

# **VR Tour - Man and the Living World Museum**

## **Statement of Work – Functional & Non-Functional Requirements**

**Performed By:**

**Bar Yaron – 206481533**

**Yakir Zafrani – 313327496**

**Project Director – Dr. Sharon Yalov Handzel**

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## Scope

This document describes the Functional and non - functional requirements, system architecture, and GANT of the VR tour project for our client - Man and the Living World Museum.

## Background:

Virtual reality (VR) is a simulated experience that employs pose tracking and 3D near-eye displays to give the user an immersive feel of a virtual world. Applications of virtual reality include entertainment (particularly video games), education (such as medical or military training) and business (such as virtual meetings).

### **VR In Education**

In the field of education, VR offers learners an immersive and interactive learning experience, allowing them to comprehend challenging concepts and ideas more efficiently and effectively. VR technology has enabled educators to develop a wide range of learning experiences, from virtual field trips to complex simulations, that may be utilized to engage students and help them learn.

## Project Goals

- To develop a new unique experience for the museum in order to attract new and diverse audiences.
- To give a new and accessible way to enjoy some of the museum's content.
- To perform a "remaster" for some outdated content in the museum and deliver said content in a fresh and innovative way.
- To give the museum the ability to continue accepting audience and present its content in a creative manner once it will be closed for renovations.

## Project Metrics

For our own evaluation regarding the performance, progress, and success of this project, we discuss the following metrics we consider:

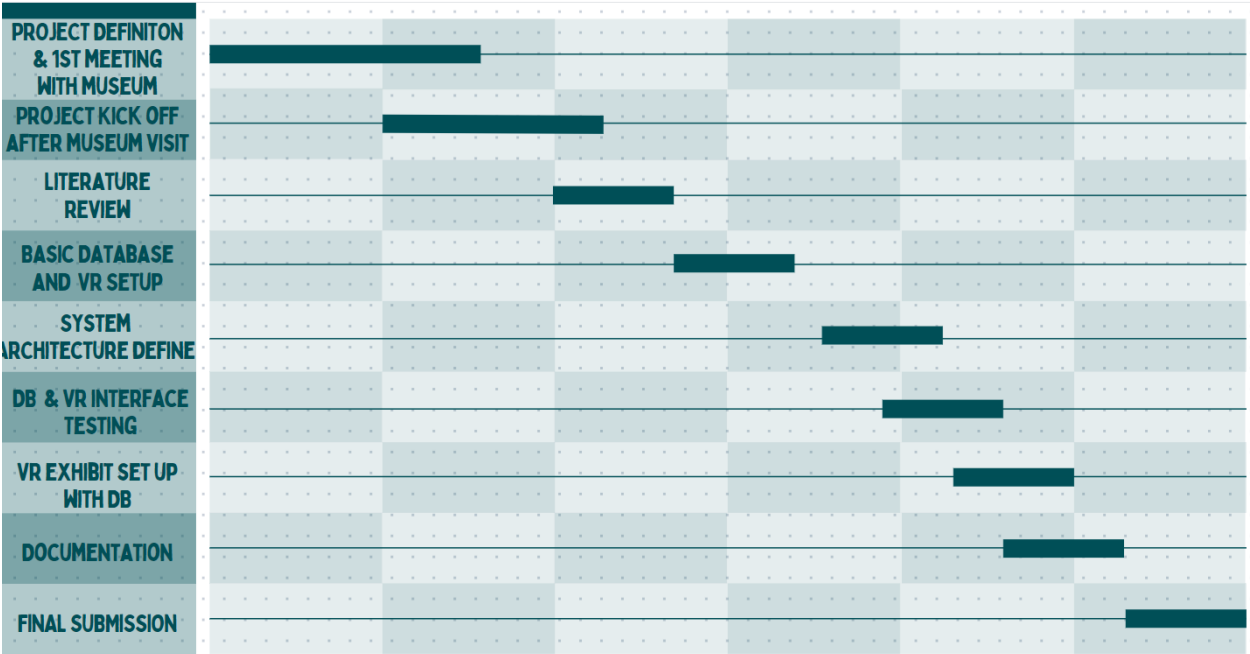
### 1. User Engagement Metrics

- 3D Environment: Regarding the overall experience, we aim to design and reproduce a portion of the museum's environment in the 3d engine, making it at least 80% reliable to the real museum.
- User Interaction Rate: We are aiming to implement 2 main features for the VR Tour which the user will interact with:
  - VR exhibit – where the user will be exposed to the museum's 3d simulated environment and interact with its objects.
  - Animal Vision Simulation – where the user could get an idea of how some animal visualize the environment.
- Time Spent in VR Environment: Average duration users spend exploring the VR museum application with the VR headset on, aiming for a 20 – 30 minutes session.

### 2. Database Performance Metrics:

- Database Response Time: Time taken for database queries to execute and return results.
- Database Throughput: Number of database transactions processed per unit of time.
- Data Integrity: Metrics related to the accuracy and consistency of data stored in the database.

VR Tour – GANT



## Initial (High Level) Requirements

### Main System Goal

As discussed in our project goals, the main goal is to develop a reliable and interactive VR experience for exploring the contents of the museum, along with integrating a database interface for the purpose of updating exhibits.

### Stakeholders

1. **Project Sponsor:** The individual or organization providing funding and overall support for the project. This could be a university department, a research institution, or a company interested in VR technology.
2. **Project Manager:** The person responsible for overseeing the project's execution, ensuring it stays on track, and coordinating activities among team members.
3. **Development Team:** This includes developers, designers, and testers directly involved in building the VR museum application. They are responsible for creating the VR environment, designing interactive exhibits, integrating the database, and ensuring the application's functionality.
4. **End Users:** The individuals who will ultimately use the VR museum application. This could include students, educators, museum visitors, or researchers interested in exploring museum exhibits in a virtual environment.

## Functional Requirements

### 1. VR Environment Interaction:

- Users should be able to navigate through the virtual museum environment using VR controllers.
- Interactive elements such as doors, buttons, and levers should respond to user actions within the VR environment.
- Users should be able to interact with exhibits by selecting, examining, and manipulating objects using VR interactions.

### 2. Exhibit Display and Information:

- Exhibits should be displayed within the VR environment with accurate representation through 3D models, textures, and animations.
- Information panels or overlays should provide users with relevant details, descriptions, and multimedia content about each exhibit.

### **3. Database Integration:**

- The system should integrate a database to store information about museum exhibits, including metadata such as name, description, artist information, place and time, multimedia assets (images, drawings) within the virtual environment.
- The database should support dynamic content management, allowing administrators to easily create, update, and manage a large mass of exhibitions without requiring significant development effort. This flexibility enables rapid iteration and adaptation to changing museum exhibits or themes
- Database queries should efficiently retrieve exhibit information based on user interactions, exhibit selections, or search queries.
- Users should have the ability to access additional information about exhibits, such as historical context, audio guides, or related articles.
- Implementing version control mechanisms within the database allows administrators to track changes made to exhibitions, revert to previous versions if needed, and collaborate more effectively during the content creation process.

### **4. User Interface (UI) and User Experience (UX):**

- The user interface should be intuitive and accessible, providing clear navigation cues and interactive elements.
- Menus, tooltips, and prompts should guide users through the VR museum experience, explaining controls and options.
- UI elements should be readable and usable within the VR environment, considering factors such as font size, contrast, and placement

## **Non - Functional Requirements**

### **1. Performance:**

- The VR museum application should maintain smooth performance, with consistent frame rates (e.g., 60 FPS) to prevent motion sickness and provide a comfortable user experience.
- Loading times for exhibits and database queries should be minimized to ensure seamless exploration within the VR environment.

### **2. Scalability:**

- The application architecture should be scalable to accommodate additional exhibits, features, and user interactions as the museum expands or evolves over time.

- Database scalability should be considered to handle increasing data volumes and concurrent user access without performance degradation.

### 3. Accessibility:

- The VR museum application should be accessible to users with disabilities, providing alternative navigation options, audio descriptions, and text-to-speech features.
- Consideration should be given to users with motion impairments or VR-related discomfort, providing options for seated or stationary VR experiences.

### 4. Design

- The 3D environments within the VR museum should closely resemble the real museum as much as possible, capturing its architectural layout, lighting conditions, and spatial dimensions.
- Environmental sounds and ambient noise should be incorporated to simulate the atmosphere of the museum, providing auditory cues that complement the visual experience.

### Block Diagram

