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# Towards the Development of an Intelligent Management System

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**ABSTRACT**

**This paper presents a architecture and several technical issues of an intelligent management system, which can bridging the substantial gap between the theory and practical of an intelligent management. The particular system, throughout its interactions with executives, automatically generated modules that lead to the accomplishments of executives' changing tasks. The generated modules have new friendly interface. They adapted to executives' role, computer skill, and special task. The adaptive behaviours of the system show that the system is superior to the prevailing systems.**

**Keywords:** Intelligent redesign; Intelligent Management System; artificial intelligent

## INTRODUCTION

Over the last decade, there has been significant development in IMS. Artificial intelligence techniques play important role in this process. The artificial intelligence techniques were advances in 1980 have led to systems that display surprising capabilities and in some cases perform better than experts in the field. Mark S. Fox has ever proposed an overview of the Intelligent Management System [1]. He believed that IMS was an ownership based application, which does not have hassles of paying after regular intervals. It can help users customize the modules as per their requirements and mix and match for the perfect combination. To date, IMS's Examples can be found in many application fields [2-6].

The broad functional goals of the Intelligent Management System include: 1) Providing expert assistance in the accomplishment of professional and managerial tasks, and 2) Integrating and coordinating the management of the organization. Integrating AI (e.g. the experts' knowledge or system) with the experiences of the executives might have more importance than the function for acquiring external information in an intelligent system. Therefore, unlike the prevailing researches

on automatic information gathering, filtering and searching, our research emphasizes on executives participatory and the application of AI.

Our research is concerned with reducing the cost of creating, maintaining, and adding new functionality by means of integration of AI and executives participatory. It is not sufficient to increase the effectiveness of one part of an organization, e.g., managerial, by increasing costs in another, namely programming and system support. Yet much of the software constructed today, while providing increased functionality, also requires increased programming support. Research and development must be concerned not only with functionality but with adaptability.

In this paper, we present a framework and some technical issues of intelligent System with intelligent redesign function. It is organized as follows. Section 2 reviews features of IMS and approaches employed in the prevailing intelligent system. In Section 3, a framework and technical details of intelligent system based on the integration of executives participatory and AI are presented. In Section 5 discusses the direction of our future work.

## INTELLIGENT MANAGEMENT SYSTEM

The major difference between intelligent management system and traditional MIS lies in three aspects. First, the former has unfixed system framework, whereas the latter is fixed one. It has good adaptability. When the user's needs change, classical software has to be rewritten. IMS can alter its processing and responses to fit the changes. Second, intelligent system has the accountability characteristic. Software users are usually unable to question how and why output was generated. It is a major obstacle affected the computer software acceptance. A module in IMS should be designed to explain its actions at various levels of detail, which will allow. Third, IMS is easy to access. The interfaces of MIS are idiosyncratic. It is difficult for users to learn and use the interfaces of a computer system. It is also a hard work for users to be re-educated, when the systems change to meet users' incremental requirements. Users want to communicate with a computer system meaningfully. IMS enables all personnel to realize their willingness. Graceful interface, which can interact with the user and provide guidance and help in deciding what the user needs, should be designed in IMS.

The approaches applied in intelligent management system is different from that used in the traditional MIS, too.

Various methods were employed in information processing, including an adaptive weight method[7], Information Retrieval technology[8], time-driven filtering approaches[9], semantics-based recommender technology[10], dynamic instance adaptation, partial completion and case handling , stochastic and fuzzy Petri Nets , rough set theory [11], and integration of rough set theory and artificial neural network(data mining executives ) [12]. However, seldom methods were really employed in enhancing the ability of MIS's learning. Although IMS and other advanced technologies such as expert system, AI, intelligent agent, machine learning, ANN etc. are closely linked. Thus, IMS has almost been ignored in recent years.

As an alternative, unstructured collaborative office management system, the operator computer management systems, visual programming platform, and visualization management system development platform have emerged[13-17]. They have to be developed by staff members in a

company, if the company is not willing to pay extra costs. They are not intelligent system but programming soft packages needed no programming skills.

## A FRAMEWORK OF INTELLIGENT REDESIGN

Intelligent redesign is a scheme which allows the system can be redesigned without the aid of the computer specialists or developed by staff members in company. The framework is illustrated in Fig.1,

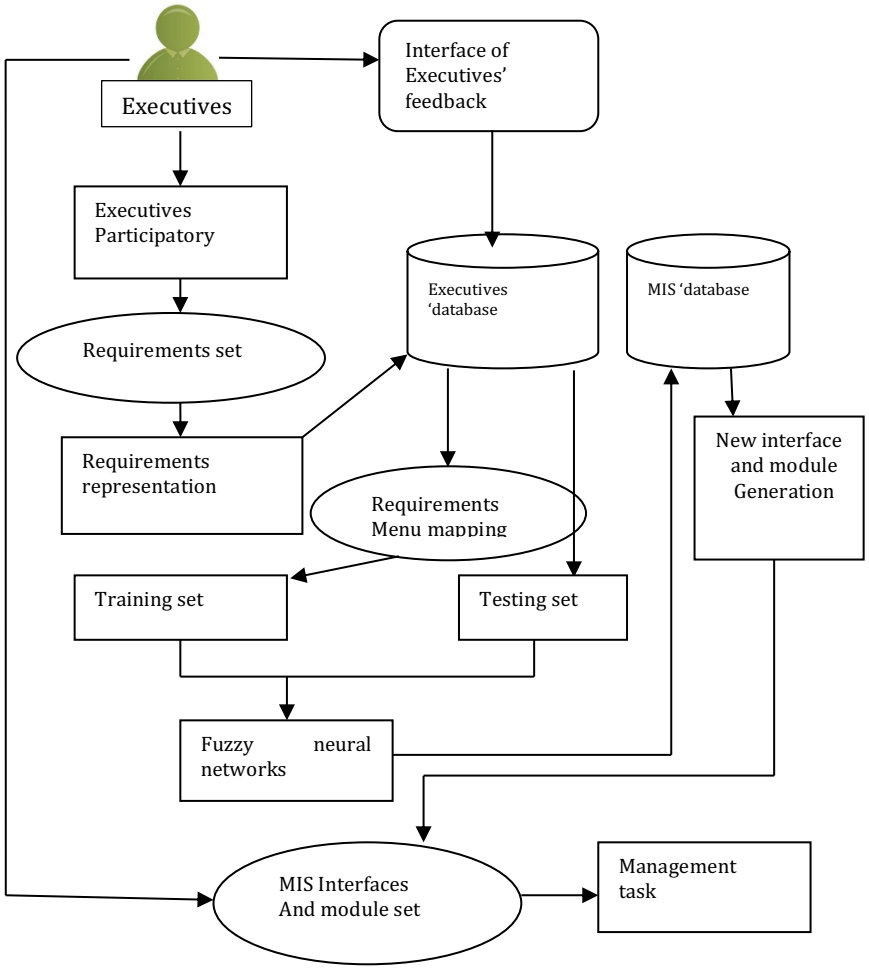



**Fig. 1. key Structure of IMS**

### Executives' feedback

Executives' feedback can be classified into two categories, explicit one and implicit one. Explicit feedback can be collected by the interactive interface which can gather the information about the executives' situation such as, the role in a company, the computer operation skill, how busy he is, etc.. Implicit feedback can be reflected by the log file embedded in the MIS, which can gather the information executives interested. Implicit feedback techniques are often used for query expansion and user profiling in information retrieval tasks. Implicit feedback techniques take advantage of user behaviour to understand user interests and preferences. Oard and Kim[18] classified observable feedback behaviours according to two axes, Behaviour Category and Minimum Scope. The observable feedback behaviours in our system are illustrated by the frequency for each unit in the executive database. Table 1 - 3 shows the detail.

**Table 1 Executives' preferences to button or menu**

| Button or menu name / Action | a | b | c | d |
|---|---|---|---|---|
| Click frequency | | | | |

**Table 2 Executives' preferences to table**

| Table name / Action | a | b | c | d |
|---|---|---|---|---|
| Browse frequency | | | | |
| Query frequency | | | | |
| Print frequency | | | | |

**Table 3 Executives' preferences to column**

| Column / Action | a | b | c | d |
|---|---|---|---|---|
| Select frequency | | | | |
| Edit frequency | | | | |

## Executive' participatory

Three kinds of relationships with the upstream and downstream enterprises are as follows: the Sale and Purchase relationship, service relationship, contractual relationship. According to the software system level, the extent of the executives involved in software can be divided into four levels, i.e. the data layer, the application layer, middleware participation, and system construct participate.

The executives refer to legal persons or individuals engaged in the trading of goods or services for profit. He can be the production enterprise worker, a team leader, foreman, workshop director, president. He can be salesperson, leader, manager, general manager of retailers[19].

Besides the implicit feedback of the executives, the executives' requirements also can be represented by fuzzy membership functions. Executives participate in this process in terms of calibration and fuzzy if-then rules.

Another function of executives participatory is to monitor the result of the redesign of MIS. If the result is not satisfactory, the process will be re-operated until satisfactory result can be obtained.

Since both executives and their requirements will be changed over time, when the change has been made, MIS will be redesigned according to the changed requirements.

## Application of AI

In Unified Theories of Cognition, Allen Newell defines intelligence as: the degree to which a system approximates a knowledge-level system.

Artificial Intelligence, in light of definition of intelligence, is simply the application of artificial or non-naturally occurring systems that use the knowledge-level to achieve goals. A more practical definition that has been used for AI is attempting to build artificial systems that will perform better

on tasks that humans currently do better. Thus, at present, tasks like real number division are not AI because computers easily do that task better (faster with less error) than humans.

The redesign of MIS is a task which human currently do better, whereas current MIS itself can do not do better. How can our framework finish this task perfectly? That could mainly contribute to the application of AI. Here we only resort to the fuzzy logic and artificial neural network. These two methodologies are combined to construct a fuzzy neural network inference system to solve the core problems of MIS's redesign.

## DISCUSSIONS AND FUTURE WORK

In this study, a framework of intelligent system for redesigning intelligent management is proposed, which executives can participate in obtaining the functional module they want.

The contributions of this study are, (1) this research is based on in-depth interviews. It will conduct to the demand analysis of IMS software development. (2)Although the inventory management system is a simple one, its intelligent idea has a major supporting role for the development of enterprises, especially for that of SMEs (small and medium enterprises). Therefore, from this perspective, it has far-reaching significance of innovation for business intelligence management system.

The limitations of this study are, (1) The intelligent management system development work, is still a research prototype, its commercial application is not yet in full swing, which affects the actual promotion of this study. (2) There are some technical details need to dig deeper to come up with better technical solutions. In the future, double fuzzy controller and adaptive fuzzy control should be further expanded.

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