KTM Workshop Management System

Course Code: CS F212

Course Name: Database Systems

Group Members:

Name	ID No.
Amritansh	2022A7PS1314H
Saarthek Raj	2022A7PS0137H
Mohd. Kamaaalullah Khan Quadri	2022A7PS0109H
Mahesh Pappu	2022A7PS0142H
Palepu Srivardhan Sharma	2022A7PS0100H

GROUP ID - G02

1. Introduction

This Database Systems (DBS) project represents an effort by us (participants) to focus on honing our skills in both Entity-Relationship (ER) design and Relational Database Implementation. With a dual objective, via this project we aim to cultivate a comprehensive understanding of database modelling principles alongside practical implementation skills, thereby equipping us with essential competencies for real-world database development scenarios.

This submission marks the initial phase of the Database System (DBS) project. It was developed in collaboration with KTM workshop management. The database acquired and used here encompasses crucial information such as workshop locations, respective areas, assigned managers, and revenue generated by each workshop.

This database will help us to implement ER modelling and their use in schema diagram. We list the data requirements here and have created a conceptual schema utilizing the modelling concepts of the ER model.

Context

KTM workshops operate within a defined service area all over India, segmented into four cardinal directions: North, South, East, and West. Each of these areas is overseen by a designated area manager responsible for coordinating workshop activities and maximizing revenue generation. The workshops are identified by their geographical location and are integral components of KTM's operational infrastructure.

Description of the Mini World

The KTM database is organized into the following entities along with their description:

1. **Workshop**: Each Workshop is associated with a unique Workshop code which acts as a primary key, a workshop in charge and the area where its located. The database keeps track of the manpower associated/available at the workshop, the number of customers visiting the workshop and its score. One workshop can have more than one workshop-incharge responsible for overseeing workshop operations and revenue generation within their workshop.

2. **Area**: An Area can be recognized by its name and consists of a large number of workshops. Each workshop is assigned to one of the four areas based on its location. Each area is managed by one and only one area manager responsible for supervising the workshop in charges of each workshop in their designated area. An Area Manager may have several workshops in charges under him/her.

3. **Revenue**: The database keeps track of revenue figures generated by each workshop (which is pegged/keyed to each workshop via the workshop's unique workshop code), providing valuable insights into financial performance and profitability. It stores detailed information such as the Total Sales, Annual Profit, Yearly and Quarterly Revenue, and the cost for services provided at the workshop.

4. **Area Incharge**: An Area Incharge is the head of each area who has control over all the operations under his/her area. He/She manages all the workshop incharges in the area and ensures efficient operation for the designated area.

5. **Workshop Incharge**: Workshop Incharge takes care of all the operations under the workshop assigned to him/her. This includes keeping track records of total revenues, service cost, performance of the staff, etc.

Functionalities

1. <u>Workshop Allocation</u>: The system facilitates the allocation of workshops to specific geographical areas based on their location and operational requirements.

2. <u>Managing details of Area Incharges</u>: Area Incharges are responsible for managing the workshop managers that come under their area, which helps in getting a better picture of each area and hence the whole working space of KTM in India.

3. <u>Manager Assignment</u>: Workshop managers are assigned to oversee operations within their respective areas, ensuring efficient management and coordination.

4. <u>Revenue Reporting</u>: Comprehensive revenue reports are generated, detailing revenue figures for individual workshops as well as aggregated revenue data for each geographical area.

Expected Outcomes

By the completion of this project phase, we anticipate delivering a robust database system capable of effectively managing KTM workshops across different geographical areas. The system will provide stakeholders with real-time access to vital information, enabling informed decision-making and strategic planning to optimize workshop performance and revenue generation.

The project aims to provide insights into the practical application of ER modelling principles and relational database management techniques in real-

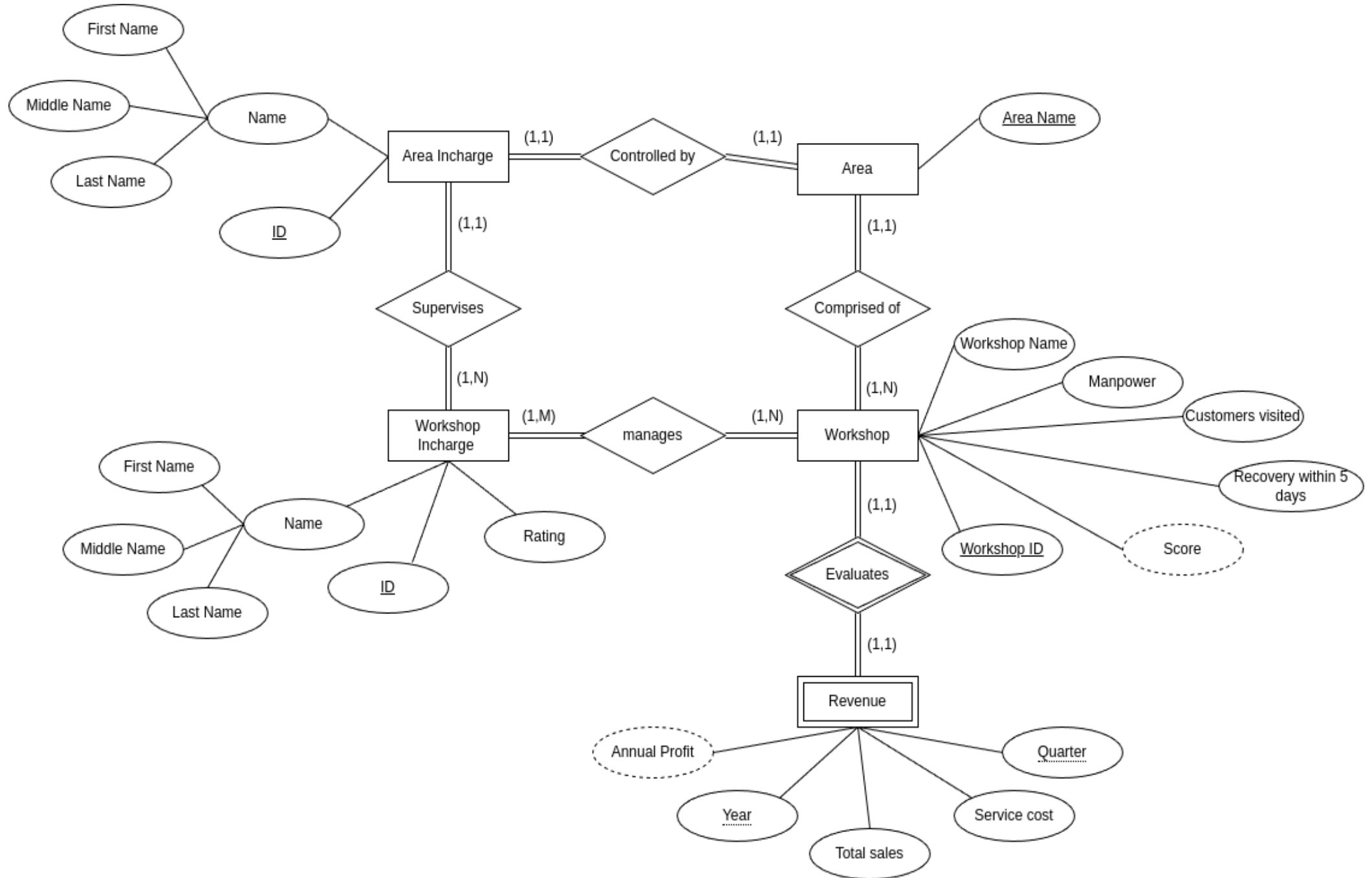world scenarios, equipping us with valuable knowledge and skills in database design and implementation.

In essence, this project endeavours to bridge the gap between theoretical concepts and practical implementations, fostering a deeper understanding of database systems and their pivotal role in modern information management practices.

Key Components

The project encompasses several key components, each playing a pivotal role in the development and deployment of the database system:

1. Requirement Analysis: Thorough analysis of requirements and domain-specific functionalities to identify key entities, attributes, and relationships.

2. ER Modelling: Construction of an Entity-Relationship (ER) model using appropriate notation to represent entities, attributes, relationships, and cardinalities.

3. Normalization: Application of normalization techniques to ensure the database schema adheres to normalization forms, minimizing redundancy and improving data integrity.

4. Relational Database Implementation: Translation of the refined ER model into a relational database schema, employing SQL (Structured Query Language) for schema creation, data manipulation, and query execution.

5. Data Population and Testing: Population of the database with representative data sets followed by rigorous testing to validate schema correctness, data integrity, and system performance.

2. ER Modelling Diagram

3. Relational Mapping

Workshop

Workshop Code	Workshop Name	Area	Manpower	Customer Visits	Recovery	Score

Area

Area Name	Incharge

Area Incharge

ID	First Name	Middle Name	Last Name	Area

Workshop Incharge

ID	First Name	Middle Name	Last Name	Rating	Area Incharge

Manages

Workshop Code	Incharge ID

Revenue

Workshop Code	Year	Quarter	Total Sales	Service Cost	Profit