

Overview

In this lab you will use a basic, incomplete database design along with the clients' sizing estimates to determine any physical design requirements such as indexes, partitions and clusters.

Pre-requisites

Read the slide notes for the physical design topic. Understand how to create index, partition, and cluster objects in Oracle.

Contents

- Part 1 - Logical Design
- Part 2 – Physical Design

Due Date:

This lab is due in 1 week at the end of lab session:

- X01A – Fri Oct 26th
- X01B – Tues Oct 23rd
- X01C - Fri Oct 26th

You must demo that your script works to the instructor.

It is the student's responsibility to arrange demo times outside of lab times. Be aware that instructors might not be available to demo outside of lab times.

You must **hand in** PDFs of your work to the lab 5 dropbox on the D2L site.

Scoring:

Lab is worth 35 marks.

Part 1 – Logical Design

Based on an initial consultation with the client, an initial logical model and relation model was created. The sql for this initial design is in the file (found on the D2L lab section) **ICS212 Lab05.sql**.

The client has now provided you with some additional sizing estimates which indicates that this is going to be a very large database application (VLDB). The new information they have provided is the following:

- 20,000,000 customers
- 1,000,000 products

- World-wide operations with warehouses in 25 different countries (and languages)
- 100,000,000 orders per year
 - Average of 10 products per order



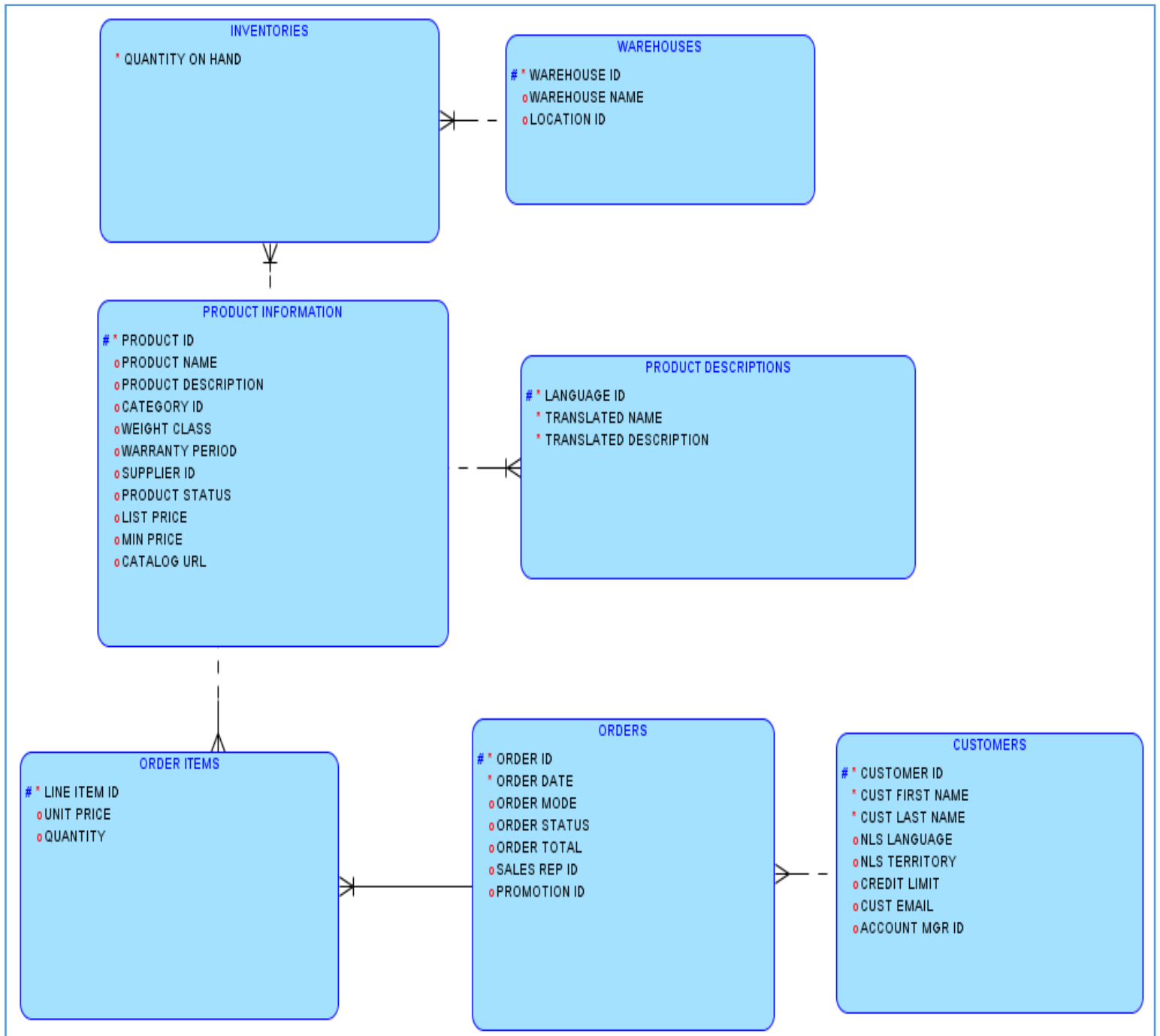
Note in this lab we are **not** calculating the physical space requirements, but only using those size estimates to determine what indexes, partitions and clusters are required.



From the logical model and relation model you can see that the initial design is only a fragment of a full system. For example there is a **supplier_id** in the **production_information** table, but there is no **supplier** table in the schema. Do not attempt to fix any of these omissions by creating new tables.

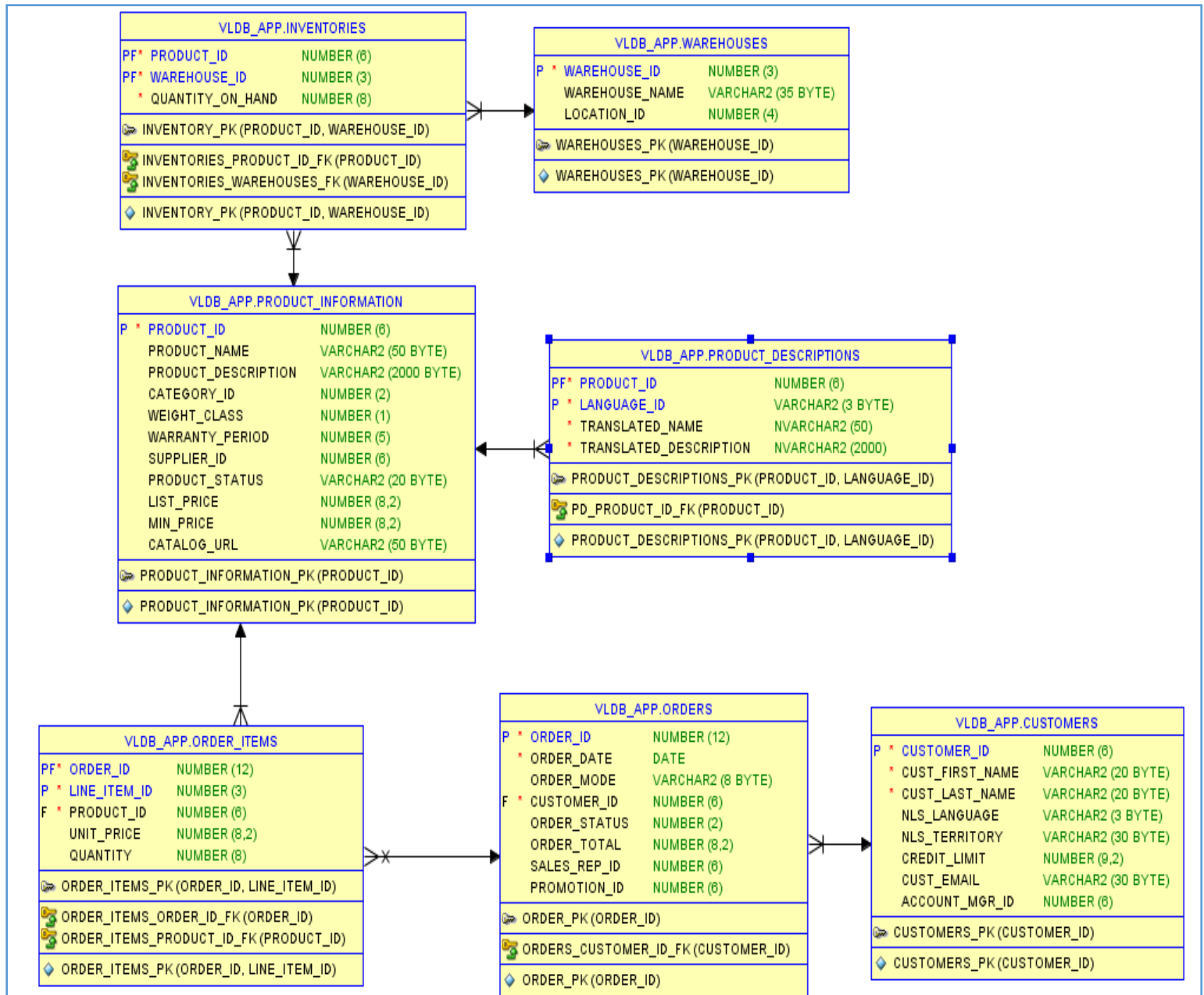
Logical Model

The following diagram shows the logical model for the initial design.



Relational Model

The following diagram shows the relation model for the initial design.



Part 2 – Physical Design

In this section you will be creating any new indexes, partitions and clusters.

- ☐ 1. Make a copy of the original script (**ICS212 Lab05 – Physical Design.sql**) and modify it as per steps 2 and 3 below.
- ☐ 2. Modify the script to provide any partitions or clusters that are needed to improve data storage and/or performance. Include comments to justify why you made those design decisions.
- ☐ 3. While the primary keys have indexes created automatically by Oracle, there are no other indexes in the original design. Determine what additional indexes are required based on foreign key requirements, alternate candidate keys and any other indexes based on potential common query requirements (your best guess). Add the CREATE INDEX statements to create these new indexes. Include comments to justify why you have included each index.
- ☐ 4. Startup SQL Develop and connect to your Camosun babbage account.
- ☐ 5. Run your script and demo that your script runs successfully (**5 Marks**).
- ☐ 6. Create a new relation model diagram showing the new schema information. Save a screen shoot of your new relational model.

DEMO**HAND IN**

Submit your new script with your justification as comments (**25 marks**) and a screen shot of the new relational model (**5 marks**) to D2L.

Hint: While there are multiple potential solutions to this design issue, one solution has the following number of objects:

- Indexes – 16
- Clusters - 3
- Partitions - 3