EnterpriseFleet_Bora_Hamarat. pdf

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Enterprise Fleet
Management System

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I. PROJECT DEFINITION AND MANAGEMENT

A. Definition

An Enterprise Fleet Management System that will enable companies to manage leasing, fuel management, accident management and maintenance management services.

B. Purpose

To create a corporate vehicle management system that reduce clerical personal costs and has an improved client access to understand and analyze the demands of companies on many issues and to produce solutions to their needs in the most effective way.

- **Tangible Benefits:** 4 percent savings in operating costs. 7 percent savings in data storage costs.
- **Intangible values:** improved vehicle service, advanced interface page, faster advertisement of the company, quicker access to the customer.
- **Key people:** Programmers, database developers, team members, presidential committees, managers.

C. Scope

- **a)Information:**To improve the quality of service by building a management system for companies to better organize their services, as customers receive insufficient service in vehicle service.
- **b)Focus and statement:**create a management system where companies can organize their vehicle services effectively. Will be involved in the project: a database system that contains the information of the customers according to the service received, the emergency support team for the emergency situations of the customers, the team that will get permission from the government institutions for official transactions. The team that will collect the personal information of the customers from the relevant government agencies. Won't be involved in project: adding any additional element outside of the agreement.
- **c)Supporting Details:**We started project in April, and we wanted to have it done by May 31st. Regarding deliverables, there are 2 main things that we want to deliver: Databases and all necessary software, official teams to provide necessary corporate services.

- **d)Key people:**Programmers, database developers, team members, presidential committees, managers.

D. Constraints

- Project start in April. All resources must be available by March 20st. Project must be done by May 31.
- Project's cost of technical sources and employees is up to 500,000 dollars .
- Database storage must up to 1000 GB and unnecessary data must be avoided.
- 2 database server, 200 computer, 30 programmer and 350 team member is essential as resources.

E. Actor Glossary

1) **Company:** The primary actor that in the consumer side. Company benefits from the application. Arrange service requests and its information. Can choose many types of service requests.
2) **System:** The secondary actor that deals all information comes from companies. Takes information from database. Checks and informs the management.
3) **Management:** The secondary actor that takes all requests from system or directly company by type of service and evaluates them. If service request is leasing vehicle. It takes request directly from company to takes extra information from company about specific issues. In the end. Provides feedback to the company about service requests.

F. Use Cases

- **1.Registered requests:** The use case which is controlled by registered companies. It provides functions for the system to detect company users who have previously created a request on the system, to create a new request, to manage their previous requests, private information about the company and information about the vehicles registered in the system. The created new request information, new vehicle information, new special information is added to the database by the system. After the company's request to change previous information, the system makes these changes in the database.

2.Non-registered requests: The use case which is controlled by non-registered companies. It includes the functions offered to the company user who will create a service request through the system for the first time. After the company is registered in the system, it can create a request by providing the necessary information for vehicle or fleet leasing service, fuel management service, accident management service and maintenance management service. If the company is going to create a request for one of the vehicle maintenance services, the system requests the information of the vehicle to which the maintenance service will be applied. After the request is created, the system adds this request to the database required for evaluation according to the type of request.

3.Evaluate vehicle management requests: The use case which is controlled by Management and system actors. Main task of this use case is to deal with vehicle maintenance requests of user companies. The system actor is the first to deal with fuel management service, accident management service and continuity management services, which are the services that companies can create related to vehicle maintenance. The task of the system is to extract and organize these services and transfer them to the management actor. Taking this responsibility by the system will save time and money for service providers. The functions that this use-case provides to the management actor is that the management receives these requests evaluates them and provides feedback, as in leasing requests.

4.Evaluate leasing vehicle requests: The use case which is controlled by Management actor. It includes functions that provide management to control and evaluate the fleet and vehicle leasing requests from the user which is company and provide feedback to them.

II. REQUIREMENTS ANALYSIS

A. Non-functional Requirements

- **a) Opertating:**
  1.1: The system will operate in windows environment.
  1.2: The system database should be able to reach every client's information.
  1.3: The system database automatically back up at the end of every day.
  1.4: Companies should reach their information wherever they want.
  1.2: In order to analyze and evaluate the requests of the user companies, information about their tools and corporate information is needed. Therefore, the system database must have access to the information of every user company that wants to receive any fleet service request.
  1.3: A backup of the database should be saved at the end of each day in order to minimize the possibility of any system or user-related data loss in the database.
- **b) Performance:**

2.1: The system should send information message about company's service to the company in 2 minutes after client adds request.
2.2: The system should delete the company's information in 5 seconds after company create service cancellation request.

- **c) Security:** 3.1: Only system and authorized employees can set, fix and update company's information.
  3.2: Every company can create service deletion request for only their own services after verification.
  2.1: The period of informing the requesting company about the outcome of the service request, which is evaluated by the management and reached the conclusion, should be as short as possible to maximize user company's satisfaction.
  2.2: The information change request of the user company who wants to update any old request, registered tools and corporate information registered in the system should reach the result as soon as possible for the accuracy of the next transactions to be made.

B. Functional Requirements

- **a) Manage company's information:**
  1.1: New company gives information.
  1.2: Company updates information.
  1.3: Company deletes information.
  1.1: The company that will make a request through the system for the first time enters the corporate information about the company into the system in order to be registered in the system.
  1.2: A registered user company can update their old corporate information with appropriate new information.
- **b) Manage company's services:**
  2.1: Company creates new service request.
  2.2: Company updates current service.
  2.3: Company deletes current services.
  2.1: The user company can make a new request for a new vehicle leasing service or one of the vehicle management services by entering the necessary information into the system.
  2.3: The user company requests cancellation for any service request that it has previously created and is in effect.
- **c) Manage company's vehicle information:**
  3.1: Company adds new vehicles.
  3.2: Company updates current vehicles.
  3.3: Company deletes current vehicles.
  3.1: The user company who wants to create a request for any vehicle maintenance service enters the information of the vehicle or vehicle group to which the maintenance service will be applied.
  3.2: The user company updates the information of any vehicle or vehicle group that it has uploaded to the system for previous requests with new information.
- **d) Evaluate vehicle management service requests:**
  4.1: System checks company's information.

4.2: System checks vehicle information.

4.3: System checks service request.

4.4: System determines the type of the request.

4.5: System sends an information message to management.

4.6: Management evaluate the service request.

4.7: Management provides feedback to establishment

4.2: For any vehicle maintenance service request, the system checks the information of the vehicle or vehicle group to which the service will be applied and compiles and organizes the information.

4.4: The system determines whether the vehicle management service type is fuel management, vehicle maintenance management or accident management and adds it to the appropriate database for evaluation by the management.

- **e) Evaluate leasing requests:**

5.1: Management checks company's information.

5.2: Management checks leasing request.

5.3: Management evaluate leasing request.

5.4: Management provides feedback to company

5.1: The management member checks the information of the company requesting the leasing service in order to be able to contact and return in case of any extra information.

5.4: After the evaluation of the leasing request, the management member informs the company about the status of the request.

III. FUNCTIONAL MODELING

A. Use-Case Diagram

Vehicle Service System Use-case

B. Use-Case Description

1) Use case Diagram describes the interaction between companies which benefits from system and management, system which provides fleet management service and manages all request comes from companies. User companies are divided into registered and unregistered, and the functions they can use at the stage of creating requests, managing their requests, and managing their personal information are specified. There are also two actors who will process and evaluate the incoming requests and provide feedback. These actors are management and system. The functions they will use differ depending on the type of demand. The system only has the function of editing for vehicle management requests, while the management has both the evaluation function for vehicle management requests and the direct receive and evaluation function for leasing requests.
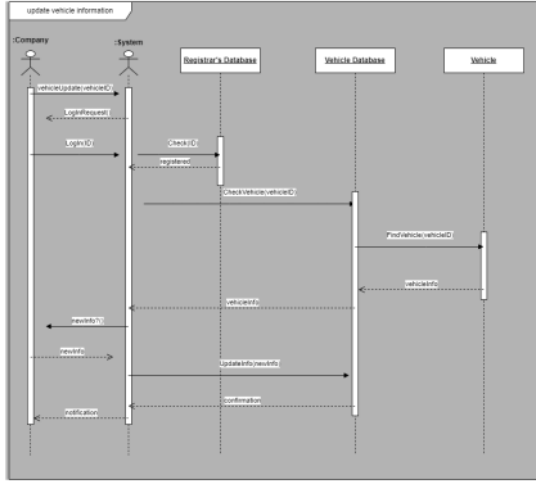
2)
- **Use case name:** Manage registered requests.
- **ID:**2
- **Importance Level:** Low
- **Primary actor:** registered company.
- **Use case type:** Real/Overview
- **Stakeholders and interests:**

  a) Registered company:Makes new service request and updates its information.

  b) System:Process data from the company.

- **Brief description:** The use case describes how a registered company makes new request and update information about them.
- **Trigger:** A registered company logs in to the system and attempts to make a new request.
- **Type:**
- **Relationships:**

  a) Association: Registered company

  b) Include:

  c) Extend: update information, leasing request

  d) Generalization: Manage requests

- **Normal flow events:**

  a) A registered company logs into the system.

  1.A registered company logs into the system.

  2. System takes company's information.

  3. System returns the previous requests and registered vehicle information of company.

  4. Company chooses the action it wants to take.

  If company chooses to update information: Execute update information.

  5. System asks company if its request is leasing or not.

  If company's request is leasing: Execute leasing request.

  6.Company makes a service request.

  If type of request is buying and selling.

  S-1: Add request to buying and selling database.

  If type of request is vehicle accident management.

  S-2: Add request to vehicle accident management database.

  If type of request is fuel management.

  S-3: Add request to fuel management database.

- **Sub flows:**

S-1:Add request to vehicle maintenance management database.
1.System receives vehicle information to apply vehicle maintenance management service.
2.System takes request information.
3.System adds all information to vehicle maintenance management database.
S-2:Add request to vehicle accident management database.
1.System receives vehicle information to apply vehicle accident management service.
2.System takes request information.
3.System adds information to vehicle accident management database.
S-3:Add request to fuel management database.
1.System receives vehicle information to apply fuel management service.
2.System takes request information.
3.System adds information to fuel management database.

C. Activity Diagrams

- **Get company's information:**System gets the information of company that want to make service request. Checks registered database to make decision whether it is a registered company or a new company.
- **Update company information:** A registered company update its old information that registered in the database.
- **Check type of request:**System checks the type of request that company wants to make. Decides whether type of request is leasing service or one of vehicle management services (fuel management, accident management, buying and selling management).
- **Create leasing request:**Company create a new leasing service request. System gets the information about request and creates a new leasing service request for this company.
- **Update leasing request:**Company requests to update information for its one of available leasing requests. System checks for new information and updates the request.
- **Delete leasing requests:**Company cancels its available leasing service request and system deletes it all information about request from leasing service database.
- **Check vehicle information:**The system checks if the company that wants to make a request for one of the other services has at least one registered vehicle in vehicle database or not.
- **Update vehicle information:**Company requests to update for its one of registered vehicle information. System finds this vehicle in vehicle database, takes new information from company about vehicle and makes change for this vehicle.
- **Add vehicle:**Company requests to add a new vehicle to use it for its other service. System takes vehicle information and create a new vehicle for company.

- **Create vehicle management request:**Company requests to create a new service for either the fuel management service, the accident management service, or the maintenance management service. The system receives the request information, checks the request type, and adds it to the appropriate database according to the request type.
- **Update vehicle management request:**Company requests to update for its one of vehicle management requests. System finds service request in appropriate database, takes new information about service from company and change service request information.
- **Delete vehicle management requests:**Company requests to delete one of its vehicle management requests. System finds service requests in appropriate database and deletes it from database.
- **Create company information:**A non-registered company gives its company information. System takes information and adds it to registered company database.
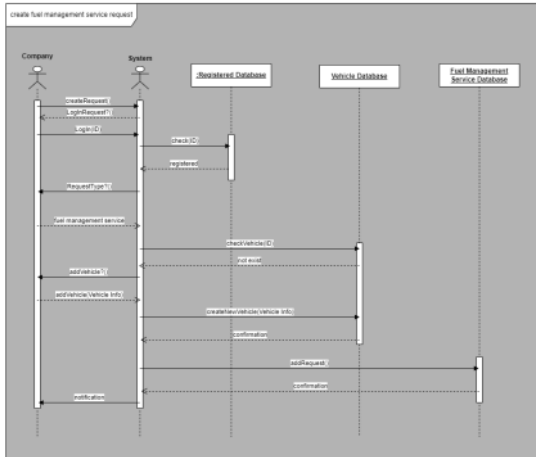

Activity Diagram

IV. Behavioral Modeling

A. Sequence Diagram-1

Sequence Diagram 1

B. Sequence Diagram-2

Sequence Diagram 2

A. Technical Complexity Factors

- Distributed System:0
- Response time or throughput performance objectives:4
- End user efficiency:4
- Complex internal processing:1
- Code must be reusable:1
- Easy to install:0
- Easy to use:4
- Portable:0
- Easy to change:1
- Concurrent :0
- Includes special security objectives:4
- Provides direct access for third parties:0
- Special user training facilities are required:0

B. Environmental Factors

- Familarity with system:6
- Application Experience:1.5
- Object-Oriented Experience:4
- Lead analyst capability:2.5
- Motivation:5
- Requirements stability:10
- Part-time staff:-1
- Difficulty of programming language:-3

C. Summary

- **Technical Factor Value=17   Technical Complexity Factor=0.6+(0.01*17)=0.77**
- **Environmental Factor Value=25 1.4+(-0.03*25)=0.65**
- **Adjusted Use Case Point=40.04**
- **Effort in person-hours=28*40.04=1121.12**

D. Gantt Chart
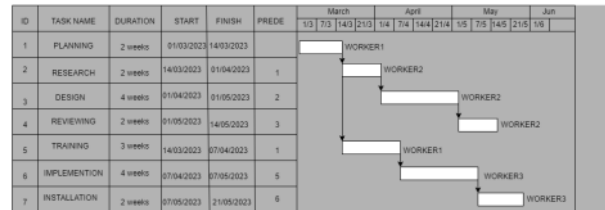
Gantt chart

V. Effort Estimation

Unadjusted Actor Weighting Table:

Actor Type	Description	Weighting Factor	Number	Result
Simple	External system with well-defined API	1	2	2
Average	External System using a protocol-based	2	2	4
Complex	Human	3	5	15

Unadjusted use-case weighting total:21

Unadjusted use-case weighting table:

Use case type	Description	Weighting Factor	Number	Result
Simple	1-3 transactions	5	2	10
Average	4-7 transactions	10	1	10
Complex	>7 transactions	15	4	60

Unadjusted use-case weighting total:80

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