic understanding of information base to realize semantic Web based intelligent question and answer (IQAS).

2. Intelligent Q &A System Core Module

The intelligent question answering system is to accumulate the disordered corpus information, orderly and scientific order, and establish a classification model based on knowledge. These classification models can guide the newly added corpus consulting and service information, save human resources and improve the information processing Automatic, reduce the operating costs of the site. Based on the common problems and answers to the basic situation of the government and the enterprises accumulated over the years, it is organized into a standardized question and answer form to support the intelligent questions and answers of various forms of problems. Convenient users, improve the efficiency of the service, enhance the corporate image. Intelligent Q & A system in the design process is divided into four large modules, can be used as shown in Figure 1 below.

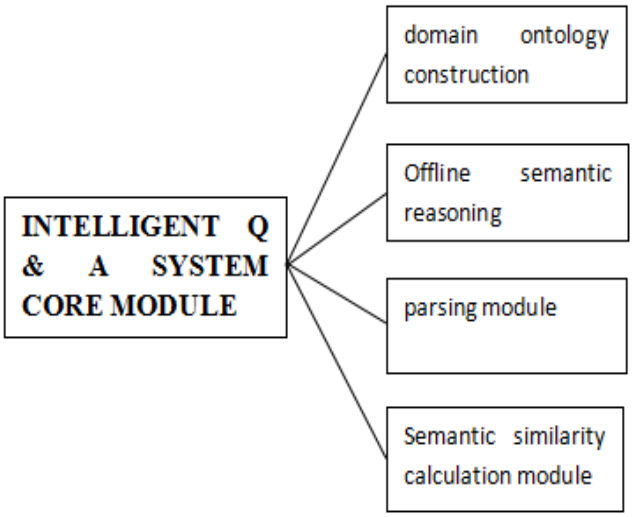

Figure 1. Intelligent Q & A system core module

2.1 Domain Ontology Construction

Since the 1990s, people have introduced the concept of ontology into the field of artificial intelligence, knowledge engineering and library and information. In these areas, ontology research is about knowledge concept representation and knowledge organization system research. In the field of library and information, ontology usually refers to a set of disciplines or a field of terms of the terms, as well as the relationship between the norms and instructions. In the design of the intelligent Q & A system, we can use protege3.1 to build a small domain ontology library for the "data structure" and use Jena to resolve the ontology library to the Mysql database.

2.2 Offline Semantic Reasoning

Offline semantic reasoning is based on fuzzy set theory, which expands the mathematical logic of describing tools based on general set theory, and establishes the fuzzy reasoning theory. Offline semantic reasoning is based on fuzzy set theory, which expands the mathematical logic of describing tools based on general set theory, and establishes the fuzzy reasoning theory.In addition, offline semantic reasoning is a kind of uncertainty reasoning. Offline semantic reasoning is of great significance in the development of artificial intelligence technology. In order to ensure the real-time response speed of the system, offline semantic reasoning will system the reasoning part as off-line processing and persistence to the database.

2.3 Parsing Module

(Using je-analysis Chinese word segmentation and Viterbi algorithm respectively), we get a set of words and parts of speech, and then divide the question by matching the pattern, and finally transform it into query block (QLB)).In addition, this module can be questioned Chinese word segmentation and part of speech. In the process of analysis, the system is used je-analysis Chinese word segmentation and Viterbi algorithm two technologies. Because for a digital system, if it can not effectively deal with the meaning of the user wants to express, then it certainly can not make the right response and feedback.

2.4 Semantic Similarity Calculation Module

The similarity of QLB and target query block (OSB) is matched, and the similarity of question is determined by vocabulary similarity. The vocabulary includes general vocabulary and domain vocabulary. The former uses semantic similarity algorithm based on "knowledge".

For the latter, we can propose a semantic similarity algorithm based on semantic distance and context weighting, from the concept distance, the concept of the parent and the offspring of three angles to calculate, to a large extent, to strengthen the field of vocabulary matching the accuracy.

Through the research and practice of this paper, IQAS based on Semantic Web can effectively use the information resources of domain ontology, to a certain extent, solve the problem of semantic understanding of search engine, and can have high accuracy.

3. Anlysis of One-stop Intelligent Q & A and Interaction

There are some common concepts and problems in the research process of the intelligent question answering system that we must understand and know. These concepts will include one-stop intelligent Q & A, related questions and answers, questioning smart tips, the focus of the problem automatically, hot spot focus, online customer Q & A, guided interactive customer service, customer service assistance, turn customer service function. Here I will be on these concepts one by one detailed description.

One-stop intelligent Q & A refers to a question and answer form, accurate positioning of the site users need to ask questions, and to provide interactive services to the site users. Related question and answer push is when the site users to ask questions, the system will not only push the answer to the question, and will be related to the knowledge of this issue are also pushed out for the user query, so do a comprehensive grasp of all the information. Questioning intelligent prompt refers to the user in the process of asking questions, the system will have to enter the content of automatic analysis to give the optimization of the completion or related tips. Focus on the problem automatically ranked in a certain period of time, the user's knowledge of the knowledge of the heat, the system automatically focus, and according to the frequency of the hot spots will focus on the system page display; specific categories of knowledge in accordance with the frequency of access sort, In the Page Knowledge category section. Hotspot focus refers to the system to the user to submit the business keywords to statistics, and in accordance with the frequency of access to focus, and keywords related to the business list automatically linked to form a business hot keywords. Online customer service Q & A refers to the simulation of online customer service personnel to the form of intelligent customer service to complete the role of customer service. Guided interactive customer service refers to the common problems into a number of process diagnostic knowledge, by guiding the interactive service, as far as possible from the Web side to solve customer problems. Customer service assistance means that the intelligent question answering system can complete the expert seat function, in the ordinary staff can not answer the question to provide standardized knowledge to help ordinary customer service staff quickly and accurately answer. Turn customer service function refers to the user can directly in the intelligent consulting service system to connect artificial customer service personnel, to customer service staff online consultation.

4. Successful Design of Intelligent Q & A System

In the past, many intelligent Q & A system design, the Shanghai Hongkou intelligent service platform is a very successful example. The following is the final version of the Shanghai Hongkou Intelligent Service Platform, hope to be similar to other design inspired.

4.1 Intelligent Consultation

Hello, welcome to use the "Shanghai Hongkou" intelligent service platform to provide you with intelligent consulting services, if necessary, please see the use of help.

First, understand the Hongkou's humanities, geography, and profile. Who is the district governor?

Second, the Advisory food, live, travel, travel, shopping, entertainment, medicine, learning. Such as: Hongkou where there is fun? Provident fund loans to buy a house the maximum amount?

Third, consult the affairs of various departments. Such as: social security card broke how to do? Foreign accounts can go to Shanghai?

Fourth, the query to the public information. Such as: how to identify high-tech enterprises? Housing was levied, the compensation standard?

Fifth, to the leadership to write a letter to reflect the problem. I would like to write a letter to the leader.

4.2 Use Help

Shanghai Hongkou "intelligent service platform will be a new way to provide you with more intimate and convenient service.

Service: intelligent, real-time, interactive automatic service.

Services: "Shanghai Hongkou" government portal all the information. More service content will continue to enrich and improve.

Service Hours: 7 × 24H all-weather service for you.

4.3 Feedback

Feedback to remind: In order to better the "Shanghai Hongkou" government portal service information intelligent and convenient to the general public, you are welcome to us to improve the views and suggestions, we must promptly adopt, and constantly enhance the intelligent service platform online service efficiency and user experience!

Basic information: name (*), gender, identity, identity card number, address, address, contact information, e-mail (*), fixed telephone, mobile phone

Feedback: Title (*), comments or suggestions (*).

5. Conclusion

Whether it is Apple's iPhone on the hot application of Siri, or in February last year in the US television competition show Jeopardy defeated the human champion Watson, are directly related to the "automatic question and answer". What is the automatic question and answer, automatic Q & A products can bring any benefits, Baidu what kind of automatic Q & A products, and this article is used in the popular language to illustrate. From the user's point of view, automatic Q & A is a simple and concise way to get information. Users directly with the natural language and Q & A system interaction, without having to consider what kind of keyword combination to express their intentions, so simple. Q & A system directly returns the answer to the question, the user does not need to find the answer content from the lengthy related documents, so concise. Automatic question and answer as a fast and easy access to information technology, information explosion today, will play an increasingly important role for people to provide more convenient.

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