TECHNOLOGICAL INSTITUTE OF THE PHILIPPINES

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In partial fulfillment of the requirements for
Information Management – ITE014

Project Compilation
"Seismic: Development of a Database System for the Subscription-Based Music Marketplace Company — Seismic"

Group Project

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Project Title

Seismic: Development of a Database System for the Subscription-Based Music Marketplace Company — Seismic

Company Background

Seismic is a start-up company that offers Subscription-Based Music Streaming Services on their platform. Since their release in February 2016, the streaming service has seen a significant increase in their user traffic. The company is founded in Aurora, Quezon City by the company's CEO, Kaithlyn Nogales along with her subordinates.

Project Statement

Since Seismic is a start-up company, there are a lot of operations that need to be improved in order to catch up with the industry standards and compete with the music streaming market. One of the issues that the company is facing is that there is little to no assurance in the quality of the databases. It will be difficult for the company to scale if the foundation of their operations is flawed.

Project Description

To design a robust database system for Seismic that can support the company's operation in the long period of time through the use of relevant database tools.

Project Objectives

The objective of the system is to allow storage of user's information via user registration (for client, admin, and employees). Additionally, the system also caters to the different music offered in the platform which also includes its metadata that can be useful for different needs like data analysis.

The specific objective of this particular system are:

- Allow the insertion of customer data from the platform's user registration that includes the following:
    - CUS_ID
    - CUS_LAST
    - CUS_FIRST
    - CUS_RDATE
    - CUS_GENDER
    - CUS_DOB
    - CUS_AGE
    - (UK) CUS_EMAIL

- Allow the insertion of the payment data through manual addition in the admin side. The payment table stores the following attributes:
    - TRA_ID
    - TRA_MODE
    - TRA_DATE
    - (FK) PRO_ID
    - (FK) CUS_ID
    - (FK) GTW_ID

- (FK) BNK_ID

- Allow the insertion of song metadata through manual addition in the admin side. Song data includes:
  - SNG_ID
  - SNG_NAME
  - SNG_ADDED
  - ALB_ID

- Allow the insertion of album data through manual addition in the admin side. Album data includes:
  - ALB_ID
  - ALB_NAME
  - ALB_GENRE
  - (FK) ART_ID

- Allow the insertion of artists data through manual addition in the admin side. Artist data includes:
  - ART_ID
  - ART_NAME

- Allow the insertion of activity log data through manual addition in the admin side. Activity log data includes:
  - ACL_DATE
  - (FK) CUS_ID
  - (FK) SNG_ID

- (FK) PLT ID

- Allow the insertion of platform data. Platform data includes:
  - PLT_ID
  - PLT_NAME

- Allow the insertion of the products offered, through manual addition in the admin side. Platform data includes:
  - PRO_ID
  - PRO_TYPE
  - PRO_PRICE
  - (FK) PLT_ID

- Allow the insertion of the subscription of the consumers. Subscription data includes:
  - SUB_START
  - SUB_END
  - (FK) PRO_ID
  - (FK) TRA_ID

- Allow the insertion of gateway (Gcash). Gateway clients data includes:
  - GTW_ID
  - GTW_NAME

- Allow the insertion of the gateway clients. Gateway data includes:
  - GCL_ID
  - GCL_LAST

- GCL_FIRST
- GCL_BALANCE
- (FK) GTW_ID

- Allow the insertion of the following banks offered by the company. The bank data includes:
  - BNK_ID
  - BNK_NAME

- Allow the insertion of bank clients through the admin's side. Bank client data includes:
  - BCL_CLIENTID
  - BCL_LAST
  - BCL_FIRST
  - BCL_BALANCE
  - (FK) BNK_ID

Significance of the Study

This project will be of significance to the:

- **Company/Stakeholders**

  The creation of the company's database system will allow their collected data over the past years to be utilized effectively. Converting the company's data in a queueable format can solve existing business problems which in turn, makes it easier to adjust its operations based on the trends of consumer behavior. Better operations for the company also makes it easier to yield profit.

- **Client (Music Subscribers)**

  The collection of client's data will allow for better optimization of recommendations shown to each user based on their current activities.

- **Data Analysts**

  As the professionals that solve the business problems, a robust database system is a must to give reliable solutions.

- **Future Researchers**

  This project allows the company's future researchers to further optimize the company's database system by studying the current system. If the company were to grow significantly in the future, the company can adjust accordingly.

Business Policies

To ensure that the services provided for the client are quality assured and the relevant information regarding the operations are protected accordingly, the following business policies are being applied:

A. Subscription Terms

a. Platforms

   i. *Platforms in the system.* As of May 2023, Seismic caters to 5 platforms: (1) Spotify, (2) Apple, (3) Soundcloud, (4) Deezer, and (5) Tidal.

   ii. *Outside company collaboration.* For the companies that want to put their promotions, contact Cailo Ongsiako, Seismic's Head of Operations, at 999-9999.

b. Products

i. *Products/promotions within the system.* As of May 2023, each platform only offers 3 promotions — Regular, Pro and Premium. The identification code for each products are:

(1 = Regular; 2 = Pro; 3 = Premium)

- Spotify — S1, S2, S3
- Apple — A1, A2, A3
- Soundcloud — SC1, SC2, SC3
- Deezer — D1, D2, D3
- Tidal — T1, T2, T3

ii. The price for each products/promotions are the following:

- Regular - 100 PHP
- Pro - 200 PHP
- Premium - 350 PHP

The product's features will be defined by the respective platforms within the system.

B. Privacy Policies

The seismic's privacy policies ensure that the collected data of the clients will be disclosed. The company is collecting the client data to optimize the services within the system. By using the Seismic website, a user is giving permission to collect and use their data for business use.

C. Device Compatibility

Seismic is a web application that runs in the web browser. If the client has a web browser on their devices (either mobile device or desktop computer), the application can run.

D. Refund Policy

The company implements the "No Return" policy for the company's digital products.

System Analysis and Design

ERD

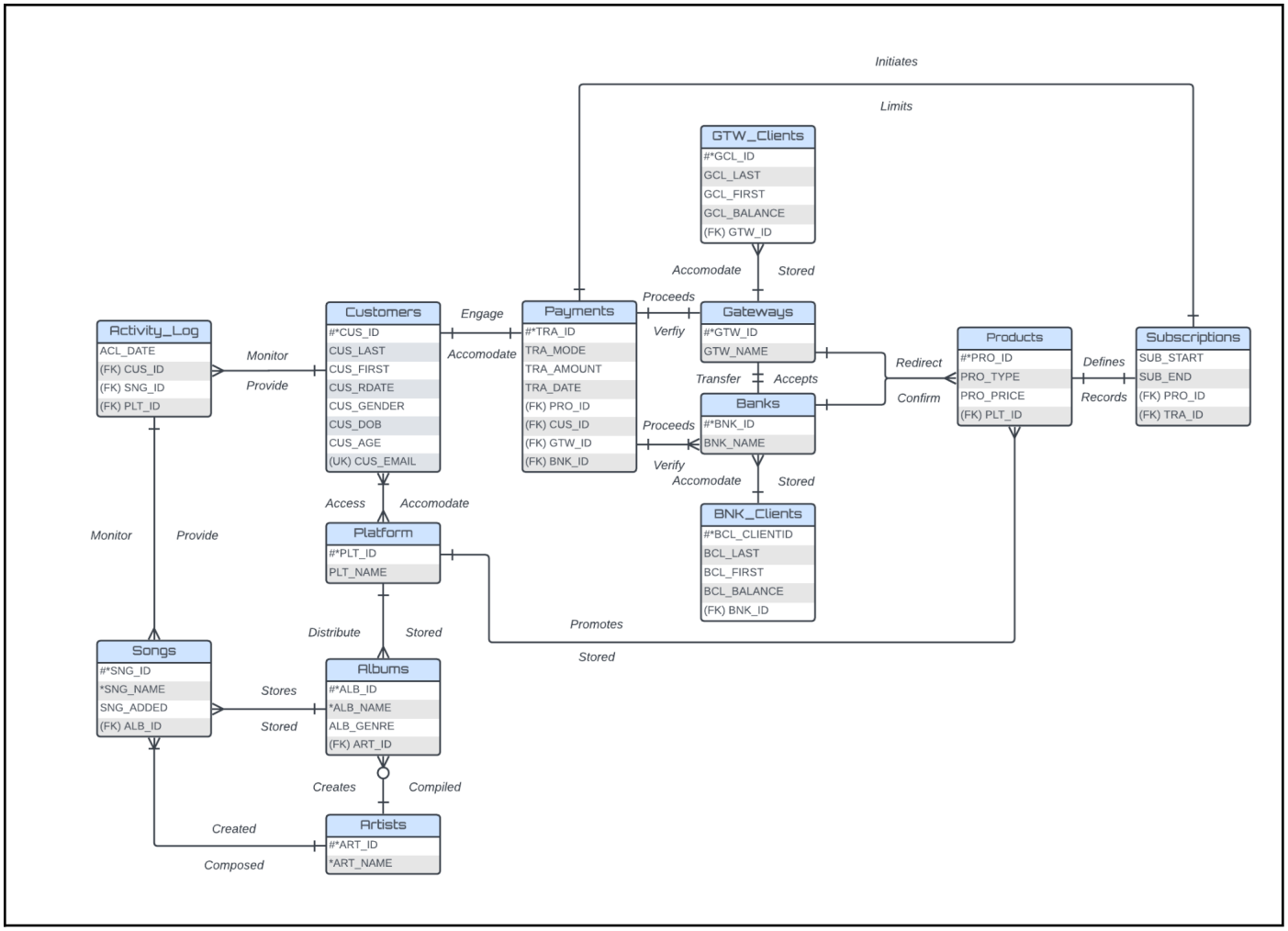

Figure 1. Entity-Relationship Diagram. The figure shows the different relationships within the database system.

Context Diagram/DFD

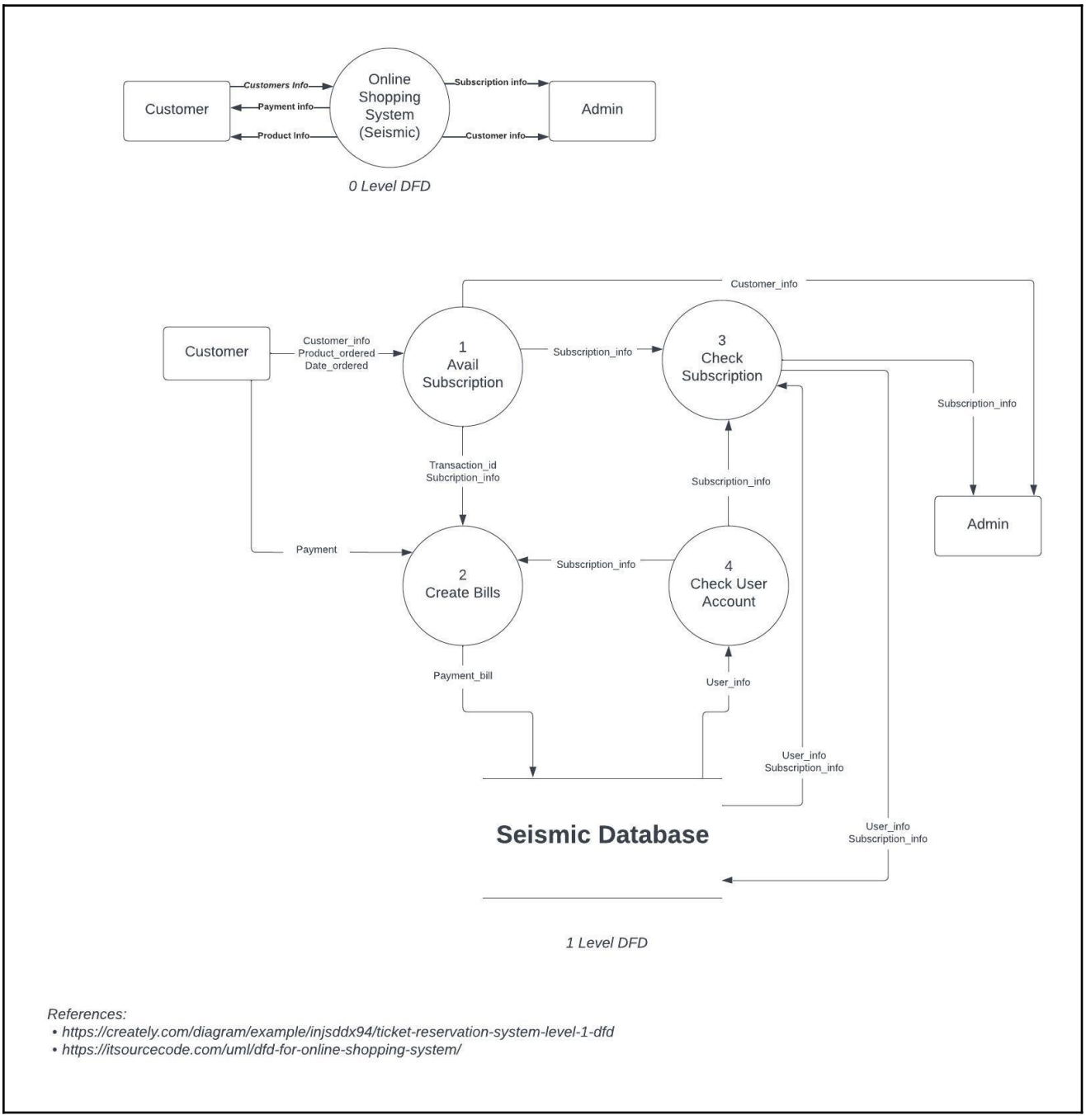

Figure 2. Data Flow Diagram (DFD) Level 0 and Level 1

Database Schema/Design/Dictionary

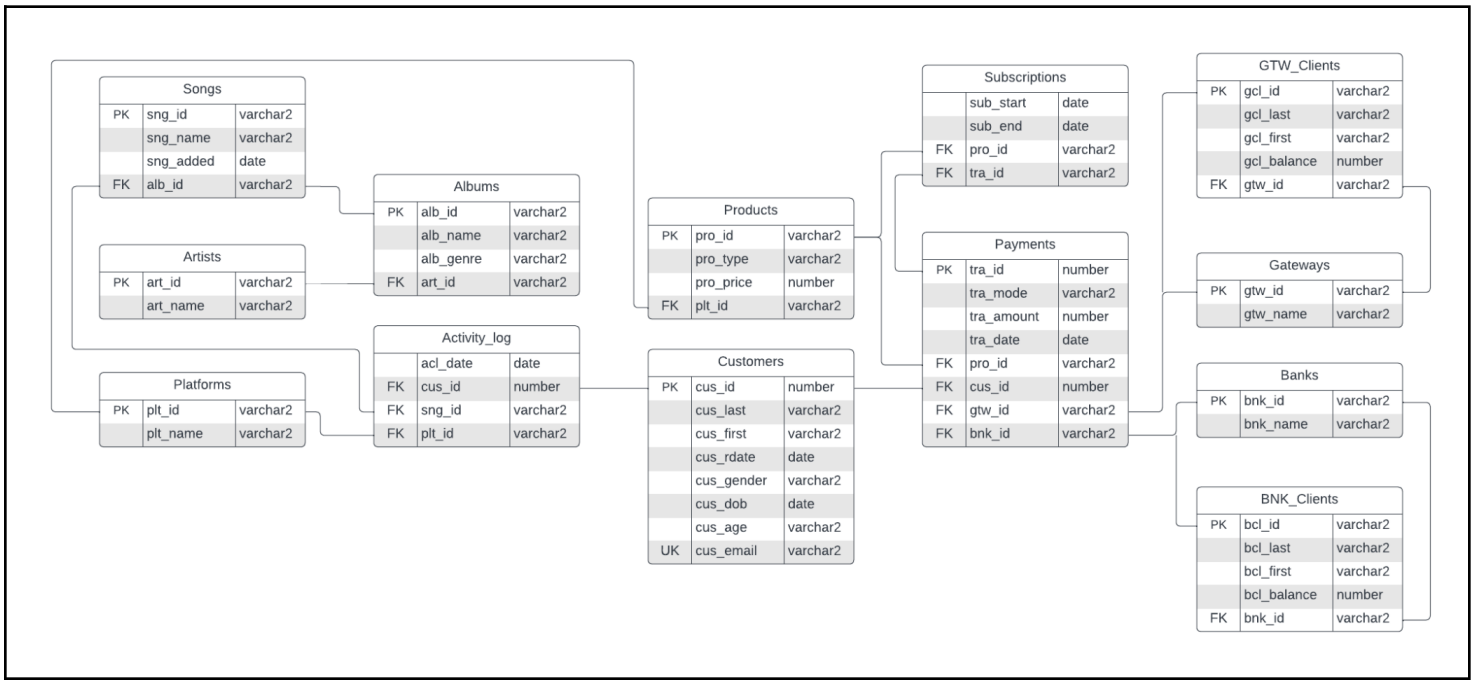

Figure 3. Database Design The figure shows the 13 tables that are relationships of tables within the Seismic database system. The connection of different tables through Primary and Foreign keys were connected.

TABLE NAME: Customers		
Column Name	*Values*	*Datatype*
Cus_id (PK)	Primary Key of the customers table	number(6, 0)
cus_last	Last name of customer	varchar2(15)
cus_first	First name of customer	varchar2(15)
cus_rdate	Registration Date. Lowest Value: February 25, 2016 Highest Value: April 10, 2023	date
cus_gender	Gender of the customer.	varchar2(1)
cus_dob	Customer birthdate	date
cus_age	Customer age	number(3, 0)
cus_email	Registered emails of the customers	varchar2(50)

TABLE NAME: Platforms		
Column Name	*Values*	*Datatype*
plat_id (PK)	Primary Key of the platforms table.	varchar2(5)
plat_Name	Name of platforms within the system.	varchar2(15)

TABLE NAME: Gateways		
Column Name	*Values*	*Datatype*
gtw_id (PK)	Primary Key of the gateways table.	varchar2(5)
gtw_name	Name of gateways within the system.	varchar2(15)

TABLE NAME: Banks		
Column Name	*Values*	*Datatype*
bnk_id (PK)	Primary Key of the gateways table.	varchar2(6)
bnk_name	Name of gateways within the system.	varchar2(15)

TABLE NAME: Artists		
Column Name	*Values*	*Datatype*
art_id (PK)	Primary Key of the artists table.	varchar2(6)
art_name	Name of artists within the system.	varchar2(15)

TABLE NAME: Products		
Column Name	*Values*	*Datatype*
pro_id (PK)	Primary Key of the products table.	varchar2(6)
pro_name	Name of products offered by the platforms within the system.	varchar2(10)
pro_price	Price of products.	number(3, 0)
plt_id (FK)	Foreign Key. Refer to the platform table that shows what platform the product resides.	varchar2(6)

TABLE NAME: GTW_Clients		
Column Name	*Values*	*Datatype*
gcl_id (PK)	Primary Key of the gtw_clients table.	varchar2(6)
gcl_last	Gateways Client's last name.	varchar2(15)
gcl_first	Gateways Client's first name.	varchar2(15)
bcl_balance	The amount of money the gateways clients have in their account.	number(6)
gtw_id (FK)	Foreign Key. Refers to the gateway where the client has an account.	varchar(6)

TABLE NAME: BNK_Clients		
Column Name	*Values*	*Datatype*
bcl_id (PK)	Primary Key of the bnk_clients table.	varchar2(6)
bcl_last	Bank Client's last name.	varchar2(15)
bcl_first	Bank Client's first name.	varchar2(15)
bcl_balance	The amount of money the bank's clients have in their account.	number(6)
bnk_id (FK)	Foreign Key. Refers to the bank where the client has an account.	varchar(6)

TABLE NAME: Albums		
Column Name	*Values*	*Datatype*
alb_id (PK)	Primary Key of the alb_id table.	varchar2(6)
alb_name	Name of the album within the platform.	varchar2(50)
alb_genre	The genre of the album.	varchar2(15)

art_id	Foreign Key. Identifies the artist that composed the album.	number(6)

TABLE NAME: Songs		
Column Name	*Values*	*Datatype*
sng_id (PK)	Primary Key of the sng_id table.	varchar2(6)
sng_name	Name of the song within the album.	varchar2(50)
sbg_added	The date the song was added to the platform.	date
alb_id	Identifies the album name where the song is stored.	varchar2(6)

TABLE NAME: Payments		
Column Name	*Values*	*Datatype*
tra_id(PK)	Primary Key of the payments table	varchar2(6)
tra_mode	Shows the platform where the transaction occurred.	varchar2(1)
tra_amount	The amount paid by the customer during the transaction.	number(3, 0)
tra_date	The date where the transaction occurred	date
pro_id	Foreign Key. The type of product that was bought in a transaction.	varchar2(6)
cus_id	Foreign Key. ID of the customer that bought the product.	number(6, 0)
gtw_id	Foreign Key, Nullable. Name of gateway where the transaction occurred.	varchar2(6)
bnk_id	Foreign Key, Nullable. Name of	varchar2(6)

	bank where the transaction occurred.	

TABLE NAME: Activity_log		
Column Name	*Values*	*Datatype*
acl_date	Primary Key of activity_log table	date
cus_id	Foreign Key. ID of the customer that engaged in an activity — listening to songs.	number(6, 0)
sng_id	Foreign Key. ID of the song that the user is listening to.	varchar2(6)
plt_id	Foreign Key. ID of the platform where the user is doing an activity.	varchar2(6)

TABLE NAME: Subscriptions		
Column Name	*Values*	*Datatype*
sub_start	The start of the activation of the user's product code. The validity will run for 30 days until the due date..	date
sub_end	The end or due of a product code's validity.	date
pro_id	Foreign Key. ID of the platform that the customer subscribed to.	varchar2(6)
tra_id	Foreign Key. ID of the transaction to track the payments of the customer.	varchar2(6)

Description of table structure using the following SQL query:

desc customers;

desc platforms;

desc gateways;

desc banks;

desc artists;

desc products

desc gtw_clients;

desc bnk_clients;

desc albums;

desc songs;

desc payments;

TABLE CUSTOMERS

Column	Null?	Type
CUS_ID	NOT NULL	NUMBER(6,0)
CUS_LAST	NOT NULL	VARCHAR2(15)
CUS_FIRST	NOT NULL	VARCHAR2(15)
CUS_RDATE	NOT NULL	DATE
CUS_GENDER	NOT NULL	VARCHAR2(1)
CUS_DOB	NOT NULL	DATE
CUS_AGE	NOT NULL	NUMBER(3,0)
CUS_EMAIL	NOT NULL	VARCHAR2(50)

figure 4. Table of Customers containing different details (Column, Null, and Type).

TABLE PLATFORMS

Column	Null?	Type
PLT_ID	NOT NULL	VARCHAR2(5)
PLT_NAME	NOT NULL	VARCHAR2(15)

figure 5. Table of platforms

TABLE GATEWAYS

Column	Null?	Type
GTW_ID	NOT NULL	VARCHAR2(6)
GTW_NAME	NOT NULL	VARCHAR2(15)

figure 6. Table of Gateways

TABLE BANKS

Column	Null?	Type
BNK_ID	NOT NULL	VARCHAR2(6)
BNK_NAME	NOT NULL	VARCHAR2(15)

figure 7. Table of Banks

TABLE ARTISTS

Column	Null?	Type
ART_ID	NOT NULL	VARCHAR2(6)
ART_NAME	NOT NULL	VARCHAR2(15)

figure 8. Table of Artists

TABLE PRODUCTS

Column	Null?	Type
PRO_ID	NOT NULL	VARCHAR2(6)
PRO_TYPE	NOT NULL	VARCHAR2(10)
PRO_PRICE	NOT NULL	NUMBER(3,0)
PLT_ID	-	VARCHAR2(6)

figure 9. Table of Products

TABLE GTW_CLIENTS

Column	Null?	Type
GCL_ID	NOT NULL	VARCHAR2(6)
GCL_LAST	NOT NULL	VARCHAR2(15)
GCL_FIRST	NOT NULL	VARCHAR2(15)
GCL_BALANCE	NOT NULL	NUMBER(6,0)
GTW_ID	-	VARCHAR2(6)

figure 10. Table of platforms

TABLE SONGS

Column	Null?	Type
SNG_ID	NOT NULL	VARCHAR2(6)
SNG_NAME	NOT NULL	VARCHAR2(50)
SNG_ADDED	NOT NULL	DATE
ALB_ID	-	VARCHAR2(6)

figure 11. Table of Songs

TABLE BNK_CLIENTS

Column	Null?	Type
BCL_ID	NOT NULL	VARCHAR2(6)
BCL_LAST	NOT NULL	VARCHAR2(15)
BCL_FIRST	NOT NULL	VARCHAR2(15)
BCL_BALANCE	NOT NULL	NUMBER(6,0)
BNK_ID	-	VARCHAR2(6)

figure 12. Table of Bank Clients (BNK_CLIENTS)

TABLE ALBUMS

Column	Null?	Type
ALB_ID	NOT NULL	VARCHAR2(6)
ALB_NAME	NOT NULL	VARCHAR2(50)
ALB_GENRE	NOT NULL	VARCHAR2(15)
ART_ID	-	VARCHAR2(6)

figure 13. Table of Albums

TABLE PAYMENTS

Column	Null?	Type
TRA_ID	NOT NULL	VARCHAR2(6)
TRA_MODE	NOT NULL	VARCHAR2(1)
TRA_AMOUNT	NOT NULL	NUMBER(3,0)
TRA_DATE	NOT NULL	DATE
PRO_ID	-	VARCHAR2(6)
CUS_ID	-	NUMBER(6,0)
GTW_ID	-	VARCHAR2(6)
BNK_ID	-	VARCHAR2(6)

figure 14. Table of Payments

TABLE ACTIVITY_LOG

Column	Null?	Type
ACL_DATE	NOT NULL	DATE
CUS_ID	-	NUMBER(6,0)
SNG_ID	-	VARCHAR2(6)
PLT_ID	-	VARCHAR2(6)

figure 15. Table of Activity Logs (ACTIVITY_LOG)

TABLE SUBSCRIPTIONS

Column	Null?	Type
SUB_START	NOT NULL	DATE
SUB_END	NOT NULL	DATE
PRO_ID	-	VARCHAR2(6)
TRA_ID	-	VARCHAR2(6)

figure 16. Table for the Subscriptions

References

J. Muenjit, etal. (2019, October 8). Challenges in Using Big Data for Analyzing Consumer Behavior. *Retrieved from* https://so05.tci-thaijo.org/index.php/MFUconnexion/article/download/241039/164110/

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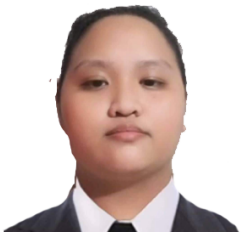
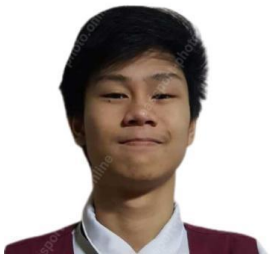
Members Contributions

Members	ID Picture	Assigned Task/s
1. **Leader**: Emerenciana, Ahdrianne Wesley C.		Assigned tasks to each member Project Proposal ERD Context Diagram/DFD GUI Tables Problems and Solutions Compilation of Errors Arrangement/Compilation of Documents
2. Casile, Jasper Riley P.		Project Proposal ERD Database Design Created Schema Tables Problems and Solutions Compilation of Errors Arrangement/Compilation of Documents
3. Nogales, Kaithlyn L.		Project Proposal ERD Table/s Tables Problems and Solutions Compilation of Errors Arrangement/Compilation of Documents
4. Ongsiako, Cailo Nehru P.		Project Proposal Final Documentation ERD Tables Problems and Solutions Compilation of Errors Arrangement/Compilation of Documents

5. Paragas, Veronica Maxine D.		Project Proposal Final Documentation ERD Tables Problems and Solutions Compilation of Errors Arrangement/Compilation of Documents