

## Research of E-government Auto Answer Consulting System Architecture

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**Abstract**—E-government is a virtualized platform which is used by the government to do the administration online. According to the observation from a growing perspective, the e-government platform should be an intelligent information management bases. In an information based e-government platform, consulting subsystem plays an important roll. Here comes up with an auto-answer counseling subsystem as an attempt. There are two key technologies with this system, a classical auto-response subsystem which supported by a database, and an AI auto-response system which can understand our nature language.

**Keywords**—component; Auto Answer;Storage type;Semantic analysis

### I. INTRODUCTION

E-government is that, government agency adopts the modern computer network technology to condense, optimize, integrate and reorganize the government management and service functions. It breaks the restriction on time, regions and the restriction between the departments through the network information platform. It provides an integrative system mode of the management and service with honesty, high quality and efficiency for the public and themselves.

Base on the innovative feature, the e-government is effectively the virtualized government administrative management, which government department realized by means of the e-government platform. But in the sense of development, the e-government platform should be a knowledge management platform. That an electronic service platform blended with knowledge management will replace the control manipulated by people. The government above is a learning organization, which is concise, orderly, with high efficiency, to serve the public, and responsible for the society. And the public can use this platform with unitary entry at any time, for inquiring and transacting the information service needed, and the services program would be started up by intelligent agent at right time. In the e-government system platform, which the ontology is the core of; consulting subsystem plays an important roll. When the social public use the e-government platform to inquire the government regulations system, the state laws and regulations, national and local economic information data, and state and local

implementation plan, the traditional manual answering mode in the face of similar questions, needs to cost the government full-time personnel much energy for processing.

Therefore, we come up Web-based auto answer consulting system architecture; the system can break the boundary of organization between administrative organs, automatic answer a variety of questions from public, to drastically cut government personnel administration work out and funding. In function system, this consultation system can use the B/S based structure of the three layer of network. The front of system is the user interface of software application; it supports the user's multimedia interactive session needs. The back end can be divided into two parts, A parts is storage type auto answer subsystem based on database; B part is the automatic response subsystem based on natural language semantics understanding. When user enters the interface of consultation system through the e-government platform, the system process will search questions in the question library which is a part of part A, and where the questions of user are sent. If there is the storage index of questions, extracts the matching problem solutions from the answer database; else if there isn't the storage index of this problem, the system process will transferred this problem to part B to proceeding semantic analysis. B subsystem have the field knowledge base of government's information, can analyze the key words in user's questions, judge and analyze the users' the essential significance of the problem. On the basis of this, extract associative content from the field knowledge base for answering. If this can't completely analyze the semantic of user's questions, answering: no comment!

### II. STORAGE-TYPE AUTOMATIC RESPONSE ARCHITECTURE

The administrative standardization of the government work determines that, there are limitations, effectiveness and similarity in social public consulting problem to a large extent. Limitations means a large number of questions can be clearly divided to the compass of some department. Effectiveness means many of the problems in a certain period may focus on the current social hot issue. Similarity means some questions may have different expression, but the proving significance of the problem is consistent. Because of

the above characteristics, based on probability and statistics at first, the system should assemble and record the amount of daily social public inquiry information to construct a questions library. The questions library has self-learning function. After getting the user's questions, it enters the retrieval function module, and searches in questions library to find whether there is a corresponding key words. If so, the data flow turns to answer database, and then takes out the answer content to users' questions. If there isn't the same semantic question with users, the question will be classified and then be added to the questions library. The data flow turns to the part B, and new questions join to the questions library. The maintenance personnel sort through questions at regular time, and add the corresponding answer to the answer database. Storage type automatic response system architecture is shown as in Fig. 1.

In this system architecture, retrieval is an important process. When retrieving, it uses the keywords which have characteristics of the category rather than simple keywords. It is easy to improve the speed and accuracy. During retrieval process, it can build the fuzzy matching algorithms with a knowledge function, to expand identification range. Semantic simple analysis, questions class analysis can be put in the Web server. The semantic analysis module function can simplify and assemble a lot of key words' meaning with the same semantic. Such as "to ask", "want to ask", "excuse me", etc. These words have little difference in semantic each other, it can conduct the simplified recognition. And the problem class analysis module adds the corresponding class number based on the semantic of questions. This provides convenience for classing during retrieving and storing.

### III. THE ARCHITECTURE BASED ON THE SEMANTIC ANALYSIS

Auto answer subsystem based on the natural language semantics understanding, can be divided into the following several parts.

- Users' questions analysis subsystem: According to the statistic of the interrogative rules, common questions corpora and relevant context, combining with domain thesaurus terms and the resource of relevant semantic, grammar, analyze the question entered by user, after screened possible ambiguity, the relation of reference, it provides a relatively clear semantic information set.
- Dictionary and knowledge base: used for storing the limited and unrestricted areas of knowledge resources.
- Xml service sub module: The process and processing of system can use XML statements to developing, and can storing the areas of knowledge in XML database. Because of the advantage of the XML database, it can proceed a effectively accessing and managing to half-and-half structured data, and can provide the operation of label and path. When the data itself has level characteristics, XML data format can express clearly the level characteristics of data.

So choosing and using XML database provides a more flexibility of the data operation.

- The answer processing module: it analyzes the semantic relations between answers and the system can do the merger and cuts properly.
- Knowledge resource management module: this sub module manages, organizes and coordinates the operation of the other modules. And this module contains the knowledge information, this knowledge information have logical semantic judgment, the language rule judgment, the box price judgment, the concept judgment, etc..

By means of the proceeding division of the above function module, the got semantic information can still cause ambiguity possibly. So with the help of the multidimensional local context analysis and judgment can eliminate the uncertainty concept. As shown in Fig.2, in the process of several related words collocation, there are several associate phrases behind "my". How to choose needs four-dimensional judgment to eliminate the ambiguous associate phrases.

The semantic constraint constrains from language logic. The connection of the two before and after associated words must comply with the semantic requirements. For example, after the word "my", can connect only the words that have the relate meaning with "my". Grammar constraint constraints from the Lord, predicate, Penn, nouns, verbs of the language. Category constraint is described from the range which the associate words belongs to. The attribute constraint constraints from the properties of object which is selected in some range, such as color, size, appearance, etc.

### IV. THOUGHTS ON THE DEVELOPMENT OF E-GOVERNMENT

In the construction and development of e-government, how to maximize the efficiency of the government, provide service to social public most conveniently, is the development direction in which government use the e-government platform. Based on this goal, the electronic government affairs platform whose main mode is knowledge management arises at the historic moment. According to news reports, the EU researched a creative construction, built a network information service platform through knowledge management concept. This platform can not only deal with government daily things fast and conveniently, but also can be intelligent to deal with the occasional, emergency decision. Refer to the others' experience, can reflect on the shortcomings of our own e-government platform. Facing on the gap of e-government development between Chinese and foreign, from value concept to implement technology, all needs our unremitting pursuit and hard work. We should achieve the goal, which is contact-centric, basing on the data and information, and making knowledge utilization and innovation as the target. In the key technology, we should be in line with the overall planning and the thought that from local sub module to expand to the overall. Automatic response consulting subsystem can be used as a beneficial attempt.

Summarizes many problems in the development of the native e-government, it can be generalized as:

- The e-government concepts of value deviation: e-government blueprint plan is very macro, function and benefit is big and complete. But it thinks highly of hardware construction, looks down upon software management, invests too much, returns very little, has not achieve the goals.
- Lack of e-government unified standards: standardization is the foundation of the e-government construction. On the standardized foundation, can link up every region and various business links organically, and can provide technical standards for each other's work cooperation. But native e-government conducts in the government at all levels and in different departments respectively. There's not a unified strategic planning, resulting in close between different departments. A considerable number of the completed e-government system model isn't unified. This independent, heterogeneous, closed system makes it difficult to realize the inter-communication between each other, so as to become the "information island".
- Digital divide: digital divide assumes the difference between the information wealthy and the information poor. Because of the difference of economy level of development in eastern and western, urban and rural areas in china, the imbalance of human resources, the information construction develops unbalanced; the e-government development of backward area e-government was hampered.

Looking into the future, the e-government in china will get a quick and leapfrog development space under the attention of the party and state leaders. With reference to the international advanced experience of the e-government, adopting the latest electronic network technology can certainly do better in e-government. In order to achieve this goal soon, we suggest taking the following measures:

- Set up government CIO, foreign e-government construction experience shows that, the implementation and development of the e-government must implement legal person responsibility. There should be someone to be liable for the e-government construction with huge investment. Select CIO as the e-government legal responsible person can do a very good planning and coordinate the difficulties and problems in development.
- Establish e-government performance evaluation system. A performance evaluation system for the e-government, can guarantee to maximize the benefit of investment, reduce the waste, use the national information resources faster and better. E-

government performance evaluation system should contain much subdivision, digital quantitative index.

- Implement e-government talent strategy. The informatization of the government work is substantially the modernization of the quality of talent. As civil servants, cannot think that as long as being familiar with government affairs, understanding the computers and Internet use can be engaged in the e-government works. The e-government requires the government workers has the ability of managing comprehensive information, the ability of using information technology, and the ability of be familiar with government affairs working process in complete quantitative electronic technology environment. At present our country civil servant's team is difficult to achieve the quality standards, so that the e-government construction is first necessarily to train the compound talents, who not only understand the information technology but also the government business process. Only talent and technical implementation synchronized advancement construction, will our country e-government undertaking move quickly and well.

## V. CONCLUSION

The construction of e-government is huge system engineering, government agencies changes from the traditional administrative model to the electronic government affairs. The technological change in the application is not enough, the more important things is the revolution of the concept. After breaking the old-style organization structure via technology, how to setting up "to the public as the center of government service" as the core value becomes the evaluation standard, that evaluates whether the electronic government affairs is successful. And better educated and intelligence of the e-government platform construction has a positive and good effect upon the transition of government function, the establishment of the values of servicing the public, the correct evaluation from public.

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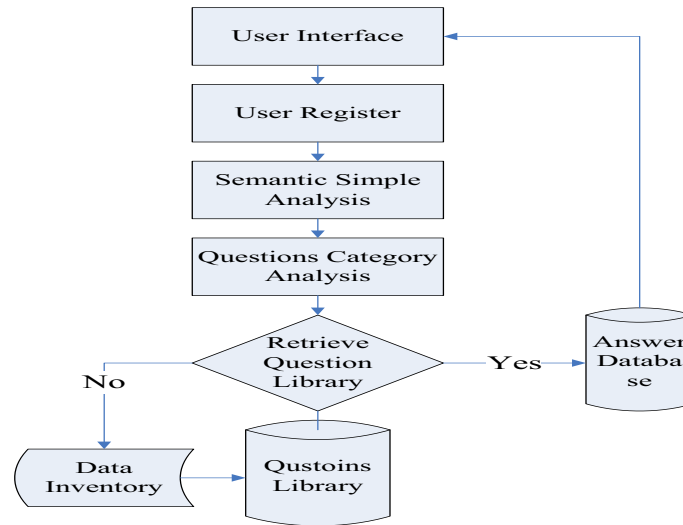


Figure 1. Storage type automatic response system architecture.

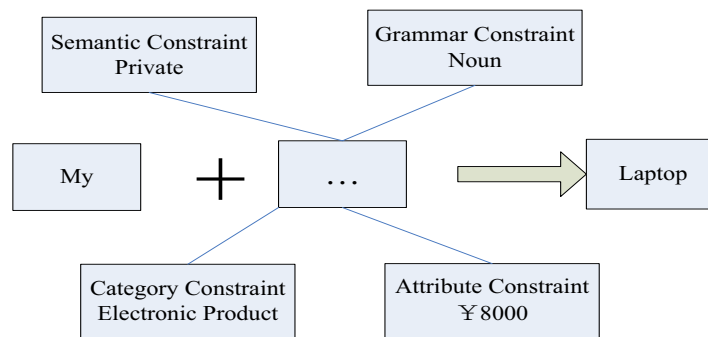


Figure 2. The four-dimentional judgement of associate words.