Maintenance Decision Support System in Small and Medium Industries: An Approach to New Optimization Model

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Summary
Maintenance management is one of the main focuses in industrial sector. Many maintenance functions with varieties optimization models have been proposed to aid maintenance management. However, there are limited models have been implemented in small and medium industries (SMIs). The data problems and the gap between theory and practice have always become a reason. In this paper, a new maintenance optimization model has been used to carry out the computations for calculating frequency of failures and downtime as the maintenance data problems using decision making grid (DMG) with fuzzy logic in maintenance decision support system (DSS). Next, SMIs can use this system to support their maintenance decision process.

Key words:
Small and medium industries, decision making grid, fuzzy logic, maintenance decision support system.

1. Introduction

The importance of maintenance functions for maintenance management in commonly industries has growing rapidly. A lot of researches and publications in the field maintenance decision models have been published to improve the effectiveness of maintenance process. As a part of research project for maintenance decision support system in small and medium industries, we have collected the related publications in those areas.

The trends shown there are limited models have been implemented in industrial maintenance process. Although the improvement of IT (both software and hardware) can support to easy develop of the system with lower cost and systematic modules, it is limited work has directed toward developing into operational applications such as computerized maintenance management system (CMMS) or DSS. It can be said that the impact of decision making within a maintenance organization has so far been limited. The data problems and the gap between theories and practice have always become the reason.

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In order to increase the effectiveness of the units, DSS is needed to simplify the analyzing process and to reduce the time needed for make a maintenance decision. The aim of this paper is to propose a new optimization technique for maintenance decision support system for analysis CMMS data to support SMIs maintenance decision process. Choosing and optimizing maintenance strategies is of for most importance in maintenance management. The paper established DMG with fuzzy logic for maintenance strategy and introduces a decision support system in CMMS application. Figure 1 shows the steps to discover decision and knowledge from CMMS database.

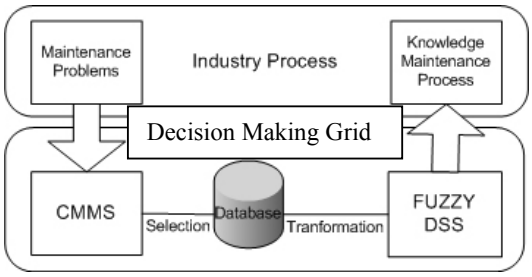

Fig. 1 Fuzzy-DSS process.

2. Related Work

Maintenance optimization is the process to attempt the balance of maintenance requirement such as legislative, economic, technical or others. The goals is to select the appropriate maintenance technique for each piece of equipment in the system and identifying the periodicity that the maintenance technique should be conducted to achieve the best requirement, maintenance target concerning safety, equipment reliability, and system availability/costs. Reference [1] has presented various resources in the field of maintenance optimization models as shown in figure 2.