Diamond Merchant

Business Scenario

**Hira Lal & Sons** is a diamond merchant, who deals in diamond sell & purchase. They have some international diamond agents from whom they buy row diamond stones. After buying diamond stones, these stones are sent to **Hira Lal & Sons** diamond workshop. Here, a team of highly skilled workers transform these pieces of stones into different shapes and size of shiny diamonds. Final piece of diamonds are then transported to different jewelry stores of **Hira Lal & Sons** and their client on demand.

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**Hira Lal & Sons** is known for their unique diamond collection & quality. People are more attracted towards their new designs. As a result you can see their stores in all major cities in India to reach more & more customer and service them. New designs are stored in a printed catalog as a showcase for customers. All major stores continuously updates their catalogs of design with updated design to show visiting customer. Festivals are busiest schedule for store managers and employees where most of the time is consumed in catalog display. This in results makes lot of customers to wait for a long time to buy their selected jewelry. Sometime people even leaves store without buying anything due to this delay. This makes store manager and other people to think for a solution.

**Hira Lal & Sons** even has tie-ups with small retailers in different market for whom they produce diamond on their request. These retailers time to time provide their requirement and orders of diamond to be manufactured. Orders are then processed in workshop and delivered to retailer. These orders are received by emails or physical purchase order invoice from retailers. This often come with problem as sometime emails are lost or orders by **Hira Lal** **& Sons** sells department and purchase order invoice are received late by postal departments due to which company is facing lot of issues.

**Hira Lal & Sons** now want a solution for their customers & retailers to have hassle free selection of design and jewelry, placing order and knowing exact period of delivery. One of a Store manager gave an idea of having a centralized system that should resolve these issues and provide future expandability of company with very less or almost no botheration. E-commerce applications are given examples during this suggestion by manager. Specifying that company may have their own web portal from where customers can select designs & jewelry, place order and even can track order. Even retailers system can be connected to same system with which they can even place orders and get other information. As a solutions developer your team is asked to develop an enterprise system for Hira Lal & Sons to resolve their problem of customers and retailers.

Your team is retained to

* Create a Web Portal for Diamond Sales for customers
* Expose services for of store for small retailers

Please go ahead and read the problem statement below.

Problem statement:

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**2.1 Assumption**

Stores are communicating information exchange through E-mail.

Orders are placed by customer only on visiting store.

Retailers are placing orders through E-mails or purchase order invoice letter.

**2.2 Points to focus**

The database design should help automate the following

* Customer & Retailers Order placement
* Centralized information flow
* Keeping track of stock

**2.3 Entities**

The database design can focus on following three entities at first cycle

* Product (Diamond) : Contains details about the product like product id (unique), name, shelf location, cost price, MRP, manufacturer.
* Customer : Holds customer records like ID (unique), name, gender and contact details. It can be used in generating membership records.
* Bill: Has a unique bill number. It also stores the date of purchase and details of the employee and customer. If time permits participants shall be encouraged to add following entities as well
* Store: Contains the store details like id (unique), address, contact no
* Employee: Contains employee details like ID (unique), name, designation, gender, date of joining and date of birth.

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* Bill Transaction: It is the entity that is continuously updated when a customer goes for billing

2.4 **Business Process in the application:**

* Customers can now search for diamonds online and place order.
* Stores can now maintain stock with a single portal.
* All bills are generated automatically using a recently-installed billing system. This system is accessed using web services.
* Customers must be able to dispute their bills within 30 days of generation. If a bill is disputed, the customer is prompted to provide additional context as text, before the bill and note is referred to a call center agent for review and reconciliation.
* In addition to viewing their current and historical bills, customers can also pay their bills online, either as one-off payments or by setting up a standing order or direct debit.
* Diamond orders are handled by an agent system, which is exposed as a JMS queue.

Tools to be used for development:

* Oracle 10g Database
* JDK 1.7
* Eclipse IDE
* Angular 4

Activities to be done by the students

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1. **Domain Model:** Develop domain model for **Hira Lal & Sons** system. This domain model should follow OOP principles with loose coupling.
2. **Services:**  Develop Business Logic for Customers services that provides following operations.
   1. Search of Diamond & Jewelry
   2. Adding it to customer cart
   3. Viewing cart items
   4. Processing purchase order
3. **Hira Lal Web Store** : you need to create a web application to allow customer operations
   1. View Diamonds & Jewelry
   2. Purchase them
4. **Retailer Services:** create and expose business logic as web service for retailers to do following operations
   1. Search for diamond or Jewelry
   2. Placing order
   3. Tracking order
5. **Security:** secure your application with **RBA** (Role Based Authentication) with following roles.
   1. User
   2. Retailer
   3. Admin
   4. Employee
6. **Transaction:** As application will be accessed by several users to allow concreate solutions apply transaction on purchase operation of Diamond.

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Guidelines to the instructors:

**Step 1**

Make student understand about the Java SE 7 platform and all its concepts. The knowledge of UML models will help them to understand the basic structure of the system.

It is mandatory to go through the given case study. Make sure each student should have his/her own documentation and plan of this system before writing the code.

**Step 2**

If students have achieved Step 1 then guide them to divide this system in spate modules. Also guide them to create use cases, dataflow diagram and flow charts to understand the modules in a better way.

**Step 3** – Role Play

* Let the team present their design.
* Note Down comments/ideas by other team and facilitator
* Keeping these ideas as base, team has to list down the operations that can facilitate the Company.
* Write algorithm to solve all above problems

**Step 4** – Validate

All modules must be validated with different input values to introspect the reliability of each module.

**Step 5** - Extension of Project work

* Algorithm to avoid the concurrency in this system
* System must support internationalization

**Step 6** – Pre Assessment and Post Assessment during the workshop

The trainer has to ensure pre assessment exam must be completed on the first day of the workshop. On the 5th and 10th day post assessment exam is to be conducted without fail, for Java SE 7.

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Reference Material:

Case study writers please add reference links to

* **YouTube**
  + <https://www.youtube.com/watch?v=Xqei4cCp2po>
  + <https://www.youtube.com/watch?v=3ED44XvRAh0>
* **Website**
  + <http://www.oracle.com/technetwork/java/javaee/javaserverfaces-139869.html>
  + <https://community.oracle.com/community/fusion_middleware/application_server/toplink_jpa>
* **Wiki pages** 
  + <http://en.wikipedia.org/wiki/Bharat_Diamond_Bourse>
  + <http://minecraft.gamepedia.com/Diamond?cookieSetup=true>