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Development of a Hospital Financial Analysis System Using Rule-Based Engine

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Abstract

The financial analysis is needed to evaluate efficiency in hospitals. A prototype using rule-based engine was developed and the results of the user evaluation suggested the effectiveness of the system.

Keywords:

financial management, computer reasoning, rule-based engine

Introduction

The financial analysis is a method to analyze the financial status of companies. It is used both for external analysis and for internal analysis to evaluate the status of one's own company. Hospitals, which are non-profit organizations, are required to manage efficiently these days, and the financial analysis in hospitals is needed. Financial analysis by computer systems is expected to save cost and time for hospitals. The objective of this research was to develop a financial status analysis system for hospitals.

Methods

Requirements

The mandatory functions to analyze financial status in hospital are to be segmented as follows: 1) Define Indices 2) Calculate Index Values 3) Evaluate Index Values 4) Find Root Cause. Rule-based engine and forward chaining was thought to be suitable for the financial analysis, because of the characteristics of the financial data which can be obtained as a group of data, and the characteristics of the financial analysis of which the knowledge system is relatively simple.

Prototype system

A prototype using a rule-based engine and forward chaining was developed. Figure 1 shows the architecture of the prototype.

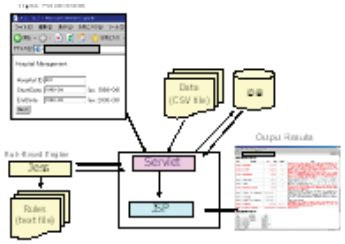

Figure 1 - Architecture of the Prototype

Jess[1], a rule-based engine described in Java was adapted. 16 financial indices were selected and defined in rules. Rules to calculate and evaluate the index values were also set in rules. Decision tree analysis was developed to infer the reasons why the operating profit was less than the threshold value by using the relationships between the indices.

Evaluation

5 end-users joined the evaluation of the prototype. All 5 subjects agreed to the evaluation item "Evaluation of the index values are reasonable". 2 subjects chose "I agree" and 3 chose "I agree a little" for the item "the system can analyze the financial status comprehensively." It showed that the results analyzed by the prototype suit the results analyzed by users.

Results

A possibility of the hospital financial analysis system using rule-based engine was shown. Rule-based engine is expected to solve the root problems in hospitals.

References

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