 

**Project requirements:** Database application for invoice management



**Project Id :** 4

**Client :** OCP's Purchasing & Contract Management Unit

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# INTRODUCTION

An invoice management system is a software application that helps businesses manage their invoicing processes. It typically includes features such as invoice creation and payment tracking. The system can be used to track the status of unpaid invoices and generate reports and data visualizations on invoice activity. The primary benefits of an invoice management system include improved efficiency, reduced errors, and better cash flow management.

This project consists of creating a Database Application to automatically clean, extract and analyze data from Excel sheets-based invoices. As discussed with the client, we have decided to divide the project into three main steps that include : Data pre-processing, Data processing and Data visualizations.

After two meetings with the client, we were able to gather enough information to design an effective ER Diagram that respects all the requirements of the project. This document will explain in detail those requirements and the steps mentioned above.

# PROJECT DESCRIPTION & REQUIREMENTS

## **Step 1 :** Data Preprocessing

This step acquires creating a code that processes a weekly exported raw invoice database (Excel sheet format) and completing it with missing information. The columns are exported in the same order, and the number of rows varies per extraction, the processing steps include:

* Importing information from the Excel sheet to the database.
* Removing irrelevant rows from the database.
* Importing missing data from a similar database (Excel sheet).
* Creating new attributes that will take values based on conditions.

## **Step 2 :** Data Processing

The objective of this phase is to extract as much information as possible from the database to develop action plans to efficiently unblock the invoices to be paid to the suppliers. The requirements of this step are the followings:

* Extracting maximum information from the database.
* Identifying the stock of invoices as well as their amount by Entity, by Deadline (Entity with the highest number of critical invoices according to the deadline attribute, for example).
* Sorting, for each Entity, the number of each type of invoice blocking at their level according to their deadline.
* Identifying the supplier with the highest number of invoices.
* Identifying the dominant type of invoices according to their deadline.
* Identifying the number of critical invoices.

The discussion may lead to extracting more interesting information from this database. The challenge is to make this information as exploitable as possible.

## **Step 3 :** Data Visualization

* Creation of a user-friendly and easy to navigate dashboard based on the provided information to facilitate decision-making.
* The dashboard should display:
  + Critical invoice rates by entity.
  + Percentage of invoices based on their blocking types.
  + Bar charts showing the number of invoices by entity, deadline, etc.
  + Having the ability to adjust the parameters through a checklist.
* Ensure data accuracy and reliability.

# ER DIAGRAM REQUIREMENTS

**NB** : All the entities with their respective attributes are named in French since it’s required in the project.

**Entities:**

* **Fournisseur** : Each supplier (fournisseur) can deliver several orders (commandes).

**Attributes :**

- Code AP (PK)

- Nom

- Site

* **Commande :** An order (commande) is delivered by a single supplier (fournisseur) and has at least one invoice (facture). An order is ordered from a single project manager (chef de projet).

**Attributes :**

- Numéro de commande (PK)

- Service : type of service

- Type d'achat PO

- Unité Opérationnelle

- Devise

- Montant commande

- Montant des réceptions

- Acheteur : buyer's name.

* **Facture** : An invoice (facture) is specific to a single order (commande) although it is managed by a single project manager (chef de projet). (Two invoices specific to an order can be paid by two different project managers)

**Attributes :**

- GED (PK)

- Numéro de facture

- Montant facture

- Blocage

- Intervenant

- Contract Admin

- Categorie (Derived attribute): This attribute is deduced according to the value taken by the attribute blockage (blocage) . The category (categorie) takes the value of the blockage that has the highest priority .

- Nombre de jours à écheance

- Écheance (Derived attribute): it takes values ​​according to the attribute number of days due (Nombre de jours à écheance) .

- Entité G (Groupe) (Derived attribute): The value taken by this attribute depends mainly on the value of the attribute contract admin as well as the value of the attribute entité site . Intuitively it seems that it is an attribute of the entity "entité" but the fact that this one depends on the attribute contract admin makes this impossible. Example: an entity (entité) has a site entity (entité site) specific to it, but this is not necessarily the case for entity G (entité G) because it depends on the value of the admin contract, from which two invoices may be managed by project managers from the same entity(entité) but have different G entities (entités G) because of the admin contract. Which makes it more of an attribute of the Invoice entity (facture).

* **Chef de projet :** A project manager belongs to a single entity (entité). He can launch several orders (commandes) although he can manage several invoices. The project manager responsible for a given order is not necessarily the one who manages one of the invoices for this exact same order.

**Attributes :**

- Id CDP (PK)

- Nom : Project’s Chief’s Name

\*CDP : Chef de projet project manager

* **Entité** : An entity (entité) can have several project managers.

**Attributes :**

- Nom Entité (PK)

- Entité site (Derived attribute) : Each entity (entité) has its own site entity (entité site).