Understanding Data modeling by designing own stress management application service

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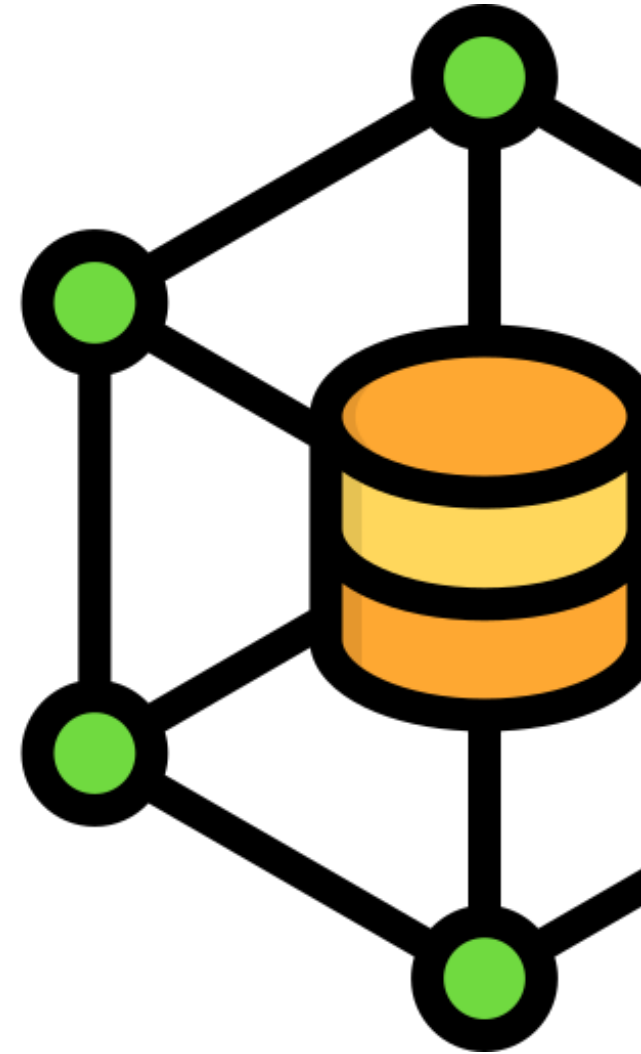   - Physical Modeling

Data Modeling

Process of visually representing the entire information system or a part of it to inform about the connections and structures between data points.
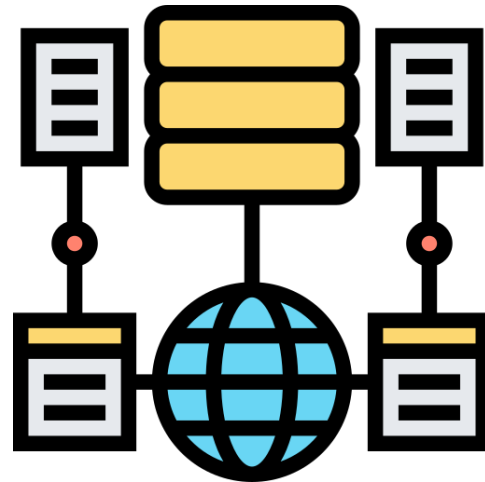
Data Modeling

It aims to identify

- the types of data used and stored within the system

- the relationships between these data types

- how data is grouped and organized, and its format and characteristics

Data Modeling

1. Requirement Analysis

2. Conceptual modeling

3. Logical modeling

4. Physical modeling

ER Modeling is particularly useful in these steps.

Data Modeling

1. Entity

   a real-world object or concept within the system, such as a person, place, or event

2. Attribute

   properties or characteristics of an entity. Each entity has attributes that describe its data

3. Relationship

   how entities are related to each other

Service Conception

I came up with an app called **STREcording**.

STREcording offers a unique solution, allowing users to record and analyze their emotions through voice diaries and providing accurate stress levels and activity recommendations to foster psychological well-being and promote a healthier lifestyle.

Service Conception

Login
- Users enter their email and password to log in.
- When the login button is clicked, user authentication is performed.
- Upon successful authentication, users are redirected to the main screen.

Profile Management
- Users can view and edit their name, email, profile image, gender, and age information.
- Clicking the save button will save any changes made.

Service Conception
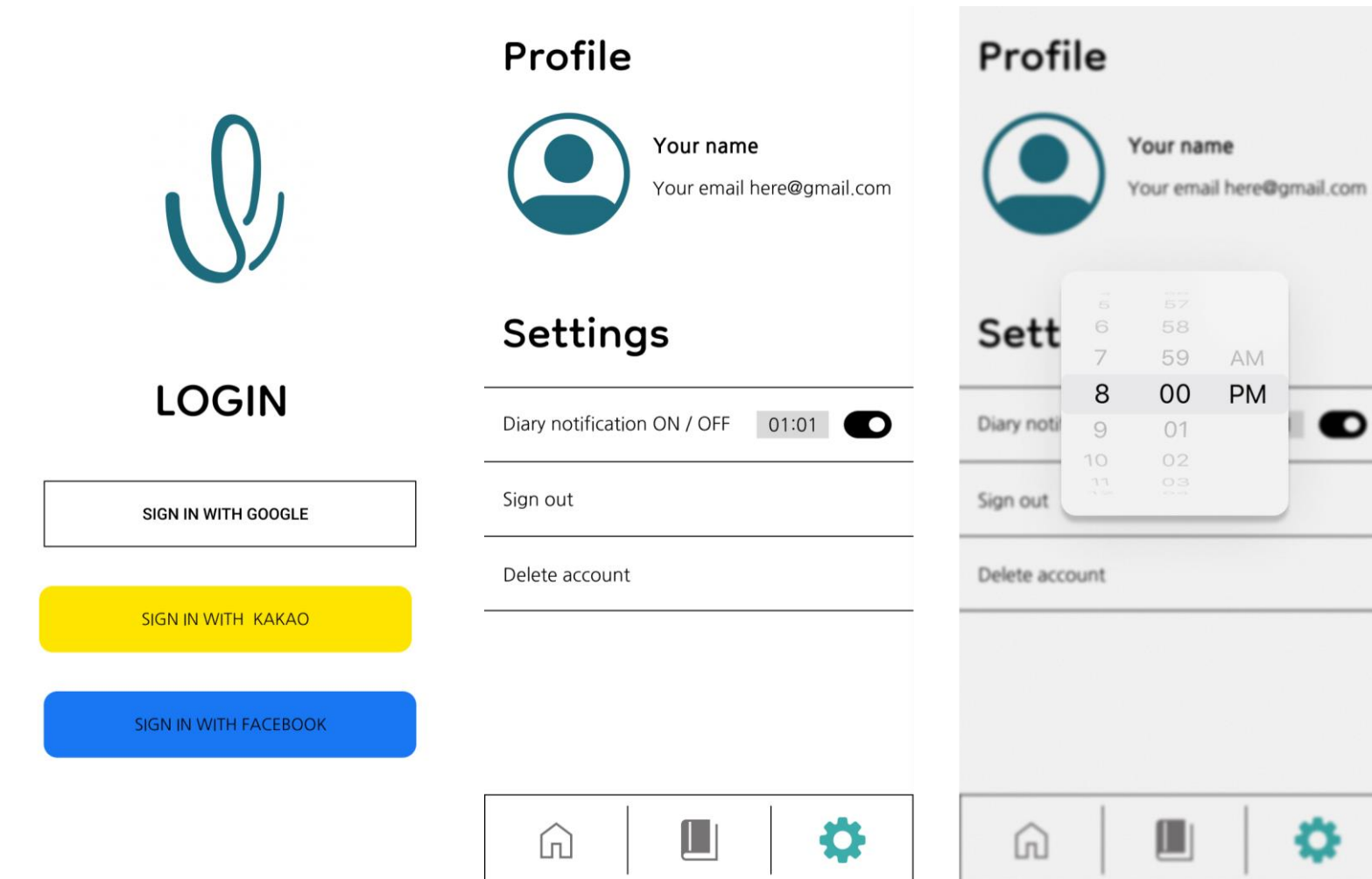
Service Conception

Main Screen
1. Diary Entry Button
- Provides a button that navigates to the diary entry/edit screen.
2. Today's Audio Recording Diary
- Displays today's audio recording diary, and clicking it will play the diary.
3. Today's Emotion Index and Stress Level
- Displays the user's emotion index and stress level for today.
4. Today's Recommended Activity
- Displays the recommended activity for today.

Service Conception

Service Conception

Diary Management

1. Diary Entry
- Provides a text field for diary entry.
- Provides a button for uploading audio files.
- Analyzes the emotional state of the audio file and saves the emotion index.
- Calculates and saves the stress level based on the emotion index.
- Converts and saves the audio recording to text.
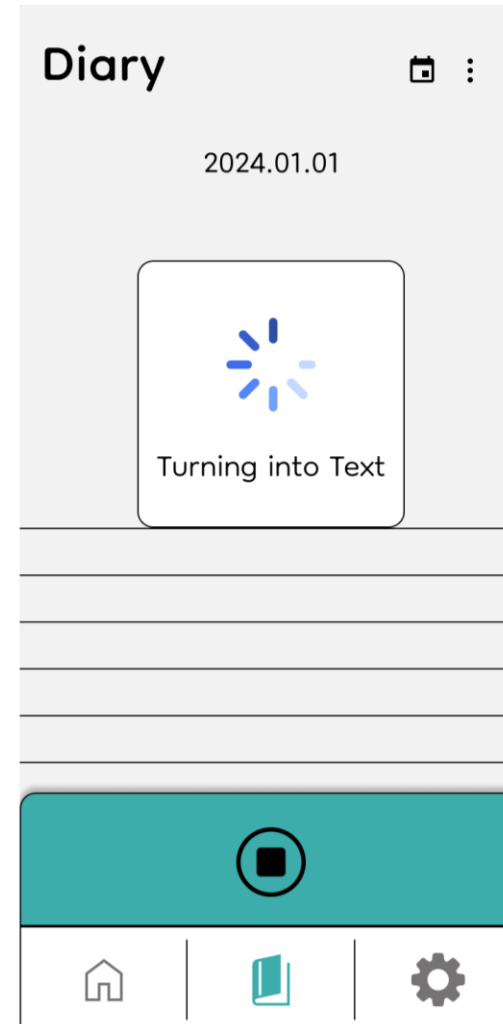
Service Conception

Diary Management
2. Displaying Diary Entries
- Displays a list of diary entries by date and emotional state.
-   Selecting a specific diary entry will navigate to the diary detail screen.

3. Diary Editing/Deleting
- Users can edit or delete diary entries.

Service Conception
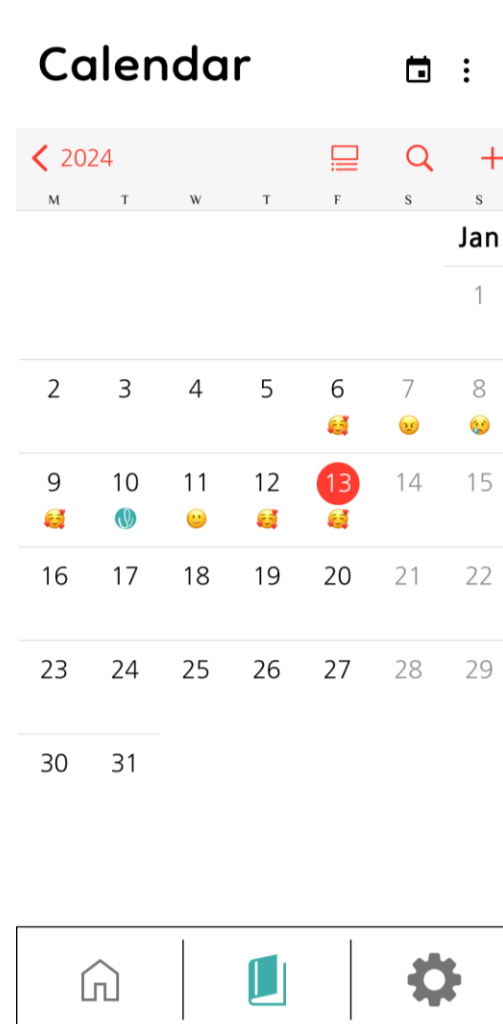
Conceptual Modeling

Entity and Attribute Extraction

User
- User name (username)
- Age (age)
- Address (address)
- Email (email)
- Gender (gender)
- Profile Image (profileImage)
- Status (status)
- Created At (createdAt)
- Modified At (modifiedAt)

Diary
- Diary ID (id)
- Content (content)
- Audio File (audioFile)
- Created At (createdAt)
- Modified At (modifiedAt)
- Status (status)
- User ID (userId)
- Recommended Activity ID (recommendedActivityId)

Conceptual Modeling

Entity and Attribute Extraction

Stress Level
- Stress Level ID (id)
- Angry (angry)
- Sadness (sadness)
- Disgusting (disgusting)
- Fear (fear)
- Happiness (happiness)
- Stress Point (stress_point)
- Maximum Emotion (max_emotion)
- Diary ID (diaryId)

Recommended Activity
- Activity ID (id)
- Image (image)
- Name (name)
- Content (content)

Conceptual Modeling

Relationship Types and Attributes

1. User - Diary
   - Relationship Type: 1:n
   - Attributes: User (optional), Diary (mandatory)
2. Diary - Stress Level
   1. Relationship Type: 1:1
   2. Attributes: Diary (mandatory), Stress Level (mandatory)
3. Diary - Recommended Activity
   1. Relationship Type: 1:n
   2. Attributes: Diary (optional), Recommended Activity (mandatory)

Logical Modeling

Relation Schema

id	username	email	Profile image	gender	age	createdAt	modified At	status

⬆️
Primary Key

DiaryId	content	audioFile	createdAt	modifiedAt	status	userId	recommendedActivityId

⬆️　　　　　　　　　　　　　　　　　⬆️　　　　⬆️
Primary Key　　　　　　　　　　　　Foreign Key　　Foreign Key

Logical Modeling

Relation Schema

StressId	angry	sadness	disgusting	fear	happiness	Stress_point	Max_emotion	DiaryId

⬆️
Primary Key

⬆️
Foreign Key

ActivityId	image	name	content

⬆️
Primary Key

Physical Modeling

Physical Modeling

Clear   Find   Actions ∨   Save   Run ▶

```
1   CREATE TABLE Users (
2       id VARCHAR2(255) PRIMARY KEY,
3       username VARCHAR2(255),
4       email VARCHAR2(255),
5       profile_image CLOB,
6       gender VARCHAR2(255),
7       age INTEGER,
8       created_at TIMESTAMP,
9       modified_at TIMESTAMP,
10      status VARCHAR2(255)
11  );
12
```

Physical Modeling

```
13  CREATE TABLE StressLevel (
14      stress_id VARCHAR2(255) PRIMARY KEY,
15      angry VARCHAR2(255),
16      sadness VARCHAR2(255),
17      disgusting VARCHAR2(255),
18      fear VARCHAR2(255),
19      happiness VARCHAR2(255),
20      stress_point VARCHAR2(255),
21      max_emotion VARCHAR2(255),
22      diary_id VARCHAR2(255)
23  );
```

Physical Modeling

Clear Find Actions ⌄ Save Run ▶

```
23   );
24
25   CREATE TABLE Diary (
26       id VARCHAR2(255) PRIMARY KEY,
27       content CLOB,
28       user_profile CLOB,
29       created_at TIMESTAMP,
30       modified_at TIMESTAMP,
31       status VARCHAR2(255),
32       user_id VARCHAR2(255),
33       stress_level_id VARCHAR2(255),
34       FOREIGN KEY (user_id) REFERENCES Users(id),
35       FOREIGN KEY (stress_level_id) REFERENCES StressLevel(stress_id)
36   );
37
```

Physical Modeling

SQL Worksheet ◇ Clear ✎ Find | Actions ∨ | | 🖫 Save | | **Run** ▶ |

```sql
CREATE TABLE RecommendedActivity (
    id VARCHAR2(255) PRIMARY KEY,
    image CLOB,
    name VARCHAR2(255),
    content CLOB
);
```

Physical Modeling

Show All   Columns   Constraints   Related Constraints   Triggers   Indexes   Code

Syntax Help ⌄   Actions ⌄   **View All Objects**

Columns

📋 Copy Query

#	Column	Type	Length	Precision	Scale	Nullable	Semantics	Comment
1	ID	VARCHAR2	255			No	Byte	
2	USERNAME	VARCHAR2	255			Yes	Byte	
3	EMAIL	VARCHAR2	255			Yes	Byte	
4	PROFILE_IMAGE	CLOB	4000			Yes		
5	GENDER	VARCHAR2	255			Yes	Byte	
6	AGE	NUMBER	22		0	Yes		
7	CREATED_AT	TIMESTAMP(6)	11		6	Yes		
8	MODIFIED_AT	TIMESTAMP(6)	11		6	Yes		
9	STATUS	VARCHAR2	255			Yes	Byte	

Constraints

Constraint	Type	Condition	Related Constraint	Related Table	Constraint Columns	On Delete	Status	Last Change	Invalid?
SYS_C00160776095	Primary Key	-	-	-	ID	-	ENABLED	10 minutes ago	-

Related Constraints

Table	Constraint	Type	Column
DIARY	SYS_C00160776098	Foreign Key	ID

Triggers

No triggers defined.

Indexes

Index Name	Index Type	Uniqueness	Status	Columns
SYS_C00160776095	NORMAL	UNIQUE	VALID	ID
SYS_IL0227078509C00004$$	LOB	UNIQUE	VALID	

Show All   Columns   Constraints   Related Constraints   Triggers   Indexes   Code

Syntax Help ⌄   Actions ⌄   **View All Objects**

Columns

⧉ Copy Query

#	Column	Type	Length	Precision	Scale	Nullable	Semantics	Comment
1	ID	VARCHAR2	255			No	Byte	
2	CONTENT	CLOB	4000			Yes		
3	USER_PROFILE	CLOB	4000			Yes		
4	CREATED_AT	TIMESTAMP(6)	11		6	Yes		
5	MODIFIED_AT	TIMESTAMP(6)	11		6	Yes		
6	STATUS	VARCHAR2	255			Yes	Byte	
7	USER_ID	VARCHAR2	255			Yes	Byte	
8	STRESS_LEVEL_ID	VARCHAR2	255			Yes	Byte	

Constraints

Constraint	Type	Condition	Related Constraint	Related Table	Constraint Columns	On Delete	Status	Last Change	Invalid?
SYS_C00160776098	Foreign Key	-	SYS_C00160776095	USERS	USER_ID	NO ACTION	ENABLED	9 minutes ago	-
SYS_C00160776099	Foreign Key	-	SYS_C00160776096	STRESSLEVEL	STRESS_LEVEL_ID	NO ACTION	ENABLED	9 minutes ago	-
SYS_C00160776097	Primary Key	-	-	-	ID	-	ENABLED	9 minutes ago	-

Related Constraints

No related constraints defined.

Triggers

No triggers defined.

Indexes

Index Name	Index Type	Uniqueness	Status	Columns
SYS_C00160776097	NORMAL	UNIQUE	VALID	ID
SYS_IL0227078515C00002$$	LOB	UNIQUE	VALID	
SYS_IL0227078515C00003$$	LOB	UNIQUE	VALID	

RECOMMENDEDACTIVITY

Syntax Help ▾ | Actions ▾ | **View All Objects**

Show All Columns Constraints Related Constraints Triggers Indexes Code

Columns

⧉ Copy Query

#	Column	Type	Length	Precision	Scale	Nullable	Semantics	Comment
1	ID	VARCHAR2	255			No	Byte	
2	IMAGE	CLOB	4000			Yes		
3	NAME	VARCHAR2	255			Yes	Byte	
4	CONTENT	CLOB	4000			Yes		

Constraints

Constraint	Type	Condition	Related Constraint	Related Table	Constraint Columns	On Delete	Status	Last Change	Invalid?
SYS_C00160776178	Primary Key	-	-	-	ID	-	ENABLED	4 minutes ago	-

Related Constraints

No related constraints defined.

Triggers

No triggers defined.

Indexes

Index Name	Index Type	Uniqueness	Status	Columns
SYS_C00160776178	NORMAL	UNIQUE	VALID	ID
SYS_IL0227078628C00002$$	LOB	UNIQUE	VALID	
SYS_IL0227078628C00004$$	LOB	UNIQUE	VALID	

Columns

[Copy Query]

#	Column	Type	Length	Precision	Scale	Nullable	Semantics	Comment
1	STRESS_ID	VARCHAR2	255			No	Byte	
2	ANGRY	VARCHAR2	255			Yes	Byte	
3	SADNESS	VARCHAR2	255			Yes	Byte	
4	DISGUSTING	VARCHAR2	255			Yes	Byte	
5	FEAR	VARCHAR2	255			Yes	Byte	
6	HAPPINESS	VARCHAR2	255			Yes	Byte	
7	STRESS_POINT	VARCHAR2	255			Yes	Byte	
8	MAX_EMOTION	VARCHAR2	255			Yes	Byte	
9	DIARY_ID	VARCHAR2	255			Yes	Byte	

Constraints

Constraint	Type	Condition	Related Constraint	Related Table	Constraint Columns	On Delete	Status	Last Change	Invalid?
SYS_C00160776096	Primary Key	-	-	-	STRESS_ID	-	ENABLED	9 minutes ago	-

Related Constraints

Table	Constraint	Type	Column
DIARY	SYS_C00160776099	Foreign Key	STRESS_ID

Triggers

No triggers defined.

Indexes

Index Name	Index Type	Uniqueness	Status	Columns
SYS_C00160776096	NORMAL	UNIQUE	VALID	STRESS_ID