

Research on Design and Appraisal of Management Information Systems

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Abstract

The development and change of MIS's concept are briefly discussed, the theoretical traits of a modern MIS are analyzed in the paper, and a Three-Layer method for designing a MIS with its appraising method is proposed according to the analysis. This method is characterized with "clear theory structure", "easy to make designing and etc.

Keywords

Design, Appraisal, Management Information System

1 THE DEVELOPMENT OF MIS

The developing process of MIS can be approximately divided into the next three stages: the initial stage from 60s to 70s; the widely developing stage from 70s to

the end of 80s; and the ripe stage from entering 90s to now. Here by the ripe we mean not only the maturing of various kinds of techniques and circumstances, but also the maturing of our recognition of MIS, such as its systematic characteristic, the significance of standardization in MIS designs, and the full utilization of existing resources of both software and hardware.

2 THE THEORETICAL DESCRIPTION OF MIS

Let $I = \{i_1, i_2, \dots, i_N\}$ be the set of inputting information of various types (where N is the number of types of information); let $SO = \{SO_1, SO_2, \dots, SO_P\}$ be the set of objectives that MIS will reach (where P is the number of Objectives); let $M = \{mf_1, mf_2, \dots, mf_K\}$ be the set of managing functions in MIS. Then we can express the relationship of the three parts in MIS by next formula :

$$S = \{I, M, SO\} \quad (1)$$

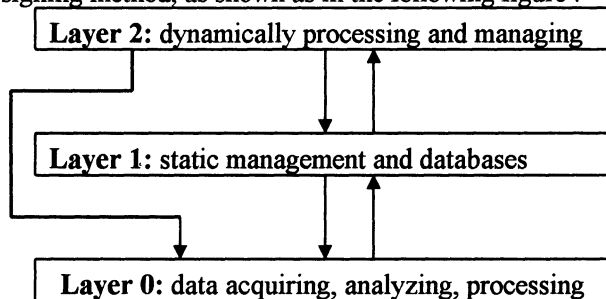
Formula (1) indicates that MIS consists of three items: I, M and SO, where the SO is reached through Function M processing input Information I, calculating and judging statistical data, making assistant decisions and etc. Clearly, DSS (Decision Supporting System) and IS (Intelligent System) and other concerning Management Science should be included in M. The final output of MIS as a S can thus be expressed by Formula (2):

$$O = M(I, SO) \quad (2)$$

From both the two formula (1) and (2) and the above description, we define MIS as such a system that people can make use of any type of techniques to reach its management objectives through a series of *processing operations over culled data or information got with any methods.*

3. THREE-LAYER DESIGNING METHOD

We put forth here a systematic guideline of how to make effective MIS's designs, i.e. Three-Layer designing method, as shown as in the following figure :



The layer 0, i.e. physical layer, is in deed the interface between MIS and the outside. Layer 1 contains mostly software techniques, distribute database designing, the design of application programs, algorithms, and various data structures and etc. The third layer, layer 2, is practically the key contents to reach systematic objectives, which involve generally Operational Management, Decisive Theory, Optimization, Expert System, Information Theory, and other available developing method and theory.

4 APPRAISAL

The appraisal to the designs of a MIS is carried out mainly according to the three aspects: The theoretical level of MIS schemes; Necessity and adaptability to users; Economical feasibility to users. We put forward 28 technical indexes used in the appraisal of MIS schemes with three available calculating methods. Suppose the

mark of each index j for a scheme be N_j , then the MARK of Fussy Weighted Method is, $MARK = \sum_{j=1}^{28} W_j * N_j$, W_j is the weight of index j .

5 CONCLUSIONS

By summarizing the above description, we make our conclusions as the following: Clear system objectives make it convenient to do system analysis and design. Relatively independent contents in each layer make us to fully utilize the existing equipment and resources. The three-layers make it easy to locate problems that may occur in MIS implementing, and to make system maintenance, and consequently to save maintaining expenses and shorten maintenance period.

6 AUTHORS' BIOGRAPHIES

Li Xuewei, born in 1962; got his bachelor degree majoring in Ecelectronics in 1982, master degree in Computer Communication in 1987, ph D in Economic Modeling in 1990; published more than 40 academic papers; his current research interests: Economic Forecasting, Modeling Financial Time Series, and MIS designs.

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