Case Study – Online Shopping Cart Application

1. Business Scenario

A Super brand shop wants to sell variety of products to their customers, they want customers to buy products online and get those products within some business days, and they sell products like Laptops, Mobile, TV’s, Sports Items, Home Appliances, Footwear’s and many more. As they want to track the customer details and the product they bought they need an application which can service their customers. They want the application to be accessed by their customers and buy the products online or on cash after they get the product.

Customer should be able to select multiple products; every product would have some items say for instance, if you consider Mobile as a product it could have items like Samsung, LG, HTC, Micro max and etc. in the same fashion other products must have some set of items, once the product is selected he could able to add to the cart, once he successfully added he should go for the payment.

The customer can also remove the selected items from the cart, but while adding and removing items to and from the cart assure that the exact items are added and removed, once the items are selected and the total amount to be paid for the items is displayed he/she goes for order option after ordering he should be able to enter his details and allow him to pay through net banking or debit card or credit card.

If the option like net banking is selected the customer should able to enter the customer id and password required for logging in to his/her account then he could able to pay the amount for the selected items only if the available balance is greater than the total price of the items, if not then a proper error message has to be displayed to the customer.

The customer can also pay the amount for the ordered items using his/her credit/debit card, when he selects the option for credit card he should able to enter his credit card number with the password, once he successfully pays the amount to the items, the amount he paid should be updated in his database meaning that the total amount he has spent from credit card.

When he uses the debit card he should able to provide his debit card number with password and go for payment if the sufficient balance is available if can successfully pay the amount for the ordered items then the same amount should be deducted from his account the same thing goes in net banking as well. The products added or removed must be tracked through some java predefined classes i.e., through collection frame work classes, if the user logs out then session should be terminated for the students should also handle Session.

Students has to use databases for storing all the product and customer information’s whenever they operate on these information they have to use the technology like JDBC/JPA for the UI you can use JSF/JSP/JSTL/HTML. Students has to do client side validations for wrong inputs provided by the customer, say for instance if the user tries to add items without selecting the item then students need to display a message saying please select the item before adding, the same thing must be done for other scenario’s which are explained in the Activity section.

1. Problem Statement

**2.1 Points to focus**

We assume that there are few tables already existing, so that Customer, Item, Product and Credit Card details should be stored manually with some amount of money in the Customer table, price of items in Product table, some list of items in Item table and Credit card information in Credit Card table. Firstly design a database table based on the following information’s. Create primary key, foreign key references and other constraints wherever necessary.

**2. 2 Entities**

**Customer :** Contains details about the customer id, account number, customer name, password and debit card number

**Credit Card:** Contains details about the, credit card number customer id, password and amount

Oracle Internal & Oracle University Use Only

**Address :** Contains customers address details about address id, street name, state, city, pin and customer id.

**Items :** Contains details about items like item id, item name (store unique id for item id and item names like Laptop, Mobile, TV, Home Appliance, Footwear)

**Product:** Contains details about products like product id, product name, item id and price

**Products Customers:** Keeps track of customers purchasing the products like product id, customer id, debit card number, credit card number and price

**2.3 Business process in the application and use cases**

**Note:** Team would implement using Java/JEE, HTML, CSS and JavaScript.

1. After entering the **URL** the application should take the user to the home page which would have **links** of items like **Mobiles, Laptops, TV’s, Sports and Footwear** under these links list of products and their price should be displayed as a check box for e.g., Under Mobiles products like Samsung Rs.29000, iPhone Rs.60000, Lumia Rs.40000 etc, in the same way under Laptops list of laptops from different company and their price must be specified the same should be applied for TV’s, Sports and Footwear. Team can list at least 5 products for each Item. These should be buttons to add selected products, Remove All and Place order.
2. The home page should also have a separate section for **displaying images** regarding some advertisements and offers which should be keep changing after some seconds.

Oracle Internal & Oracle University Use Only

1. Under Every Item list of products and their prices should be displayed

Once items are selected you customer could able to add all the selected items to a cart, if the user clicks on remove all , the selected items must be cleared

Oracle Internal & Oracle University Use Only

Oracle Internal & Oracle University Use Only

Oracle Internal & Oracle University Use Only

Oracle Internal & Oracle University Use Only

Oracle Internal & Oracle University Use Only

If the user clicks on add selected it should go to a new page displaying all the selected items and their price including the total price in a table with the following options, Add an item, Remove an item and Order, If user clicks on Add an Item the user should be again directed to the home page again having all the selected items check in a checkbox, and should be able to select some more items if customer needs, If in case he wants to remove an Items the user should be again directed to the home page so that he can uncheck the items which were selected and again he should select Add Selected if he wants to proceed with the order, If in case customer wants to proceed with payment he should click on order, once customer clicks order he should be directed to the page with customer details where he can fill his details like name, address etc.

Oracle Internal & Oracle University Use Only

1. After entering customer details he can proceed with payment options
2. Once he clicks on payment option he should be directed to a page where he can select the way he wants to pay for the items, either by credit card or debit card or net banking
3. On selecting one of the above options customer should be able to enter valid credentials and pay for the items

Oracle Internal & Oracle University Use Only

Oracle Internal & Oracle University Use Only

1. Tools to be used:

Tools to be used:

* Oracle Database 10g
* JDK 1.7
* Eclipse
* Apache Tomcat
* Angular 4

1. Activities to be done by the students

Students should first create all the tables with the following columns and store some records inside them.

**Customer**

customerId (primary key)

accountNumber

customerName

password

debitCardNumber

**CreditCard**

creditCardNumber(primary key)

Oracle Internal & Oracle University Use Only

accountNumber

customerId (references Customer table)

password

amount

**Address**

addressId (primary key)

streetName

city

state

pin

customerId (references Customer table)

**Item**

itemId (primary key)

itemName

**Product**

productId (primary key)

productName

itemId (references Item table)

price

**ProductsCustomers**

productId

customerId

debitCardNumber

creditCardNumber

price

Once all the tables are created update ProductsCustomers with appropriate values when the payment is done, this is to keep track of customer and products

After all the database table design is over team must concentrate on development process, firstly create a home page which will have an heading welcome to online shopping please select the products below, the page should have a section with categories like Mobile, Laptops, TV’s, Sports and Footwear’s under these categories create checkboxes which is going to be the products the customer is going to select, ex: under Laptop have the following products with the prices beside the product like HP Rs. 34000, Dell Rs. 43000, Acer Rs. 28000, Sony Rs. 38000 and Asus Rs. 48000. Apply the same for all other Items, all these Items, Products and items should be displayed by them from the database, these information's are stored manually in a table but while displaying them team has to be fetching from the table since any changes made in the product would be automatically reflected if it isn’t hard coded.

Oracle Internal & Oracle University Use Only

Customer should be able to select multiple products; once he selects the products he should able to select two options,

1. Add Selected
2. Remove All

Upon clicking on Add Selected the selected items should be added in a LinkedList object of java.util package. These items should be read from a Servlet and add all the items to the LinkedList by displaying the selected items, their price and total price in tabular format with other possible options(buttons) asking to Add an item, Remove an Item and Order, if user selects add an item option the page should be redirected to the home page again with all the selected items checked and allow customer to add some more items and select the Add Selected option, If user selects remove an item option the page should be again redirected to the home page with all the selected items checked and allow him to remove the items he wants to, later user should again select Add Selected which in turn brings him to the page where it displays the selected items, their price and total price in tabular format with the three buttons Add and Item, Remove an Item and Order. Whenever the customer does these operations team must take care adding and removing elements from the LinkedList.

Upon clicking on Remove All, the application should clear all the selected items

Once the items are selected and customer goes to Order option, the customer should be asked to enter his Name and Billing address in the form with the button Payment, all these details should be again read in a separate Servlet’s and stored in a java bean. After clicking on Payment option a page should be rendered to the user asking him to select the way of payment either through credit card or debit card or net banking based on the options he selects another page should be rendered asking the valid information’s.

* + - If he selects the credit card then the page should ask his credit card number and password with the two buttons pay and reset, proper validations must be done for empty inputs, once the credentials are authentic the complete product and customer details should be maintained in a table productscustomers table, and the amount should be updated in the credit card table, if in case the credentials are invalid redirect him again to the same page saying invalid credentials so that he can once again enter the proper credentials
    - If he selects the debit card then the page should ask his debit card number and password with the two buttons pay and reset, proper validations must be done for empty inputs, once the credentials are authentic and the account has a sufficient balance then the amount should be deducted from his account and should display a message saying successfully ordered and also the productscustomers table should be updated with the proper details, if in case the amount is insufficient an error message should be displayed saying insufficient balance by redirecting to the home page, , if in case the credentials are invalid redirect him again to the same page saying invalid credentials so that he can once again enter the proper credentials.

Oracle Internal & Oracle University Use Only

* + - If he selects the net banking then the page should ask his customer id and password with the two buttons pay and reset, proper validations must be done for empty inputs, once the credentials are authentic and the account has a sufficient balance then the amount should be deducted from his account and should display a message saying successfully ordered and also the productscustomers table should be updated with the proper details, if in case the amount is insufficient an error message should be displayed saying insufficient balance by redirecting to the home page, if in case the credentials are invalid redirect him again to the same page saying invalid credentials so that he can once again enter the proper credentials.

**Note:**

1. **Students has to use java beans and DAO whenever they found some values/object properties should be checked in the database and pass the values/objects to another page or when the values has to be reused.**
2. **Session has to be maintained from the moment user starts selecting items till he does the payment, terminate the session once the payment is done**
3. Guidelines to the instructors:

**Step 1**

After teaching them the HTML, CSS, JavaScript, SQL/PLSQL, Java, JDBC and JEE. Let student create all the required tables for the project. It might go in cycle and the facilitator helps the participants to design tables by giving the comments and feedbacks.

**Step 2**

Once the basic design is approved by the facilitator, the team can go ahead and create a web project in IDE, components to be monitored

Oracle Internal & Oracle University Use Only

Creation of Tables and constraints

Inserting the records to the table

Designing View components

Navigating from one view to another

Creating Java Beans and DAO for the database tables

Creation of Servlet’s for reading the user data and rendering the proper View

Input Validation

**Step 3** – Role Play

Let the team present their project.

Note Down comments/ideas by other team and facilitator

**Step 4** – Validate

All learning objectives defined above for the project should have been met. If not revisit and ensure the learning objectives are met for the project

**Step 5** - Extension of Project work

If student completes the above task well in advance trainer has flexibility to give additional work to the existing components. Like a page that can display all the products and the total price of the products selected by a particular customer, the user enters his customer id and password in a page that should fetch the details from the Products\_Customers table.

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

1. Reference Material:

Java Documentation :

<http://docs.oracle.com/javase/tutorial/>

Java EE Documentation :

<http://docs.oracle.com/javaee/7/tutorial/>

Case Study – Finance Company

Oracle Internal & Oracle University Use Only

1. Business Scenario

Ganesh Finance Limited Company provides loans for an individual for their needs. It offers a wide variety of loans like auto finance, house loan, gold loan, loan against property etc.

Ganesh Finance has branches all over the country in all major cities. Ganesh Finance advertises, typically through newspapers and TV shows.

Ganesh Finance offers maximum loans for less interest, relatively little higher than other banks. Customers produce required documents to avail a specific loan.

Oracle Internal & Oracle University Use Only

The loan amount will be credited to their personal bank account once the loan is approved. Refund of loan will be through ECS, post dated cheques or by directly paying cash in the branch. Upon request, the bill collectors from the company also visit to customer place and collect the due amount.

At present, the Loan processing is done manually with its employees. Recently there were lots of problems regarding the document processing and verification and customers were unhappy because of a long waiting time for getting the loan even though the customer had submitted all the required documents.

Ganesh Finance is also planning to reduce the labor costs by automating to Loan application process, where one are two employees can do document processing and approval.

This is what happened yesterday.

“Mr. Dinesh submitted the required documents for the car loan. Mr. Kiran who processes and manages all documents for the customer had misplaced some of the documents, and requested Mr. Dinesh resubmits the documents. Similar reasons for Mr. Raju who submitted the documents for Home loan but due to one missing document his loan was not approved by the manager.

These were the major reasons that the customer did not get the loan and the loan request was processed by another Finance company.

Since the customers were moving to other finance companies Ganesh Finance is losing their business. With automation, they are planning to get back into business.

1. Problem statement:

**2.1 Points to focus**

The Application should help automate the following

Loan Application Process from multiple client machines.

Online Loan Application process for customers.

Uploading required documents to the Database

Loan Approval by manager.

**2. 2 Entities**

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

Customer

Holds customer records like ID (unique), name, gender and contact details. It can be used in Storing application records.

Loan

Contains details about the loan types like loan id, loan type.

Oracle Internal & Oracle University Use Only

Loan Application

Has a unique application number and also stores loan details like customer id, loan type, loan amount.

Documents

Has an application number and also stores documents in the data base.

2.3 **Business Process in the application:**

Oracle Internal & Oracle University Use Only

1. The branch clerk wants to add new customer and his loan application details.
2. The clerk also wants to add a new loan application for existing customer.
3. The clerk uploads all the scanned documents(only in .jpg image format) for that loan application and mark for approval from the manager
4. The Manager needs to access the uploaded application and all related documents, verify and update the application as "approved" or "not approved".
5. The Manager wants see list of approved or not approved waiting for approval applications separately.
6. The clerk also want to get list of customer details, application details, loan wise application details, date wise application details etc..
7. Customer can apply loan directly using online web application.
8. Customer can also upload required documents in image [jpg] format.

Oracle Internal & Oracle University Use Only

1. Manager access online application and verify and approve the loan.
2. Manager wants to send a mail notification to the customer whose applications are approved for loan.
3. Tools to be used for development:

Tools to be used:

* Oracle Database 10g
* JDK 1.7
* Eclipse
* Apache Tomcat
* Angular 4

1. Activities to be done by the students

5.1 Java

Create required tables in the database

Add sample data to the tables

Implement one to many relationships with customer and loan application, loan and loan application, loan application and document tables.

Build desktop user interface for clerk to add new customer, loan application, document upload.

Build desktop user interface for manager to view and approve the uploaded documents for loan application and send mail notification for customers.

Oracle Internal & Oracle University Use Only

Build reports as per business process.

Create users and roles to implement security. Only specified role should able to perform the business process.

5.2 Advance Java

Create web application using Java Server Faces.

Create new user, login page.

Create Apply Online page along with required document upload page

Build required business components using EJB Session Bean.

Bind business components with desktop and web user interfaces.

Build message driven beans to send email notifications to customer.

Configure Security using JAAS.

1. Guidelines to the instructors:

**Step 1**

Help the participants to create a schema in the database.

Creation of Tables

Feed Data ( Encourage them to insert some realistic data)

Create other objects

Views

Sequences

Constraints

**Step 2**

Let the team build desk top application for clerk and manager.

Team need to build all required business components and test the components by writing test clients,

Note Down comments/ideas by other team and facilitator

Keeping these ideas as base, team has to list down the queries that can facilitate the loan application process and approval.

Write queries to solve all above problems.

After building business components team need to build user interface.

Oracle Internal & Oracle University Use Only

**Step 3** – Validate

All learning objectives defined above for the Java should have been met. If not revisit and ensure the learning objectives are met for the Java.

**Step 4**

After successful completion of desktop application the team should build web application.

They should use existing business components to build pages.

**Step 5** – Validate

All learning objectives defined above for the Advance Java should have been met. If not revisit and ensure the learning objectives are met for the Advance Java.

**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 without fail for Java and Adv Java.

1. Reference Material:

https://docs.oracle.com/javase/tutorial/

http://docs.oracle.com/javaee/6/tutorial/doc/

http://www.javaworld.com/blogs

http://www.oracle.com/technetwork/java/blogs-141806.html

http://blog.bielu.com/