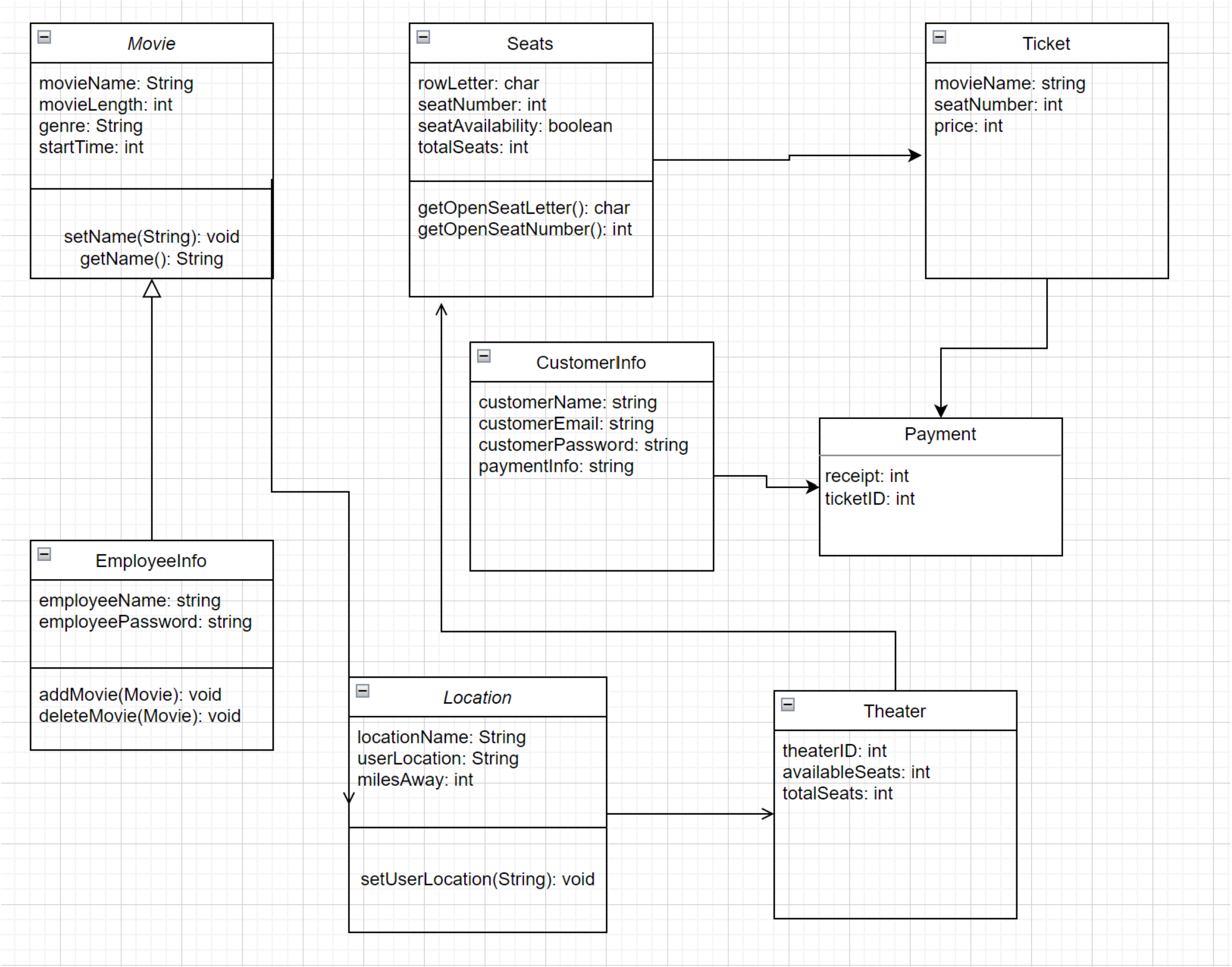
Design Specification Diagram Update:

UML Diagram



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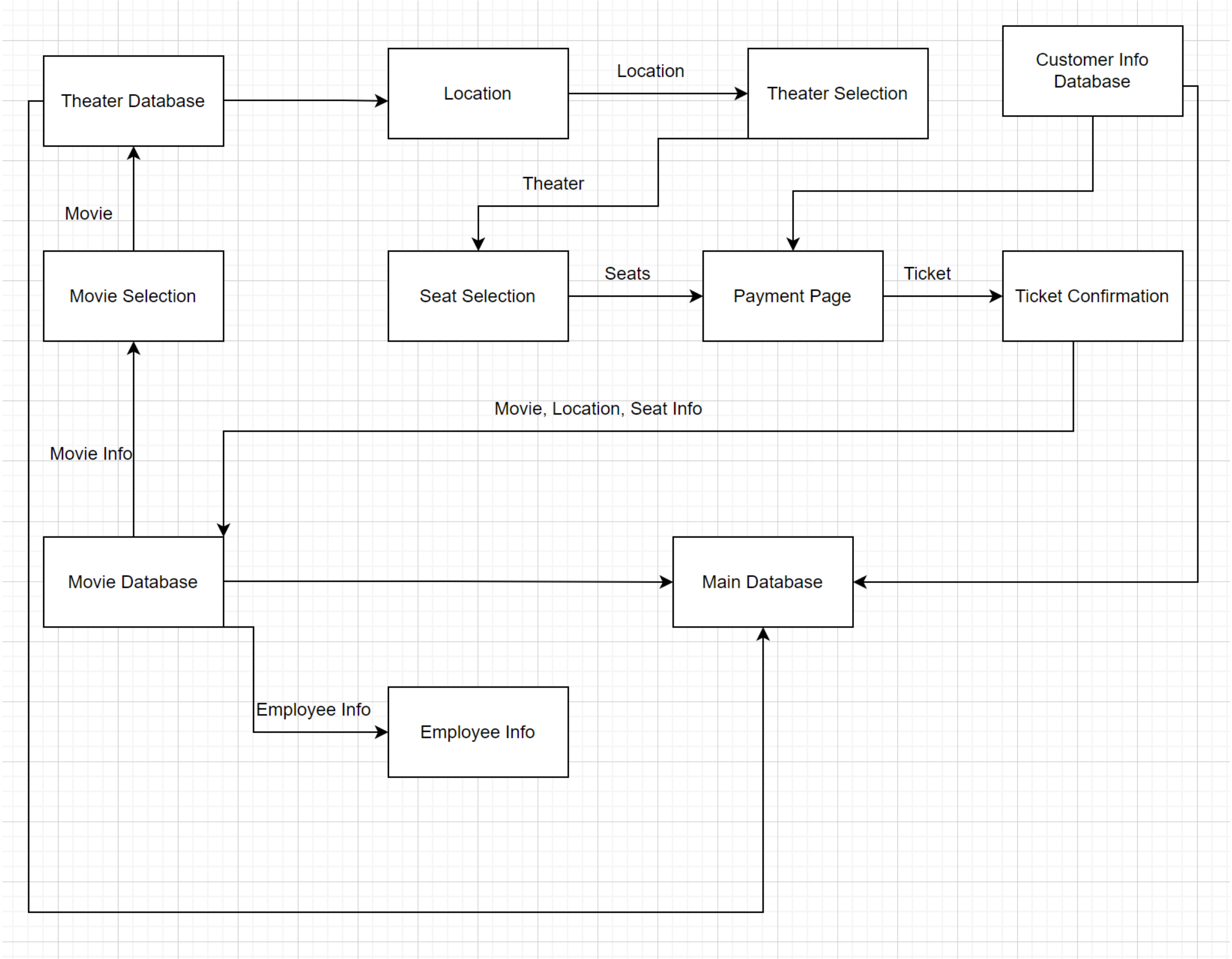
Architectural Diagram



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Design Specification Description Update:

We updated our UML diagram with a Theater class that will hold the theater id as an int, available seats as an int, and total number of seats as an int. We get this information from the theater class by first going through the Location class which will lead us to the correct theater information that needs to be accessed. From there we used the theater class to go to the seat class which holds similar data as the theater class. This ensures that we are able to get the right specific theater room in the theater and the correct chair as well. As for the updates to the Architectural Diagram we distinguished the different databases that we need to get information from and store information to. The main database is what holds all the information from the Movie, Theater, and Customer Info database. The Movie database is used inorder to hold employee information and we also get Movie information in order to reach the Movie selection stage. The movie selection gets stored in the Theater database which will take us to locations that have the movie that is desired. Lastly, the Customer info database is used to secure a safe transaction when paying for the ticket. All these databases are used to help visualize where developers making the program are getting the information from in order to make an efficient program that will help customers buy movie tickets.

Data Management Strategy Diagrams

SQL Theater Database

theaterID	availableSeats	location
01	13	miramesa
02	47	miramesa
01	32	lamesa
…	…	…

SQL Movie Table Example for Miramesa Location Database

movieName	movieLength	genre	startTime	totalSeats	theaterID
mario	92	adventure	8 pm	120	01

avatar	192	sci-fi	7 pm	100	02
…	…	…	…	…	…

SQL Customer Info Table Database

customerName	customerEmail	customerPassword	paymentInfo
John Smith	jsmith11@gmail.com	*********ve	**** **** **** 7310
Mary Brown	marybrown214@yahoo.com	******89	**** **** **** 5526
…	…	…	…

Data Management Strategy Description

Our data management strategy for the software systems revolves around what we know is persistent and sensitive data and is based on SQL. We have chosen SQL as our database management system as it provides a reliable, efficient, and scalable solution for storing and retrieving data.

Design Decisions:

We have divided our data across three databases: the Theater Database, the Movie Database, and the Customer Info Database. This approach enables us to efficiently manage and retrieve data specific to each entity while ensuring the security and integrity of our data. The Theater Database includes the theater ID, the number of available seats, and the location of the theater. The Movie Database includes the name of the movies, the movie length, the movie genre, the movie start time, the movie end time, and the theater ID. The Customer Info Database includes the customer name, customer email, customer password, and the payment info. By splitting up the data logically into three different databases, we can reduce the likelihood of data duplication and inconsistency. It also allows us to implement security measures specific to each database, ensuring that only authorized users have access to sensitive information. These security measures will help to reduce security risks and ensure the protection of our data.

Possible Alternatives:

Although we have chosen SQL as our database management system, we could have used a non-SQL system such as NoSQL. NoSQL is known for its scalability and flexibility, but it may not be the best choice for our specific needs. SQL offers strong consistency, which is essential for our software systems. A possible alternative for how we handled the organization of data is that we could have chosen to store all data in a single database. However, this could have resulted in a more complex system that would have been challenging to maintain and manage.

Tradeoff Discussion

SQL is the data management strategy that we will use for our project. The SQL approach is the most appropriate because SQL is vertically scalable and table-based, whereas NoSQL is document, key-value, graph, or wide-column stores. The table-based approach is superior at utilizing the Movie Ticketing System. SQL systems are better for multi-row transactions. The Movie Ticketing System is structured and NoSQL is better for unstructured data like documents. Although SQL is more expensive to scale, it better matches the objectives of this project. The data should be first normalized then optimized to meet customer requirements and performance needs. This is done to reduce inefficiency and redundancy. The database should use third normal form to include name, genre, and runtime. The database should include a high level of indexing for faster access time and slower write time, as we will be accessing the data more than writing it.