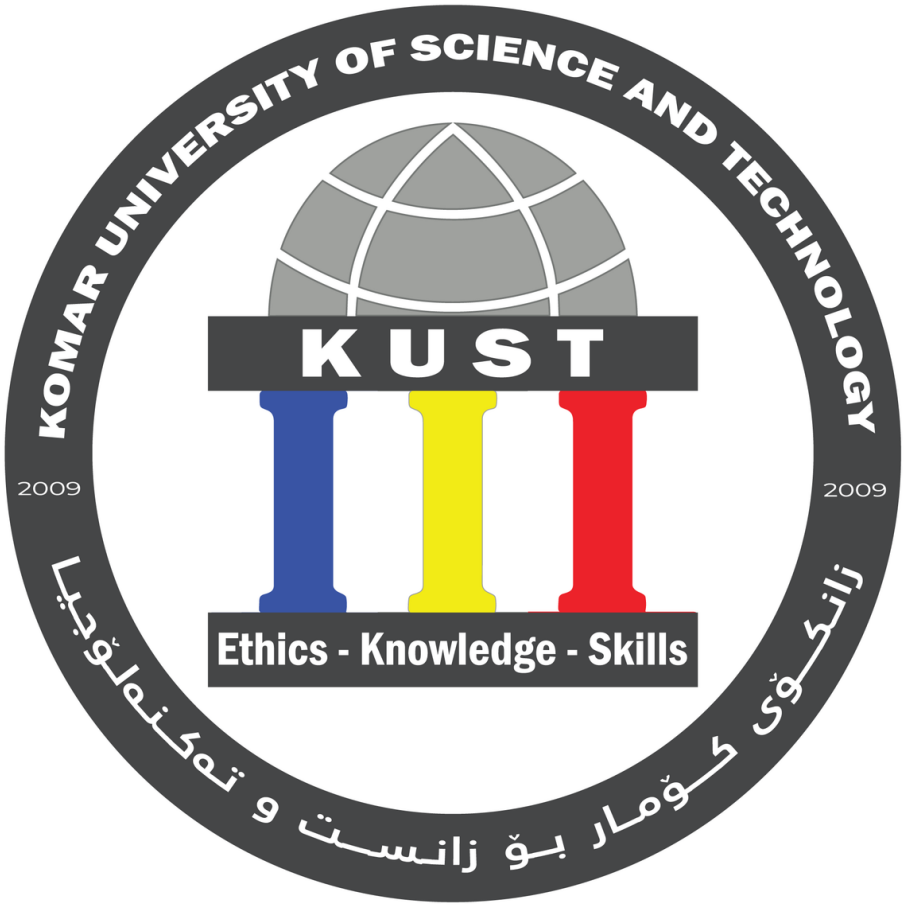
Komar University of Technology and Science

Computer Science



Space Mission Management System

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Fundamental of database

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Introduction

This project is a well-structured database on a space mission management system. It contains detailed information about the astronauts, missions, spacecrafts, and resources. A database such as this is of high importance for a space mission organization to monitor their operations so that, later on, they can utilize this data to evaluate successes and shortcomings and also to store specific data that is easy to update, modify, and retrieve.

Objectives

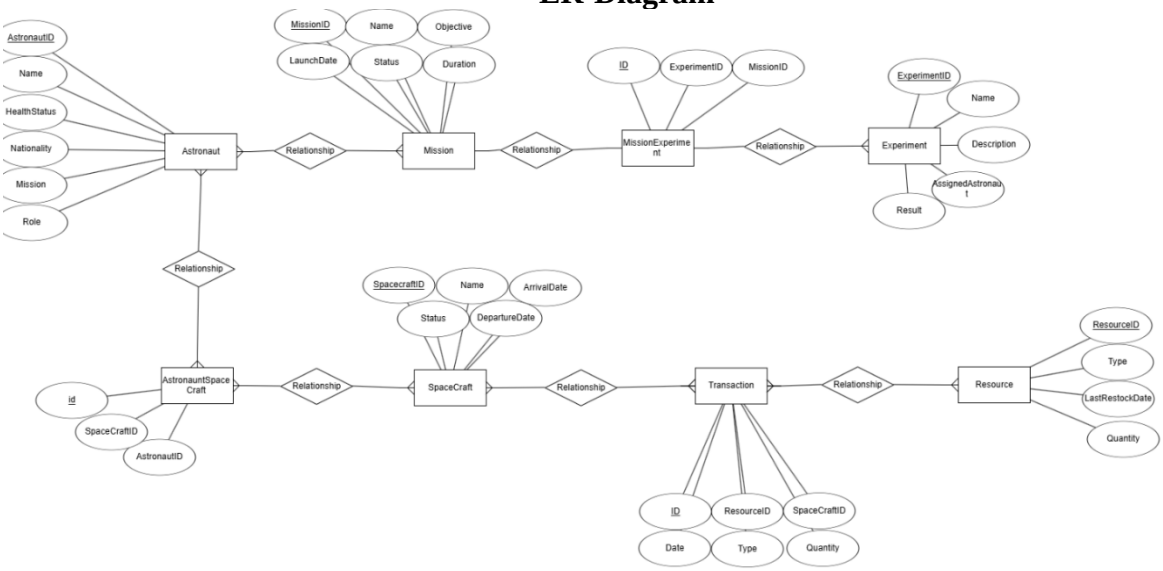
- To make a database that keeps track of astronauts, missions, spacecrafts, and other space-related things.
- To help users easily save, find, and update space mission data.
- To create useful views and queries so users can quickly see important information.
- To make sure all the data is correct, organized, and easy to grow in the future.

Tools and Softwares

- **Database language:** mySQL
- **ER-Diagram:** ERDplus website
- **Database interface:** phpMyAdmin
- **Development** Environment: XAMPP (Localhost Server)

Database Structure

ER-Diagram



Tables

- **astronauts**: Contains astronaut ID, name, age, rank, and specialization.
- **spacecrafts**: Stores spacecraft ID, name, capacity, and type.
- **missions**: Records mission ID, name, assigned spacecraft, date, duration, and goal.
- **experiments**: Includes experiment ID, mission ID, type, status, and result.
- **resources**: Lists available tools and consumables by ID, type, quantity, and status.
- **transactions**: Logs the use of resources by astronauts or missions, including date and quantity used

Queries

1. **Active Astronauts:** Utilized to retrieve and identify only astronauts with an active status. This is particularly useful when a new mission arises and there is a need to assign healthy and available astronauts.
2. **Active Astronauts missions:** Employed to retrieve missions that are currently ongoing. This is particularly useful for monitoring the number of active missions.
3. **Mission experiment details:** This is employed to view all relevant details without the need to query multiple tables, as the table contains only the mission and astronaut IDs. It enables access to names and additional information efficiently.
4. **Resource usage per spacecraft:** This is to assess the amount of resources required and the quantity utilized up to the present time.
5. **Upcoming missions:** This is to view the upcoming missions, organized in ascending order from the nearest to the most distant in time.
6. **Waste per spacecraft:** This is to calculate the returned resources by determining how many were initially allocated and how many have been restored to storage.

7. **Spacecraft resource status:** This checks the resources in the spacecraft; if the amount falls below 50, it is particularly useful for identifying which spacecraft is low on resources.

Conclusion

Space Mission management system and database helps the company significantly by providing a well clean structure information that is easy to maintenance and use, really useful for analyzing and very secure from any unauthorized source for access.