**Packford’s Storage Company Case Study**

**PART 1**

Packford’s is a storage company that store standard size crates for companies in various warehouses in the UK. Companies use these crates to store different types of contents such: paper business records (paper files), electronic media, miscellaneous (Christmas decorations, etc)

Clients can request the collection of crates for storage, and also can request the return of crates to any one of a number of delivery addresses. Delivery and collection times are usually on a next day basis. Clients are charged monthly according to the number of deliveries and returns.

Only certain staff have the authority to make orders for crates. Some clients have many branches, and crates are ordered by branch, but billed centrally. Some crates are left for so long that they may not ever be needed. They may be destroyed if the client wishes, but Packford’s want to bear no risk of destroying needed crates.

Packford’s management staff are authorized to view all crates and their history with the storage company. They may also obtain statistics on customer usage. Accounts staff may obtain information on customer usage for customer billing. Sales staff are allowed to enter new business.

All crates are uniquely identified and associated to the right client. The staff must record the warehouse and the particular shelf in the warehouse where a crate is stored. They can track a crate to see if it is on the shelf, at the client or in transit (waiting to be delivered in the pick-up room or on the delivery van).

**PART 2**

The Packford’s management has come up with some future enhancements of the business. These were a result of discussions between Packford’s sales managers and new potential business customers currying lucrative new accounts.

The desired enhancements are summarized in the following points:

1. Customers need the ability to request specific files contained in a crate. When the file is returned to be stored, the customer staff may request that it is put into a different crate/box from which it originated. The future business model needs to be able to track such movements.

2. The system needs the ability to keep track of crates/boxes containing different types of contents, such as electronic media as well as normal files. However, each box/crate will only hold one type of contents.

3. Customers may need to request a delivery of a box at some time in the future or a periodic delivery of a box (Such as: “deliver every Monday mornings and return on the following Friday afternoon”)

4. The system needs to keep track of specific journeys on which a specific delivery was made.

You have also been given some new information about the technical specifications of the system: Packford’s has a contract with an ISP that can provide a selection of web servers and server side software platforms and database back ends. The Packford’s HQ has a dedicated high end server for this project, but it has a slow connection to the Internet (ISDN). The main warehouse is adjacent to the HQ, and it is connected by a fast Ethernet connection

You have been employed by the Packford’s to model the current business system and propose a new, integrated software system that will include all current functionality and any enhancements needed. Your job is to elicit the exact requirements from the client (your case study). You can make further assumptions, but they need to be clearly stated in your report. After eliciting the initial requirements for the new system, you are required to produce a design of the new system and a prototype using any competent technology/tools you are familiar with.

**Requirements**

**1)** Produce a preliminary design using traditional, structured methodologies, covering the functionality of the proposed new system described in **PART 1** of the case study. The design should include:

o **Entity Relationship Diagram**. You are required to distinctly show all entity types, attributes (including primary key attributes) and relationships

o **Data Flow Diagram** . Include the DFD levels 0 (context diagram) and, optional, level 1 only

**2)** After completing the initial structured design, it was decided to design and build the system using object-oriented methodologies, to allow for more flexible design/build iterations and re-use of design and code. You have therefore now been asked to produce a “first cut” design of the new system described in the **PART1 +PART2** using object-oriented analysis and design principles and UML.

The UML design should include:

o **Use Case Analysis -** A UML Use Case diagram identifying all actors and their Use Cases.

o **Interaction Diagrams.** Using UML sequence (interaction) diagrams perform an analysis of the main Use Case scenarios

o **Design UML Class Diagram - Show all attributes, methods and associations for all main classes.**

o **State chart diagrams for all major classes (approx. 3 classes)**

**3) A prototype system** is to be built using any appropriate technology/tools you are familiar with. The prototype system will need to have enough business and UI functionality to test the competence of the design for **2 main functionalities of the system (2 main use cases).**