

Virtual Art Gallery

1. Introduction

- **1.1 Purpose**

- Our e-commerce platform for an art gallery enables users to purchase a diverse range of artworks, focusing primarily on Singapore and the broader Asian market. We specialize in various art forms, including paintings, sculptures, eco-friendly crafts, historical pieces, and food art. A unique feature of our platform is that artists can directly upload their own works and manage their own gallery space, creating a hybrid experience reminiscent of both a traditional art gallery and an online marketplace like eBay. Additionally, we offer online exhibitions to showcase artists' creations to a wider audience.

- **1.2 Intended Audience**

- The composition of the audience for a virtual art gallery can vary significantly depending on the exhibition's context and objectives. Potential target audience segments include:
- Art Enthusiasts: These individuals have a deep appreciation for art and frequently attend exhibitions and events. They can be reached through established arts organizations, social media platforms, and subscription-based email newsletters.
- Art Learners: This group seeks to expand their understanding of art, whether for personal enrichment or professional development. Tailoring outreach to specific interests in particular art genres can enhance engagement and learning outcomes.
- Art Buyers: Individuals interested in collecting and purchasing art form a crucial segment of the audience.
- Connections of Featured Artists: Friends and acquaintances of the artists showcased in the exhibition are also a significant audience segment.
- Educational Groups: School classes visiting the virtual exhibition as part of field trips contribute to a richer educational experience through interactive engagement with artistic content.

- **1.3 Intended Use**

User Requirements

- As an artist, I need a platform where I can upload and showcase my artwork to a global audience.
- As an artist, hosting a physical exhibition can be quite costly. Expenses like venue rental, transportation, installation, insurance, marketing, and refreshments can add up to be a lump sum, having a virtual art gallery could be budget-friendly while still reaching the audience.
- As an art enthusiast, I require a platform that allows me to share and explore artwork with others, fostering a community that appreciates and engages with diverse artistic expressions.
- As an artist selling my work online, I need a platform where I can easily monitor and track my sales.
- As an artist, I want to gauge interest in my art through metrics such as likes and views.
- As an art enthusiast, I require a user-friendly platform that enables me to easily discover and access local art from Singapore and Asia, allowing me to support and appreciate homegrown talent.
- As an emerging artist, I need a platform that enhances my visibility and promotes recognition of my work, helping me expand my audience reach effectively.
- As an administrator, I require a comprehensive moderation mechanism to manage access permissions, ensuring that only verified and approved individuals are granted entry to maintain security and integrity.

2. Methodology Used

This project will use the waterfall methodology. Due to its prearranged nature, there is significant potential for errors if expectations do not align with reality. Additionally, once a phase is completed, it cannot be revisited. The process begins with requirement analysis and proceeds through design, implementation, verification (testing), and maintenance, following a systematic step-by-step approach. Before moving to the requirements phase—where written specifications detailing cost, dependencies, criticality, and risks are created—the project must be thoroughly understood. In the Design phase, technological solutions are developed using scenarios, layouts, and data models to address the issues identified in the system requirements.

3. System Features and Requirements

3.1 Functional Requirements

The virtual art gallery system will include an admin feature that restricts artists to those based in Singapore and Asia, ensuring a localized focus. An additional module will vet uploaded artwork, requiring approval 5 to 6 hours before it is publicly posted.

To enhance user experience, the platform will provide a user-friendly interface that allows easy navigation of exhibitions and interaction with artworks. Features will include zooming, rotating, and viewing pieces in various contexts, such as virtual rooms or curated collections. The system will support high-resolution images and videos to accurately showcase the details of the artworks.

Robust security measures will be implemented to protect intellectual property and user data, ensuring the platform can scale to handle increasing visitor traffic and content uploads without performance issues. Integration with social media platforms and analytics tools will facilitate tracking visitor engagement and artwork popularity, enhancing user experience and supporting artists' promotional efforts.

Additionally, the system will allow users to track likes and views, fostering interactive engagement with the artwork. Artists will have access to analytics displaying the number of likes and views for each piece, with sorting capabilities to identify the most popular works and understand audience preferences. This functionality not only boosts user engagement but also provides artists with valuable insights into their artwork's reception.

Furthermore, the system will feature an artist wallet page that offers secure and transparent management of financial transactions. This includes functionalities for receiving payments, tracking earnings, and managing withdrawal requests, ensuring a seamless financial experience for artists.

3.2 External Interface Requirements

Home Page:

- Links to: About, Gallery, Artists, Exhibitions, Contact Us, User Account, and Purchase Page.
- Sections for Featured Art Pieces, Upcoming Exhibitions, and Artist Spotlight.

Gallery:

- Links to individual Art Piece Detail pages.
- Search function for finding specific art pieces.

Art Piece Detail:

- Accessible from the Gallery page.

Artists:

- Links to individual Artist Profile pages.
- Search function for finding specific artists.

Artist Profile:

- Accessible from the Artists page.

Exhibitions:

- Links to individual Exhibition Detail pages.

Exhibition Detail:

- Accessible from the Exhibitions page.

Contact Us and User Account:

- Direct links from the Home Page.

Purchase Page:

- Accessible from the Home Page or after adding items to the cart.

Admin Dashboard:

- Includes Content Management System (CMS), Order Management, and Analytics.
- Accessible by admin users only.

3.3 Non-functional Requirements

Ease of Use: Our system should allow users to search for each art piece or artist using keywords. The interface will be clutter-free, featuring well-organized menus, icons, and toolbars. A clear visual hierarchy will enable users to quickly identify and access commonly used features without distractions. The web app will be visually appealing, intuitive, and easy to navigate, ensuring a smooth experience for discovering art.

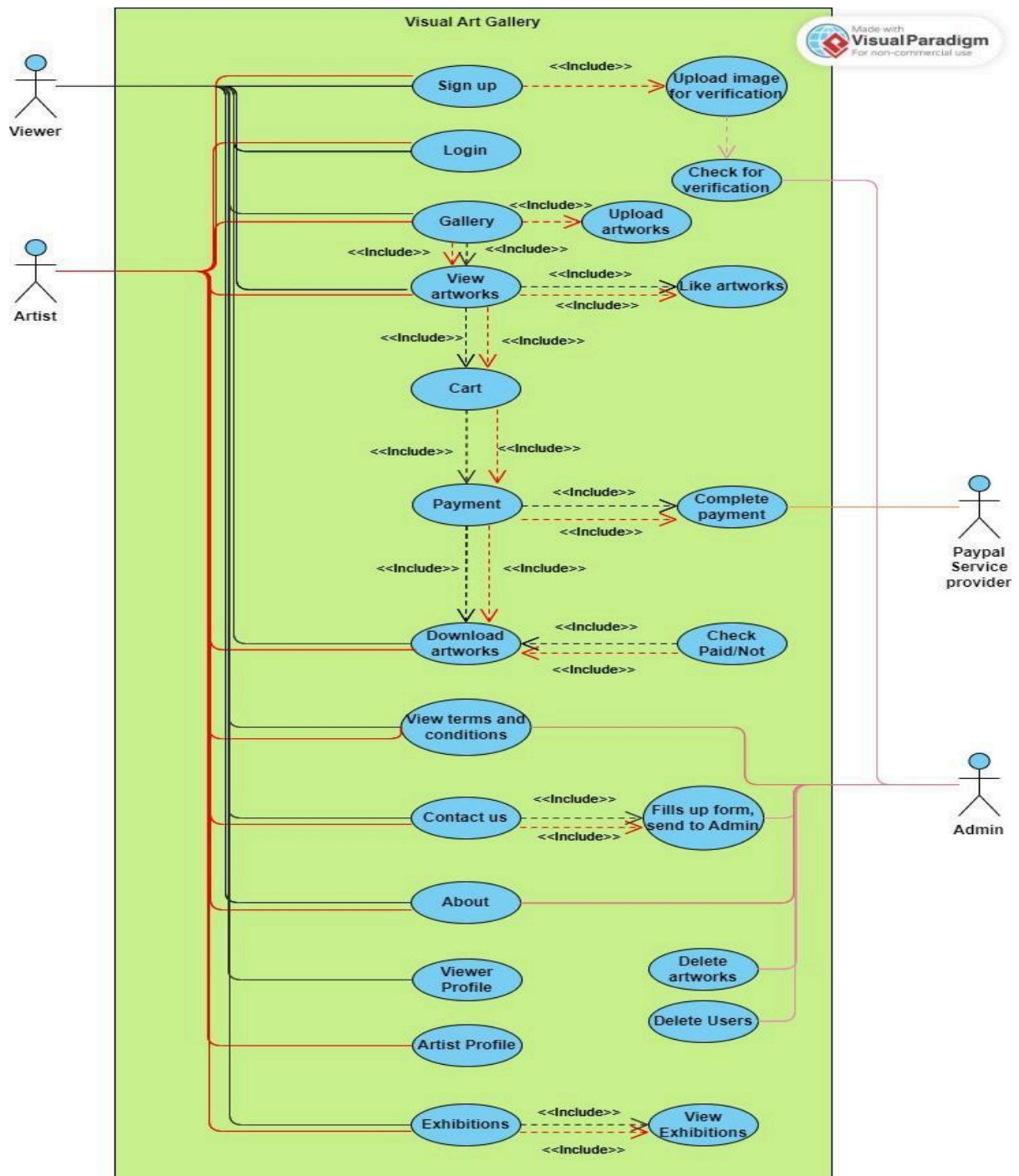
Size: The system must handle large amounts of data, with a minimum capacity of 10TB. We will maintain an optimized database size to store data while limiting the size of images uploaded by artists to ensure efficient storage management.

Reliability: The system should operate without crashing or freezing during normal usage. Stability is essential to ensure uninterrupted workflows and to prevent the loss of unsaved work due to unexpected failures.

Security: Transactions must be secure, incorporating a thorough vetting process for new artwork submissions. The system should prioritize the safety of users' credentials and data. Regular security updates will be conducted at the end of each month, along with collaborative and reliable penetration testing to identify and mitigate vulnerabilities.

4. Diagrammatic representation of the requirements

4.1 Use Case Diagram



Viewer

- What is the **Viewer** and what functions can it do?
- The **Viewer** has the least permissions among all.
- The **Viewer** has these functions:
 - Sign Up.

- Login.
- Gallery – View Artworks – Like Artworks – Add to Cart – Payment – Complete Payment – Check Paid/Not – Download Artworks.
- View Terms and Conditions.
- Contact Us – Fills up form and send it to **Admin**.
- About.
- Viewer Profile (Set up/edit own profile).
- Exhibitions – View Exhibitions.

Artist

- What is the **Artist** and what functions can it do?
- The **Artist** has moderate permissions among all.
- The **Artist** has these functions:
 - Sign Up – Upload image for verification – Wait for verification from Admin.
 - Login.
 - Gallery – View Artworks – Like Artworks – Upload Artworks – Add to Cart – Payment – Complete Payment – Check Paid/Not – Download Artworks.
 - View Terms and Conditions.
 - Contact Us – Fills up form and send it to **Admin**.
 - About.
 - Artist Profile (Set up/edit own profile).
 - Exhibitions – View Exhibitions.

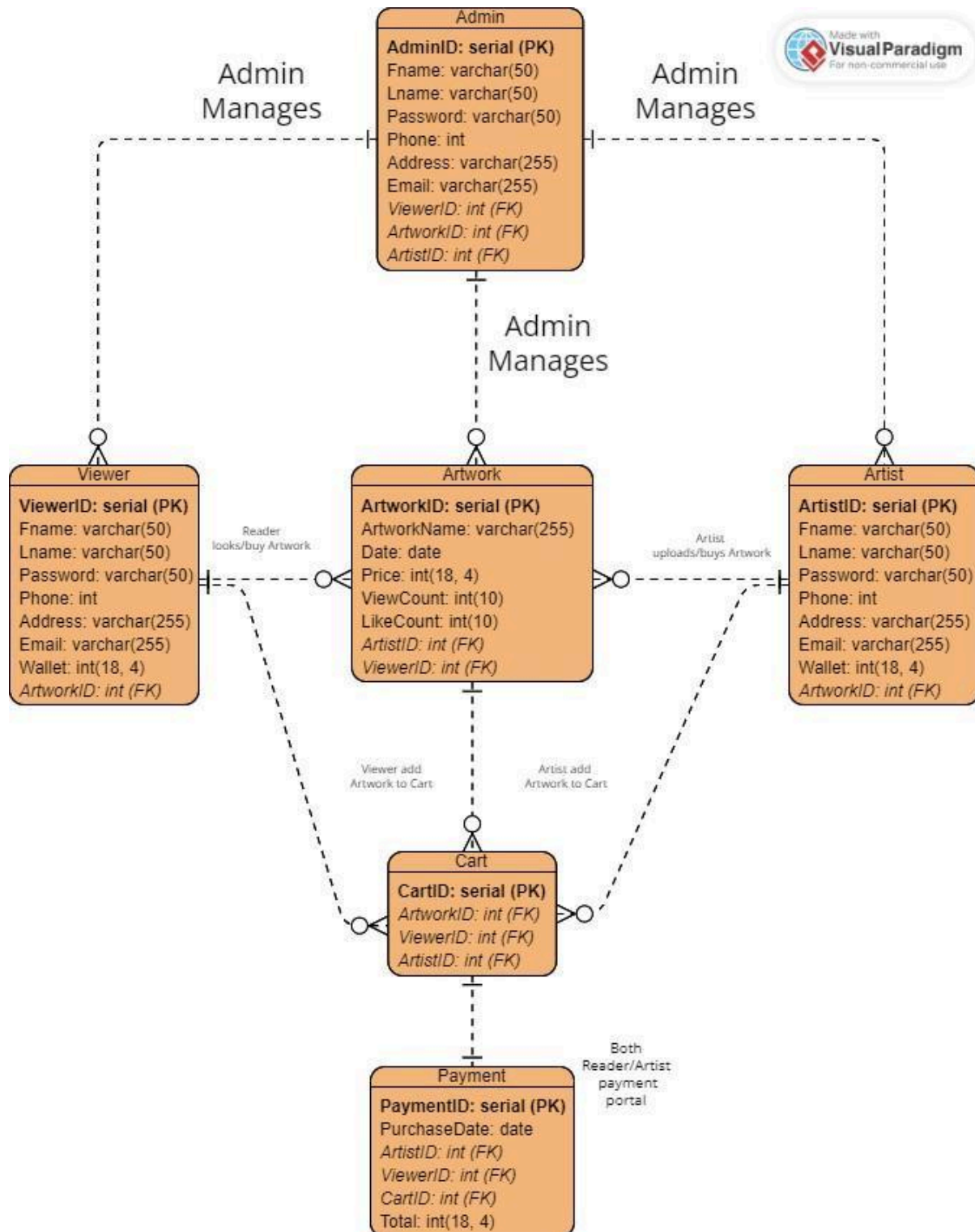
Admin

- What is the **Admin** and what functions it can do?
- The **Admin** has the highest permissions among all.
- The **Admin** has these functions:
 - Permissions to add/edit/delete all pages.
 - Permissions to edit/delete all artworks.
 - Permissions to edit/delete **Viewer/Artist**.
 - Verifies the **Artist's** image and Artworks.
 - Controls the Terms and Conditions page.
 - Controls the Contact Us page – including the forms and replying.
 - Controls the About page.

PayPal Service Provider

- What is the **PayPal Service Provider** and what functions can it do?
- The **PayPal Service Provider** has minimal permissions among all.
- The **PayPal Service Provider** has these functions:
 - Manage the Checkout/Payment process page.

4.2 ER Diagram



Viewer

- What is the **Viewer** and what does it do?
- **Viewer** is a user that can view, like, or buy an **Artist's** artwork.
- **Viewer** also comes with an empty wallet that has zero dollars in it.
- It first must create/sign up for an account in **Visual Art Gallery** website.
- Fill in their credentials like **First Name, Last Name, Phone Number, Address, and Email**.
- Once done, they must validate their account via their provided email address, this is to prevent bots from mass creating multiple accounts, potentially overloading the server or website, thus reducing the performance and lower user's satisfaction.
- After validating, they now can login via the login page and view various **Artist's** artworks.
- Should they want to download and use any Artist's artwork for commercial purposes, they would need to pay using their top-up wallet.
- Once the artwork is purchased, it is stored under their ID, and they can download or share anytime they want.

Artist

- What is the **Artist** and what does it do?
- **Artist** is a user that can view, like, buy an **Artist's** artwork, upload or delete their own artwork.
- **Artist** also comes with an empty wallet that has zero dollars in it.
- It first must create/sign up for an account in **Visual Art Gallery** website.
- Fill in their credentials like **First Name, Last Name, Phone Number, Address, and Email**.
- Once done, they must validate their account via their provided email address, this is to prevent bots from mass creating multiple accounts, potentially overloading the server or website, thus reducing the performance and lower user's satisfaction.
- After validating, they now can login via the login page and view various **Artist's** artworks or start to upload their own artworks.
- Should they want to download and use any Artist's artwork for commercial purposes, they would need to pay using their top-up wallet.
- Once the artwork is purchased, it is stored under their ID, and they can download or share anytime they want.

Artwork

- What is Artwork and what does it do?
- **Artwork** is a storage place where artists upload and store their artworks at.
- It is also where both **Viewer** and **Artists ID** are stored, to retrieve the correct artwork to them.
- It stores the **Date, Price, Like Counts, and View Counts** as well.

Cart

- What is the **Cart** and what does it do?
- **Cart** is the shopping cart where both Viewer and Artist can add the artwork to their shopping cart.
- This shopping cart will be able to display the artwork name, and the total price.
- Should they click the checkout button in the **Cart**, it will direct them to the **Payment** page with all the relevant artworks from the **Cart** as well.

Payment

- What is the **Payment** and what does it do?
- **Payment** is the place where both **Viewers** and **Artists** purchase their artworks at.
- It is a payment/checkout portal.
- It stores the **Date**, **Viewer ID**, **Artist ID**, and the **Total Price**.

Admin

- What is the **Admin** and what does it do?
- **Admins** are super users, they manage the website, validate the artwork, **Viewers**, **Artists**, add or delete any users or artworks that they deem unethical or harmful to others.

Unethical or harmful meaning – disturbing, offensive, blasphemy artworks.