

Chapter VII

Conclusion and Recommendation

7-1 Conclusion

The Decision Support System for Maintenance Planning is developed in purpose of helping a decision-maker to select and to plan the maintenance tasks. It aims to optimize the costs of maintenance and the equipment performance. The development of the DSMP requires the information and knowledge of the machine, the maintenance policies, and the process of maintenance planning and scheduling. The maintenance data, such as the machine failures and the preventive tasks, as used for supporting the DSMP programs in the planning or analysis activities. The knowledge of the maintenance planning and scheduling process and the maintenance models are used in developing the DSMP programs. It makes the system to be capable to support a decision-maker in the maintenance planning and scheduling activities.

To develop the DSMP, the knowledge and information are acquired from various sources. The knowledge of the maintenance planning and scheduling process is collected by interviewing from the experts. It is also applied from the theory in the maintenance textbooks. The knowledge of the maintenance models is collected and applied from the research papers and the textbooks. The maintenance data in the database of DSMP are collected from the past data records and the machine manual.

The knowledge and information regarding the maintenance planning and scheduling are used to define the decision models. These decision models are used for creating the knowledge base and programs in the DSMP. After defining these decision models, the DSMP architecture is designed. The structure of the DSMP is composed of the data, the knowledge base, the model, and the dialog components. The designed structure of DSMP is implemented into the application software by using the Visual FoxPro.

After developing the DSMP, the system is implemented to solve the problems in the maintenance planning of the printing machinery. The implementation of DSMP is performed by simulating the past production and maintenance data in the printing process into the DSMP software. By applying the different maintenance policies and the simulated conditions, the capabilities of the DSMP in the maintenance planning are evaluated. The DSMP can demonstrate its capability and usefulness in supporting a decision-maker to

make and to select the maintenance plan and schedule. The benefits of the DSMP in the maintenance planning and scheduling can be concluded as the following.

- Selecting the suitable preventive tasks by comparing the costs of preventive tasks and the costs of related machine failures and considering the effects of machine failures.
- Identifying the optimal frequency to perform each preventive task based on the information of related machine failure.
- Setting the maintenance plan and schedule.
- Monitoring the costs and performance of the maintenance work and the equipment by summarizing the maintenance work report and calculating the maintenance costs and the performance indexes.

Although the knowledge and data regarding the maintenance planning are collected and applied for creating the DSMP, these knowledge and information can be changed or updated. The maintenance data, such as the failure rate of machine, require a lot of historical records to be more reliable and accurate for calculating the maintenance failure indexes. The process of the maintenance planning can be changed depending on the different conditions of the operations. As a result, to maximize the performance of the DSMP, system needs to be developed continuously by updating the maintenance information in the database and changing or adding the knowledge in software programs.

7-2 Recommendation for further development

The recommendations for further development of the DSMP are presented as the following.

- (1) To increase the performance and reliability of the DSMP in calculating the machine failure indexes, more information of the machine failure records need to be added in the database.
- (2) More maintenance index models, such as the performance of the equipment, should be applied to the system. This increases the capabilities of the DSMP in analyzing the maintenance performance.

- (3) More knowledge of the maintenance planning process and the maintenance policies should be added in the knowledge base. This can help to increase the capability and flexibility of the DSMP to apply with the other different operations.
- (4) The priority of the maintenance tasks and the machine failures should be considered in the maintenance planning process. This will increase the effectiveness of the maintenance plan.
- (5) The graphic reports, such as chart or bar, should be added to the system in order to increase the effectiveness in presenting the output results.
- (6) The architecture of the DSMP can be used as the prototype to develop the software for the other operations, such as production planning and inventory control.



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