**AcuArt Online Gallery Platform**

**Business Requirements and Technical Design Document**

**1. Executive Summary**

AcuArt Online Gallery Platform is a sophisticated web-based e-commerce solution designed to showcase and sell artwork from emerging and established artists. The platform provides a comprehensive digital gallery experience with integrated shopping capabilities, artist portfolio management, and customer engagement tools. The system prioritizes user experience and rapid content delivery while maintaining a clean, artistic interface.

**2. Business Requirements**

**2.1 Functional Requirements**

**User Authentication and Account Management**

* Customer registration and login system
* Artist account management with portfolio access
* Guest browsing capabilities
* Password recovery and account settings
* User profile management with purchase history

**Art Gallery and Catalog Management**

* Comprehensive artwork display system
* High-resolution image gallery with zoom functionality
* Artwork categorization by style, medium, artist, and price range
* Advanced search and filtering capabilities
* Featured artwork and recommendation engine

**E-commerce Shopping Platform**

* Shopping cart functionality with persistent sessions
* Secure checkout process with multiple payment options
* Order management and tracking system
* Inventory management for limited edition pieces
* Digital receipt and confirmation system

**Artist Portfolio Management**

* Artist profile creation and management
* Portfolio upload and organization tools
* Artwork metadata management (title, description, price, dimensions)
* Artist biography and exhibition history
* Commission request system

**Content Management System**

* Dynamic content publishing for exhibitions and events
* Blog platform for art news and artist features
* Comment system for artwork and blog posts
* Social media integration for sharing
* Newsletter subscription and management

**Customer Service and Communication**

* Contact form for customer inquiries
* Live chat support system
* FAQ and help documentation
* Customer feedback and review system
* Artist-customer direct messaging

**2.2 Non-Functional Requirements**

**Performance and Scalability**

* Fast image loading with progressive enhancement
* Support for high-resolution artwork images
* Scalable architecture for growing artist and customer base
* Optimized database queries for catalog browsing
* CDN integration for global content delivery

**User Experience**

* Responsive design for desktop, tablet, and mobile devices
* Intuitive navigation and search interface
* Accessibility compliance for all users
* Multi-language support capability
* Clean, artistic visual design

**Security and Trust**

* Secure payment processing integration
* Customer data protection and privacy
* Fraud detection and prevention
* Secure file upload for artist portfolios
* Regular security monitoring and updates

**3. Technical Architecture**

**3.1 Technology Stack**

**Frontend Technologies**

* HTML5 and CSS3 for modern web standards
* JavaScript for dynamic user interactions
* Responsive design framework for mobile compatibility
* AJAX for smooth browsing experience
* Image optimization and lazy loading

**Backend Technologies**

* PHP 7.4+ for server-side processing
* Object-oriented programming architecture
* RESTful API design for mobile app integration
* Session management for shopping cart persistence
* Template engine for consistent design

**Database Infrastructure**

* MySQL database for data persistence
* Optimized indexing for search performance
* Relational design for complex art metadata
* Backup and recovery procedures
* Data integrity constraints

**Infrastructure and Hosting**

* Apache web server with mod\_rewrite
* SSL/TLS encryption for secure transactions
* Cloud hosting for scalability
* Regular backup systems
* Performance monitoring tools

**3.2 Database Design**

**User and Authentication Tables**

CREATE TABLE users (

user\_id INT PRIMARY KEY AUTO\_INCREMENT,

username VARCHAR(50) UNIQUE NOT NULL,

email VARCHAR(100) UNIQUE NOT NULL,

password VARCHAR(255) NOT NULL,

first\_name VARCHAR(50),

last\_name VARCHAR(50),

user\_type ENUM('customer', 'artist', 'admin') DEFAULT 'customer',

registration\_date TIMESTAMP DEFAULT CURRENT\_TIMESTAMP,

last\_login TIMESTAMP,

is\_active BOOLEAN DEFAULT TRUE

);

**Artwork and Gallery Tables**

CREATE TABLE artworks (

artwork\_id INT PRIMARY KEY AUTO\_INCREMENT,

title VARCHAR(200) NOT NULL,

description TEXT,

artist\_id INT NOT NULL,

category\_id INT,

price DECIMAL(10,2),

image\_url VARCHAR(500),

dimensions VARCHAR(100),

medium VARCHAR(100),

year\_created YEAR,

is\_available BOOLEAN DEFAULT TRUE,

created\_date TIMESTAMP DEFAULT CURRENT\_TIMESTAMP,

FOREIGN KEY (artist\_id) REFERENCES users(user\_id)

);

CREATE TABLE categories (

category\_id INT PRIMARY KEY AUTO\_INCREMENT,

category\_name VARCHAR(100) NOT NULL,

description TEXT,

parent\_category\_id INT,

display\_order INT DEFAULT 0

);

**E-commerce and Order Management**

CREATE TABLE shopping\_cart (

cart\_id INT PRIMARY KEY AUTO\_INCREMENT,

user\_id INT,

artwork\_id INT NOT NULL,

quantity INT DEFAULT 1,

added\_date TIMESTAMP DEFAULT CURRENT\_TIMESTAMP,

FOREIGN KEY (user\_id) REFERENCES users(user\_id),

FOREIGN KEY (artwork\_id) REFERENCES artworks(artwork\_id)

);

CREATE TABLE orders (

order\_id INT PRIMARY KEY AUTO\_INCREMENT,

user\_id INT NOT NULL,

total\_amount DECIMAL(10,2) NOT NULL,

order\_status ENUM('pending', 'confirmed', 'shipped', 'delivered', 'cancelled'),

shipping\_address TEXT,

billing\_address TEXT,

payment\_method VARCHAR(50),

order\_date TIMESTAMP DEFAULT CURRENT\_TIMESTAMP,

FOREIGN KEY (user\_id) REFERENCES users(user\_id)

);

**Content and Communication Tables**

CREATE TABLE blog\_posts (

post\_id INT PRIMARY KEY AUTO\_INCREMENT,

title VARCHAR(200) NOT NULL,

content TEXT NOT NULL,

author\_id INT NOT NULL,

publication\_date TIMESTAMP DEFAULT CURRENT\_TIMESTAMP,

is\_published BOOLEAN DEFAULT FALSE,

view\_count INT DEFAULT 0,

FOREIGN KEY (author\_id) REFERENCES users(user\_id)

);

CREATE TABLE comments (

comment\_id INT PRIMARY KEY AUTO\_INCREMENT,

post\_id INT,

artwork\_id INT,

user\_id INT,

comment\_text TEXT NOT NULL,

comment\_date TIMESTAMP DEFAULT CURRENT\_TIMESTAMP,

is\_approved BOOLEAN DEFAULT FALSE,

parent\_comment\_id INT

);

**3.3 Application Architecture**

**MVC Structure**

* Models: User.php, Artwork.php, Order.php, Category.php
* Views: Twig template engine for clean separation
* Controllers: HomeController.php, ShopController.php, UserController.php
* Services: PaymentService.php, EmailService.php, ImageService.php

**API Layer**

* RESTful endpoints for mobile app integration
* JSON response format for all API calls
* Authentication middleware for protected routes
* Rate limiting for API abuse prevention

**4. Feature Specifications**

**4.1 User Authentication System**

**Registration and Login**

// User registration processing

$username = $\_POST['username'];

$email = $\_POST['email'];

$password = $\_POST['password'];

$query = "INSERT INTO users (username, email, password) VALUES ('$username', '$email', '$password')";

$result = $database->query($query);

**Session Management**

* PHP session-based authentication
* Shopping cart persistence across sessions
* Remember me functionality with secure cookies
* Automatic logout after inactivity

**4.2 Artwork Gallery System**

**Artwork Display and Search**

// Artwork search functionality

$search\_term = $\_GET['search'];

$category = $\_GET['category'];

$query = "SELECT \* FROM artworks WHERE title LIKE '%$search\_term%' OR description LIKE '%$search\_term%'";

if ($category) {

$query .= " AND category\_id = '$category'";

}

$results = $database->query($query);

**Image Management**

* High-resolution image upload system
* Automatic thumbnail generation
* Image optimization for web delivery
* Watermark protection for artist portfolios

**4.3 E-commerce Shopping Cart**

**Cart Management**

// Add item to shopping cart

$user\_id = $\_SESSION['user\_id'];

$artwork\_id = $\_POST['artwork\_id'];

$quantity = $\_POST['quantity'];

$query = "INSERT INTO shopping\_cart (user\_id, artwork\_id, quantity) VALUES ('$user\_id', '$artwork\_id', '$quantity')";

$database->query($query);

**Payment Processing**

* Integration with multiple payment gateways
* Secure tokenization of payment information
* Order confirmation and tracking
* Digital receipt generation

**4.4 Content Management**

**Blog and News System**

// Blog post creation

$title = $\_POST['title'];

$content = $\_POST['content'];

$author\_id = $\_SESSION['user\_id'];

$query = "INSERT INTO blog\_posts (title, content, author\_id) VALUES ('$title', '$content', '$author\_id')";

$database->query($query);

**Comment System**

// Comment submission

$post\_id = $\_POST['post\_id'];

$user\_id = $\_SESSION['user\_id'];

$comment\_text = $\_POST['comment'];

$query = "INSERT INTO comments (post\_id, user\_id, comment\_text) VALUES ('$post\_id', '$user\_id', '$comment\_text')";

$database->query($query);

**4.5 Artist Portfolio Management**

**Portfolio Upload System**

// Artwork upload processing

$title = $\_POST['title'];

$description = $\_POST['description'];

$price = $\_POST['price'];

$image\_file = $\_FILES['artwork\_image'];

$upload\_dir = './uploads/artworks/';

$image\_path = $upload\_dir . basename($image\_file['name']);

if (move\_uploaded\_file($image\_file['tmp\_name'], $image\_path)) {

$query = "INSERT INTO artworks (title, description, price, image\_url) VALUES ('$title', '$description', '$price', '$image\_path')";

$database->query($query);

}

**4.6 Customer Service Features**

**Contact and Inquiry System**

// Contact form processing

$name = $\_POST['name'];

$email = $\_POST['email'];

$message = $\_POST['message'];

$inquiry\_type = $\_POST['inquiry\_type'];

$query = "INSERT INTO customer\_inquiries (name, email, message, inquiry\_type) VALUES ('$name', '$email', '$message', '$inquiry\_type')";

$database->query($query);

**5. User Interface Design**

**5.1 Homepage Layout**

**Hero Section**

* Featured artwork carousel with high-quality images
* Artist spotlight with rotating profiles
* Call-to-action buttons for browsing and registration
* Search bar with intelligent autocomplete

**Navigation Structure**

* Main menu with gallery categories
* User account dropdown with login/register
* Shopping cart icon with item count
* Mobile-responsive hamburger menu

**5.2 Gallery and Shop Interface**

**Artwork Grid Display**

* Masonry layout for optimal image presentation
* Filter sidebar with category, price, and artist options
* Sort functionality by price, date, popularity
* Infinite scroll or pagination for large catalogs

**Individual Artwork Pages**

* High-resolution image viewer with zoom
* Detailed artwork information and artist bio
* Add to cart and wishlist functionality
* Related artwork recommendations
* Customer reviews and ratings

**5.3 Shopping Cart and Checkout**

**Cart Interface**

* Item preview with thumbnails and details
* Quantity adjustment and removal options
* Price calculation with taxes and shipping
* Save for later functionality
* Guest checkout option

**Checkout Process**

* Multi-step form with progress indicator
* Address validation and shipping options
* Payment method selection
* Order summary and confirmation
* Email confirmation and tracking information

**6. Security and Data Protection**

**6.1 Data Security Measures**

**User Data Protection**

* Encrypted password storage
* Personal information access controls
* GDPR compliance for European users
* Data retention and deletion policies

**Payment Security**

* PCI DSS compliance for payment processing
* SSL encryption for all transactions
* Secure payment gateway integration
* Fraud detection algorithms

**6.2 Application Security**

**Input Validation**

* Form input sanitization and validation
* File upload restrictions and scanning
* SQL injection prevention measures
* Cross-site scripting protection

**Access Control**

* Role-based permission system
* Administrative interface security
* Artist account verification process
* Customer data access restrictions

**7. Integration and Third-Party Services**

**7.1 Payment Gateways**

**Supported Payment Methods**

* Credit and debit card processing
* PayPal integration
* Digital wallet support (Apple Pay, Google Pay)
* Bank transfer and wire payment options
* International currency support

**7.2 Shipping and Logistics**

**Shipping Integration**

* Real-time shipping rate calculation
* Multiple carrier support (UPS, FedEx, DHL)
* International shipping capabilities
* Package tracking integration
* Insurance and signature confirmation

**7.3 Marketing and Analytics**

**Analytics Integration**

* Google Analytics for user behavior tracking
* Conversion funnel analysis
* Artist performance metrics
* Customer lifetime value calculation
* A/B testing framework

**8. Performance and Optimization**

**8.1 Image Optimization**

**Image Processing Pipeline**

* Automatic image compression and resizing
* WebP format support for modern browsers
* Lazy loading for improved page speed
* CDN distribution for global performance
* Progressive image enhancement

**8.2 Database Optimization**

**Query Performance**

* Indexed searches for artwork and categories
* Query caching for frequently accessed data
* Database connection pooling
* Optimized join operations
* Regular maintenance and optimization

**9. Mobile and Accessibility**

**9.1 Mobile Experience**

**Responsive Design**

* Touch-optimized interface elements
* Mobile-specific navigation patterns
* Optimized image sizes for mobile bandwidth
* Progressive web app capabilities
* Offline browsing for cached content

**9.2 Accessibility Compliance**

**Universal Design Principles**

* Screen reader compatibility
* Keyboard navigation support
* High contrast mode availability
* Alternative text for all images
* WCAG 2.1 AA compliance

**10. Testing and Quality Assurance**

**10.1 Functional Testing**

**Core Feature Testing**

* User registration and authentication flow
* Shopping cart and checkout process
* Payment processing verification
* Image upload and display functionality
* Search and filtering accuracy

**10.2 Performance Testing**

**Load Testing Scenarios**

* High-traffic gallery browsing
* Concurrent checkout processes
* Image-heavy page loading
* Database query performance under load
* Payment gateway stress testing

**10.3 Security Testing**

**Vulnerability Assessment**

* Input validation testing
* Authentication security verification
* File upload security validation
* Payment security compliance
* Data protection audit

**Document Version:** 1.0  
**Platform Type:** E-commerce Art Gallery  
**Target Audience:** Art Collectors, Artists, Gallery Visitors  
**Business Model:** Commission-based Art Sales Platform