SOFE 3650U Software Design and Architecture

Iteration 3 of Art Gallery Project

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Project Use Cases :

Use Case	***Description***
UC-1: Information Page	A user can access the information about the art gallery website, history of art gallery website, and the events of the upcoming art gallery and its location Administrator can update this information, upload new information, new events description.
UC-2: Buy or Sell Arts	A user can buy art pieces from the sales page and can select the quantity required to buy. Administrator has the access the to update the art pieces for selling. Administrator can also buy the art pieces from the artists.
UC-3: Make Payment	A user can use the different payment methods to buy the desired art pieces. Administrator can buy art from the users that are selling the art pieces by making payment through this method.
UC-4: Contact Art Gallery	A user can provide feedback, express concerns, make a complaint regarding the services provided at art gallery website through Art Gallery contact page. A customer service representative can see the complaints and concerns of the users through art gallery contact page and can access them accordingly.
UC-5: Collection Page	A user can see the different art pieces listed on the collection page. Collection Page is only meant to display the art pieces. Users can access this page free of cost. Administrator can remove, add or modify the art pieces on this page.
UC-6: Manage Users	The administrator removes or adds the users. Administrator can modify the permissions of the users. User can be removed for a limited period or permanently by the administrator .
UC-7: Login and Logout	A user login into the system through a password /login page will be promoted when the user clicks on sign in. Once the user has been authorized the access to the art gallery, user can navigate the art gallery website according to the roles. Administrator have access to the login and passwords of every user of the art gallery website.
UC-8: Manage Art Gallery	Administrator have access to the art gallery and manages the amount of art pieces displayed, any information or issues related to the art gallery. Technician manages the art gallery by fixing the concerns related to the art gallery functioning. Technician is responsible for the overall maintenance of the art gallery website.

Quality Attributes :

Quality Attribute	Description	Associate Use Case(s)
QA-1: Performance	The User should not experience delays of more than 5 seconds in retrieving information from the site.	All UC
QA-2: Usability	The User has many methods of paying for the art they desire. The system should reflect this and offer many payment methods (bank transfer, e-transfer, cash by mail etc…)	UC-3
QA-3: Testability	The system may sometimes receive invalid inputs. The system should be able to process these inputs within 10 seconds per invalid input.	All UC
QA-4: Security	User's will store private financial information on thesite to buy and sell art. Therefore, the system should encrypt the private information of its users like login and financial info.	All UC
QA-5: Modifiability Usability	The system administrator should be able to modify theart gallery.	UC-1, UC- 2, UC-5, UC-8
QA-6: Testability	The system must be able to complete art transactions	All UC
QA-7: Availability	The system must continue to operate and be available all the time. For UC-4 availability must be predefined	All UC
QA-8: Interoperability	The system must exchange data with external systems such as banking services and online payment providers	UC-3
QA-9: Performance	The users can see new art pieces withing thirty minutes from an update by the administrator.	UC-5
QA-10: Security	The management can easily find out the different modes of payments and which users have made the payments	UC-3
QA-11: Security	The administrator can decide which users can be added or removed from the art gallery due to any security concerns which might be temporary or	UC-6

Constraints:

Constraint	Description
CON-1	The system must be accessible and run smoothly by all popular web browsers (mozilla, chrome, edge etc...) and all popular operating systems (Windows, mac os x). Additionally, the system must also support mobile devices.
CON-2	All user data including financial and transactional records must be stored indefinitely.
CON-3	The system must have a mobile-friendly design.
CON-4	The system must work properly when viewed with different resolution monitors. The system must work when the view is stretched or shrunk.
CON-5	All art uploaded to the system must have the authors permission.

Iteration 3: Further identifying structures to support functionality

The goal of this iteration is to further implement structural functionality to support the primary use cases.

Step 2: Establish Iteration Goal by Selecting Drivers

The main driver of this iteration will be UC-2: Buy or Sell Arts. The broad approach used to implement functionality in iteration 2 resulted in overlooking some requirements of UC-2. Specifically, the ability for a user to buy art was implemented, but the ability for a user to sell their own art was neglected.

To fulfill UC-2, CON-5 must also be fulfilled as all art uploaded to the website to make a profit must be verified.

Step 3: Choose One or More Elements of the System to Refine

The elements that are necessary to refine to implement the functionality are listed below:

Module/Element	**Rationale**
Tier: Server	
Layer: Business	
Home Controller	Functionality must be added to the Home Controller that allows users to post artwork on the website. Additionally, functionality to support new modules must be added
Layer: Presentation	
User Interface	A new form for displaying payment options, total profit, revenue, etc. should be added to display to users who sell art.
UI Process Logic	New logic to display forms should be added to support UC-2 functionality
Layer: Data	
Payment System Connector	The payment system connector should be updated to add automatic functionality to pay users selling their art.

Step 4: Choose One or More Design Concepts That Satisfy the Selected Drivers

Design Decision	**Rationale**
Update Domain Model	The Domain model should be updated to include new functionality
Payment Controller	A payment controller module to handle operations regarding paying users must be implemented (UC-2).
Art Verification	An external verification system for new art added by users must be added to ensure that all art on the website is sold legally (CON-5).

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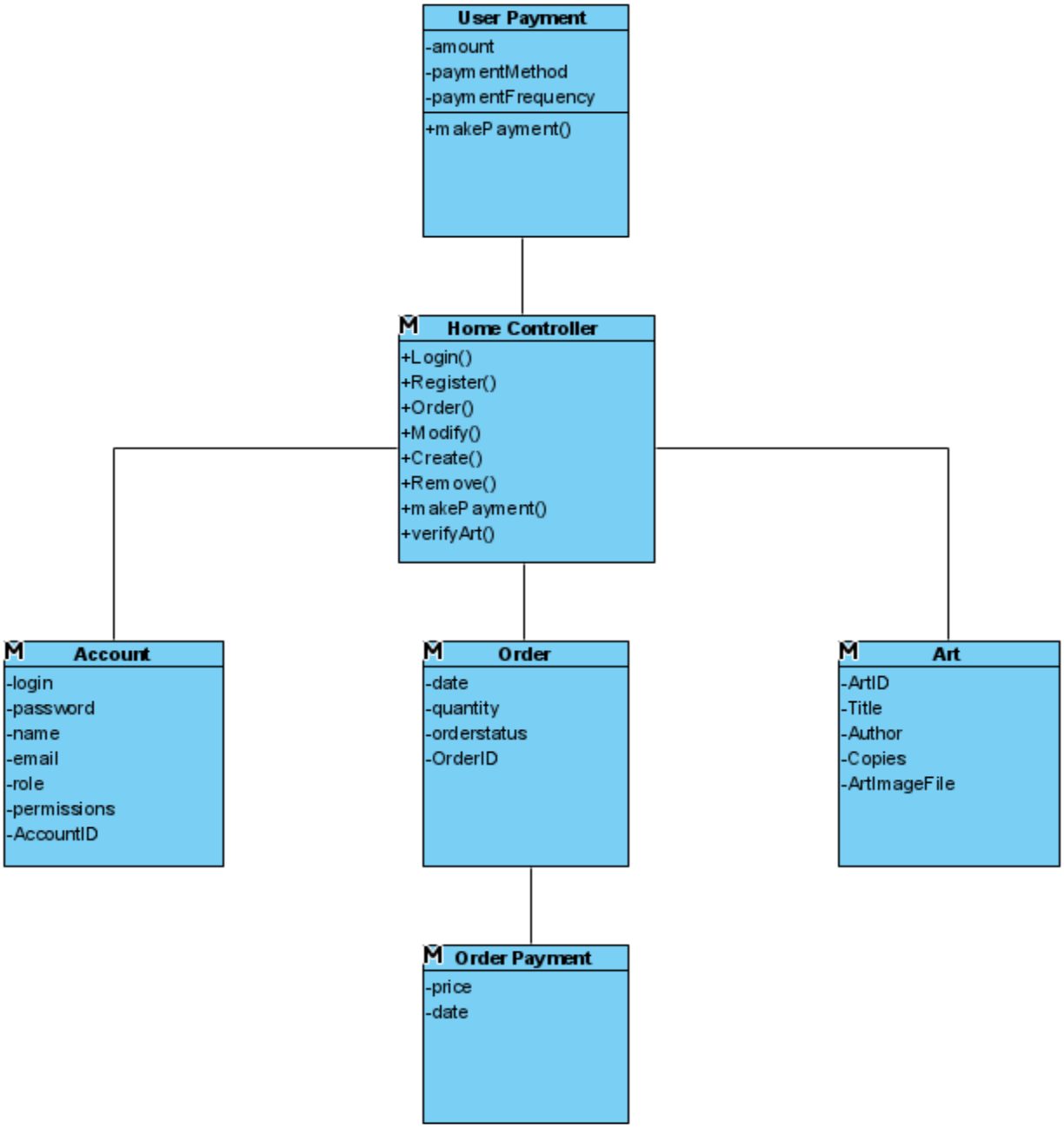
Step 5: Instantiate Architectural Elements, Allocate Responsibilities, and Define Interfaces

Design Decision	**Rationale**
Update Domain Model	The Domain Model must be updated to show the new module.
Add Payment Controller to Business Layer	The Payment Controller must be added to the business layer to communicate with other modules. The Payment Controller will communicate with the Payment System Connector and the Home Controller.
Add functionality to Home Controller to support Payment Controller and Art Verification Connector	Functionality that supports the Payment Controller must be added to the Home Controller. This functionality includes a function makePayment() that communicates with the Payment Controller for paying users. Additionally, functionality that supports verifying art via connecting to an external art verification system must be instantiated.
Add functionality to Payment System Connector to support Payment Controller	Functionality to support automatic paying of users must be added to the Payment System Connector.
Add Art Verification Connector to Data Layer	An Art Verification Connector must be added to communicate with the external Art Verification System. The connector should be in the data layer to communicate with external systems
Add external Art Verification System	An external Art Verification System must be added to ensure art sold on the website by its users is sold legally.

Step 6: Sketch Views and Record Design Decisions

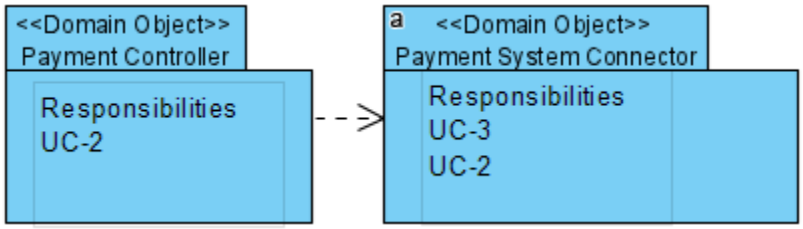
Updated Domain Model:



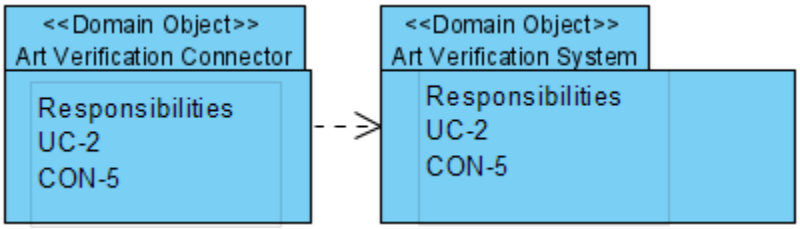
The updated domain module provides clarity to the previous payment module, specifying its use as payments via customers buying art. On the other hand, User Payment has been added to support the functionality of paying users for selling their art. Additionally, the verifyArt() method was added to the model for providing functionality to the external system.

New Domain Objects:

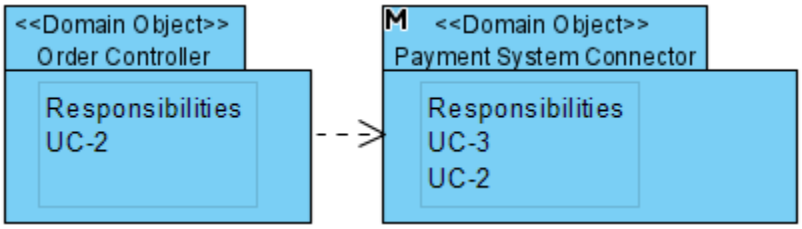
- Added Payment Controller which communicates with the Payment System Connector for handling payments to users selling art.



- Added Art Verification Connector to connect to the new external Art Verification System

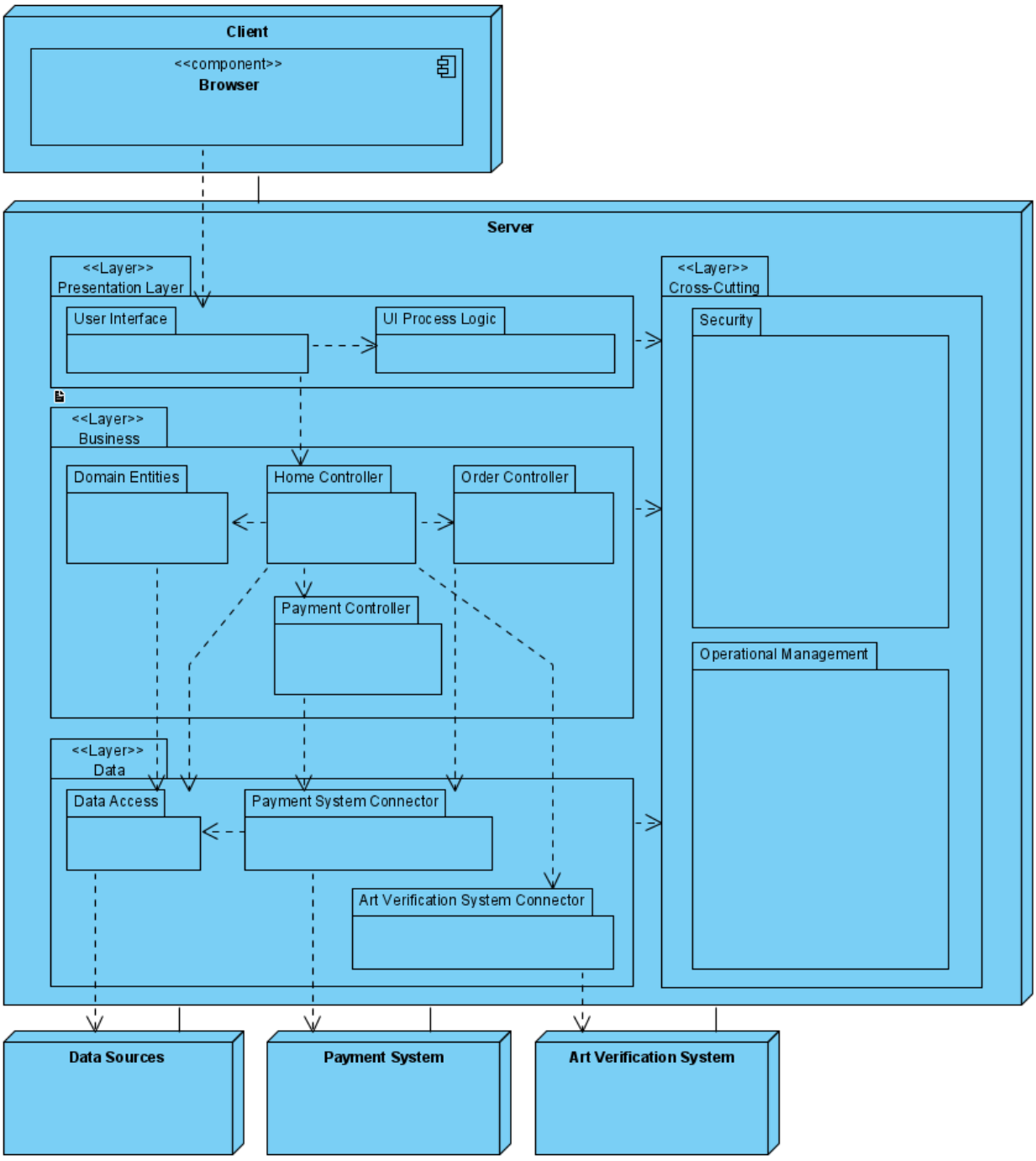


Updated Domain Object:



- The Payment system connector has now also been updated to include UC-2 as one of its responsibilities.

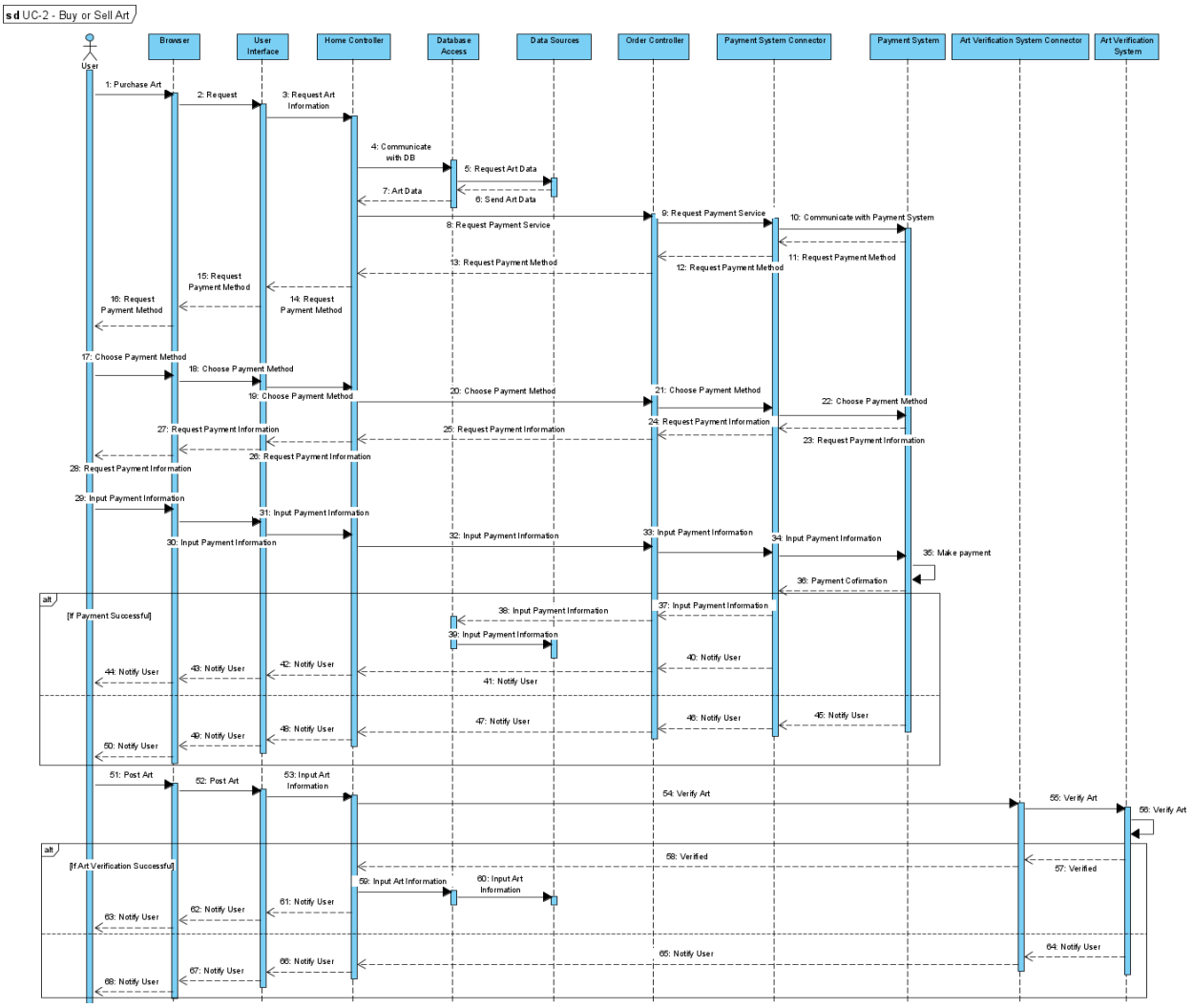
Updated Module View containing new module Payment Controller:



Element	Responsibility
Payment Controller	This controller contains business logic pertaining to UC-2. Specifically, the controller will process payments to users that are selling art on the website
Art Verification System Connector	This connector is responsible for communication between the Home Controller and the external Art Verification System, in other words, a service agent
External Art Verification System	Added to verify art posted on the website by the users.

Sequence Diagrams:

Updated UC-2: *Buy or Sell Art*



All method names will be further refined as they are implemented.

This sequence diagram now includes posting art to the system.

Method	**Definition**
Element: Browser	
Post Art	The User inputs information regarding their artwork like price, the image file, quantity, etc.
Element: User Interface	

Input Art Information	The User inputs information regarding their artwork like price, the image file, quantity, etc.
Element: Home Controller	
Verify Art	The Home Controller must verify the art provided by the user with a external art verification system
Input Art Information	This Home Controller must the new artwork into the database
Element: Art Verification System Connector	
Verify Art	Connect to the external Art Verification System to verify art from Home Controller
Element: Art Verification System	
Verify Art	Self message where the Art Verification System verifies data given
Element: Database Access	
Input Art Information	Access Database to input art (price, quantity etc.)

Step 7: Perform Analysis of Current Design and Review Iteration Goal and Achievement of Design Purpose

The design decisions in this iteration provided further understanding of the functionality supported in the system with regards to the primary functional use cases. Modules associated with the functionality of the system were identified and defined.

Not Addressed	Partially Addressed	Fully Addressed	Rationale
		UC-2	The payment system to pay for art has been implemented and the ability for artists to post their art for sale has also been implemented.
		CON-5	The constraint that all art must be verified to be legally sold has been fully addressed with the implementation of an external art system and its modules/interfaces.