

The Design and Actualization of the Vehicle Management in Shandong Juneng Heating Company

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Abstract. The paper, in answering for the actual needs of Shandong Juneng Heating Company, analyses the vehicle management system, constructs the model utilizing UML; designs the database based on the Erwin mechanism and constructs the vehicle management system based on B/S model, in which such data as applications, approvals can be edited, statistically analyzed and printed.

Functioning analysis

Shandong Juneng Heating Company is a small-scale company functioning in electric power generation and heat supplying. The Company owns seven subsidiary companies which demands a scientific management of its vehicles. Based on our analysis, a chart for vehicle management system is drawn as follows:

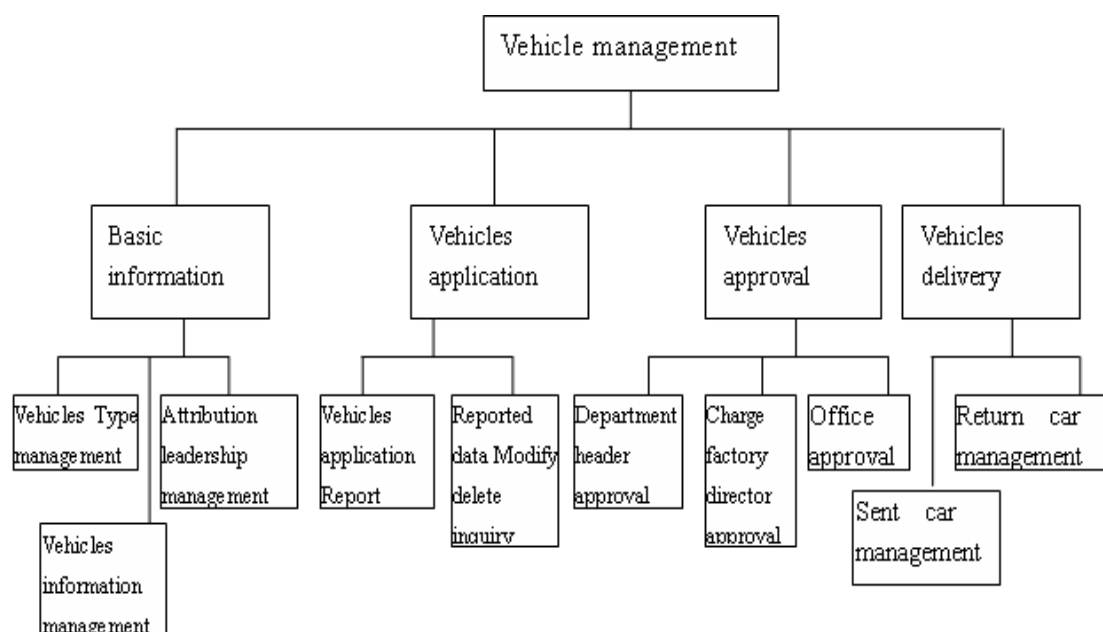


Chart 1 Breakdown of Vehicle Management Functioning

Sample Analysis

The system comprises four different roles: system administrator, applicants in subsidiary companies, departmental approver, dispatcher and returning person, in which the sample table for the role of administrator is shown in Chart 2, the rest of it looks similar:

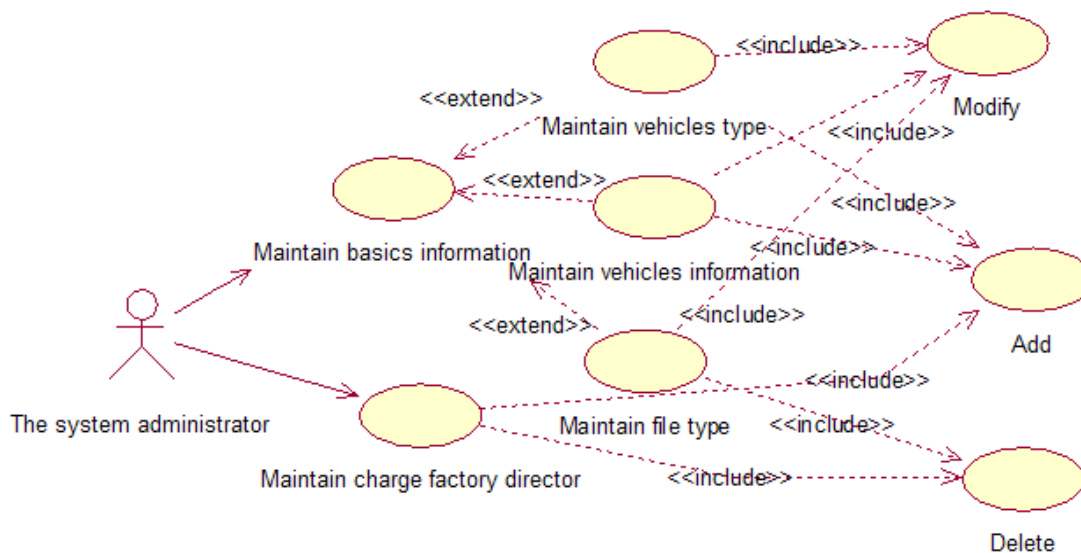


Chart 2 Sample Table for the Role of Administrator

Static Structure Analyses

Based on the sample model, the static model for vehicle management (i.e. categorical model is abstracted, which is shown in Chart 3

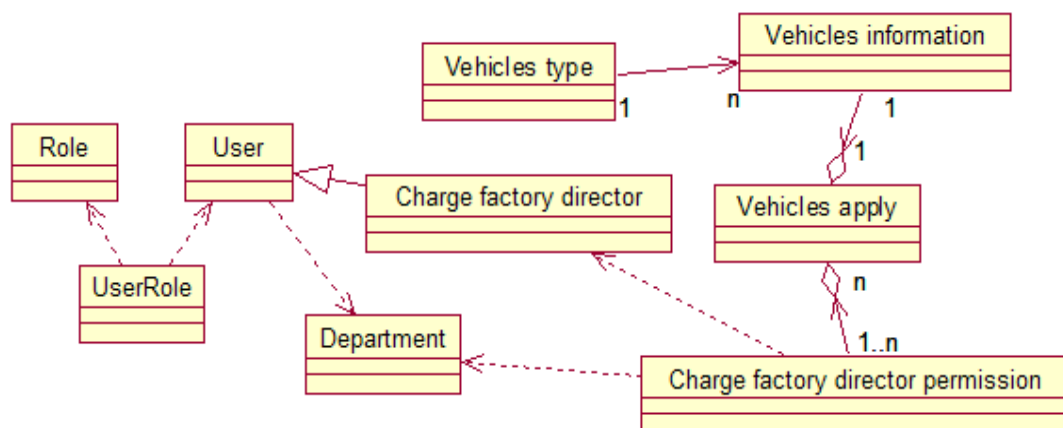


Chart 3 Categorical Model for the System

Dynamic Structure Analyses

The Vehicle Management System comprises such procedures as application, multi-level approval, dispatching, and returning. After the applicants in the subsidiary companies fill out the application forms, the departmental managers examine and approve these applications, and then the managers of each subsidiary company examine and approve the information approved by the departmental managers; the director of the general office examine and approve the information approved by the subsidiary companies. After the approval from the general office, the vehicle dispatcher sends out the vehicle, in which case the system will prompt the applicant to take the vehicle. Afterwards, the applicants need to return the vehicle after using it to the dispatcher. The specific procedures are shown in Chart 4:

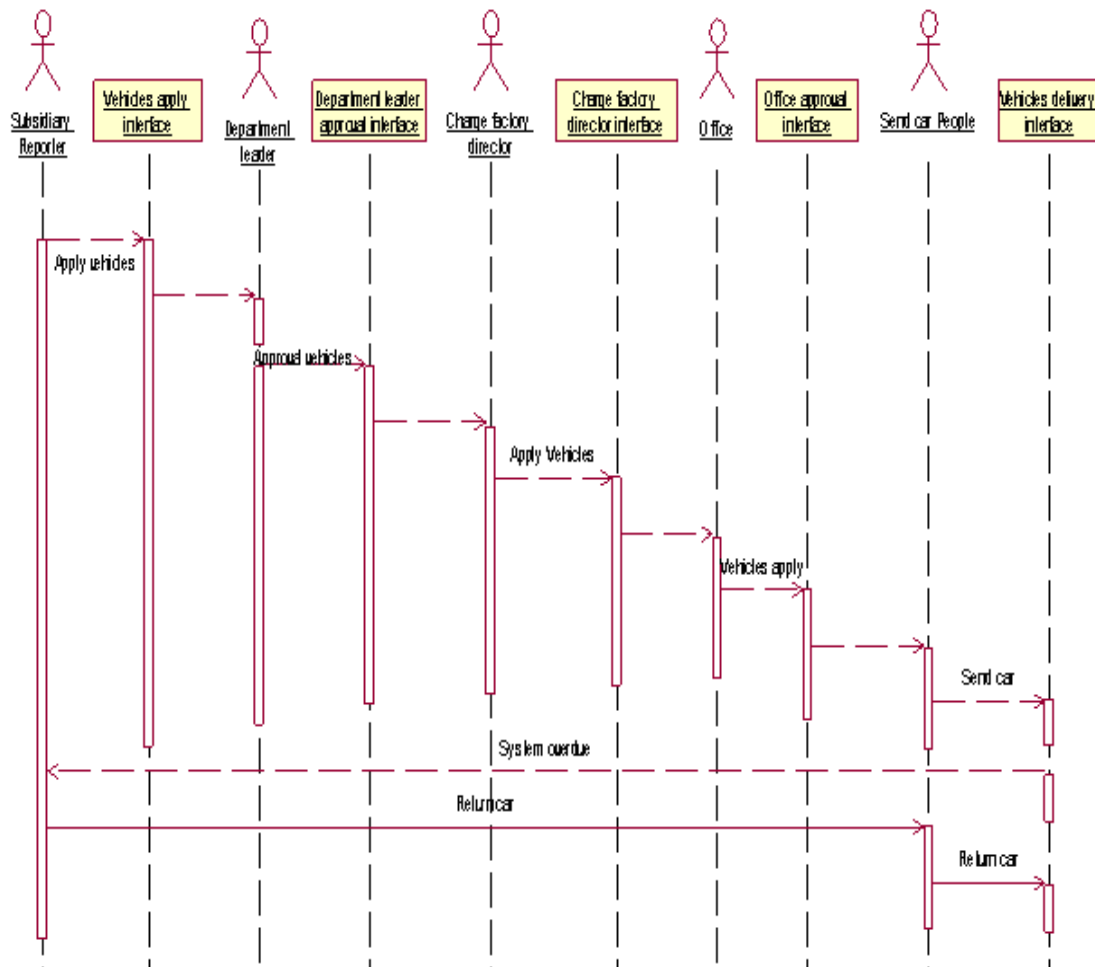


Chart 4 The Procedure of Vehicle Management

Logic Database Design

Through analysis, the entities involved in the vehicle management system are determined, and the entity-relationship diagram is drawn by utilizing Erwin, which is shown in Chart 5:

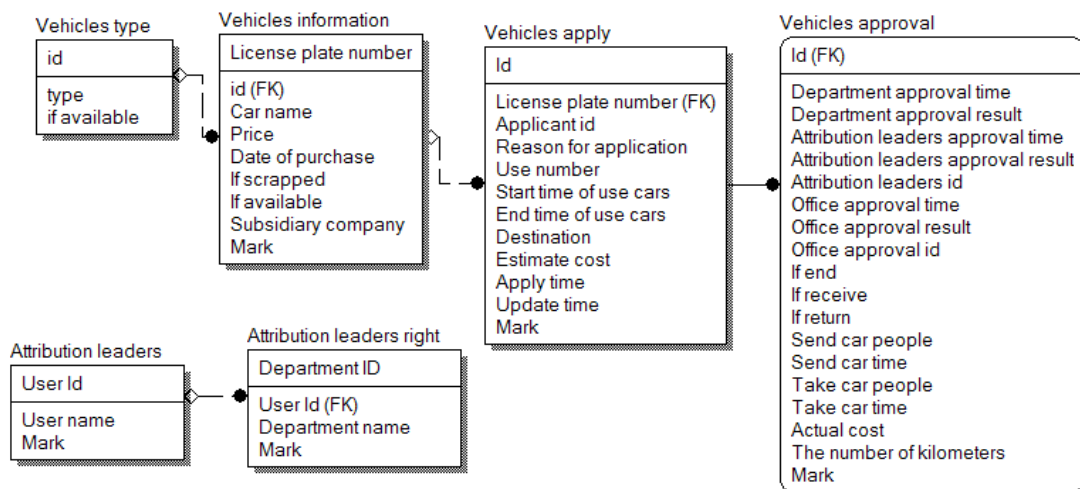


Chart 5 The Entity-relationship Diagram

Physical Database Design

Based on the logic model of the database, by using its own data dictionary, and the forward engineering of Erwin, the logic database model can be converted into physical database model, which is shown in Chart 6:

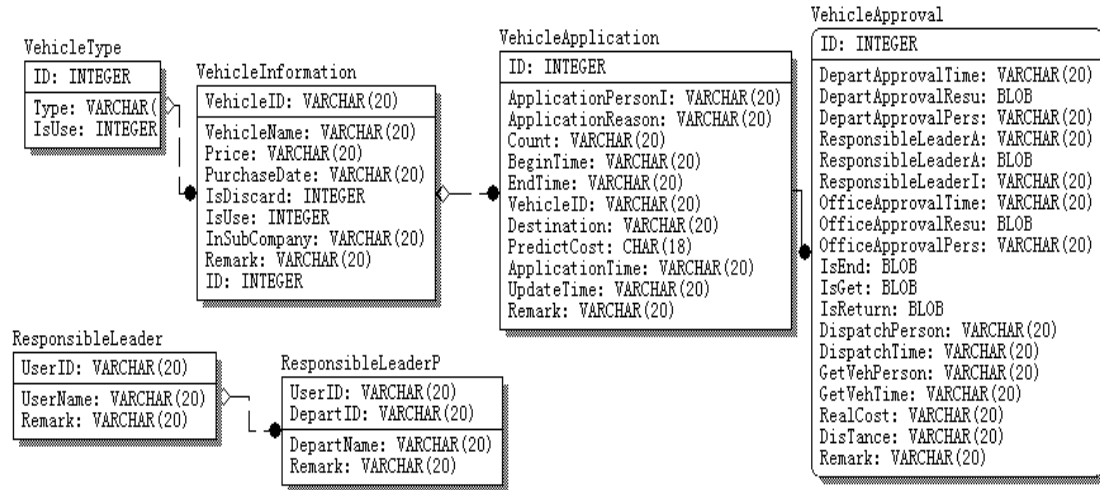


Chart 6: The Physical Model for Vehicle Management

Software System Structure Design

The system adopts a three-layer structure: presentation layer, business layer, data layer, and designs the software based on B/S model. Under such structure model, the user job interface is actualized through the www browser. A very small part of the job is done at the front-end while most part of the business logic is down at the server, in which case the workload of the user computer is greatly simplified, the cost of system maintenance and updating as well as the workload are significantly reduced. The overall cost of the client is thus reduced.

System Actualization

The system is developed through .NET platform. The interface of vehicle application is shown in Chart 7. The upper part of the page is for the application for vehicles while the lower part is the management for information modification, deletion, consultation, and examination and approval.

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Chart 7 The Interface for Vehicle Application

Conclusion

The Vehicle Management System is a sub-system of Shandong Juneng Heating Company. Comprehensive thoughts are given when designed to the server, the database, the application programs, and the users. It is mainly applicable to the B/S model. Rigid reference integrity and database structure are being established. The trigger, storage process, constraint, rules and business are integrated into the design of the database, which improves the background management and efficiency, classifies database security to achieve scientific management. The security level of the database is improved, redundant data is reduced. The system has higher data conformity, operability, safety, and thus popularization value.

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