Objectives

The course objectives met by this assignment include:

- Course specifications are available online from the USQ website <http://www.usq.edu.au/course/specification/>. Always check the website for the latest version.

On successful completion of this course, students should be able to:

1. demonstrate advanced written and oral communication skills by preparing and presenting professional documentation that is tailored to a specific audience
2. demonstrate the ability to organise and contribute to a project in a group environment
3. demonstrate the ability to manage, set and meet the deadlines agreed to as part of a group activity
4. demonstrate understanding of advanced programming and design techniques in developing distributed business enterprise systems
5. apply the appropriate planning and problem-solving skills required for the successful completion of a business systems project
6. demonstrate an understanding of technologies used in J2EE Enterprise applications (such as JSF, JSP, XML, DOM, StAX, JAX-RS, JAX-WS, SAX, SOAP, EJB, RPC, JMS, JNDI, JMS, etc)
7. demonstrate creativity, initiative, and enterprise by translating the problem into a solution (enterprise web application) that is efficient, economic, smart, and easily maintainable, and complies with the course material and specified Java 2EE software installations
8. demonstrate the ability to create, manage, and distribute robust, reliable, secure, and user-friendly component-based enterprise applications to provide business solutions in a multi tier web based enterprise system
9. where relevant, demonstrate the capacity to work successfully with others as part of a team to plan and deliver a project

Project Specifications Duke-Bookstore

Background

Currently our organisation has a sample running application to sell books which has been designed as an early proof of concept. The application can be found in your installation at **C:\glassfish4\docs\javaee-tutorial\examples\case-studies\dukes-bookstore** if you installed the system as per instructions. The demo uses NetBeans project so you should be able to open existing project to load the application and all its files into the IDE. Please take time and explore the

application fully to understand how it operates. You should also examine other projects and sample as they demonstrate technologies and techniques that you may find useful for your project. The sample application provides very basic functionalities that you will need to upgrade and extend to deploy as an enterprise business solution. A number of changes to the current system have been identified that must be implemented before you can proceed to the next step of suitability evaluation. You have been given a lot of freedoms in the look, feel and functionality of the design.

Desirable features to be implemented

Below is a list of features that the customer envisages the system should be able to support. The Sales, Auction and Auction notification modules and the background systems to support them are not negotiable and they must be implemented.

As part of your project you will need to identify the other features you will implement and the features that will be implemented as a possible future project. Each of the features you identify as possible future projects will need to be documented along with how the system will function without them.

With the negotiated optional features you will still need to do the design for those features in your modelling of the system, but will not need required to implement them with this iteration.

New Feature List

New Features (Sale, Auction and Auction Notification Mandatory)

The organisation has decided to add in a module to provide a system were participants can sell their previous bought copies of books either as a market sale item or as an auction item. For the market sale item a fixed price is set by the seller. For auction items the item is sold to the highest bidder for the item. The seller may set the minimal starting price for the auction and the first bid has to at least match that price. All subsequent bids have to higher then the highest bid up to that time. If one is not set it is assumed that any offer will be accepted at the end of the auction. The system has rudimentary management of items, customers and payment processing modules. You will need to modify and build in extra capabilities to facilitate the sales module.

Site Users

The market place will be only available to registered customers. Only sellers need to be registered members. A buyer will need to register when buying an item or placing a bid for an item. A visitor can look and evaluate the items for sale/auction without being registered. In order to make a bid/purchase for an item the bidder/buyer has to be registered and authenticated member.

Auctions Items

A user can register an item for sale as an auction item. They will need to provide the usual description of the item for auction along with the optional starting price and the duration of the auction and information regarding any delivery charges. It would be advantageous if the system had capability of adding an image of the item for sale.

After the auction is expired the winning bid will need to be notified as well as the seller of the item. See processing payments section. The losing bidder's information will be used to create email notification when same type of item is made available or sale again.

Auction Seller Items

For an auction item the seller will want to be able to review the bidding activity. As a seller they will want to see reports of their previous sales and the bidding activity associated with the auctions.

Auction Notification Registration

For users who made a bid on an auction item the ability to receive notifications when a competing bid has been placed on the auction item.

At the first stage only the collection and storage of information and access to the information needs to be implemented. This would include registration of users who have placed a bid on an item and who wish to be notified of rival bids. The mobile bidding application is being developed by a separate group and they will need a well-documented API to retrieve the notification information.

Market Sale Items

A registered user can put up an item for sale at a set price. When a buyer purchases the item the seller needs to be notified and the transaction processed. During the period the item is on sale the seller may change the asking price as they wish. Once the item is sold the prices cannot be modified. See processing payment section.

Market Seller Items

As a sales item the seller will want to review all his previous sale items to make decisions regarding which items to put up for sale and when.

Purchaser Rating

Purchaser can rate the performance of the seller and leave comments regarding their experience. The system needs to provide a summarized rating of the seller with an optional drill down for the comments from the buyers.

Processing Payment

The gateway will process all the payments as a separate activity. We only need to build in features to collect the information for the payment module which is yet to be built and implemented. The one problem is security of the customer data. As we will be collecting customer details and credit card information we need to take extra precautions. As part of the project you will need to research and recommend a process whereby we can guarantee the safety of the customer data.

Service Cost

As part of the service the organisation retains 5.5% of the cost of every item auctioned and a 3.5% charge for items sold as part of service cost to the users.

Auction Item Reports

The system will need to generate reports regarding the auction items from all the auctions on the system. The reports need to generate summary information from all the auction items between set

periods of time for review by management. The reports need only be Web based and accessible with appropriate authorisation.

Market Item Reports
The system will need to generate reports regarding the market items from all the sellers on the system. The reports need to generate summary information from all the seller items between set periods of time for review by management. The reports need only be Web based and accessible with appropriate authorisation.

Newsletters
When new items become available on the system newsletters to interested customers who have signed up to receive newsletters should be generated. At the moment the system is generic and generates newsletters to all signed up to receive newsletters customers.

New Items Newsletters
When a new item is placed either for sale or auction all customers who failed a bid for a similar item should be notified that the item is available for sale again. Only those customers who have indicated that they would be interested in receiving notifications should be included.

System Changes

Visual Changes
The web site needs to have a uniform design and feel across all the pages. The functionality needs to be carefully separated so as not to confuse the user as to the purpose of current pages. For example the current design allows us to control the shopping cart (delete all items) shop for available articles and see the current stock and quantities. This design is too cluttered and confusing. You are encouraged to look at other designs for inspirations but not copy the ideas. You will have to add extra pages and navigational capabilities between the different sections depending on the current logical state of the activities.

Things to be addresses by new design
- Unified screen design and placement of option across all the screens.
- Separate screen for different sections of activities
- Add last historical data for the user when logging onto the system (last login and purchases with greeting)
- Unified mechanisms for moving between the screens and options on the web pages.
- Extend the book descriptions to provide more details reading book structure and content.
- Ability to review previous shopping history for the customer
- Ability to modify information for the customer (shipping address and so on)
- Information to personalise the pages across different screens when logged into the system.
- Ability to peruse and add items to the cart without being logged in or registered to the system
- Ability to add and remove items to a wish list as future possible purchases.
- Ability to review historical purchases for registered and authenticated users.

- Users should be given the option to rate/review a book once they are a member and have logged into the system.
- List of the rate/reconditions of books by the customers
- Extend the options to include other categories of products beyond computer programming
- Expand the collection of customer information to include contact details and newsletters as well new product notifications
- Current front screen needs to be brought up to date and made more functional.

Structural Changes

The structural changes are modifications to the system either logical or physical by addition of new capabilities or design to add or capture new data or activities.

Currently the information tier is a simple item in the backing bean to fill in the DB with books and details. For current iteration of the project you can either keep it in the "in memory database" or convert the system to a physical Data Base system. If using the "in memory database" you will need to modify the process so that changes to the database can be exported in appropriate format to be loaded at next start-up of the system. Current solution uses classes to create the database entries which are not flexible for our purposes. You are free to utilise whichever database system you are familiar with or wish to explore. The database system does not need to be traditional Relational system. If you want you can look at alternative NoSQL type of solutions.

Functional Changes

There are a number of changes that need to be implemented in terms of processing to make the system more suitable for the organisation. These changes are designed to provide extra feedback and incentive for users to return and participate in the product offerings.

Things to be addresses by new design
- A more functioning database mechanism needs to be implemented to record and search the information stored in the application
- The system must be able to support multiple connections and processes by appropriately separating the state information between different communications.
- Collect information to create a mailing list of customers with their authorisation. The system will look at the wish list and notify of them of the current process as well as any new products in their wish list category
- Collection of information to form the base of mobile notifications of the bidding process
- Authentication and for logging into the system. Preferably that you use the existing facilities security mechanisms but if that fails write your own checks
- Full controls of the shopping cart to be able add and remove items as well as process payments.
- Rating system for the seller of goods for both auction and market place items.
- Where possible provide client side checks and validations for input before being submitted.

Final Thoughts

This is a group project so everyone in the group has to facilitate in developing and delivering a solution. The solution is only part of the overall evaluation. The groups activates, communication and documentation (both as a group and individual work) contribute towards the final grade.

While the changes do not look difficult in order to add them to the existing system they require quite a good understanding of how the current system operates and the services supplied by each of the technologies. While the changes might look trivial actually implementing them can be quite demanding.

The biggest change will be moving to the database option and linking the resources correctly. All the activities are grouped around the data store and access operations. Once you are over that hurdle and can access the data store you can either use mapping or backing bans for the access. Both options have their advantages and disadvantages.

The final design and operation of the screen are left up to the individual. Note that you are encouraged to utilise the new design features and technologies. Solutions which have been discarded / deprecated by the J2EE systems should not be implemented. For example you are encouraged to use JSF solutions in place of Servlets or Scriptlets. Separation of responsibilities and a good MVC design is very important for future development.

Be careful of adding new frameworks to the solution. While they might simplify part of the project the integration and learning curve could be more complicated than the standard features available in J2EE. If the team chooses to use another library make sure you document its inclusion. Any third party libraries must be fully free and open source. **Do not use any commercial or free to try third party components.**

The downloaded textbook provides you with a lot example code demonstrating various technologies or procedures to correctly set up and deploy the solutions. You are strongly encouraged to carefully go through the different aspects to familiarise yourself with the technology and terminology. Try and work only on one part at a time as a small error can be quite hard to diagnose. Please use the discussion list for the course to discuss issues and possible problem solutions.

All the best