Term Project – Part II: Normalization, Selection of a RDBMS, and Logical Design

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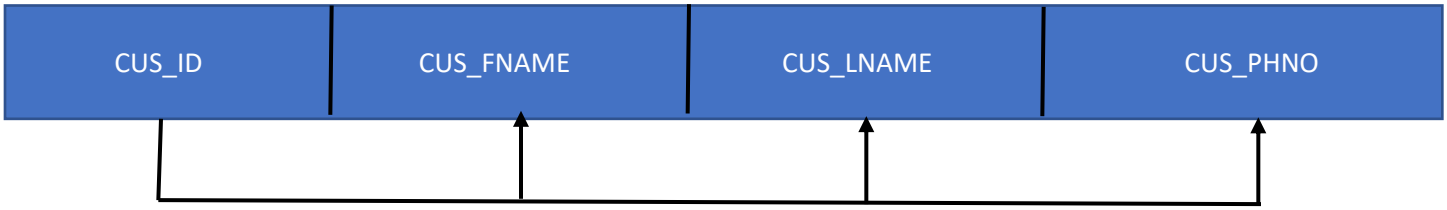
SECTIONS: Normalization, Revised ERD, Selection of a RDBMS, and Logical Design

Section 1: Normalization

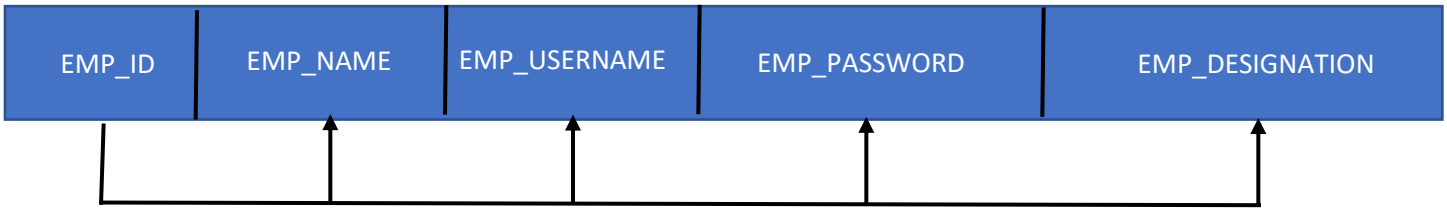
In our phase 2 of the project we have not created any new entities. The ERD was already in 3NF and we have shown the dependency diagram for the entities of our schema. There are only full dependencies and no partial or transitive dependencies. Please refer below for our dependency diagram.

1. CUST TABLE

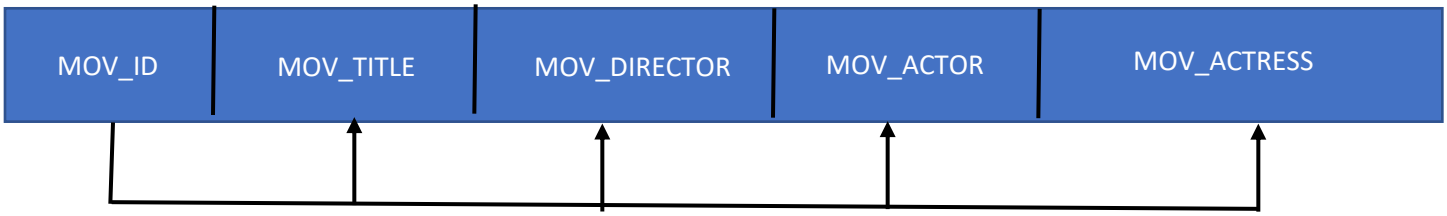


2. AUDITORIUM TABLE

3. EMPLOYEE TABLE

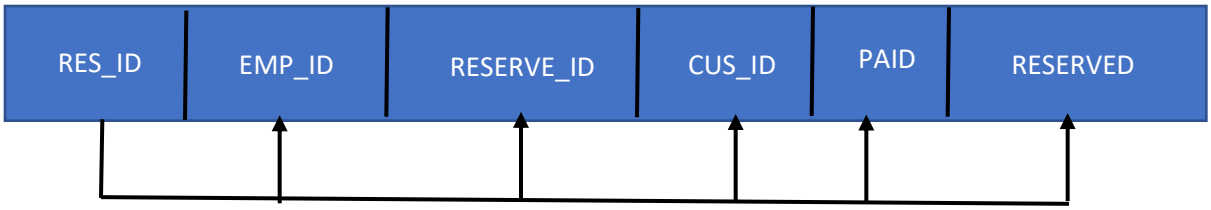


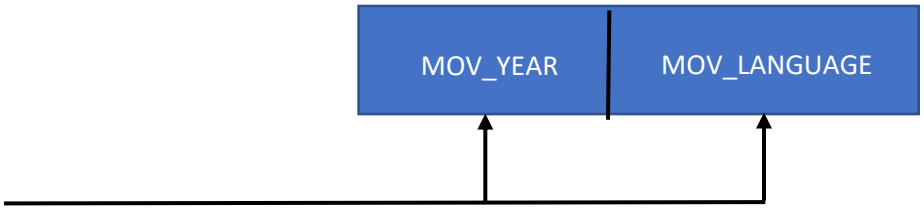
4. MOVIE TABLE



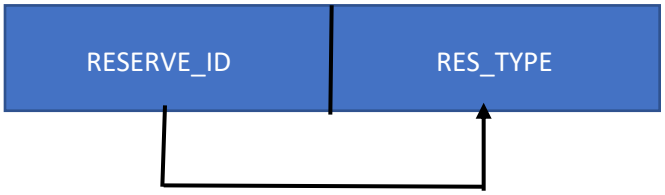
5. PAYMENT TABLE

6. RESERVATION TABLE



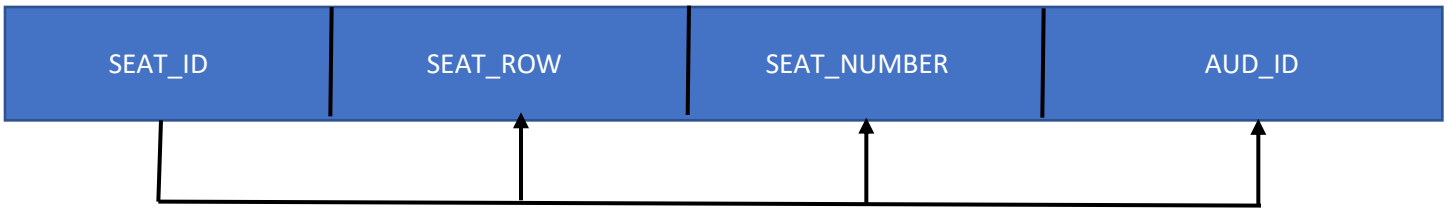


7. RESERVATION_TYPE TABLE



8. SCREENING TABLE

9. SEAT TABLE



10. SEAT_RESERVED TABLE

Section 2: Revised ERD

We have carefully reviewed and incorporated all the changes because of the feedback provided by the instructor and the peers. It helped us to refine the ERD of the database, making it more efficient. As per the changes suggested, we have done all the changes suggested:

By Instructor:

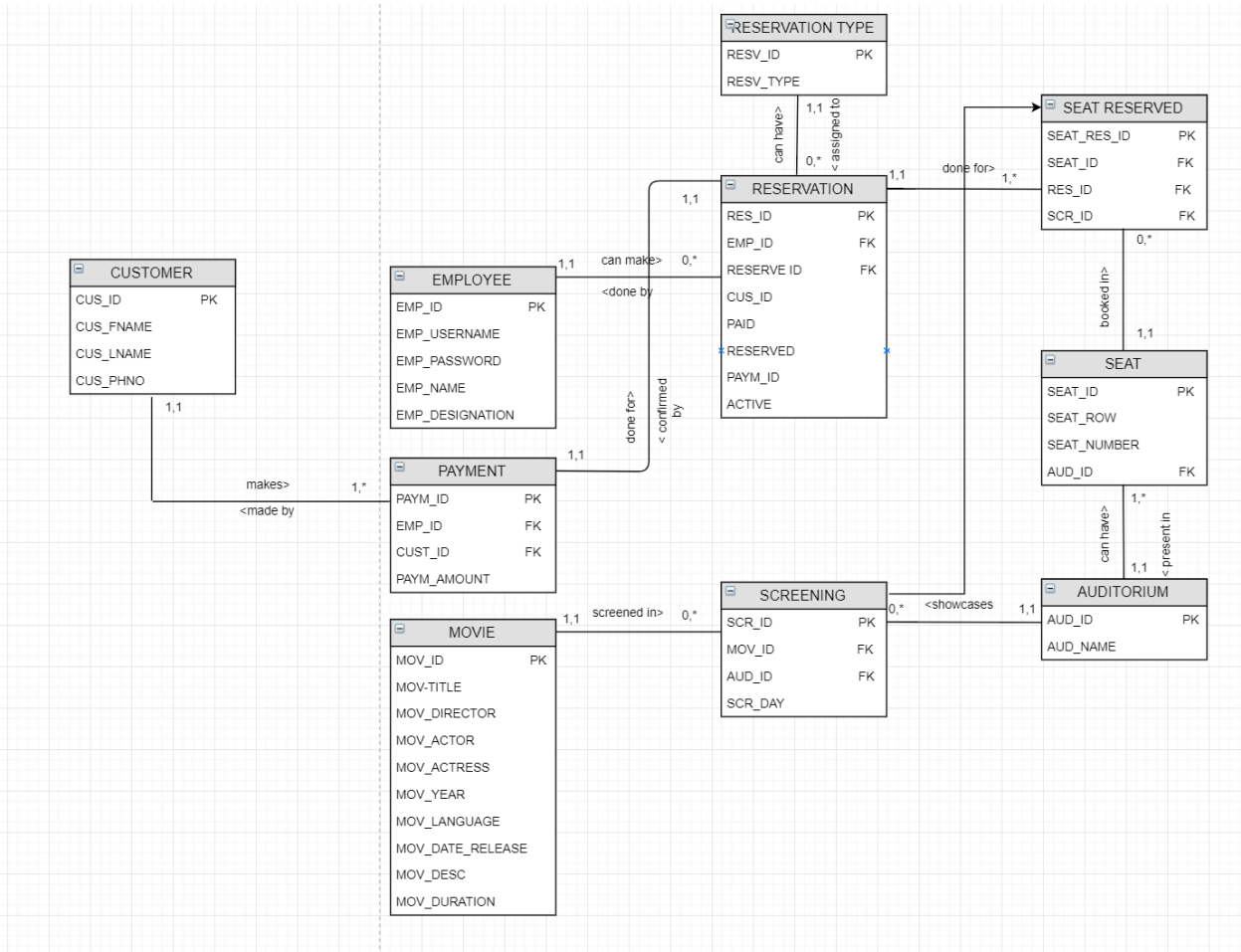
1. Eliminated the relationship between CUSTOMER and EMPLOYEE entities.
2. Added name attribute to EMPLOYEE
3. Eliminated the relationship between EMPLOYEE and PAYMENT entities.
4. Created a relationship between RESERVATION and PAYMENT entities.
5. Changed name SCREEN to SCREENING
6. Eliminated the relationship between SCREENING and RESERVATION
7. Created a relationship between SCREENING and SEAT RESERVED
8. Added attributes DAY and TIME to SCREENING

By peers:

1. We have created the relationship between CUSTOMER and PAYMENT entity, as now the customer can directly make the reservation and do the payment.

2. We have analyzed the attributes of the entities and made certain changes like splitting customer name into first name and last name, added attributes to the movie entity, added employee name to employee entity.

3. We have resolved the problem of confusing attribute names like RES_ID and RESV_ID.



Section 3: Selection of RDBMS

The RDBMS used for implementation of our schema is SQL Server 2014. Microsoft SQL Server 2014 is a powerful and reliable free data management system that delivers a rich and reliable data store for lightweight Web Sites and desktop applications. [1]

1. **Cost:** This includes the original purchase price, along with maintenance, operational, license, installation, training, and conversion costs. SQL Server can be installed using "setup wizards"; the installer also detects, downloads and installs any required prerequisite updates. These features reduce the complexity of installing the software. SQL Server includes Advanced Compression, data management tools, disk partitioning, data mining tools, Enterprise Reporting, and Advanced Security at no additional cost. SQL Server includes backward compatibility with SQL Server 2005 and 2008, so there is no need to update or upgrade every computer [3].
2. **RDBMS features and tools:** Setting up almost everything, from installing on a VM to initial query writing and editing, is incredibly easy. If there are problems in any stage of development, there is a plethora of online support and documentation in addition to live product support. Object Scripting feature in SQL Server Management Studio lets you script out an object from one server to any other server (could be different version / type [2]. SQL Server Management Studio provides Generate Script Wizard which helps customers to migrate their databases in an easy and quick way [2]. SQL Server Management Studio provides a different set of dialogs and wizards to make

the DBA job simpler [2]. Object Explorer Details, a component of SQL Server Management Studio, provides a tabular view of all the objects in the server and presents a user interface to manage them [2]. SQL Server has transparent data compression and encryption built in. There is no need to modify or change programs to encrypt data. SQL Server has more efficient access control and permission management tools and offers better performance in data collection. SQL Server also integrates with Microsoft Office [3].

3. **Underlying model**: It is also an object-relational database management system (**ORDBMS**) which is a database management system that is like a relational database, except that it has an object-oriented database model.
4. **Platform**. It is platform dependent and both GUI and commands based software.
5. **DBMS hardware requirements:** Requires minimum 512 MB RAM for SQL Server Express with Tools and 4.2 GB of Disk Space.
6. **Number of expected users:** SQL Server allows a maximum of 32,767 user connections. Because **user connections** are a dynamic (self-configuring) option, SQL Server adjusts the maximum number of user connections automatically as needed, up to the maximum value allowable. For example, if only 10 users are logged in, 10 user connection objects are allocated [4].

SECTION 4: Logical Design

We have built a database named “Cineplus” and we have built 10 tables as mentioned in our dependency diagrams. We have implemented NOT NULL, UNIQUE constraints and implemented PK and FK.

Through our logical design and the implementation of our schema, we will only be solving the objectives which have a high priority in our Term Project Report 1.

Please see attached .sql file for the implementation of our schema which has been populated with sample data and we have also uploaded the sample data in an excel file for reference.

References:

[1] https://www.microsoft.com/en-gb/download/details.aspx?id=42299

[2] https://blogs.msdn.microsoft.com/sateeshp/2010/01/01/seven-benefits-for-using-the-sql-server-management-studiossms-for-managing-the-sql-azure-database/

[3] https://www.techwalla.com/articles/microsoft-sql-server-advantages

[4]https://social.msdn.microsoft.com/Forums/sqlserver/en-US/00e864e7-74dc-48c8-9749-78816b835b2c/number-of-active-users-connected-to-sql-server?forum=sqldatabaseengine