

Foundations of Databases A.Y. 2021-2022

Homework 1 – Requirements Analysis

Master Degree in Computer Engineering

Master Degree in Cybersecurity

Master Degree in ICT for Internet and Multimedia

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Objectives of the System

Interviews

Natural Language Sentences

A major international food and beverage company is investing in a new set of technologies to increase profits. The company produces and distributes an average of X products every year, including drinks, juices, beers and snacks of various kinds.

The company's goal is to develop a new information management system that will help reduce excess and shortages of inventory. Furthermore, it is required to keep in memory as much information as possible about the commercial activity so that it is also possible to make analytics to monitor sales and expenses.

In this system:

- the technical employees will manage the products in the inventory, invoices, and the employees;
- The sellers, on the other hand, will have to deal with customers, orders, shipments and payments;
- Managers will be in charge of managing suppliers and contracts;
- Data analysts will have access to the acquired data for inventory, cost and profit analysis;
- A system administrator will be responsible for managing the access privileges for each user on the system.

The figure of the Manager is important for the management of relationships (and therefore of contracts) with suppliers. The latter are intended to supply the raw materials to the company. For example, if the company produces sugary drinks, suppliers will supply elements such as sugars, additives, artificial colors, water and natural flavors. In addition to these elements, there will be suppliers who will supply different types of packaging such as glass or aluminum latins, double corrugated cardboard boxes. The Managers manage relations with suppliers through contracts, within which certain parameters are specified such as: type of contract, duration of the contract, monetary agreement, quantity requested and finally an identification for both the supplier and the raw material. It will therefore be possible for managers to view, for example through a list, all the contracts stipulated with the different suppliers. Furthermore, through the identification of the raw materials, managers have the possibility to filter contracts based on the type of product. Therefore, it is possible that the company can purchase the same type of product from different suppliers. Contracts stipulated between managers and suppliers are of different types. They can be:

- Joint venture;
- Partnership;
- Collaboration-type network agreement;
- Network contract for joint operation.

OLD TEXT:

The company objective is to optimize costs by having only the bare minimum item quantities. In this way, there should be no waste of resources. The company produces and sells food and beverages. Each product has details, such as name and brand.

The objective of the company is to implement an IMS to address overstocking and outages of items. To accomplish this, each item is stored in the system with name, relative quantity, and expiration date. In particular, when there is a shortage of one or more items, the supplier providing it will be immediately notified with an automatic e-mail. Also, when a product is manufactured but has not been purchased yet, it should be stored in the system as well, with name, quantity, and expiration date. When a shipment that contains a specific product leaves the factory, the latter must be deleted from the inventory.

Some products can be produced in advance, which means that the inventory should have a little stock of them, acting as a “buffer”, to be able to evade small orders smoothly. If an order requires more products than how many are already finished, the first is held pending until the requested goods are not manufactured and packaged for the shipping. Of course, products, as well as items, that are expired, must be removed from the inventory as soon as possible as they cannot be sold anymore.

A customer should be able to register to a website in order to search for products to buy, view and manage its orders, and to write reviews – made of a rating and some comments – about products. Upon registering, it must specify its name, contact details, and delivery address. The customer receives an invoice with all the details when it places an order and can track it with a dedicated tracking number provided when the shipment is assigned to the courier. Suppliers must also be registered in the system, along with their name, contact details, and the agreement made with the factory stating which types of items the supplier will be responsible to provide.

In the described system, the manufacturing and shipment of products is performed by simple workers, who are supervised by a manager. The latter is also responsible for finding and making agreements with suppliers for the replenishment of the inventory. Another important figure is the salesman, which is responsible for interacting with customers, advertising products and ensure that they are satisfied. In the end, there is the analyst, which is in charge of performing analyses and predictions on various Key Performance Indicators (KPIs), such as revenues, generated income for each product, and products rating, in order to determine which are the popular products and, on the contrary, which of them should be decommissioned. Each employee must be registered in the system with name, surname, contact details, the department in which he or she is working, and his or her role.

Filtered Sentences

Term Glossary

Term	Description	Synonyms	Connection
A relevant term or object	A brief description of the term: what does it means?	What other words describe the same object?	What other terms in our glossary are linked to it?

Table 2: Describe in this table the terms of your system

Functional Requirements

Non Functional Requirements

Constraints

The Database Management System application should satisfy the following additional constraints:

- Be implemented to run on Windows operating system;
- Be implemented with PostgreSQL;
- Client side implemented as a Web application, to guarantee easy management through different devices (Html, css and javascript will be used);
- Server side implemented using Tomcat, java servlet, and REST web service.