Movie Theater Architecture Design w/ Data Management

Prepared By: Ahmed Hageb, Aaron Maryfield, Michael Zalameda, Trenton Taylor, and James Yang

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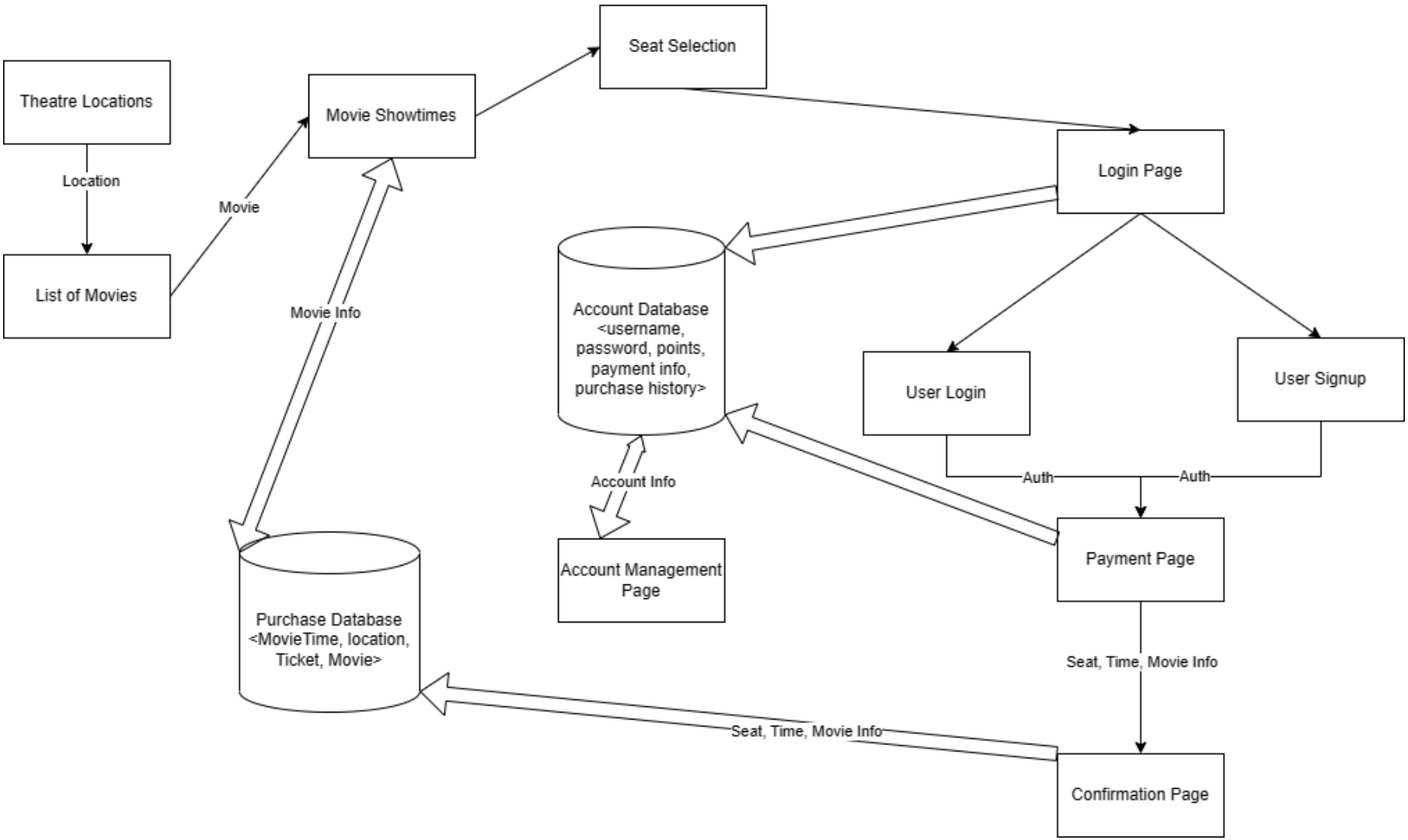
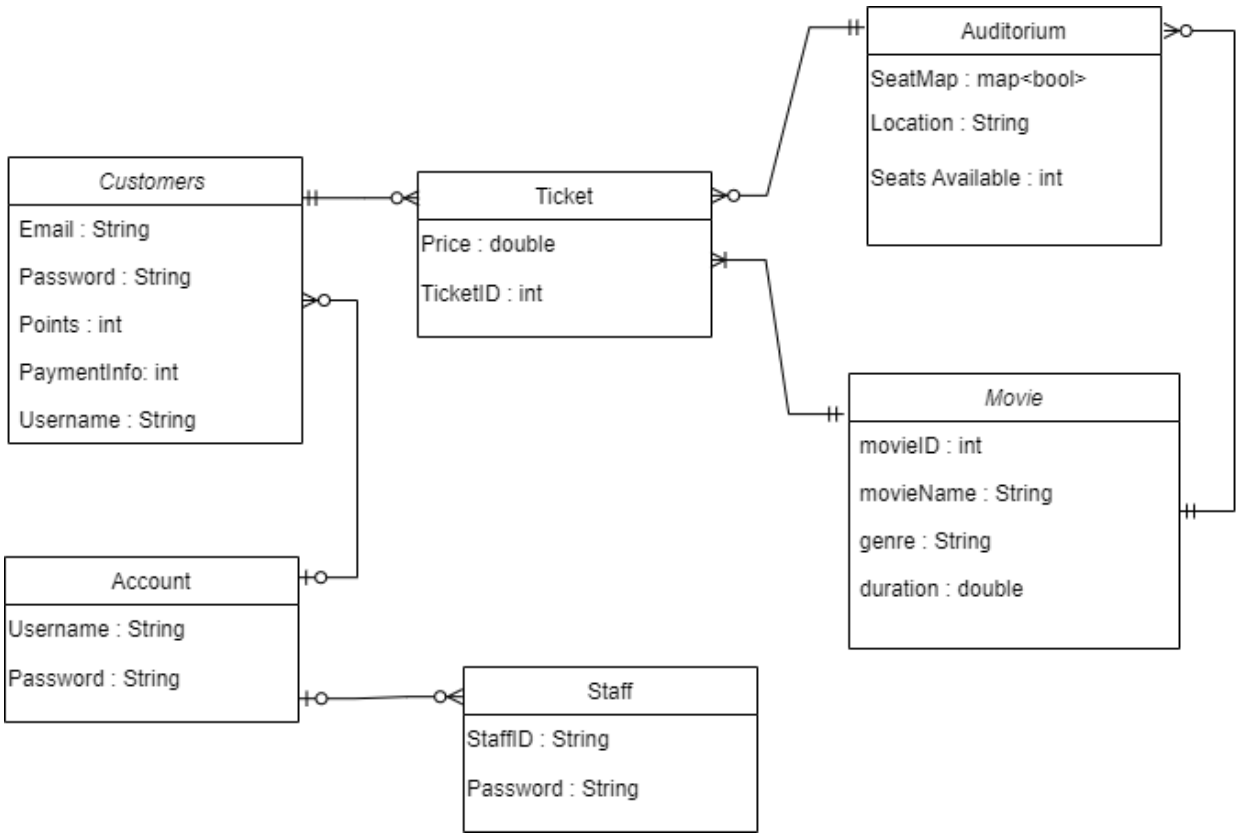


Adjustments:

- Separated the databases into Account and Purchase Databases for better data management

Data Management Strategy :



This ERDiagram features the 2 databases:

- **Account Database:**
    - Every account can either be of type customer account or a staff account. You can have many 0 or many customer/staff accounts in your database.
- **Purchase Database:**
    - Every customer account can purchase 0 or many tickets. Each ticket is specified to one and only one customer.
    - Every ticket can only be specified to one movie. You can have one or many tickets. A movie can be shown in one or more auditoriums.
    - Every ticket is specified to one and only one auditorium. You can have 0 or many tickets for one auditorium. Each auditorium is specified to one and only one movie at a time.

Discussion :

In our design we decided to include databases. One for the storing all the account information details such as usernames, passwords, account rewards, payment information, and purchase history. The other database would store all the movie details, such as the list of movies, movie showtimes, and movie auditorium. We split the database in this way because we wanted to separate the account aspects of the data from the movies aspect of the data. By having two databases it allows the data to be more organized and allows easier and quicker access of data. An alternative to this would be to just have one big database with everything inside of it. Just having one database would make it so it would be stored in one place, but instead it would cause the data we need to be disorganized. Additionally we could add more databases to separate information to allow quicker access, but this would increase costs as there would be a need for more storage. Due to these tradeoffs, we decided to only use two databases as we believed it would be the most efficient in terms of organization, access, and hardware costs.

When deciding on the database management system for our movie theater architecture design, we considered both SQL and NoSQL options. If we were to use SQL databases our decided options were MySQL, Oracle, or MicrosoftSQL. And for NoSQL, our options were MongoDB, BigTable, or Redis. After evaluating the requirements and constraints of the project, we ultimately chose MySQL because of SQL's ability to handle complex relationships between data and its strong consistency guarantees. One of the primary advantages of SQL is its ability to handle complex relationships between data, which is essential for our project. For example, each ticket must be linked to a specific customer account, movie, and auditorium. SQL databases allow us to define these relationships using foreign keys and other constraints, ensuring data integrity and making it easier to query and analyze the data. Another advantage of SQL is its strong consistency guarantees. This means that any changes made to the database are immediately reflected in all queries, ensuring that everyone accessing the database is seeing the most up-to-date information. In a high-volume environment like a movie theater, this is critical for ensuring that customers are able to purchase tickets for the movies they want to see. While NoSQL databases can also handle complex relationships between data, they do not provide the same level of consistency guarantees as SQL. This can lead to issues with data integrity and reliability in high-volume environments, which is why we ultimately chose SQL for our project. However, there are tradeoffs to using SQL. For example, it can be more difficult to scale SQL databases horizontally as the amount of data grows. Additionally, SQL databases can be more complex to set up and maintain than non-SQL databases. However, for our specific use case, the benefits of SQL outweigh these potential tradeoffs.