SECP2523 DATABASE

SESSION 2024/2025 - SEMESTER 1

ALTERNATIVE ASSESSMENT REPORT: PHASE 1

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Case Study	Member Management Module
System Name	KADA ESERVE
Group Name	TECH AWAY

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SECTION A (System's Overview)

1.1 Overall Description

The Member Management Module has been created to replace KADA's existing manual, paper-based registration process with a fully digitized, database-driven system. This module utilizes a centralized relational database to store and manage member information, ensuring data consistency, scalability and security.

In the current system, KADA staff must complete physical forms, which clerk then manually process and enter disparate storage systems. This approach leads to a significant risk of data inaccuracies, duplication and potential loss. The proposed system digitizes this procedure, allowing KADA staff to enter their information through an intuitive interface, while the system checks and stores the data directly in a database. The database structure ensures normalized storage of member data, optimizing storage efficiency and allowing for smooth retrieval and updates. This database-first approach not only improves the accuracy and reliability of data but also allows for integration with other modules, such as loan management and reporting modules, creating a unified system experience.

Group Members' Name	Matric No	Module
SABRINA HENG WEI QI	A23CS0265	Member Management Module
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GUI KAH SIN	A23CS0080	Loan Management Module
BRENDAN CHIA YAN FEI	A23CS0211	Savings and Dividend Management Module

1.2 Project Weaknesses or Improvement

One significant weakness of the current system is its dependence on manual procedures, resulting in disjointed and inconsistent data management. In the absence of a centralized database, member information is susceptible to inaccuracies, delays and redundancy. Furthermore, the necessity for manual data entry makes it challenging to scale operations as KADA grows, limiting the system's ability to accommodate an increasing volume of records.

To address this, the proposed system introduces a centralized relational database as the backbone for member management. This database will implement validation constraints (such as unique keys to avoid duplicate records) and promote data uniformly through normalization. In addition, the system will integrate automated data backups and access controls to enhance security and reliability. This database-centric approach will support real-time data updates, enabling faster and more accurate reporting and decision-making.

1.3 Proposed Module

The proposed Member Registration Module focuses on leveraging a database-driven system to enhance the registration process. This module consists of the following components:

1. Dynamic Registration Form: Members will enter their information into a digital form that automatically verifies the data before storing it in the database. The system will validate data by checking for duplicate email addresses or invalid inputs.

2. Centralized Relational Form: All member data will be stored in a normalized structure within a relational database. This ensures efficient storage, retrieval and updates while avoiding redundancy.

3. Data Validation and Integrity: The database will implement validation rules to ensure unique member IDs, email addresses and phone numbers to maintain data integrity.

4. Real-Time Data Storage: After validation, the member's details are instantly saved in the database, allowing immediate access for other modules, such as loan applications or generating reports.

5. Scalability and Reporting: The centralized database structure allows for the seamless addition of new members as the organization grows. It also facilitates the generation of real-time reports on member registrations, ensuring that KADA can monitor and analyze trends efficiently.

The database-driven approach to the Member Management Module will transform the registration procedure into a more efficient, secure and expandable system, addressing the shortcomings of the current manual approach and guaranteeing that KADA can adequately manage its expanding operations.

2.1 Conceptual ERD
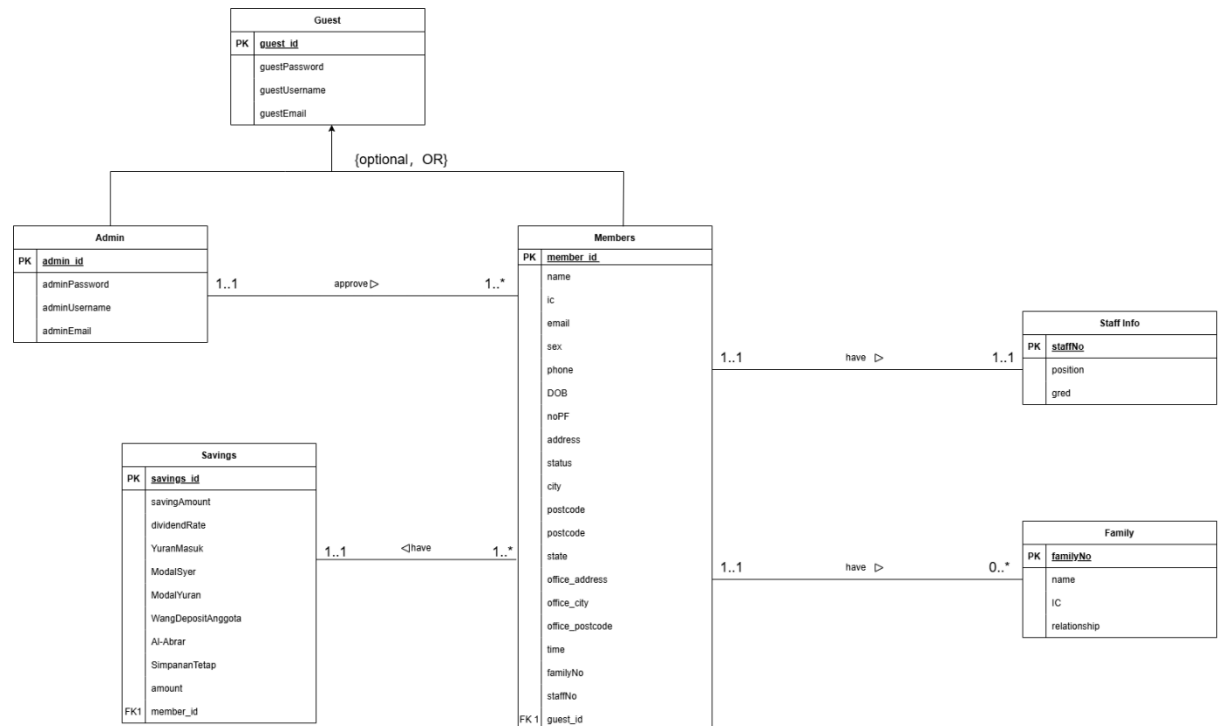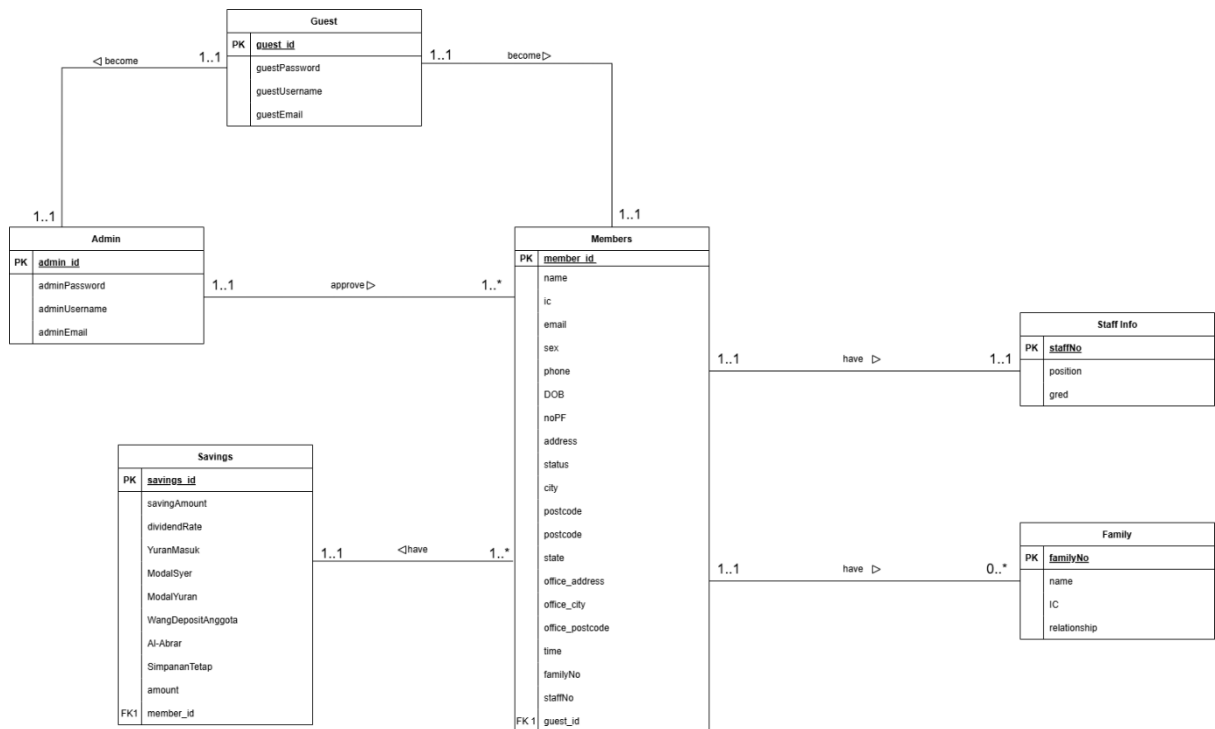
2.2 Logical ERD

2.3 Data Dictionary for Logical ERD

2.3.1   Identifying Entity

Entity Name	Description	Aliases	Occurrence
Guest	General term describing all users KADA-eServe	Visitor	Occurs when a user register in the system
Member	General term describing all user logged in as member using KADA-eServe	Registered staff	Occurs when a guest registration application approved by admin
Admin	General term describing admin managing KADA-eServe	Clerk, Administrator, manager	Occurs when the system built
Savings	General term describing the savings info of each member	Yuran, Modal, Deposit, Simpanan	Occurs when a guest registration application approved by admin
Family	General term describing the family info of each member	Pewaris, Keluarga	Occurs when a guest registration application approved by admin
Staff Info	General term describing the staff position, grade info	KADA staff Info	Occurs when a guest registration application approved by admin

2.3.2   Identifying Relationship Types

Entity name	Multiplicity	Relationship	Entity Name	Multiplicity
Admin	1..1	approve	Members	1.. *
Guest	1..1	become	Members	1..1
Members	1..1	have	Savings	1..1
	1..1	have	Family	0.. *
	1..1	have	Staff Info	1..1

2.3.3   Attributes Description

Entity Name	Attributes	Data Type & Length	Description	Nulls	Multi-valued	Example
Guest	guest_id (PK)	int	Uniquely identifies each guest	No	No	1
	guestPassword	varchar(255)	Account password for login	No	No	$sf@142
	guestUsername	varchar(255)	Guests' full name	No	No	Ali
	guestEmail	varchar(255)	Account email for login	No	No	staff@gmail.com
	member_id (PK)	int	Uniquely identifies each member	No	No	5
	name	varchar(255)	Members' full name	No	No	Ahmad
	ic	int	Members' identification card number	No	No	981119-01-8732

	email	varchar(255)	Account email for receive notification	No	No	ahmad@gmail.com
	sex	varchar(255)	Members' gender	No	No	Lelaki
	phone	varchar(255)	Members' phone number	No	No	011-16596391
Members	DOB	date	Members' birth date	No	No	19/11/1998
	noPF	int	Members' personal profile	No	No	6
	address	text	Members' address	No	No	No 128 Taman U
	status	ENUM	Indicates the application state	No	No	Johor
	city	text	City where the member is located	No	No	Muar
	postcode	int	Postcode where the member is located	No	No	84000
	state	text	State where the member is located	No	No	Kelantan
	office_address	text	Office address of member	No	No	Peti Surat 127
	office_city	text	Office city of member	No	No	Bandar Kota Bharu
	office_postcode	int	Office postcode of member	No	No	15710
	time	date	The date of submission application	No	No	05/1/2025
	familyNo (FK)	int	Family record of members	Yes	Yes	2
	staffNo (FK)	int	Staff number of member	No	No	4672
	guest_id (FK)	int	Uniquely identifies each guest	No	No	1
Admin	admin_id (PK)	int	Uniquely identifies each admin	No	No	1
	adminPassword	varchar(255)	Account password for admin login	No	No	$gf@142@
	adminUsername	varchar(255)	Admins' full name	No	No	Ahmad
	adminEmail	varchar(255)	Account email	No	No	admin@gmail.com

			for admin login			
Savings	savings_id (PK)	int	Uniquely identified savings record	No	No	56
	savingAmount	float	Amount of the member savings	No	No	3000
	dividendRate	float	Yearly dividen rate	No	No	0.03
	YuranMasuk	float	Amount of members' Yuran Masuk	No	No	2550
	ModalSyer	float	Amount of members' Modal Syer	No	No	1480
	ModalYuran	float	Amount of members' Modal Yuran	No	No	1320
	WangDepositAnggota	float	Amount of members' deposite	No	No	2550.50
	Al-Abrar	float	Amount of members' Al-Albrar	No	No	1000.50
	SimpananTetap	float	Amount of members' fixed deposit	No	No	6000.50
	amount	float	Total amount of the savings	No	No	20000
	member_id (FK1)	int	Indicated to the member who own the savings record	No	No	6
Family	FamilyNo (PK)	int	Uniquely identified family record of member	No	No	4
	name	varchar(255)	Members' family name	No	No	Ismail
	IC	varchar(255)	Members' family ic	No	No	931118-01-1236
	relationship	varchar(255)	Relationship between the family and member	No	No	Adik lelaki
Staff Info	staffNo (PK)	int	Uniquely identified each staff	No	No	9824
	position	varchar(255)	Staffs' position in KADA	No	No	perkhidmatan pelanggan
	gred	varchar(255)	Staffs' grade in KADA	No	No	M40

2.4 Relational Database Schema

The Relational Database Schema represents the tables derived from the Logical ERD, showing the primary keys, foreign keys and relationships. Below is the relational database schema for this Member Management Module:

1. Guest (guest_id, guestPassword, guestUsername, guestEmail)

   Primary Key: guest_id

2. Member (member_id, name, ic, email, sex, phone, DOB, noPF, address, status, city,postcode, state, office_address, office_city, office_postcode, time, familyNo, staffNo, guest_id)

   Primary Key: member_id

   Foreign Key: guest_id references Guest(guest_id), familyNo references Family(familyNo), staffNo references StaffInfo(staffNo)

3. Admin (admin_id, adminPassword, adminUsername, adminEmail)

   Primary Key: admin_id

4. Family (familyNo, name, IC, relationship)

   Primary Key: familyNo

5. Staff Info (staffNo, position, gred)

   Primary Key: staffNo

6. Savings (savings_id, savingAmount, dividendRate, YuranMasuk, ModalSyer, ModalYuran, Wang DepositAnggota, Al-Abrar, SimpananTetap, amount, member_id)

   Primary Key: savings_id

   Foreign Key: member_id reference Member(member_id)

2.5 Normalization
Member Table
1NF
MemberForm (member_id, name, ic, email, sex, phone, DOB, noPF, address, status, city,postcode, state, office_address, office_city, office_postcode, time, familyNo, staffNo, guest_id, familyNo, name, IC, relationship, staffNo, position, gred, savings_id, savingAmount, dividendRate, YuranMasuk, ModalSyer, ModalYuran, Wang DepositAnggota, Al-Abrar, SimpananTetap, amount)
Primary Key: member_id

2NF
Member (member_id, name, ic, email, sex, phone, DOB, noPF, address, status, city,postcode, state, office_address, office_city, office_postcode, time, familyNo, staffNo, guest_id, familyNo, name, IC, relationship, staffNo, position, gred)
Primary Key: member_id

Savings (savings_id, savingAmount, dividendRate, YuranMasuk, ModalSyer, ModalYuran, Wang DepositAnggota, Al-Abrar, SimpananTetap, amount, member_id)
Primary Key: savings_id
Foreign Key: member_id reference Member(member_id)

3NF
Member (member_id, name, ic, email, sex, phone, DOB, noPF, address, status, city,postcode, state, office_address, office_city, office_postcode, time, familyNo, staffNo, guest_id)
Primary Key: member_id
Foreign Key: guest_id references Guest(guest_id), familyNo references Family(familyNo), staffNo references StaffInfo(staffNo)

Savings (savings_id, savingAmount, dividendRate, YuranMasuk, ModalSyer, ModalYuran, Wang DepositAnggota, Al-Abrar, SimpananTetap, amount, member_id)
Primary Key: savings_id
Foreign Key: member_id reference Member(member_id)

Family (familyNo, name, IC, relationship)
Primary Key: familyNo

Staff Info (staffNo, position, gred)
Primary Key: staffNo

Admin Table
1NF
Admin (admin_id, adminPassword, adminUsername, adminEmail)
Primary Key: admin_id

2NF
All the derived relations are already in Second Normal Form(2NF) as there is
no partial dependencies exist in the relation. Therefore, all the derived dependencies
will stay unchanged which same as First Normal Form (1NF).

3NF
All the derived relations are already in Third Normal Form(3NF) as there is
no partial dependencies exist in the relation. Therefore, all the derived dependencies
will stay unchanged which same as Second Normal Form (2NF).

Guest Table

1NF
Guest (guest_id, guestPassword, guestUsername, guestEmail)
Primary Key: guest_id

2NF
All the derived relations are already in Second Normal Form(2NF) as there is
no partial dependencies exist in the relation. Therefore, all the derived dependencies
will stay unchanged which same as First Normal Form (1NF).

3NF
All the derived relations are already in Third Normal Form(3NF) as there is
no partial dependencies exist in the relation. Therefore, all the derived dependencies
will stay unchanged which same as Second Normal Form (2NF).