Database Design Document

for

MovieBase

Prepared by

Group 21

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1 PURPOSE

This Database Design Document for the MovieBase application meticulously outlines the chosen database management system after a thorough analysis of the software system's requirements, assuring the utmost data consistency and integrity. The Entity-Relational model, thus crafted based on the use case diagram, is seamlessly translated into a relational schema tailored for the selected Database Management System (DBMS).

1.1 Document Objectives

The Database Design Document has the following objectives:

1. To outline the software design and specification of the MovieBase database in addition to the system architecture and components that can be accessed by users or system developers via a DBMS.
2. To provide a fundamental approach for implementing the database and related software units, thus aiding in extracting details necessary for the software development of the application

1.2 Intended Audience and Document Overview

The document is intended to serve several groups of audience members.

1. Technical reviewers for evaluating and assuring the quality of the document.
2. The document will be referenced by the system designers to create the design of the application based on the requirements specified.
3. The developers and testers shall view it to ensure that the requirements have been met.
4. The admin and users who are the clients for the project shall review the document to get an understanding of the basic product functionalities.
5. The application maintenance staff can also review the document for future modifications to gain clarity on the current functionality.

The next section of the document, Assumptions and Constraints gives an overview about the suppositions taken care of and the restrictions imposed for developing the product. The second section Database wide design focuses on describing the behaviour of the system laying importance to the major roles/actions along with the details of the DBMS platform,security requirements, performance and availability decisions.The fourth section, Database Administrative Functions provides the Entity Relationship Model created, the relational schema formed out from the ER diagram with the normalization and data formats details.

1.3 Definitions, Acronyms and Abbreviations

S. No	Abbreviation	Definition(s)
1.	ISAN	International Standard Audiovisual Number
2.	1NF	First Normal Form
3.	2NF	Second Normal Form
4.	3NF	Third Normal Form
5.	DBMS	Database Management System
6.	Admin	Administrator of the database
7.	MovieBase	Movie Database
8.	Database	Stores the details, reviews and ratings of movies and login credentials of users

1.4 References

- Fundamentals of Database Systems by Ramez Elmasri
- Design document reference
- Flowchart maker
- SRS document.

2 ASSUMPTIONS AND CONSTRAINTS

2.1 ASSUMPTIONS

The following are the assumptions made while developing this product.

- The data of all available movies and registered users must be stored in a database.
- The system must have sufficient storage capacity and render fast access to the database.
- The system should be available at all times.
- The entire interface will be in english. Admins and users must have basic knowledge about the language.
- The admins and users are aware of the basic functioning of the system.
- Database is updated after every add/delete/update operation.
- The web based application requires internet connection to be accessed. Admins and users are expected to have internet connectivity.
- Both users and admins have familiarity with the using of computers and devices such as mouse and keyboard.

2.2 Constraints

The following design and implementation constraints are employed in the system.

- All accesses are protected with unique credentials.
- Admins have exclusive credentials to prevent unauthorized access.
- All users have a unique ID, username and password.
- Only admins can add/delete/remove movie records.
- Only admins can add/remove verification status from users.
- Only admins can recommend movies.
- Only users can add ratings and reviews.
- A particular user can view only their own history.

3 DATABASE WIDE DESIGN DECISIONS

3.1 Behaviour

3.1.1 Login or Register

The user is directed to the login page on opening the application. The user can enter a valid username/userID and password to login to the application. The admin can enter a valid admin ID and password to login to the application. A new user can enter a valid username, user ID and set a valid password to create a new account and then login with the corresponding credentials. They are then directed to pages corresponding to their respective roles.

3.1.2 User

Users are presented with the following options after login:

- Search for a book based on title/actor/director
- View movie details and ratings and reviews submitted by other users
- View details of upcoming movies, recently released movies, highest rated movies and popular movies
- View and edit the user's watchlist
- View search history
- Submit ratings and reviews for movies

3.1.3 Admin

Admins are presented with the following options after login:

- Add a movie to the movie database
- Delete a movie from the movie database
- Update movie details in the movie database
- Delete reviews from the movie database
- Recommend selected movies as editor's choice
- Verify critics and proficient reviewers

3.2 DBMS Platform

MovieBase is a user-friendly web application designed to offer a seamless and interactive movie browsing experience. Its intuitive design adheres to a consistent template across all interfaces. This versatile web application is compatible with various web browsers and caters to a diverse user base.

Users can effortlessly log in with their credentials and are dynamically redirected to specific pages based on their roles. The range of features available to each user is tailored to align with their respective roles, ensuring a customised and secure experience.

3.3 Security Requirements

The system prioritizes data security by housing all information in a well-protected database. While regular users have read-only access to movie details, the ability to add, update, or delete records, manage reviews, and grant special user statuses is reserved for a select group of individuals known as Admins. Stringent encryption measures are in place to ensure the confidentiality of user credentials, and the system is designed to pose no inherent threat to the safety of users or administrators.

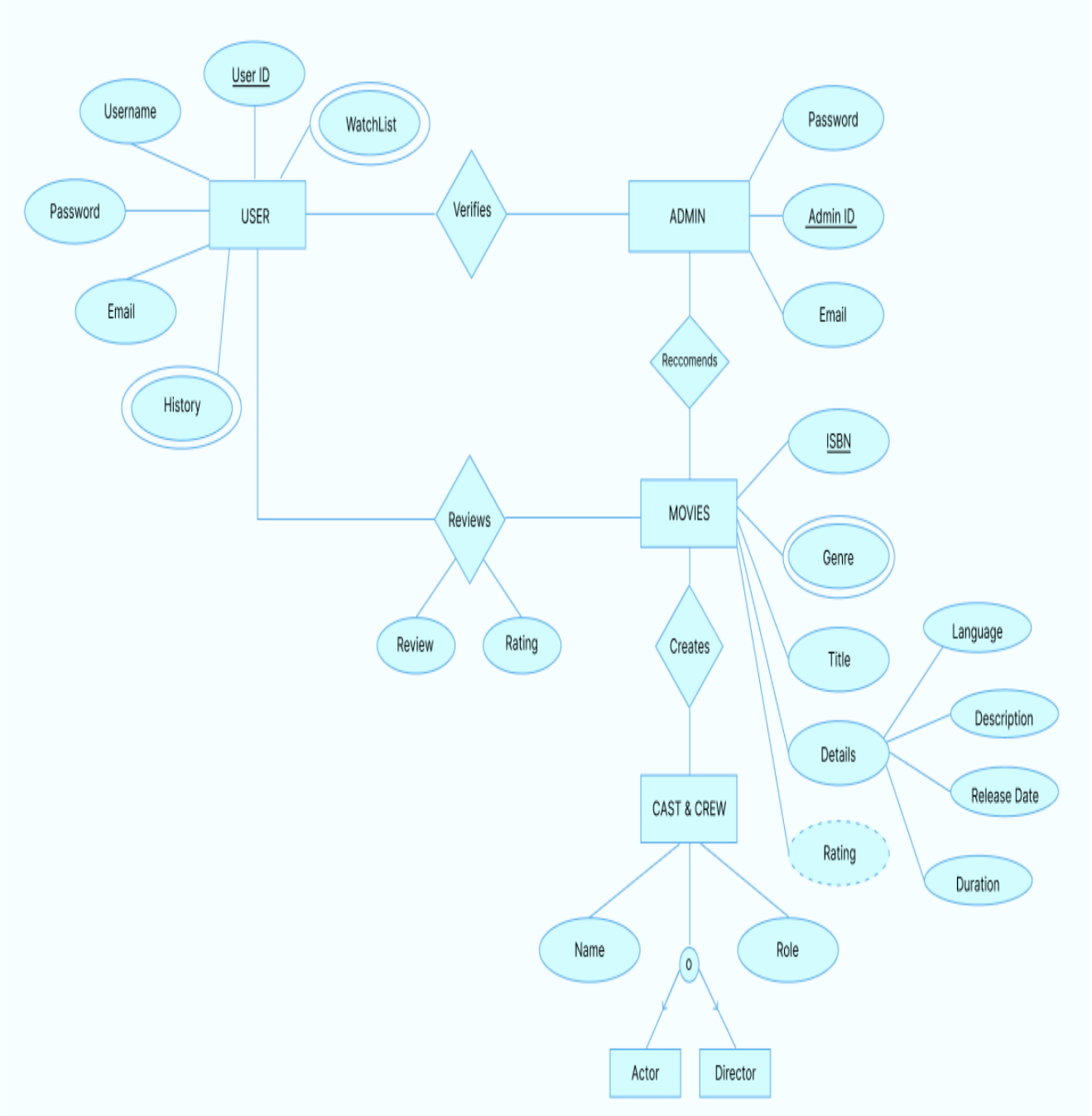
In addition to these security measures, the proactive practice of regular data backups is strongly recommended to safeguard against potential cyber threats. By maintaining up-to-date backups, the system can effectively mitigate the risks associated with data loss or breaches.

3.4 Performance and Availability Decisions.

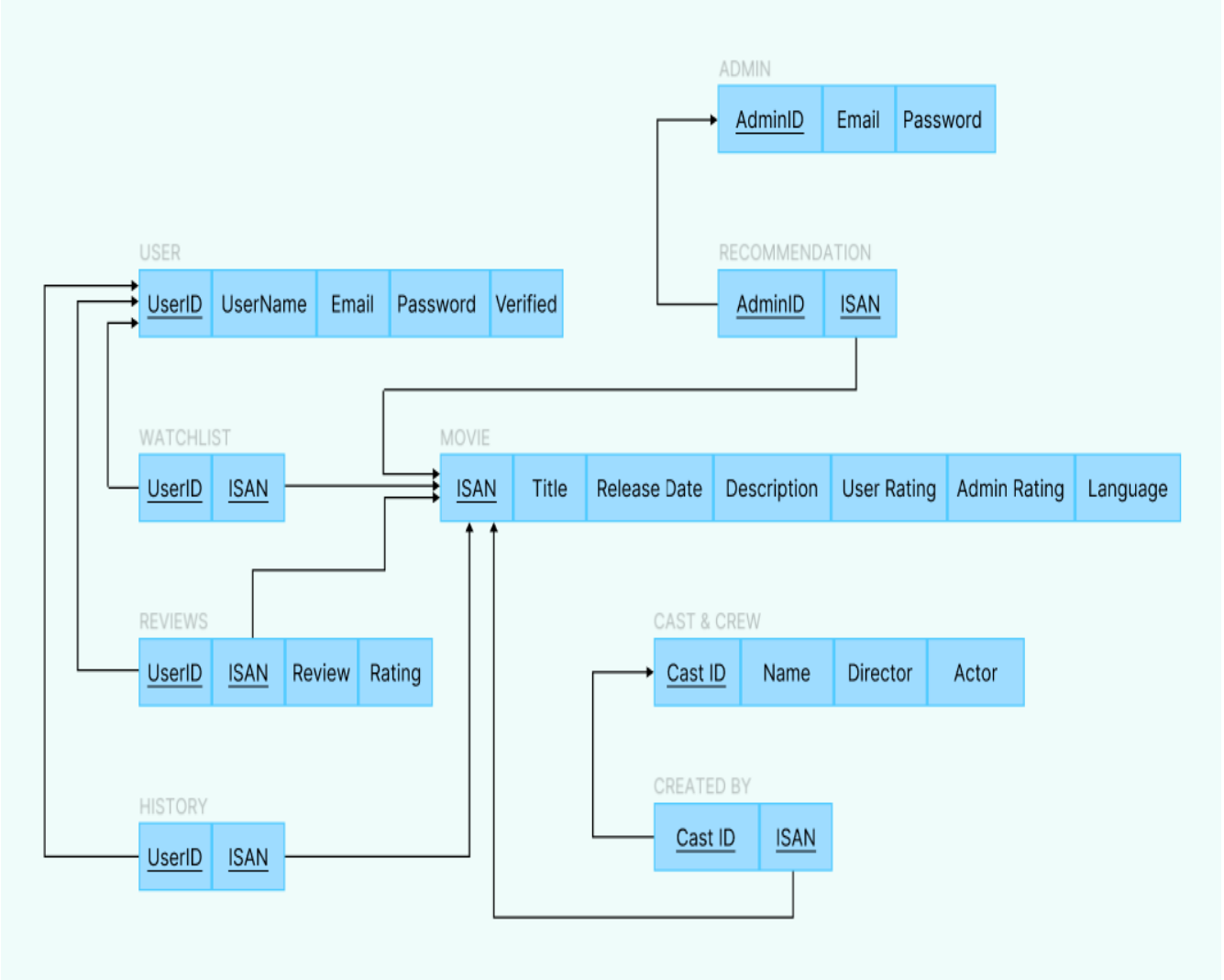
The core of the system's functionality lies in its database-driven search and retrieval capabilities. Users are granted access to data, while administrators hold the authority to make data modifications. Response times to user and admin requests are finely tuned for rapid and accurate interactions. Notably, the system is equipped to handle vast amounts of data, encompassing extensive records of movies, users, and administrators. This well-structured design prioritizes space and time optimization to deliver peak performance.

4 Database Administrative Functions

4.1 Entity-Relation Model



4.2 Relational Schema



4.3 Normalization

- The tables have been created such that it satisfies the requirements of the first normal form (1NF). There are no composite attributes or multivalued fields. Each cell in the tables holds individual, atomic values, and each record is distinct. Therefore, we can confidently conclude that the database is in 1NF.

- The database has already been proved to be in the first normal form (1NF), and there are no partial dependencies, which means that no non-prime keys rely on just a portion of the primary key within any of the tables. Consequently, the database is in second normal form (2NF).

- The tables have already been established to meet the criteria of the second normal form (2NF), and there are no transitive functional dependencies present within the schema. Furthermore, there are no instances where non-prime keys depend on other non-prime keys within individual tables. As a result, the database is confidently confirmed to be in third normal form (3NF).

4.4 Schema Description & Data Formats.