

Project (Two people per group are allowed)

## 1.0 Introduction

Your team is commissioned to **design and develop** a **Record-maintenance System** for **MagicWand Inc.**, a company that provides computer repair and maintenance services.

The Record maintenance system is required to maintain customer service contracts and repair jobs.

*MagicWand Services Inc.* provides system administration and computer maintenance services for individuals and small companies. A customer employs the services of *MagicWand* to maintain a number of machines (PCs, workstations, printers etc) for them, where the services may include a regularly-scheduled hardware maintenance, software updates and repair services when problems arise (both hardware and software). *MagicWand* is currently planning to automate its **record-maintenance system using a commercial Database Manage System.**

The record maintenance system will help *MagicWand's* administration to do the following tasks.

- a. Maintain a detailed list of the customer records, service contracts and repair jobs.
- b. Assist the management in calculating their monthly and yearly revenues and the future areas for business expansion.

The enterprise-specific details of the *MagicWand Services*, relevant to designing the database, are given below.

A **customer** (name, phoneNo, address) may choose to take a **service contract** with MagicWand Inc. A service contract (contractId, startDate, endDate) can **cover** 1 or more **service items**. The status of a service contract may be active or inactive (if service is not continued). A service item (item Id, make, model and year) can be a **desktop**, a **laptop** or a **printer**. A desktop can be associated with a **monitor** (make, model, year and size). The desktop and monitor are considered 1 service item.

The coverage by the service contract includes **type of service** (hardware maintenance, software updates) and labor for any repairs (does not include parts that may be required).

A customer may have several service contracts, but a specific service item is covered by a single contract. Service fees are charged \$15 for hardware coverage, \$10 for software coverage per month per single computer (Desktop or laptop) and \$5 (only hardware coverage) for a peripheral device like a printer.

A repair item is a machine that is brought in for service to fix problems. For a repair item that is covered under service contract, no charge will be made for labor, but only for parts (if they are required). For a repair item that is not under a service contract, charges include labor and parts.

## 2.0 Functionality and Queries (to implement in your application)

The functionality provided by your database application is mainly to

- a) Create Service Contracts for customers.
- b) Create Repair jobs.
- c) Generate a bill for a repair job.
- d) Generate statistics using the data for Service Contracts and Repair Jobs

### Some implementation specifics:

#### Create a **service contract** for a given customer and a machine(s):

Write a **PLSQL procedure** to create a service contract and add it to the **SeriveContract** table.

Each service contract should consist of a customer id, service contract id (a unique number), start date of service, end date of service, id of the machine covered, type of service (hardware or software), fee charged per month. This information should be passed into the procedure via parameters. The service contract, when created, has an active status. The status may be updated to inactive.

The procedure creates an instance of the contract and stores it in the appropriate table.(s)

#### Create a **repair job**

Write a **PLSQL procedure** to create a repair job.

Each repair job should consist of a customer information (name, phone,a ddress), date of service, id of the machine covered, type of service (hardware or software), if it is a service item covered and an **itemized list of charges**.

### Constraints to be enforced:

1. In the service contract, the end date cannot be less than the start date of the contract.
2. When a service contract is deleted, the customer's information and the date of cancelation, should be recorded (in a separate table) automatically.

### 3.0 Deliverables

**Requirements for each deliverable will be posted separately.**

#### **Deliverable 1 (25 pts) Due 21<sup>st</sup> Feb**

A detailed, conceptual design using the **E-R model** should be included, showing the entities, relationships, multiplicities and integrity constraints. Any diagramming tool may be used, but a detailed legend to identify the notation used, should be included (you may be given recommendations for an automated tool).

#### **Deliverable 2 (175 pts) Due 17<sup>th</sup> March**

- a) The process of translating the E-R model into a relational model should be clearly shown with the resulting tables. Clearly identify the primary keys and foreign keys. **(10 pts)**
- b) The script files to create the tables using SQL and load the tables with data of your choice. The script files and program files to implement the queries that are necessary to offer the functionality required. **(40 pts)**
- c) A spool file that clearly demonstrates the functionality implemented by showing the queries and the results. **(125 pt)**

**The functionality you should demonstrate should include the following:**

- a) Creating customers and at least three service contracts. One of the service contracts should include multiple service items (a laptop, desktop etc).
- b) Creating at least two repair jobs, where one repair job has a repair item that is included in a service contract and one repair job that has a repair item with no service contract.
- c) Display a service contract by contract id.
- d) Display all the service contracts for a specific customer (by phone).
- e) Display a repair job. This should include all the information about customer, each repair item and the itemized bill.
- f) Display the number of active service contracts and the total revenue generated each month by these contracts.
- g) Display the total revenue generated in a specific month by all the repair jobs.

### 3.1 Two People Teams

You must provide a GUI (Graphic User interface) to the *MagicWand's* Record Maintenance System and execute all the queries using a web page as the front end to the application. You must provide an order form to enter the details of a Service Contract and a Repair Job via the web form. The front-end GUI should connect to a PHP application and Oracle database on the server.

### 3.2 Tools and Technologies

**You are required to use Oracle as the relational database.** For the GUI, you must use **HTML** and **PHP** as the Web technologies. You are free to use any other additional tools you may be familiar with.