Faculty of Engineering
Helwan University

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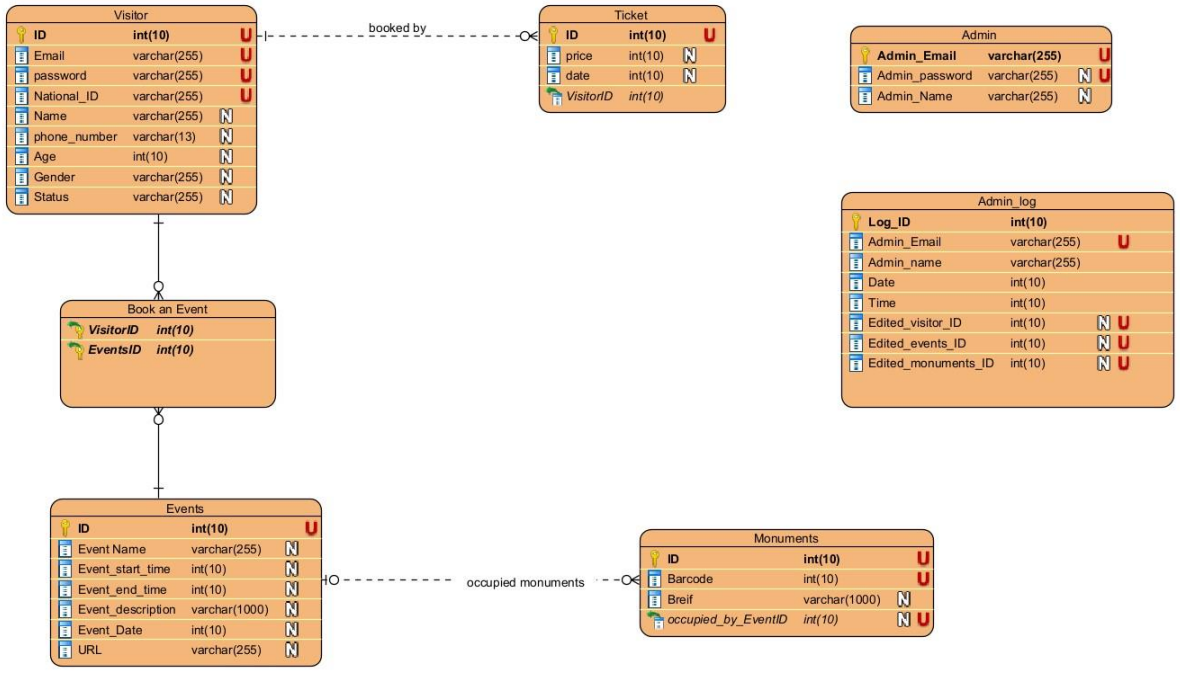
2. INTRODUCTION:

SAS product engineered to automate the museum entrance system, events registration and database The system provides the visitor with an easy user friendly interface which they can book a ticket to the museum or to preview events that take place inside the museum and register in one of them. Preview monuments and mini statues. As well as preview the museum map. The museum system stores thefollowing: -

- The name, ID of the visitor and date of visit
- The events that take place in the museum with their dates
- Data about the monuments in the museum
- Data about the events that take places inside the musem

The Data base of museum system is shown in the followingentity–relationship model (ER model)



User in the system will be able to:

- visitor FUNCTIONS:

- Register an account in the museum system.
- Book a ticket to visit the museum.
- Pay the ticket money in cash or by credit card.
- Preview the upcoming events.
- Register in a one or more event.
- Preview details about the monuments.
- Explore the museum.

- Administrative functions:
  - Edit or Delete a visitor account
  - Edit or Delete an event account
  - Check monuments availability and status
  - Reserve some monuments to a specific event.

The operative environment of the application will be: java (jdk) environment .

2. USER REQUIREMENTS:

Requirement Label	Description
REQ-I	Having a user account to hold user data for ticket booking and surveying purposes. Including(Name, Email, National ID, Gender, State, password for the account, and age)
REQ-II	Having an explore page categorizing types of monuments to ease the navigation
REQ-III	Having a detailed description for each monument, showing its era, size, owner, and the story behind it.
REQ-IV	Having a visitation ticket booking service, specifying date of visit, National ID, Name, Phone number.
REQ-V	An events list page, holding event titles, brief description and advertising image.
REQ- VI	An event description page, where event details are written, its whereabouts, date and time.
REQ- VII	An event registration page, where interested personal can register for attending the events with their information including National ID, Name, Phone number.
REQ-VIII	A payment selection page, where user can choose the option between paying Online or Offline.
REQ-IX	An online payment page where the user enter their Credit Card info to be sent to the payment portal
REQ-X	Having offline payment option for users who can't pay online
REQ-XI	A map of the museum available for users.

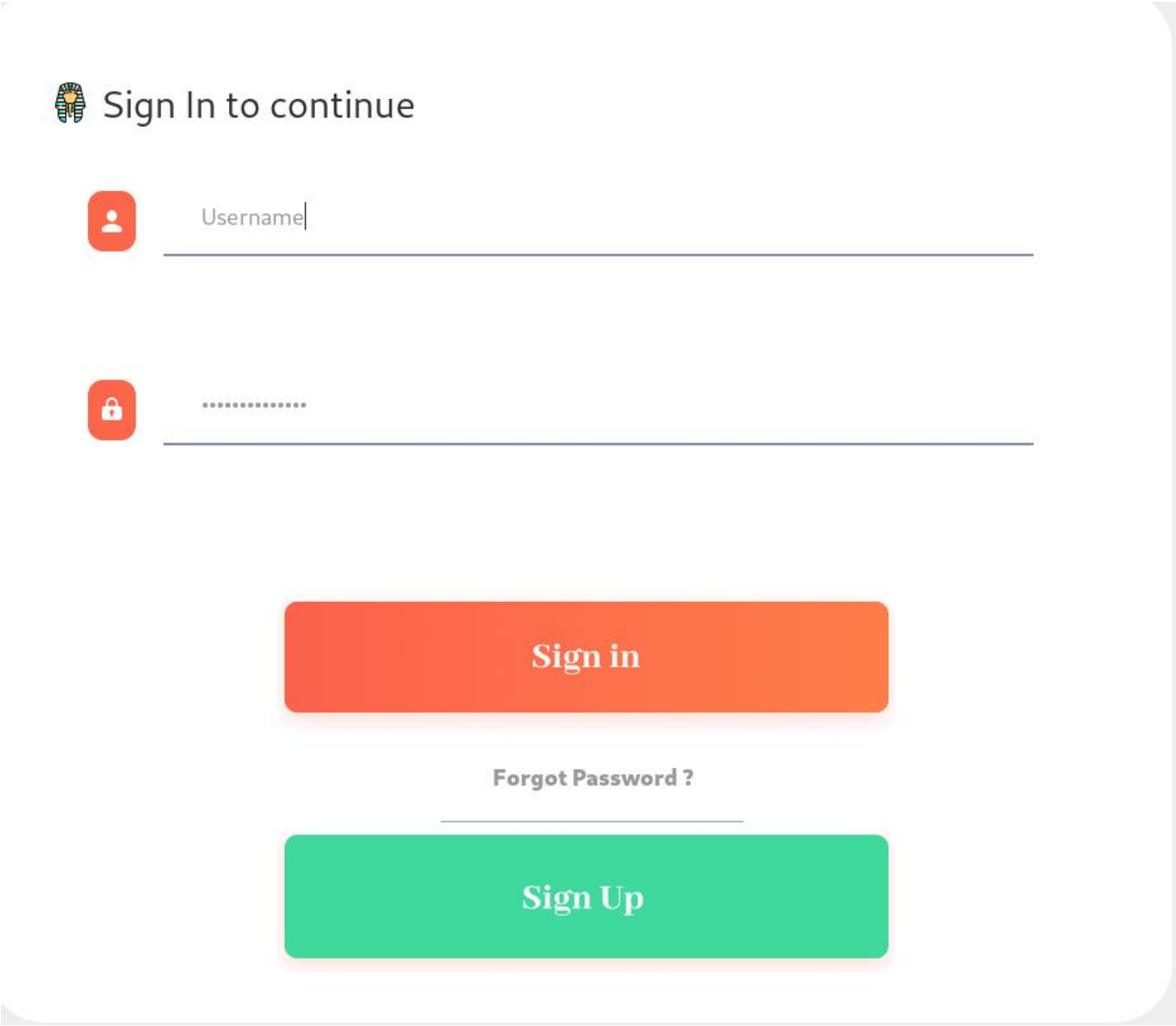
3. SYSTEM USERS:

- **Visitors:**
  - The most frequent user.
  - View events.
  - Explore the museum.
  - View the map.
  - Book the ticket of the event.
- **Administrator:**
  - Add new events
  - Delete events.
  - Ensure visitors data security.

- Fill the museum information.
- Edit the working dates.

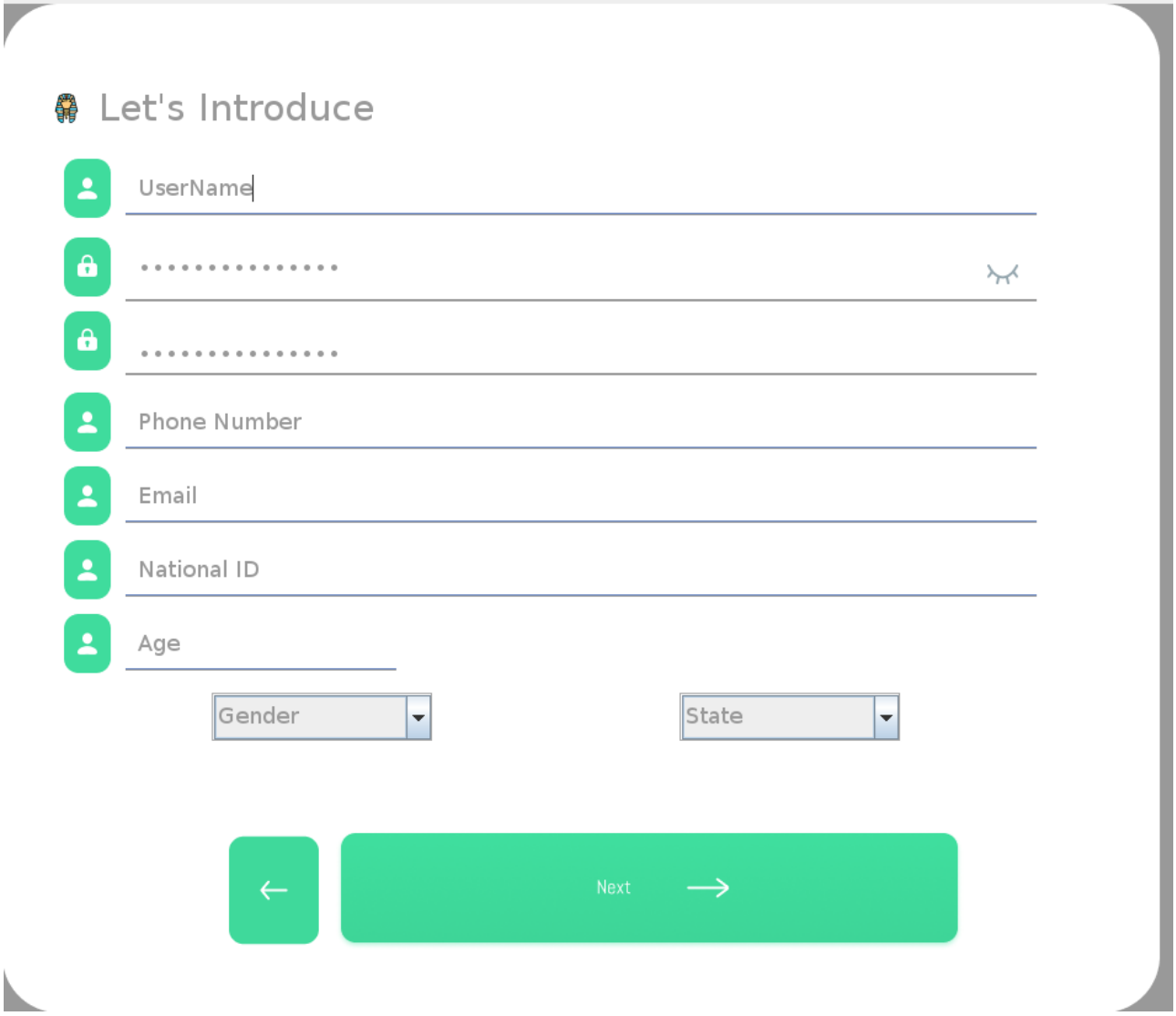
4. SYSTEM INTERFACES:

5.1Sign In



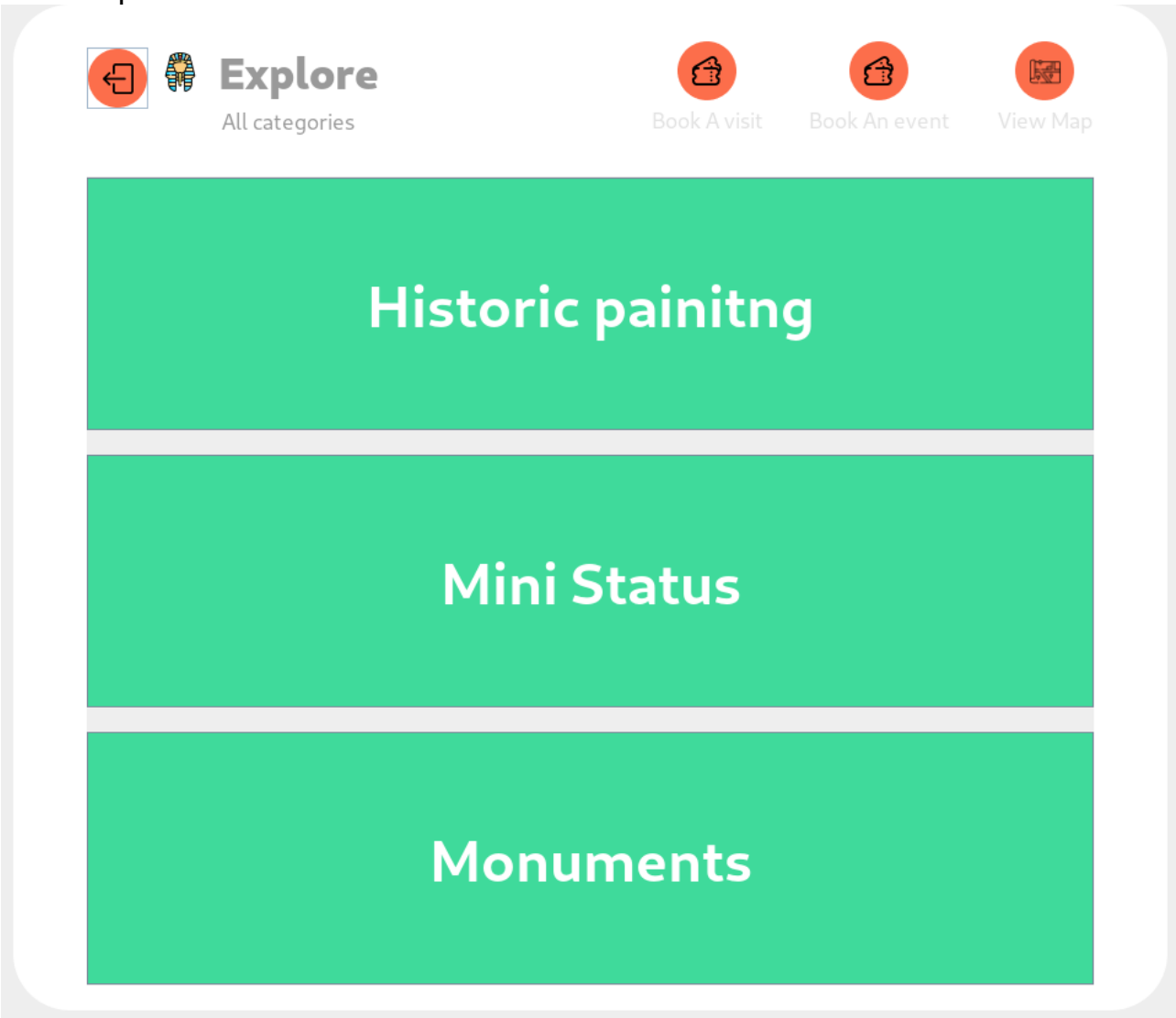
user can input his email and password if he already registered before
this page also shows if the user has entered a wrong password or email.

5.2 Sign Up



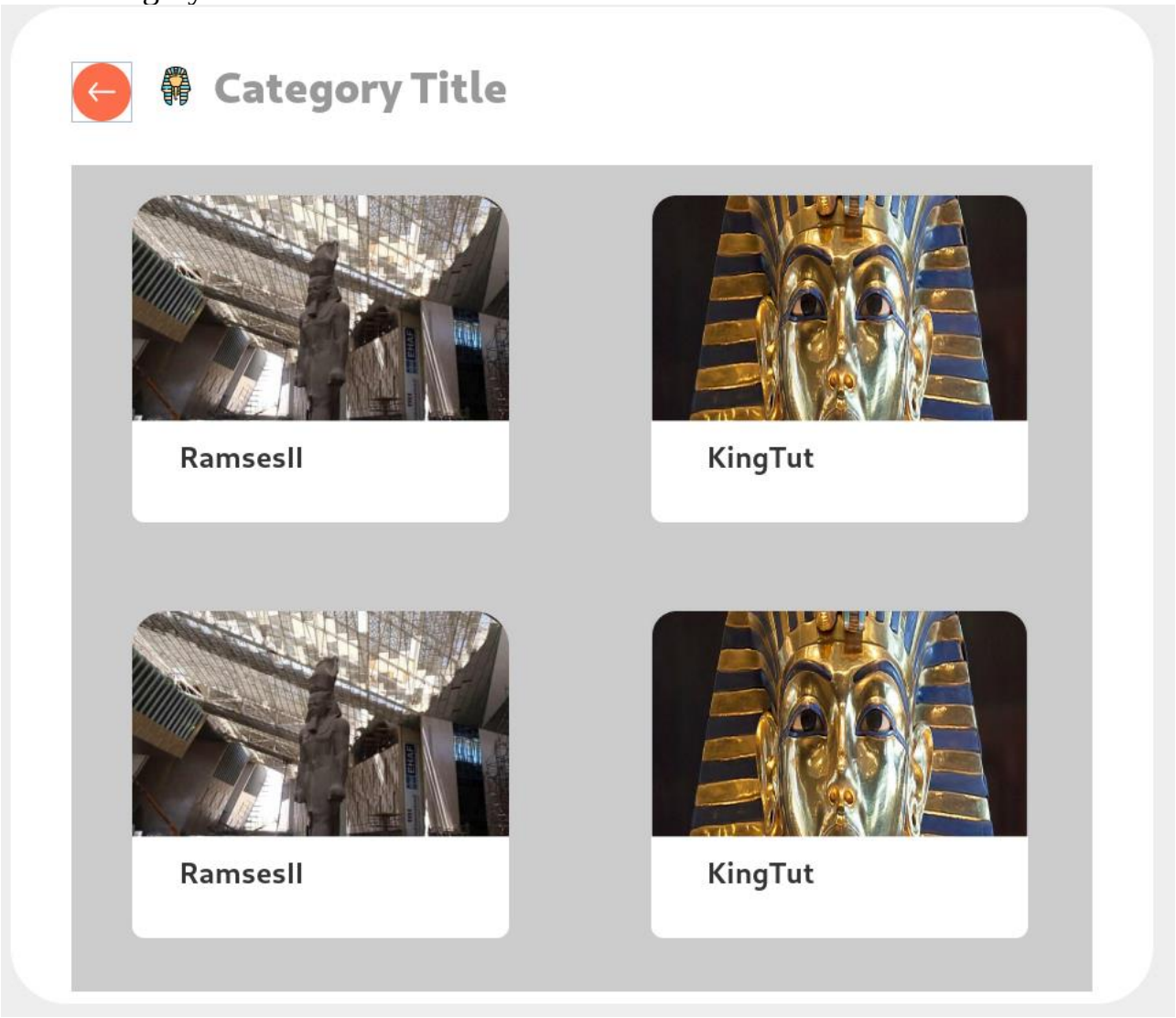
this page allows new users to register their accounts , also it shows any error that occurred during the process.

5.3 Explore



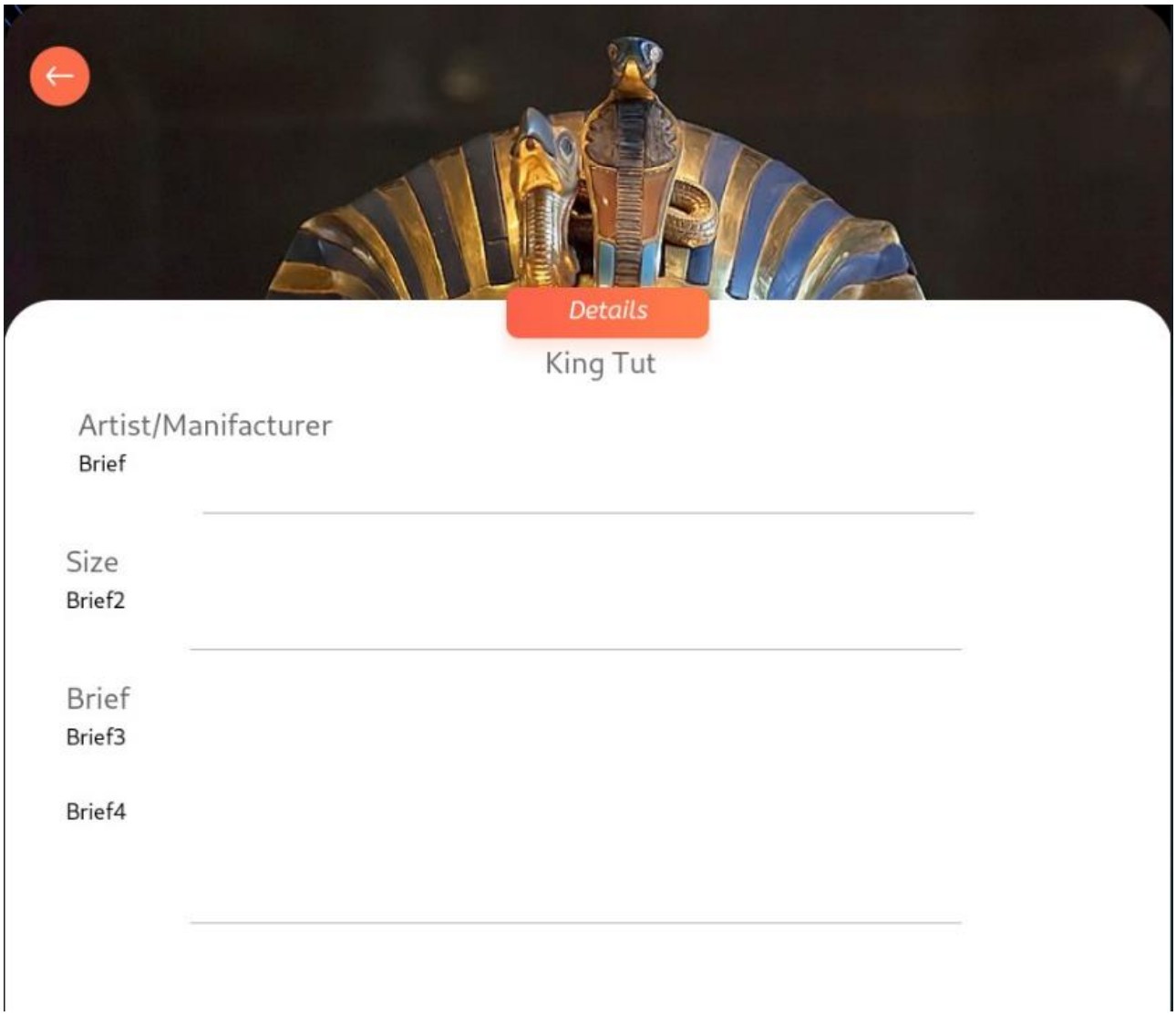
this page shows the user the main available categories at which he can select one to further explore.
This page also can navigate the map [5.5] or Book a ticket[5.6] or explore upcoming events[5.7]

5.4 Category



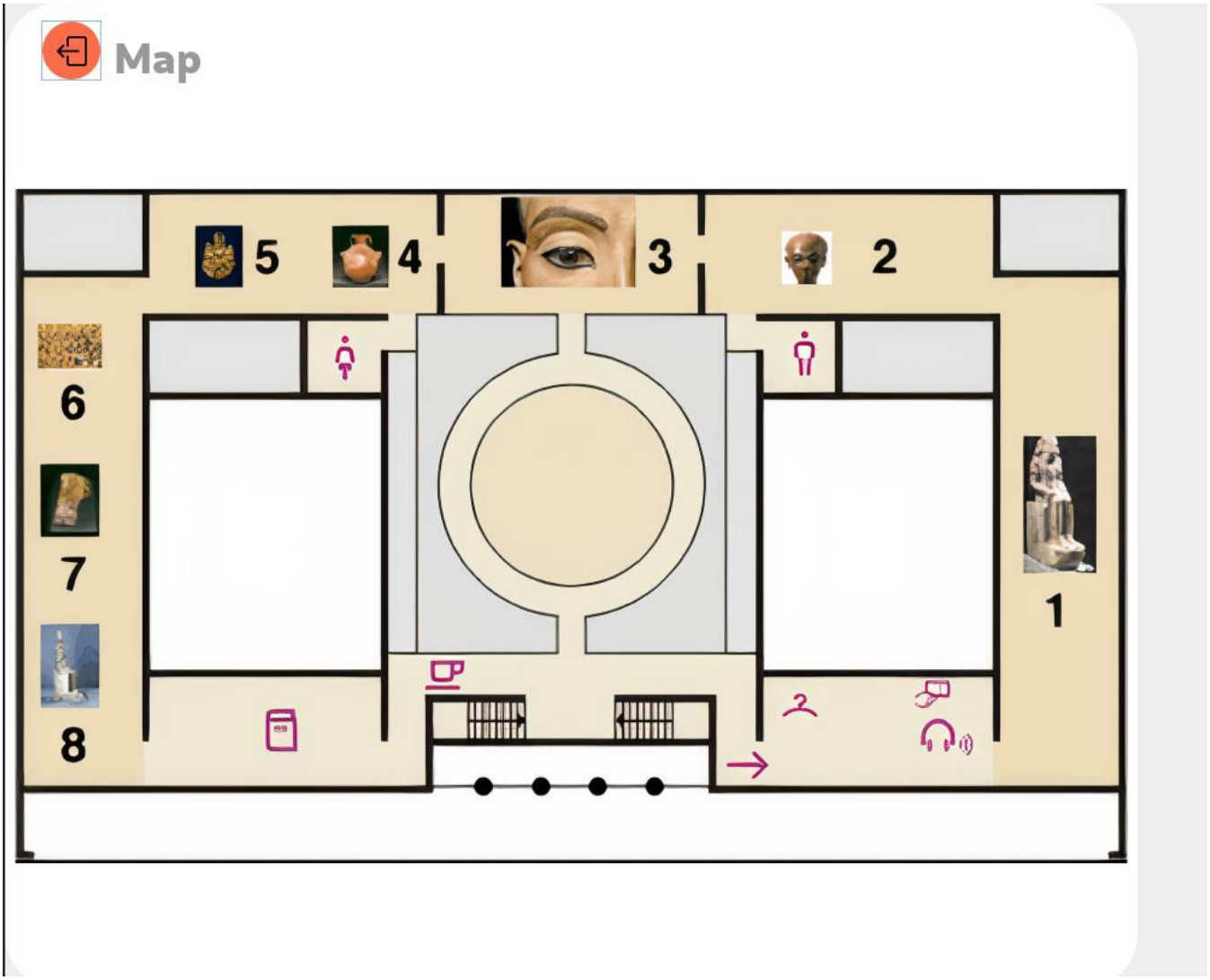
shows the user what her can find in the selected category.and navigates him to the details page [5.4(a)].

5.4.a Monuments Details



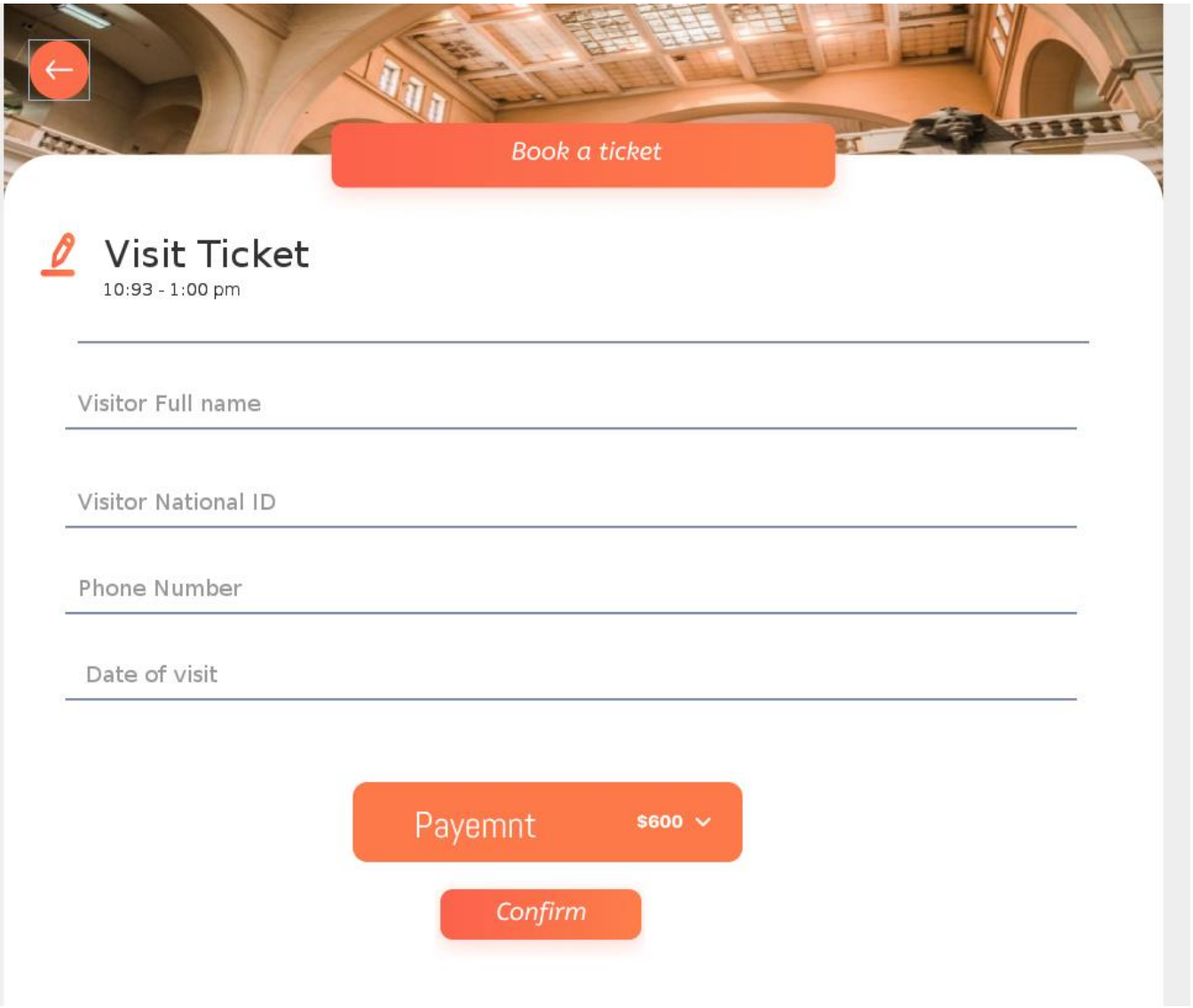
shows more details about the selected artpiece .

5.5 Map



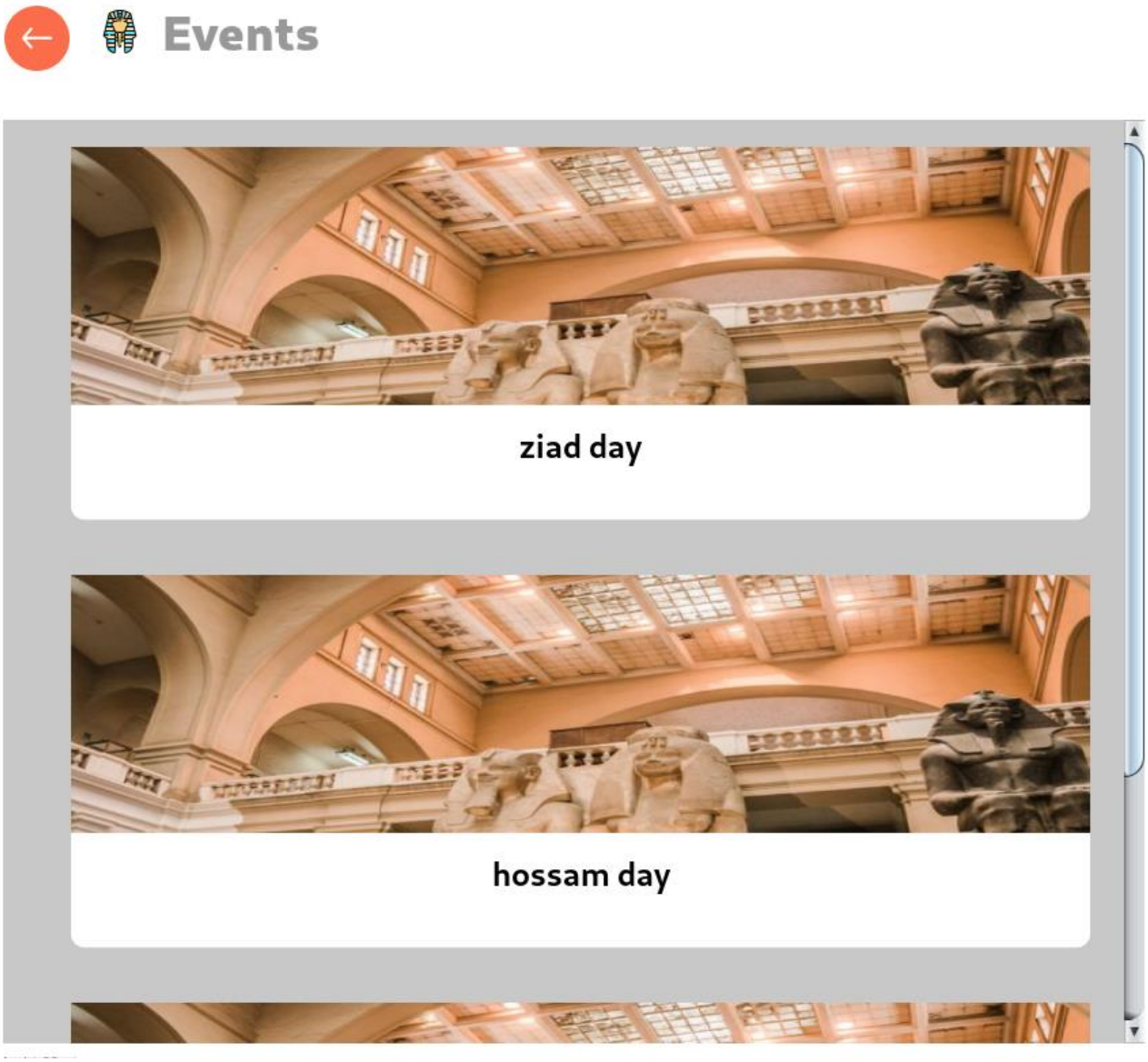
Shows the user a map of all the Museum with labeled Categories .

[5.6] Book a ticket



this form takes the user input (user visit details) and stores the visit details to the server , then it navigates him to select payment details.

5.7 Explore Events



this page shows the available details , upon selecting an event it navigates the user to the page where he can book the ticket for this event.

5.8 Event Details

ziad day

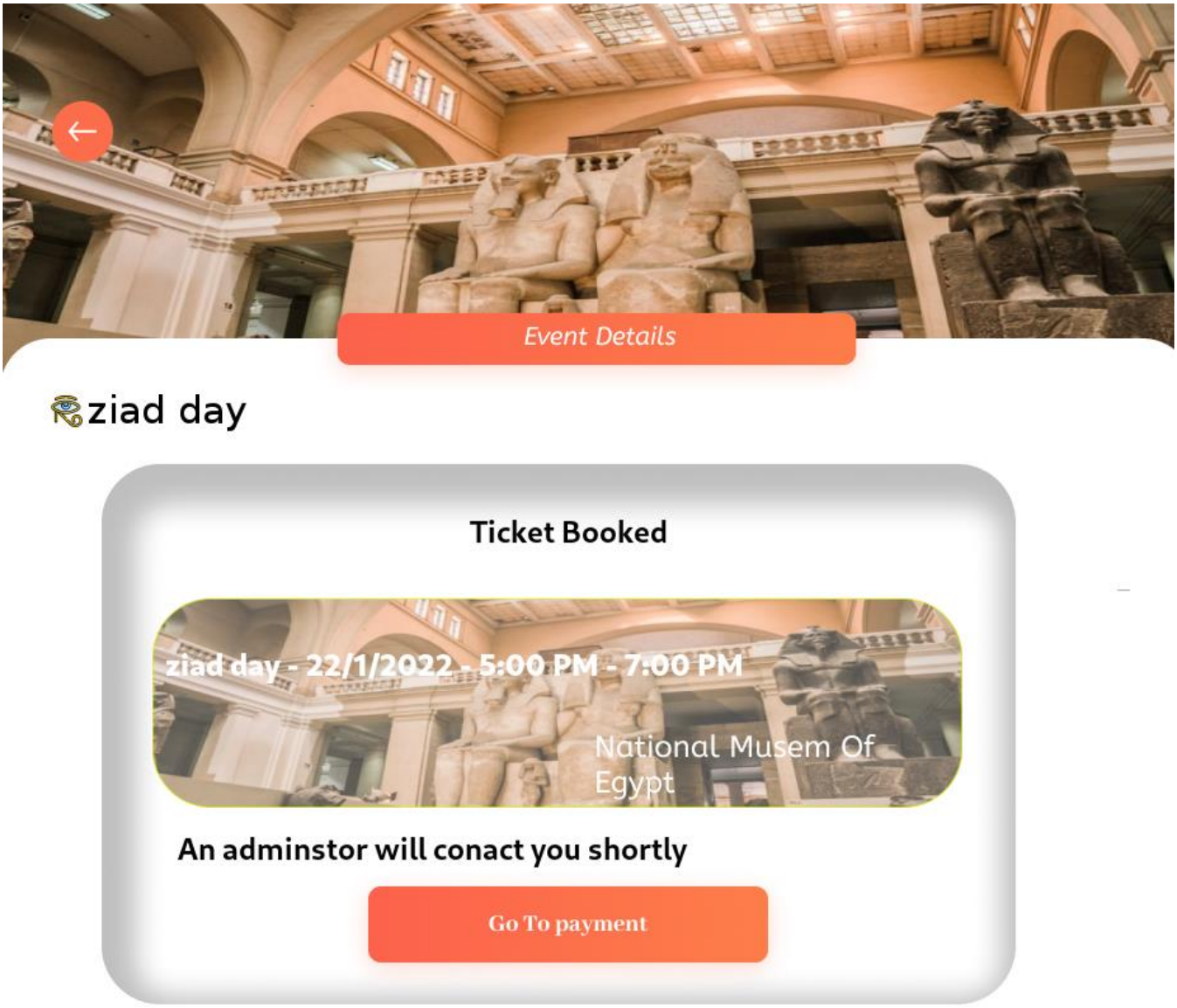
Date 22/1/2022

Time 5:00 PM - 7:00 PM

Details

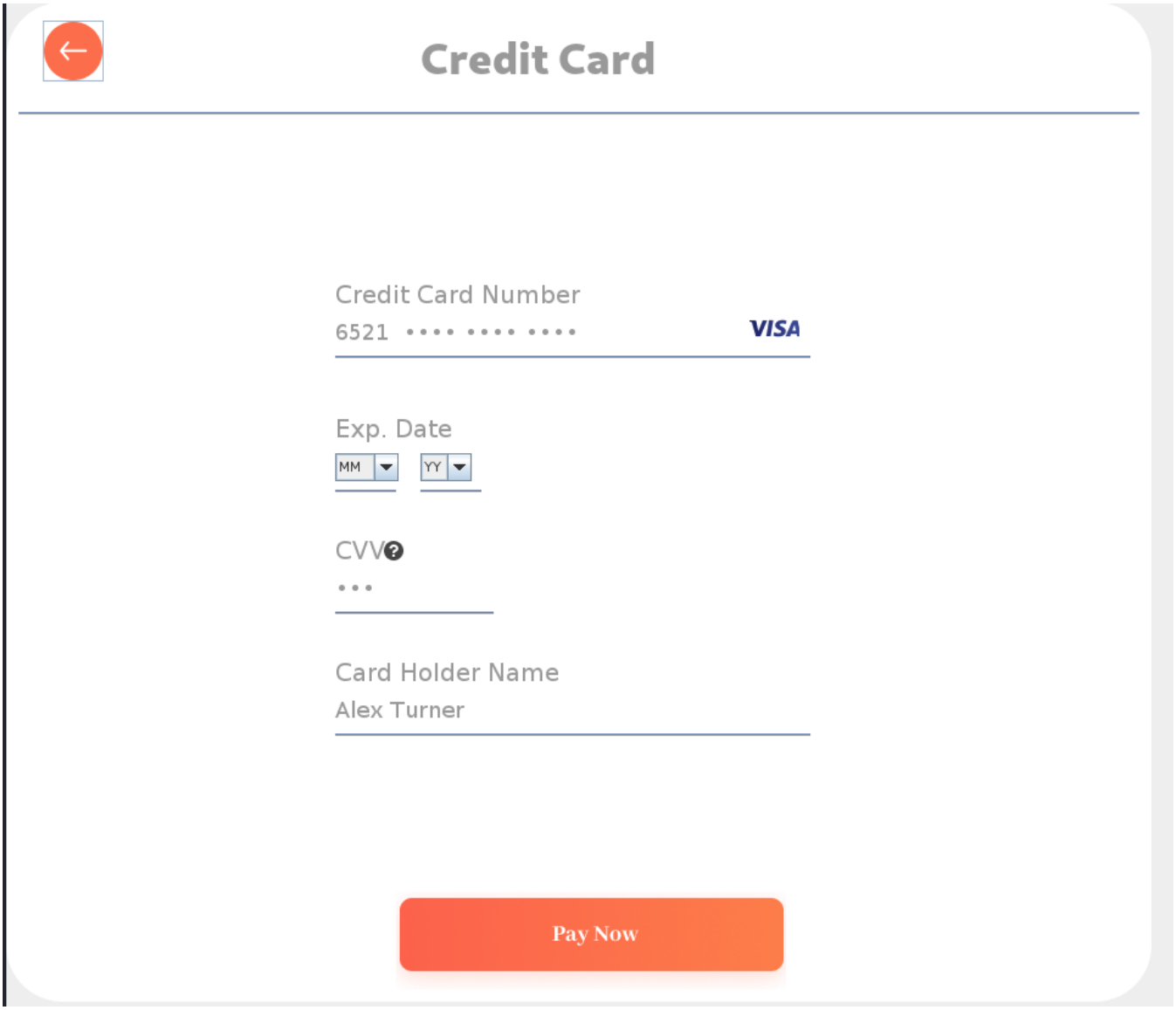
Evant meya al meya w gameed

Book a ticket !



this page shows the user more details about the selected event , upon confirming it shows the ticket details , and navigates him to the payment page.

5.9 Credit card Payment



Takes the Payment information form the user, this page is shown after either booking visit or registering in an event.

5. SOFTWARE REQUIREMENTS AND SPECIFICATIONS:

Detailed description of each functional requirement in the system with a Use case diagram for that functionality.

6.6. FUNCTIONAL REQUIREMENTS:

- **Login**:

  The user inputs username and the associated password to log in the app again and the app sends the username where it'll be compared to the usernames in the data base, if found it'll fetch the password and compare it with the associated password for this username, if correct the user can access the app, if not a wrong password message appears, the inputted username and password gets deleted from the interface.

- **Forgot Password:**

  When the user clicks it, the app sends the username to be compared to the usernames in the data base, when found it sends a reset password link to the phone number associated with the username in the data base, where the user can update the password in the data base, when returned username and password will be deleted form the interface.

- **Sign Up:**

  The user moves to a new page in the interface, where they can create a new account.

- **Sign Up Page:**

  The user will insert his data inside this page:

  - Full name
  - National Id
  - Username
  - Create password
  - Repeat password
  - Phone number
  - Age

- Gender
- State (Student – Employee - Tourist)

Until button next is clicked data won't be sent to the database, when clicked data will be sent to the data base where, National Id is compared to all Ids registered before, if found user will be back to the signup page interface with error message saying "This user already exists", if not password will be checked for (Having 8 or more characters, one uppercase letter, one lower case letter, one number), if doesn't pass the data will be returned to the Signup interface page with message "password doesn't meet standards", if it passes it will be compared to Repeat password input, if it doesn't match the data will be returned to the Signup interface page with message "passwords don't match", if it does the data will be registered permanently into the data base and user will be moved to the main app interface.

- **Explore Page In The UI:**

  When user moves to the explore page, it'll appear the categories for the museum collections, categorized either by a historic period or so, A three pictures from each collection willappear in the page UI.

- **Expanding A Category:**

  When the user clicks on a category, they will be moved to a new page in the interface where, the artifacts will be listed horizontally where their image and a title above it will specify each artifact.

- **Clicking On The Artifact:**

  A new page will appear with the data of the artifact listed including, artifact name, age, location, and a brief historical background regarding the artifact, with audio description available.

- **Audio Play Button:**

  When pressed the audio file is played.

- **Back Arrow:**

  When clicked the user moves to the previous page.

- **Map Button:**

  When clicked it goes straight to the museum map, where they can scroll through it (view only).

- **Events Button:**

  When clicked it moves to the events UI page, where each event is displayed, alongside event picture, interested numbers, name, and date.

- **Event Clicked:**

  When event is clicked it moves to the event UI page, where event title, picture, date, time, guide name, and event description.

- **Register In The Event Page:**

  When clicked the user moves to UI page where a registration for the event associated with this button can be made.

- **Event Registration Page:**

  The UI page includes event title, location, date, time, and information filling space including:

  - Full name (Auto filled from user data in the data base, and can be edited by the user)
  - National ID (Auto filled from user data in the data base, and can be edited by the user)
  - Phone Number (Auto filled from user data in the data base, and can be edited by the user

- **Visit ticket booking:**

  When clicked user is moved to normal ticket booking page

  The UI page includes information filling space including:

  - Full name (Auto filled from user data in the data base, and can be edited by the user)
  - National ID (Auto filled from user data in the data base, and can beedited by the user)
  - Phone Number (Auto filled from user data in the data base, and can be edited by the user)
  - Visit date (Limited by museum opening dates and working days)

- **Confirm Button:**

  Registration is confirmed.

- **Payment Method Selection:**

  A ticket price is shown, with two buttons for online payment and offline payment.

- **Online Payment Button:**

  The user is sent to online payment page.

- **Online Payment Page:**

  - The user selects what type of card is used through radio buttons. The user types the card holder name

  - card number (limited to 16 number spaced each 4 numbers)

  - expiration date (limited by months on the left and by 2-digit year specification on the right)

  -CVV number (3 digits only)

  By clicking confirm payment, the data registered will be sent to online payment page through the internet, and processed through internet payment services)

  If payment is confirmed a message appears to the user “Payment confirmed” and ticket appears on page.

- **Offline Payment:**

  A message appears to the user “Booking is complete”, and an unpaid ticket appears to the user.

6.1. NON FUNCTIONAL REQUIREMENTS:

XII- Reliability and capacity : the app should withstand an average of 200 users, and should have error handling to avoid crashing.

XIII- Scalability: the GUI should be made using dynamic layouts to support further scalability and addition of multiple Art pieces and painting.

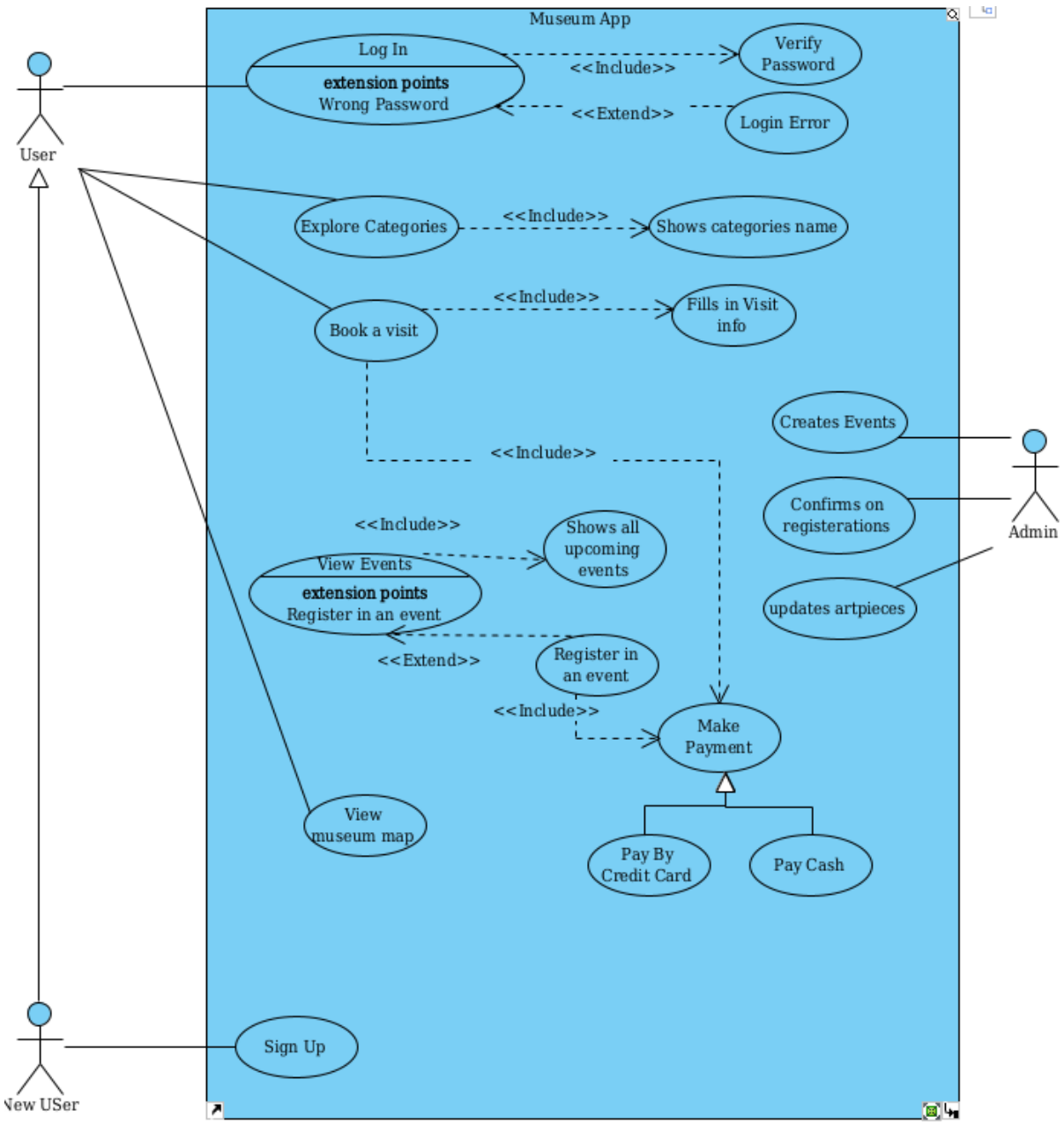
XIV- Security: User data should be secure against cyber hacking attempts.

XV- Localization: this app should have localization features, thus a way to change all the language and description should be considered in the design of the system.

XVI- Usability: the app is used to be specially used as an interface for the grand museum of Egypt

Platforms: the application is initially stated to be developed for desktop users, with the capability to be converted into a mobile build with minimal changes.
Interoperability: the app should have only one instance of any manager/ driver classes.
Safety: Servers shall be kept in the museum manager office.

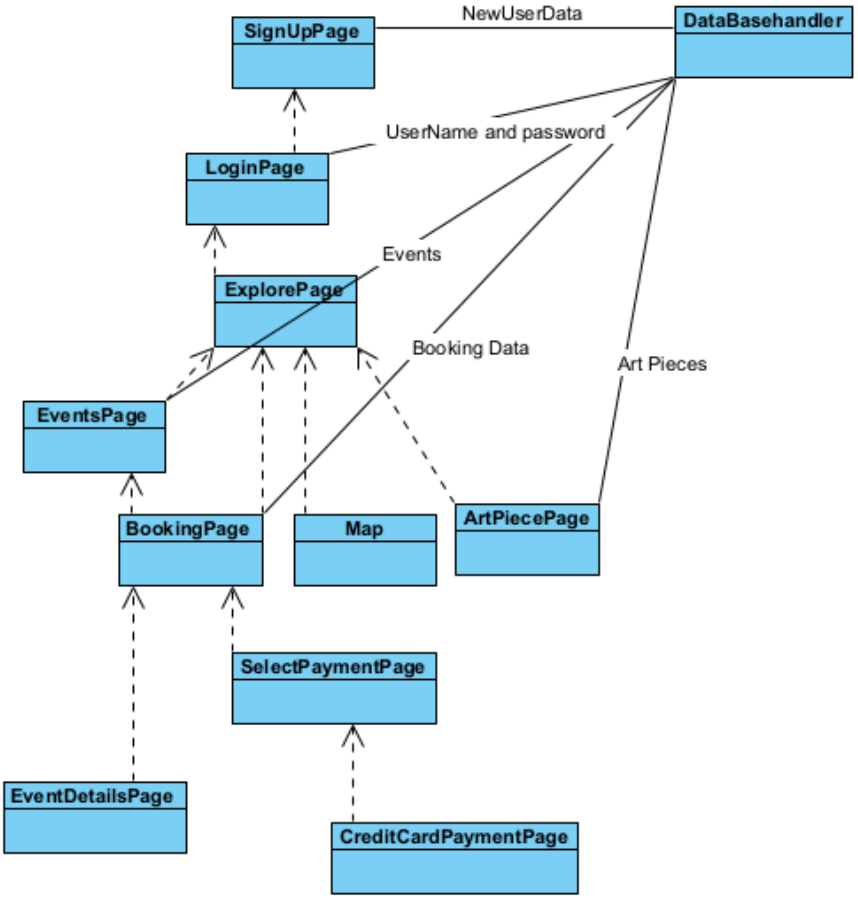
Use case Diagram:



6. SYSTEM MODELING:

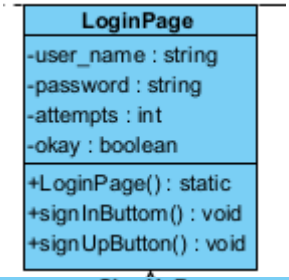
Class Diagram:

Overall class diagram:

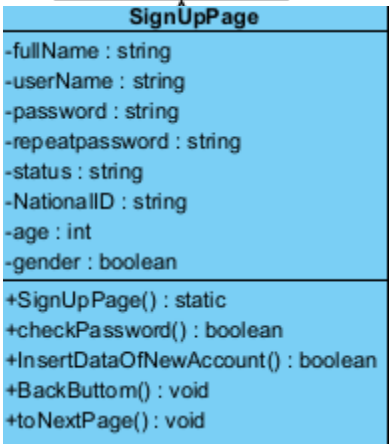


Individual Classes:

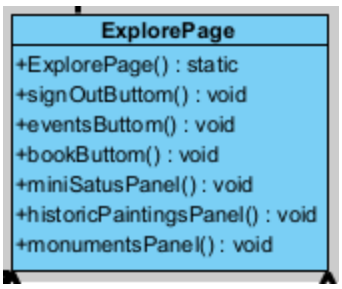
1- First Class of the program, associated with DataBasehandler class for information checking.



2- SignupPage: depends on LoginPage as you can't move to SignUp without Login page, associated with DataBasehandler class for data storing.

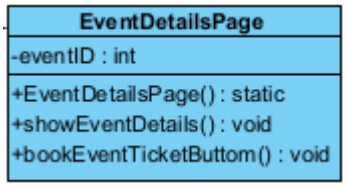


3- ExplorePage: Depends on LoginPage as a user can't access the system without Login.

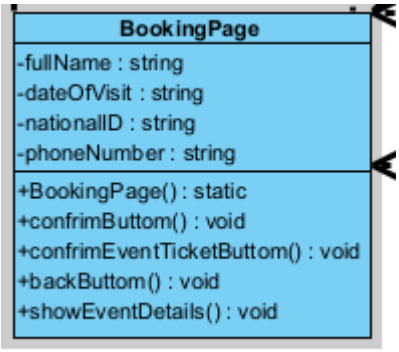


4- EventsPage: Depends on the Explore as it's accessed through it, and associated with DataBasehandler as events are imported from database.

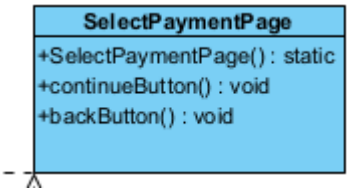
5- EventDetailsPage: Depends on EvengtsPage, as the user access event details when he clicks on specific event in Eventspage, and associated with DataBasehandler as events details are imported from database.



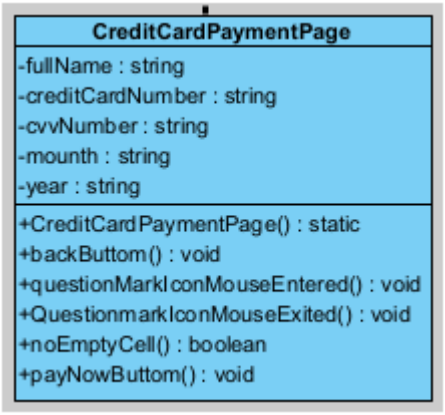
6- BookingPgae: The class depends on EventDetails as Event Booking option is in it and also normal Ticket booking so it also depends on ExplorePage in which normal Ticket booking option is available, and associated with DataBasehandler as user Id and event Id are registered in database.



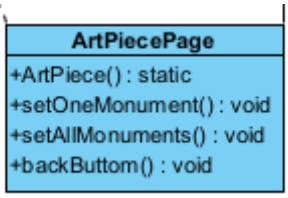
7- SelectPaymentPage: Depends on BookingPage.



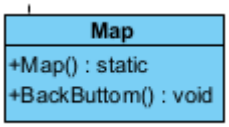
8- CreditCardPaymentPage: Depends on PaymentSelectionPage.



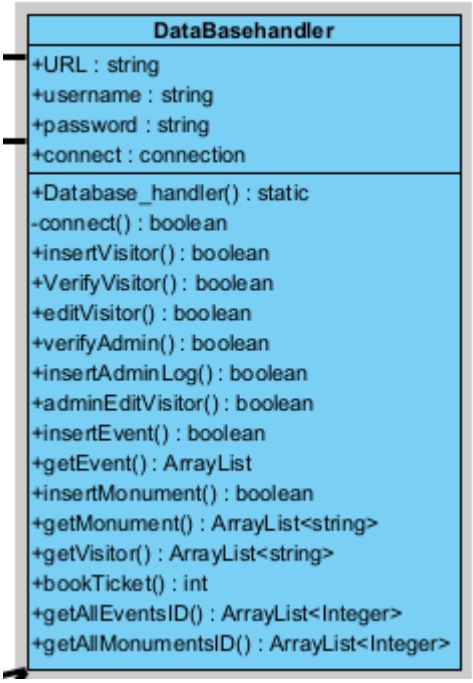
9- ArtPiecePage: Depends on ExplorePage.



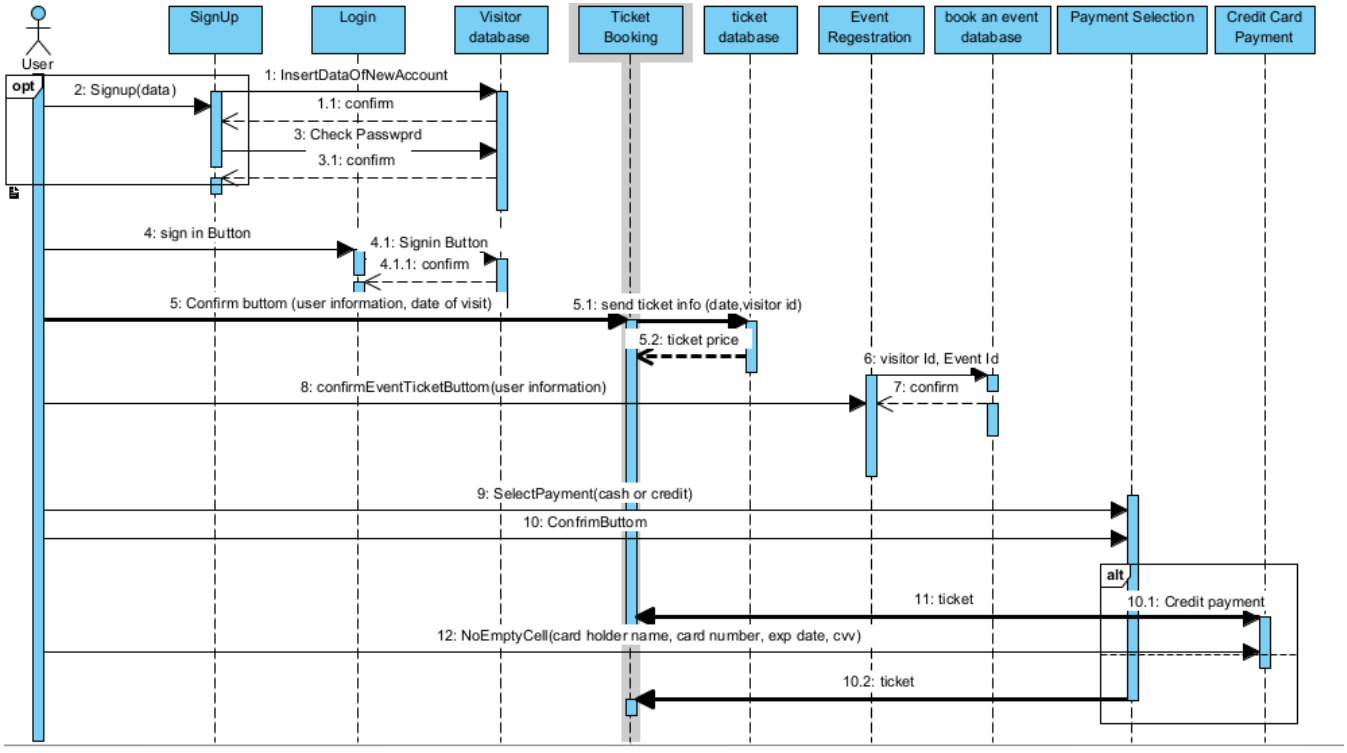
10- Map: Depends on ExplorePage.



11- DataBasehandler: Associations are explained in the previous classes.



Sequence Diagram:

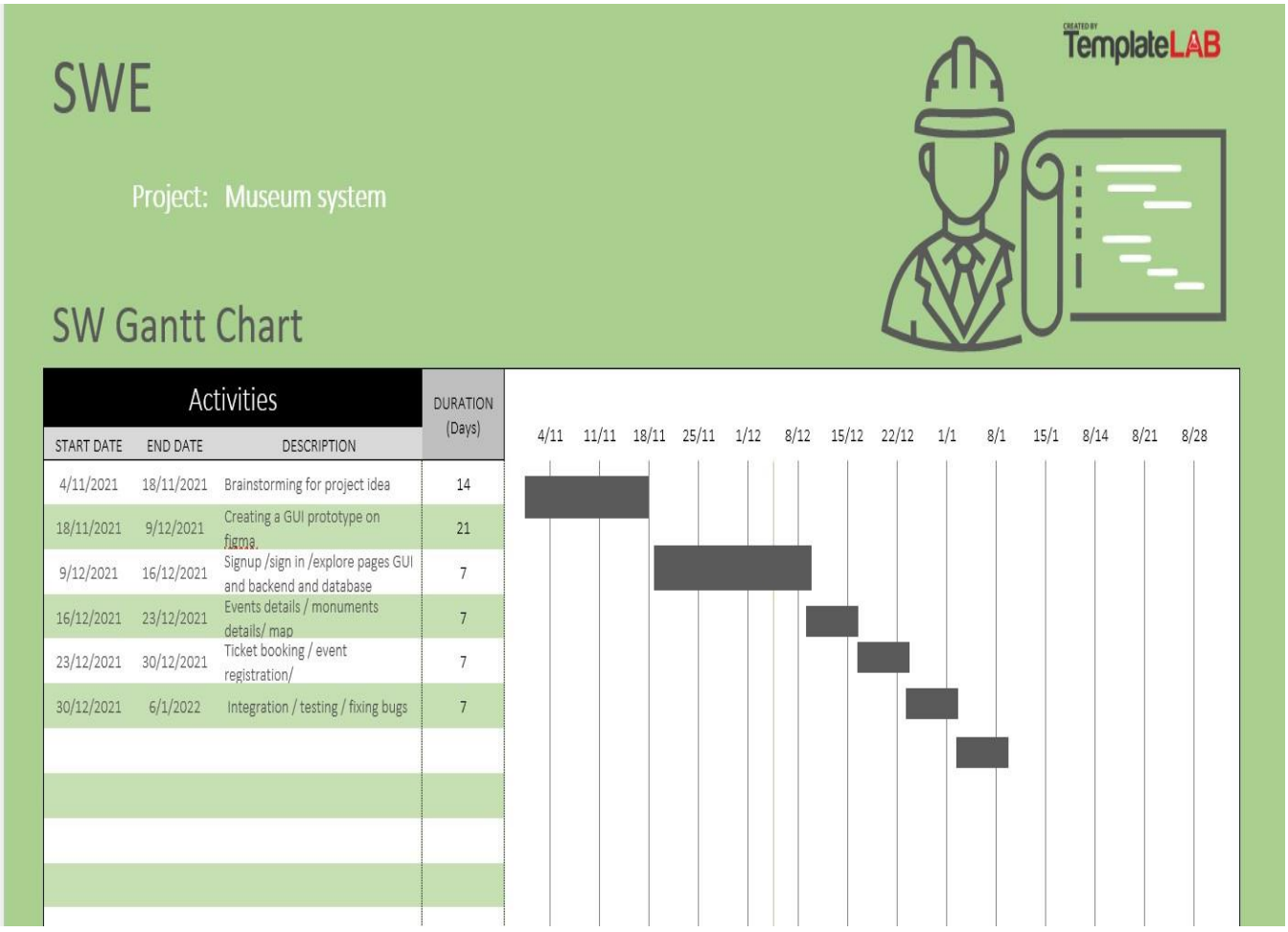
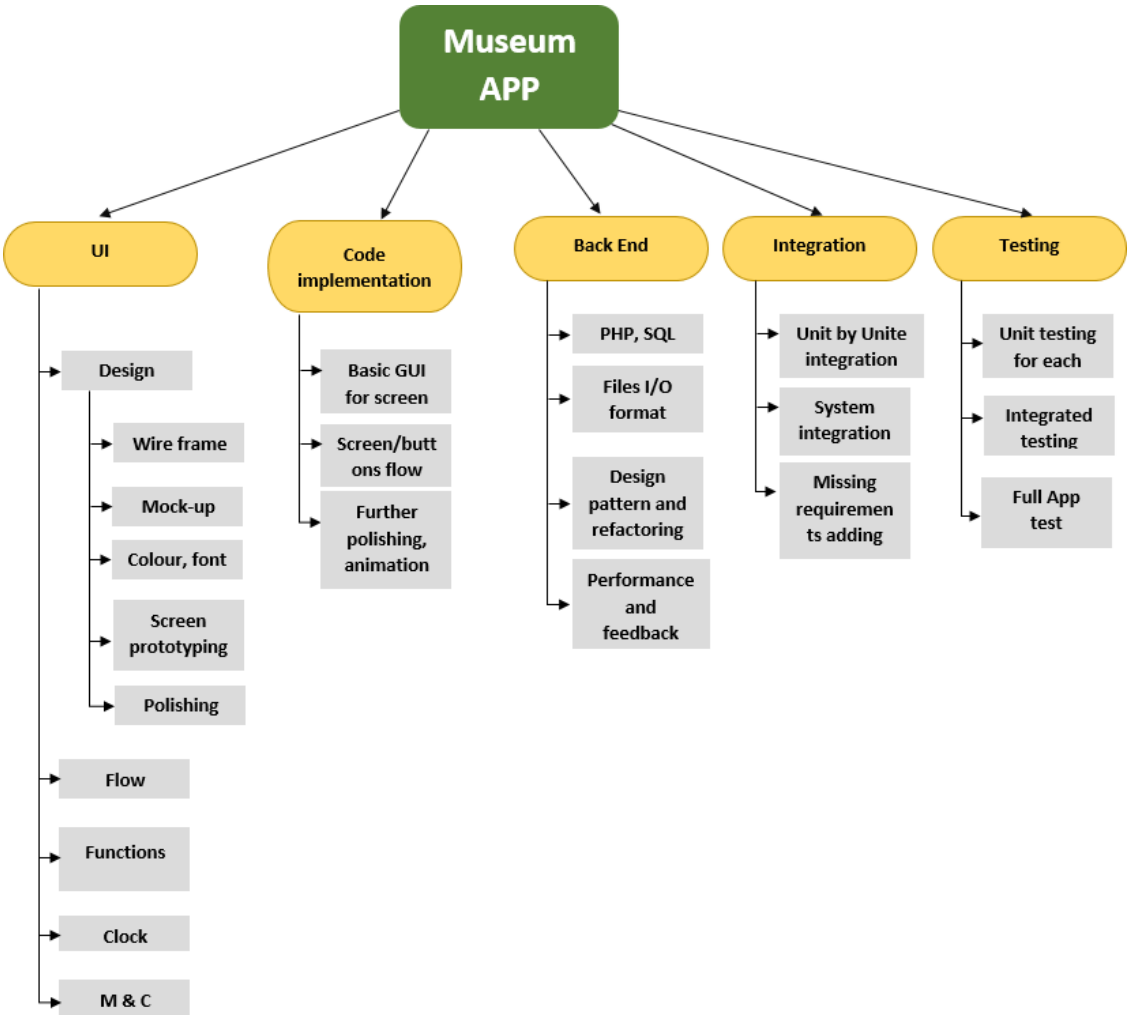


7. FUTURE WORK:

- In the future plans we consider making a different GUI for the admin in which when an admin login and the database authenticate his credentials he will have a different GUI in which he can add or edit or delete any monument or piece. we also added an admin log table in the database as to keep record of every change in the system done by an admin.

- we also wanted to make a portal for every piece in which every monument or event have a QR code which will be put on the museum when scanned by the user it will take him to a link where a demographics and audio tracks that describe the monument or the event. In addition to making a chat bot within the app where the user can ask questions regarding the artifacts and be answered through the chat bot.

8. WORK PLAN:



The Work Breakdown Structure