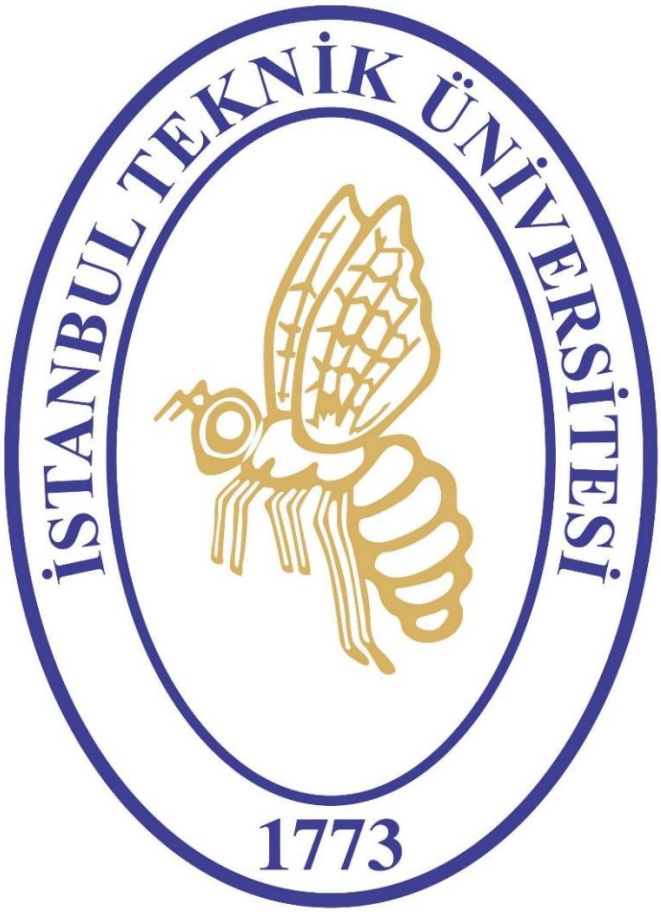

DATA MANAGEMENT IN INDUSTRIAL SYSTEMS

END 213E

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EXPLANATION OF THE SYSTEM

1.1.Brief Information about the System

Facebook is a platform that allows people to communicate and shop with each other in various ways. There is a huge increase in the number of Facebook users. This increase shows that facebook is a platform that people prefer.

When registering to the system, an active email or a phone number must be entered. After logging in to the application, you can message with your friends, video call your friends and family. Also, you can buy or sell products,cars, houses in the marketplace.In addition to them, you can play various games, broadcast live events for all users or specific users, watch other users' broadcasts and videos, interact by liking and commenting on posts shared by others. You should do these in accordance with the rules. Because publicly shared activities are controlled by admins and if the rules are not followed, your posts may be removed by the admins, your access to publications and even your access to facebook may be suspended.

1.2. Processes of the System

1-) If the person chooses to be user:

A- The user is initially taken to the login page. If not, a new account is made for him or her and subsequently saved in the user database. The user inputs the password and continues if the account is already established.

B- A user interface is displayed. There are five paths you can take.

- A user may stay at the main page. She/he can view, like and/or comment on posts from her/his friends or the pages she/her follows.

- A user may enter her/his profile. She/he can edit personal information such as the city she/he lives in. Also, a user may add new friends, share new contents and view her/his gallery. Otherwise the user can log out and exit.

- A user may enter to Messenger page. After that she/he may contact with her/his friends via video call. Also, she/he can chat with friends.

- A user may enter into the Marketplace page. Via this page the user may view ads in order to buy his/her needs or user can sell items and place an ad. If a user wants to sell an item she/he decides the type of the item. Users can sell a product, car or a house. If a user decides to buy an item she/he can easily contact via message in order to negotiate with the user that sells that certain product. If a user decides to check that ad later, she/he can save this ad. The ad information, saved ads information, messages between the seller and buyer are stored in corresponding databases.

- A user may get into the Games section. A user may decide to either watch or play games. She/he can play and can stream their play with other users and record them. If a user decides to watch a stream they can choose between different options. These options are live streams or recorded ones. The related information about recorded streams/videos are stored in the video information database. Also, the related information about saved games are stored in the saved games database.

2-) If administration chooses to enter:

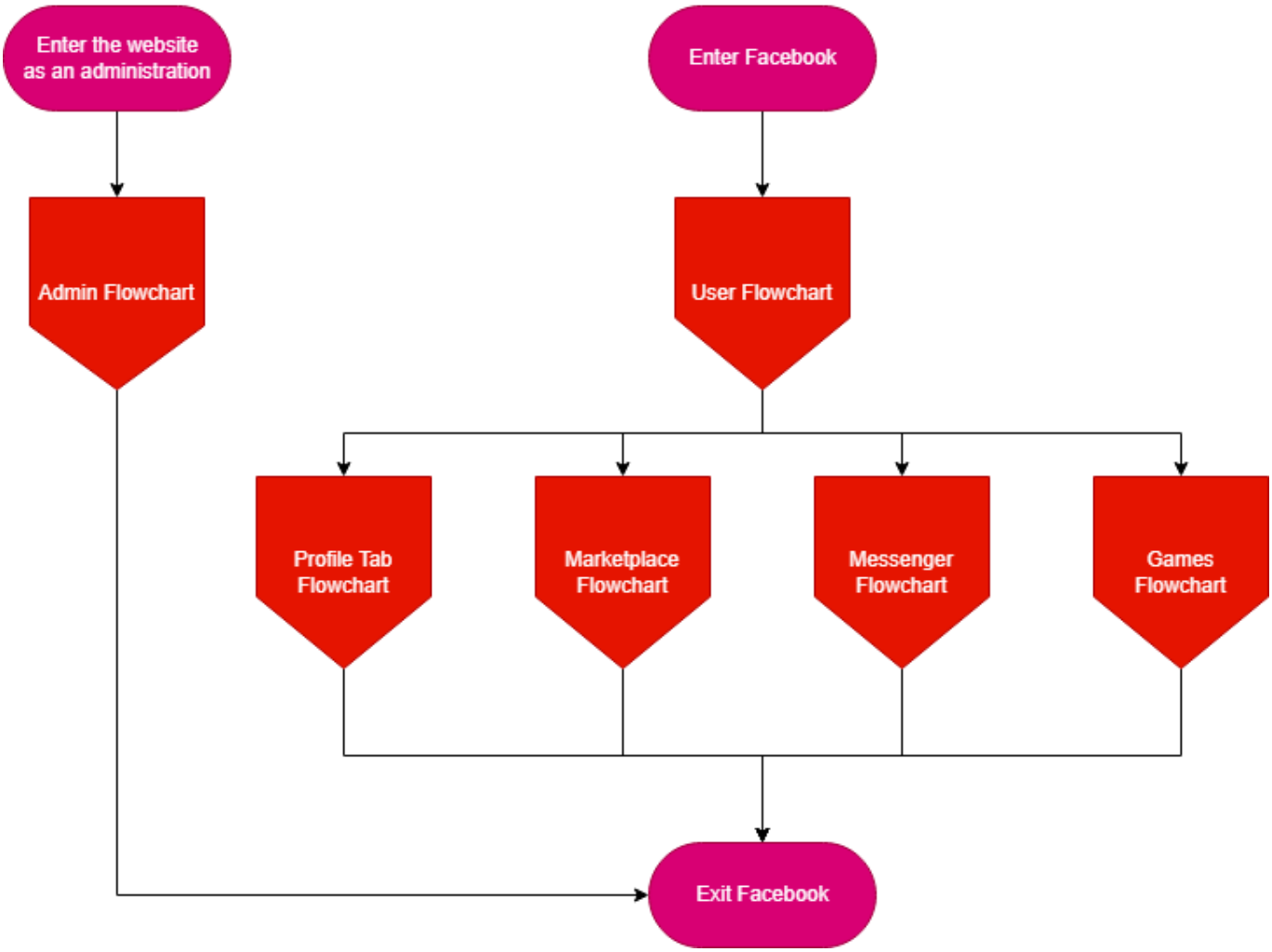
A- The administrator fills out the login page's username and password.The home page of the admin panel is shown.

- An admin may choose to check the validity and appropriateness of the ads which are found in the marketplace. In order to manage that, he/she needs to get in the Ad verification panel. Then, he/she removes the invalid or inappropriate ads from the marketplace and he/she marks the other ads as valid and appropriate. Corresponding changes are done at the ad information database.

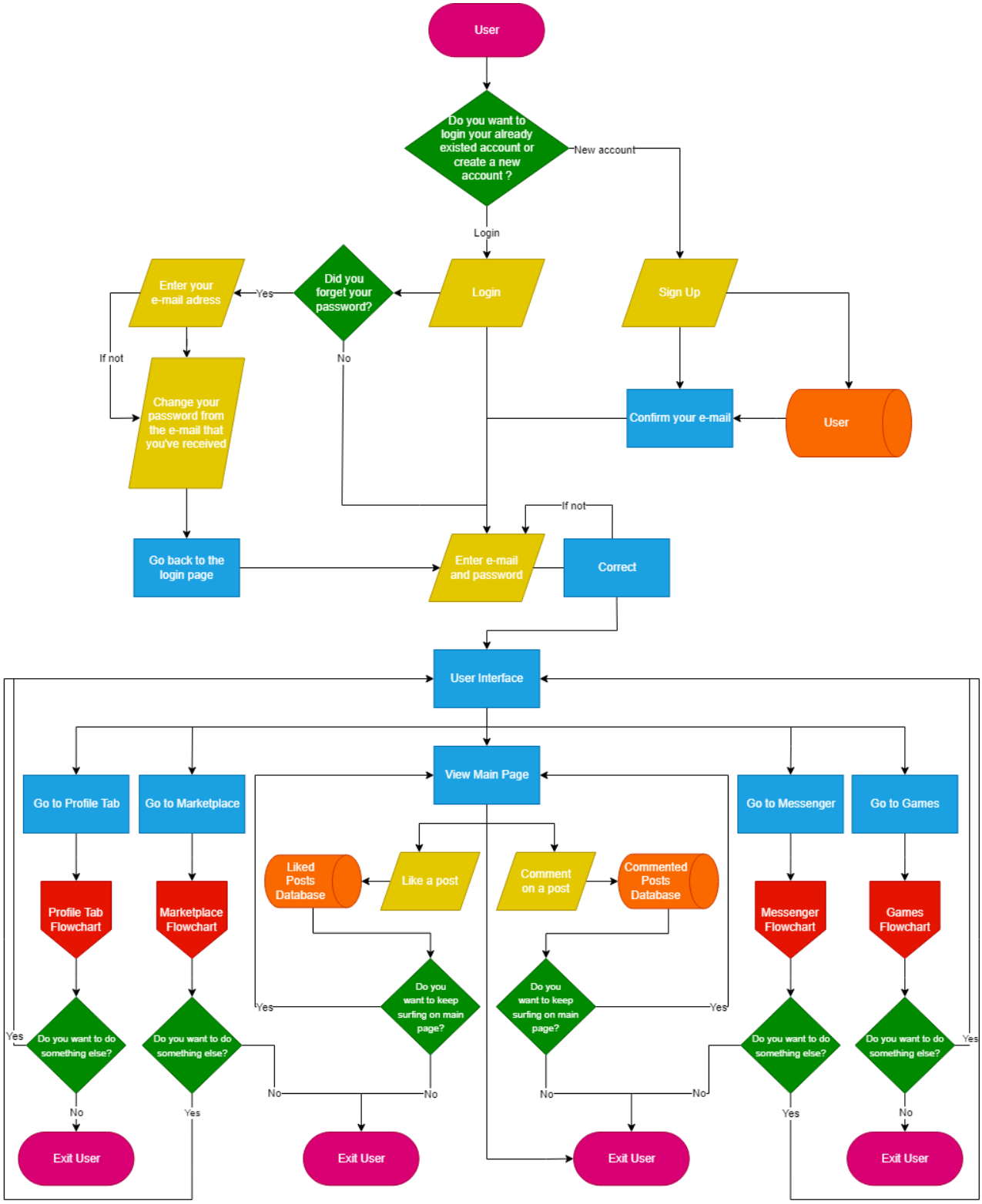
- An admin may choose to check the validity and appropriateness of the profile and posts of a user. In order to manage that, he/she needs to get in the User verification panel. Then, he/she removes the invalid or inappropriate users. Corresponding changes are done at the user information database.

- An admin may choose to check the validity and appropriateness of videos and streams of a user. In order to manage that, he/she needs to get in the User verification panel.Then, he/she removes the invalid or inappropriate videos and streams from the games platform and he/she marks the other videos and streams as valid and appropriate. Corresponding changes are done at the stream/video information database.

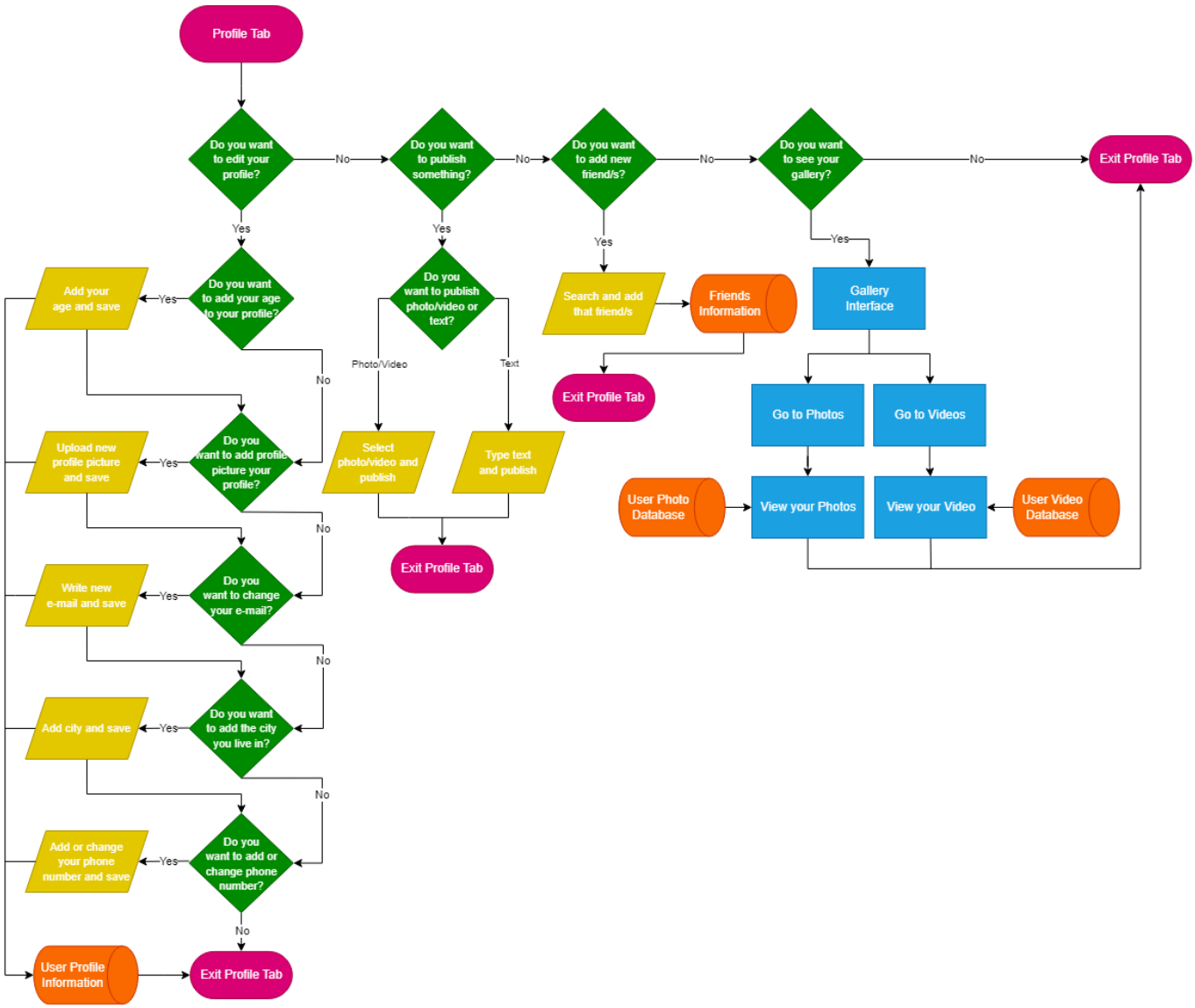
1.2.1. Flowchart of the overall system



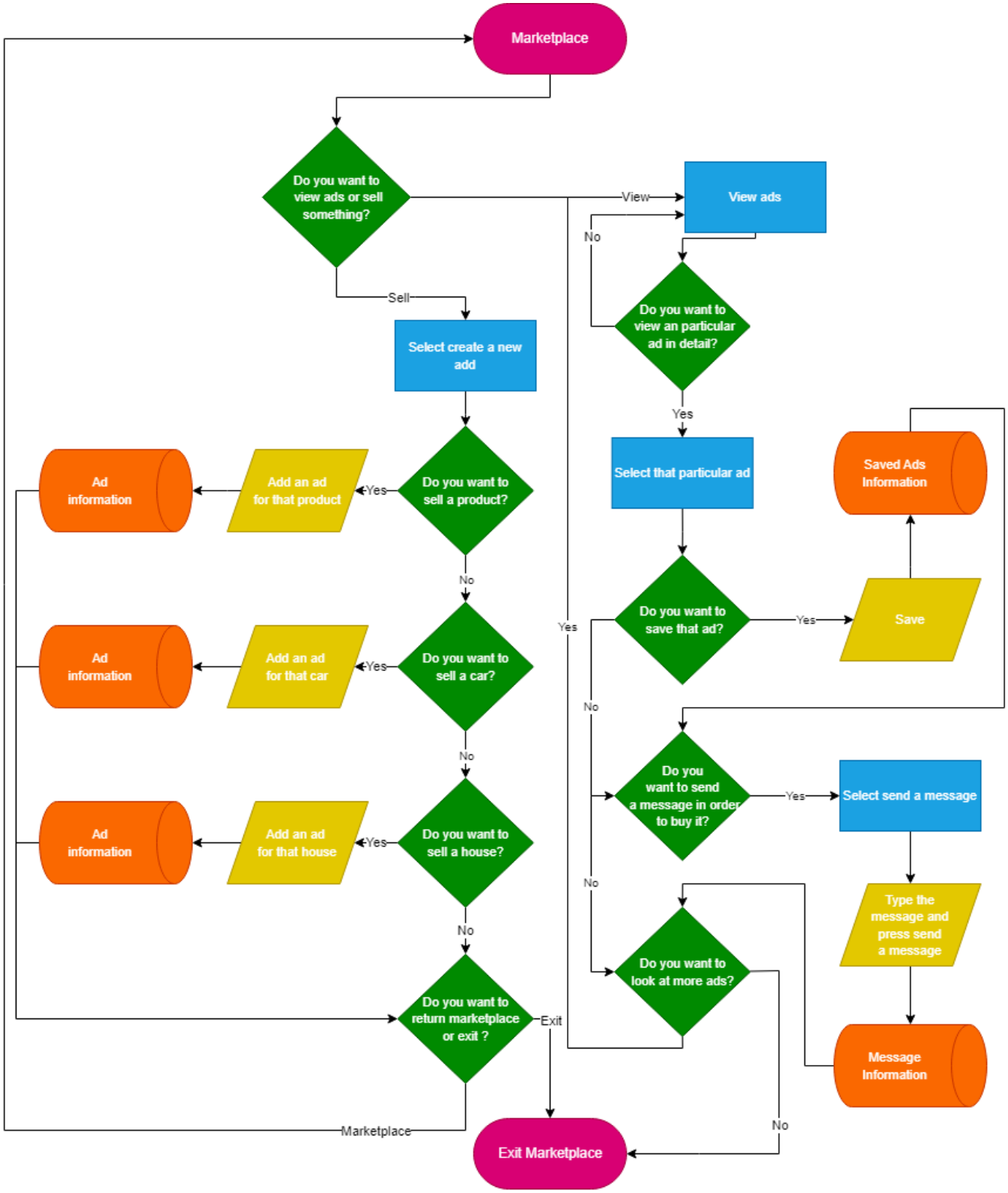
1.2.2. Flowchart for the users



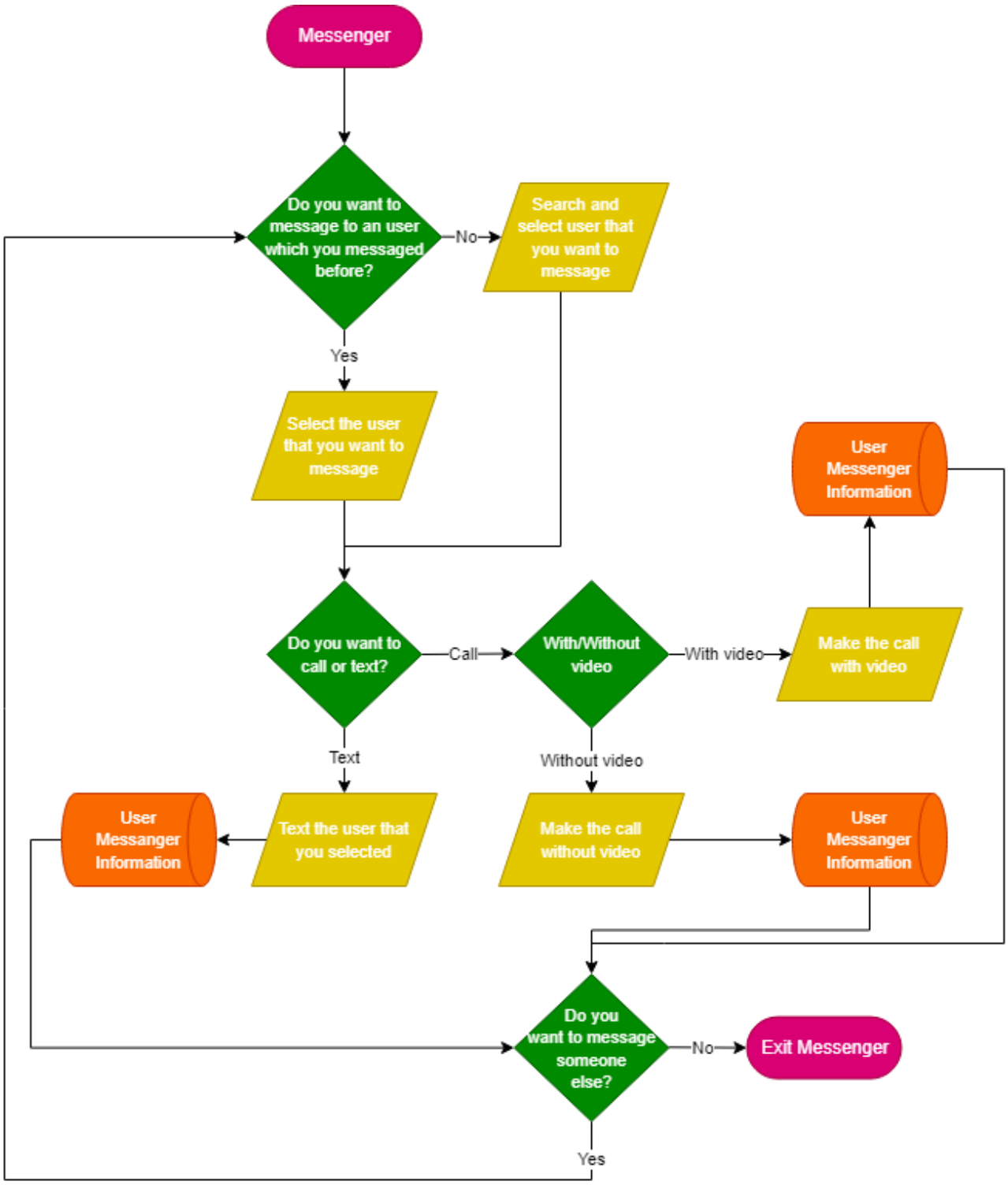
1.2.3. Flowchart for the profile tab



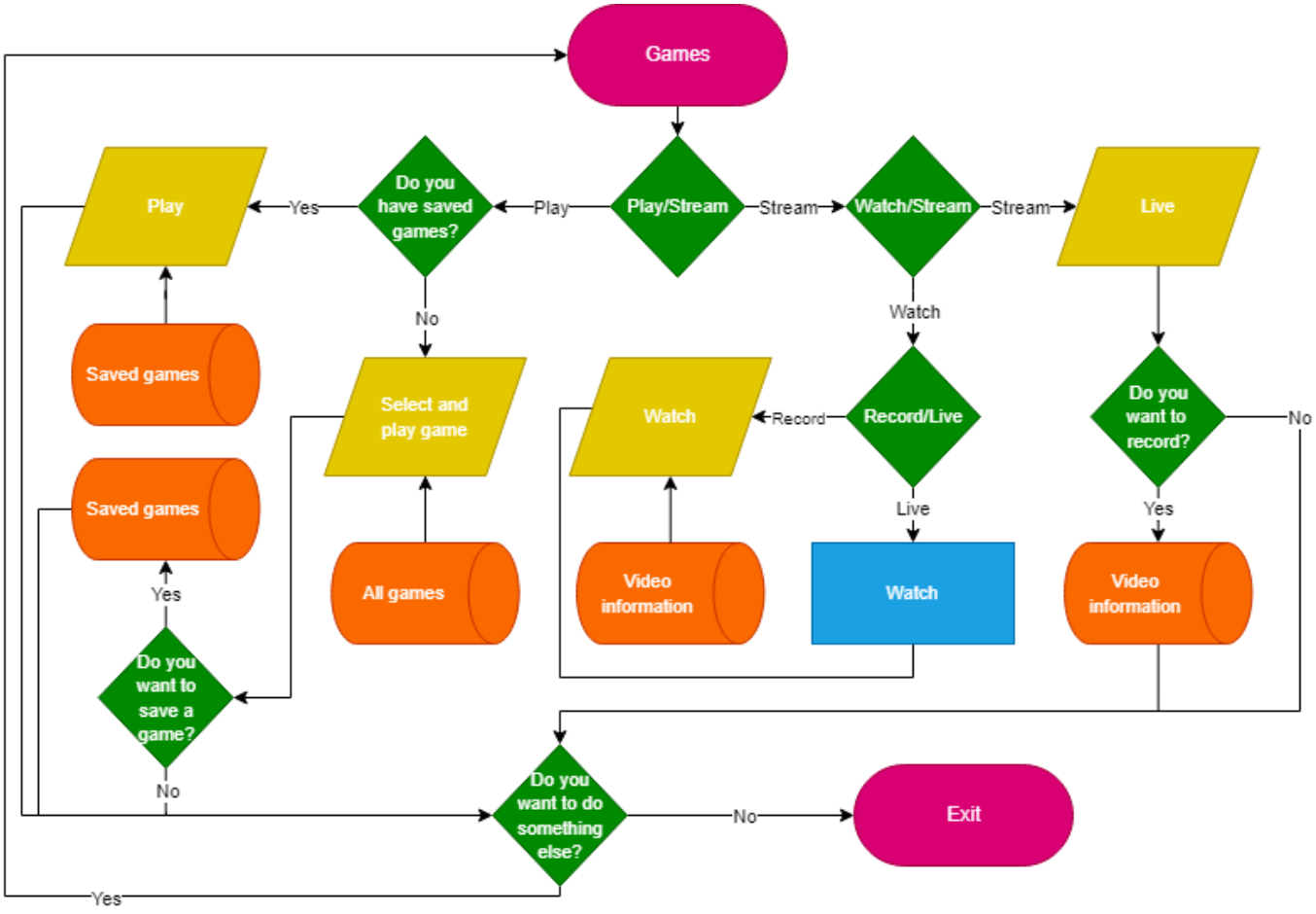
1.2.4. Flowchart for the marketplace



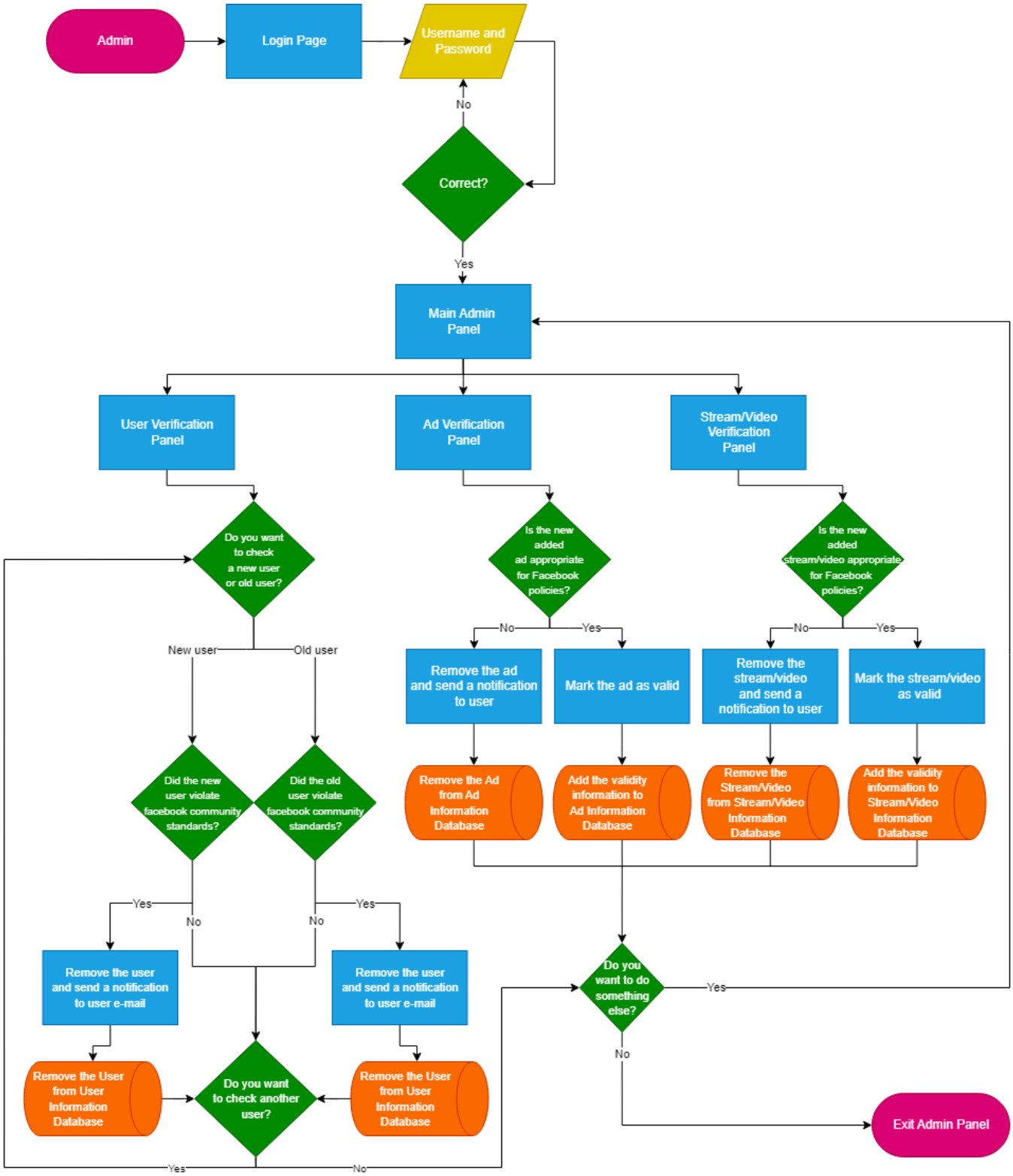
1.2.5. Flowchart for the Messenger



1.2.6. Flowchart for the games



1.2.7. Flowchart for the admins



1.3. Aims of the System

Social media sites have already become one of our parts of daily life. Everybody uses Twitter, TikTok, and Instagram. But before all these social media apps Facebook introduced us with this new thema. We spend time with our old friends and also we make new friends via these apps.

Facebook has brought this concept into our lives for nearly two decades. As time went by Facebook didn't stay static. It developed itself. Attributes within Facebook become significantly high.

It started as a friendship site then it became a relatively large number of people' virtual lives. Users began to not need any other platforms on the internet. They play games with each other, sell and buy items, rate and comment on the contents of loved ones.

Interacting via social media took the attention of entire humanity. We are all addicted to Facebook. It was an epochal business. We tend to like this app because it brought us together. It makes borders and distances disappear.

After a user enters the site, the main page welcomes her/him. Surfing on the main page allows you to view and react to other users' contents. If you decide to use other specialities of Facebook, it offers you varied specialities such as marketplace.

By simply pressing the marketplace button you can view the market. Features and prices are added by other users. Facebook grants its users a pretty free market without certain regulations. Users can compare different prices and decide on which product they will buy.

Another speciality that Facebook offers is 'Games'. Users can socialize and have some fun via video games which are presented by Facebook. They can send gifts or invite each other to different games. It makes them feel bonded with other users.

Because of Facebook's varied user profiles, firms don't want to ruin this opportunity as a marketing area. Professional accounts of the firms make them able to spread the good sides of their products and convince customers to buy these products. Marketers pay more attention to social media than they do for traditional advertising medium.

As a conclusion we can clearly state that Facebook changed our lives with its cool and useful features and became a significant part of our lives.

1.4. Expected Benefits of the System

Facebook offers many wonderful aspects, despite the fact that many people only focus on its disadvantages. Users of Facebook can share their experiences or leave comments on everything they see on their homepage or elsewhere thanks to the interface they created. Additionally, Facebook provides a huge selection of games for its users to play while surfing the web and connecting with one another. Even though it is believed that these activities won't have much of an impact, many persons with severe social anxiety benefit from them (McCord et al., 2014). Furthermore, Facebook is not the only platform with these benefits. For instance, it offers a setting where users may actively engage with other users to sell their useful items. Additionally, Facebook offers a favorable atmosphere for small businesses looking to promote an event or their goods. Furthermore, gathering user data and selling it to specific businesses will generate a big amount of revenue for Facebook, while businesses that acquire and use this data will get more reputation by marketing to users' inclinations. Moreover, through regional or global organizations established by other people, it enables users to interact with others who share their interests or require help on any issue. Facebook also provides group administrators with an easy-to-use interface to ensure a peaceful atmosphere in the groups they oversee. It can be claimed that such applications, especially Facebook, offer an excellent environment for those who want to participate in such actions.

2. DESIGN OF THE DATABASE

2.1. Data Types, Fields and Definitions

Account

ACCOUNT_ID (PK): This ID is automatically assigned by the database to each account and this feature gives users a sense of individuality when logging in. Account_ID is an auto number data type. It is a primary key for this entity.

EMAIL: The email address or phone number is required for registration to Facebook. Also after registration with email, account updates and other notifications are sent by email from Facebook. The data type is long text.

PASSWORD: To log into the system, you must need the special password. It makes it possible for users to access Facebook's assets. The data type is short text.

REGISTERED_PHONE_NUMBER: The email address or phone number is required for registration to Facebook. Also after registration with a phone number, account updates and other notifications are sent by SMS from Facebook. The data type is short text.

REGISTRATION_DATE: The date which shows the time account was registered in the system. The data type is date/time.

ACCOUNT_TYPE: There are two types of accounts in Facebook which are admin accounts and user accounts. The information about account type is kept here. The data type is yes/no (Such as yes means user account, no means admin account.).

User

USER_ID (PK): This ID is automatically assigned to the user by the database and this feature ensures uniqueness for the users. User_ID is an auto number data type. It is the primary key of this entity.

ACCOUNT_ID (FK): This ID is automatically assigned by the database to each account, and this feature gives users a sense of individuality when logging in. Account_ID is an auto number data type. It is a foreign key for this entity.

USER_NAME: This attribute is the name of the user and it appears in the notifications and information emails. User_Name is a short text data type.

PHONE_NUMBER: This attribute is the contact number of the user which is shown in his profile. It is an optional attribute so it can be NULL in some accounts. Its data type is short text.

DATE_OF_BIRTH: The date showing when the user was born. The data type is date/time.

GENDER: This shows the genders of users. The data type is number (Such as 1 represents male, 2 represents female, 3 represents the ones that do not want to indicate their gender.).

USER_ADDRESS: This shows the location of the user. The data type is short text.

EDUCATION: This shows the education level of the user. The data type is short text.

Admin

ADMIN_ID (PK): The admin gets this ID automatically from the database and this feature ensures the uniqueness for the admins. Admin_ID is an auto number data type.

ACCOUNT_ID (FK): This ID is automatically assigned by the database to each account and this feature gives users a sense of individuality when logging in. Account_ID is an auto number data type. It is a primary key for this entity.

ADMIN_NAME: This is the name of the admin who is in charge of the system. The data type is short text.

ADMIN_CATEGORY_ID: Admin's categories are to specify the responsibilities of the person in charge. The data type is number (Such as 0 for admins who control the marketplace, 1 for controllers of the games section etc.).

Play

PLAY_ID (PK): This ID is automatically assigned to the play by the database and this feature ensures uniqueness. Play_ID is an auto number data type. It is the primary key of this entity.

GAME_ID (FK): This ID is automatically assigned to the game by the database and this feature gives the games a sense of distinctiveness. Game_ID is an auto number data type. It is the foreign key of this entity.

USER_ID (FK): This ID is automatically assigned to the user by the database and this feature ensures uniqueness for the users. User_ID is an auto number data type. It is the foreign key of this entity.

TIME_STAMP: This shows when the user started the game. The data type is date/time.

Games

GAME_ID (PK): This ID is automatically assigned to the game by the database and this feature gives the games a sense of distinctiveness. Games_ID is an auto number data type. It is the primary key of this entity.

GAME_TYPE_ID: There are different types of games on Facebook. In order to represent them, they have different category numbers. The data type of Game_Type_ID is number (Such as 1 denotes board games, 2 denotes sport games etc.).

GAME_NAME: This is the name of the game. The data type is short text.

NUMBER_OF_FAVS: This is the number of games saved by the user. The data type is number.

NUMBER_OF_PLAYERS: This is the number of users enrolled in one game. The data type is number.

GAME_DESCRIPTION: This is the explanation of the game. Game producers are able to edit the game description to improve the context of the game. The data type is short text.

Streamer

STREAMER_ID (PK): This ID is automatically given to the streamer by the database to ensure their uniqueness. Streamer_ID is an auto number data type. It is the primary key of this entity.

USER_ID (FK): This ID is automatically assigned to the user by the database and this feature ensures uniqueness for the users. User_ID is an auto number data type. It is the foreign key of this entity.

STREAMER_MAIL: This is the contact mail of the streamer. The data type of Streamer_Mail is long text.

STREAMER_DESCRIPTION: This is the detailed information about the streamer itself and its content type. The data type of Streamer_Description is short text.

NUMBER_OF_FOLLOWERS: This shows the amount of people who follow this particular streamer. The data type is number.

Stream

STREAM_ID (PK): This ID is automatically assigned to the stream by the database to ensure its uniqueness. Stream_ID is an auto number data type. It is the primary key of this entity.

STREAMER_ID (FK): This ID is automatically given to the streamer by the database to ensure their uniqueness. Streamer_ID is an auto number data type. It is the foreign key of this entity.

STREAM_TITLE: This is the title of the stream set by the streamer. The data type is short text.

DATE_OF_THE_STREAM: This shows the date the stream was made. The data type is date/time.

DURATION: This indicates the duration of the stream. The data type is number

NUMBER_OF_VIEWERS: This shows the number of viewers watching the broadcast. The data type is number.

TOTAL_EARNING: Some streamers can earn money via streaming, if they meet the monetization requirements of Facebook and Total_Earning shows the total money that a streamer earned from a stream. The data type is number.

Message

MESSAGE_ID (PK): Database automatically assigns this ID to the message to provide uniqueness to every particular message. Message_ID is an auto number data type. It is the primary key of this entity.

USER_ID (FK): This ID is automatically assigned to the user by the database and this feature ensures uniqueness for the users. User_ID is an auto number data type. It is the foreign key of this entity.

CONTACT_ID: Database automatically assigns this ID to the contact to provide uniqueness. Actually, Contact_ID is an User_ID of the contact person. Contact_ID is an auto number data type.

MESSAGE_CONTENT: This shows the content of the message created by the user. The data type is long text.

READ_RECEIPTS: This indicates whether the message has been delivered, read or unread. The data type is number (Such as if its value is 1; which means the message is not delivered to the contact user.).

MESSAGE_TYPE: There are different types of message options on Facebook such as text message, video message and Message_Type indicates the type of the message sent by the user. The data type is number (Such as 1 indicates text type of messages etc.).

POST_DATE: This shows the specific date and time of the message that was posted. The data type is date/time.

Ads

AD_ID (PK): This ID is automatically assigned to the ads by the database to ensure their uniqueness. Ad_ID is an auto number data type. It is the primary key of this entity.

USER_ID (FK): This ID is automatically assigned to the user by the database and this feature ensures uniqueness for the users. User_ID is an auto number data type. It is the foreign key of this entity.

AD_TYPE: This information shows the type of the specific ad. There are three different types of ads on Facebook which are house, car and other products. The data type is number (Such as 1 represents house ads, 2 represents car ads.).

DATE_OF_AD: This gives a specific date of that given ad. The data type is date/time.

LIKES: This shows the amount of likes for a particular post. The data type is number.

Vehicle_Ads

VEHICLE_AD_ID (PK): This ID is automatically assigned to the vehicles by the database to distinguish it from the others. Vehicle_Ads_ID is an auto number data type. It is the primary key of this entity.

AD_ID (FK): This ID is automatically assigned to the ads by the database to ensure their uniqueness. Ad_ID is an auto number data type. It is the foreign key of this entity.

VEHİCLE_TYPE: This indicates the type of a particular vehicle. There are 8 different types of vehicles on Facebook. The data type is number (Such as 1 represents car/truck ads, 2 represents caravan ads, 3 represents motorcycle ads etc.).

BRAND: This shows the brand of the vehicle. The data type is short text.

MODEL: This shows the model of the vehicle. The data type is short text.

VEHICLE_LOCATION: This shows the location of a particular vehicle. The data type is short text.

MODEL_YEAR: This shows the date when the vehicle was produced. The data type is number.

VEHICLE_PRICE: This shows the price of a particular vehicle. The data type is number.

VEHICLE_DESCRIPTION: This shows the given details of a particular vehicle. The data type is long text.

House_Ads

HOUSE_AD_ID (PK): Database automatically assigns this ID to the house to provide uniqueness to every particular house. House_Ad_ID is an auto number data type. It is the primary key of this entity.

AD_ID (FK): Database automatically assigns this ID to the ads to provide uniqueness for the ads. Ad_ID is an auto number data type. It is the foreign key of this entity.

NUMBER_OF_BEDROOM: This shows the amount of bedrooms in a particular house. The data type is number.

NUMBER_OF_BATHROOM: This shows the amount of bathrooms in a particular house. The data type is number.

TYPE_OF_SALE: This indicates that the house is for rent or for sale. Data type is yes/no.

AREA_OF_HOUSE: This shows an area of a particular house. The data type is number.

House_Rental_Ads

HOUSE_RENTAL_AD_ID (PK): This ID is automatically assigned to the rental house by the database to give each individual house rental ad some level of distinctiveness. House_Rental_Ad_ID is an auto number data type. It is the primary key of this entity.

HOUSE_AD_ID (FK): Database automatically assigns this ID to the house to provide uniqueness to every particular house. House_Ad_ID is an auto number data type. It is the foreign key of this entity.

RENTAL_FEE: This shows the required monthly payment in order to rent that particular house. The data type is number.

RENTAL_HOUSE_ADDRESS: This shows the address of that particular house. The data type is short text.

RENTAL_TYPE: This shows the type of the house which will be rented. The data type is short text.

DESCRIPTION_ABOUT_TENEMENT: This gives specific information about that particular house. The data type is long text.

DOG_ACCEPTANCE_STATUS: This shows whether a dog is accepted or not. The data type is yes/no.

CAT_ACCEPTANCE_STATUS: This shows whether a cat is accepted or not. The data type is yes/no.

For_Sale_House_Ads

FOR_SALE_HOUSE_AD_ID (PK): This ID is automatically assigned to the for sale house by the database to distinguish it from the others. For_Sale_House_Ad_ID is an auto number data type. It is the primary key of this entity.

HOUSE_AD_ID (FK): Database automatically assigns this ID to the house to provide uniqueness to every particular house. House_Ad_ID is an auto number data type. It is the foreign key of this entity.

FOR_SALE_HOUSE_ADDRESS: This shows the address of the house for sale. The data type is short text.

PURCHASE_FEE: This shows the required payment in order to buy that particular house. The data type is number.

Other_Products_Ads

OTHER_PRODUCTS_AD_ID (PK): Database automatically assigns this id to the other products to provide uniqueness to every particular product. Other_Product_Ad_ID is an auto number data type. It is the primary key of this entity.

AD_ID (FK): Database automatically assigns this ID to the ads to provide uniqueness for the ads. Ad_ID is an auto number data type. It is the foreign key of this entity.

AD_TITLE: This shows the title of that particular ad. The data type is short text.

PRODUCT_PRICE: This shows the price of that particular product. The data type is number.

CONDITION: This shows the part where information about the condition of the product is given. The data type is short text.

PRODUCT_DESCRIPTION: This shows the given details of a particular product. The data type is long text.

STOCK_STATUS: This shows whether that particular product is in stock. The data type is yes/no.

PRODUCT_SELLER_ADDRESS: This shows the address of the user who owns that particular product. The data type is short text.

Saved_Ads

SAVED_AD_ID (PK): This ID is automatically assigned by the database to the saved ads to ensure their uniqueness. Saved_Ad_ID is an auto number data type. It is the primary key of this entity.

AD_ID (FK): Database automatically assigns this ID to the ads to provide uniqueness for the ads. Ad_ID is an auto number data type. It is the foreign key of this entity.

USER_ID (FK): This ID is automatically assigned to the user by the database and this feature ensures uniqueness for the users. User_ID is an auto number data type. It is the foreign key of this entity.

SAVED_TIME: This shows the saved date of the ad. The data type is date/time.

Posts

POST_ID (PK): This ID is automatically assigned to the every new published post by the database and this feature ensures uniqueness for the posts. Post_ID is an auto number data type. It is the primary key of this entity.

USER_ID (FK): This ID is automatically assigned to the user by the database and this feature ensures uniqueness for the users. User_ID is an auto number data type. It is the foreign key of this entity.

CONTENT_REFERENCE: Facebook or other social media platforms (Instagram, Twitter etc.) does not store posts in a blob format instead they store it in content distribution networks (in different servers all around the world) that can serve up the images to browsers based on closest location. They only store a path or a link to the related content of the post. The data type is hyperlink.

POST_TYPE: This information shows the type of the specific post. There are three different types of posts which are game, stream and user posts. The data type is number (Such as 1 represents games, 2 represents streams, 3 represents user posts.).

VISIBILITY: This information shows the visibility type of the specific post. There are three different types of visibility option on Facebook which are Public, Friends, Only Me. The data type is number (Such as 1 represents Public, 2 represents Friends.).

NUMBER_OF_LIKES: This shows the amount of likes for a particular post. The data type is number.

PUBLISHED_AT: This shows the specific publish date and time of the post. The data type is date/time.

Comments

COMMENT_ID (PK): This ID is automatically assigned to the every new published comment by the database and this feature ensures uniqueness for the comments. Comment_ID is an auto number data type. It is the primary key of this entity.

POST_ID (FK): This ID is automatically assigned to the every new published post by the database and this feature ensures uniqueness for the posts. Post_ID is an auto number data type. It is the foreign key of this entity.

USER_ID (FK): This ID is automatically assigned to the user by the database and this feature ensures uniqueness for the users. User_ID is an auto number data type. It is the foreign key of this entity.

CONTENT: This shows the content of the comment and its data type is long text. The data type is long text.

NUMBER_OF_LIKES: This shows the amount of likes for a particular post. The data type is number.

PUBLISHED_AT: This shows the specific publish date and time of the comment. The data type is date/time.

LOCATION: This information shows where the comment was made. There are three different types of posts that can be commented on, these are game, stream and user posts. The data type is number (Such as 1 represents games, 2 represents streams, 3 represents user posts.).

DATABASE TABLE			
TABLE NAME	**DATA FIELD**	**DATA TYPE**	**DEFINITION**
ACCOUNT	**Account_ID (PK)**	Auto Number	This ID is automatically assigned by the database to each account and this feature gives users a sense of individuality when logging in.
	Email	Long Text	The email address or phone number is required for registration to Facebook. Also after registration with email, account updates and other notifications are sent by email from Facebook.
	Password	Short Text	To log into the system, you must need the special password. It makes it possible for users to access Facebook's assets.
	Registered_Phone_Number	Short Text	The email address or phone number is required for registration to Facebook. Also after registration with a phone number, account updates and other notifications are sent by SMS from Facebook.
	Registration_Date	Date/Time	The date which shows the time account was registered in the system.
	Account_Type	Yes/No	There are two types of accounts in Facebook which are admin accounts and user accounts. The information about account type is kept here (Such as yes means user account, no means admin account.).
USER	**User_ID (PK)**	Auto Number	This ID is automatically assigned to the user by the database and this feature ensures uniqueness for the users.
	Account_ID (FK)	Auto Number	This ID is automatically assigned by the database to each account and this feature gives users a sense of individuality when logging in.
	User_Name	Short Text	This attribute is the name of the user and it appears in the notifications and information emails.
	Phone_Number	Short Text	This attribute is the contact number of the user which is shown in his profile. It is an optional attribute so it can be NULL in some accounts.
	Date_of_Birth	Date/Time	The date showing when the user was born.
	Gender	Number	This shows the genders of users (Such as 1 represents male, 2 represents female, 3 represents the ones that do not want to indicate their gender.).
	User_Address	Short Text	This shows the address of the user.
	Education	Short Text	This shows the education level of the user.
ADMIN	**Admin_ID (PK)**	Auto Number	The admin gets this ID automatically from the database and this feature ensures the uniqueness for the admins.
	Account_ID (FK)	Auto Number	This ID is automatically assigned by the database to each account and this feature gives users a sense of individuality when logging in.
	Admin_Name	Short Text	This is the name of the admin who is in charge of the system.
	Admin_Category_ID	Number	Admin's categories are to specify the responsibilities of the person in charge (Such as 0 for admins who control the marketplace, 1 for controllers of the games section etc.).
PLAY	**Play_ID (PK)**	Auto Number	This ID is automatically assigned to the play by the database and this feature ensures uniqueness.
	Game_ID (FK)	Auto Number	This ID is automatically assigned to the game by the database and this feature gives the games a sense of distinctiveness.
	User_ID (FK)	Auto Number	This ID is automatically assigned to the user by the database and this feature ensures uniqueness for the users.

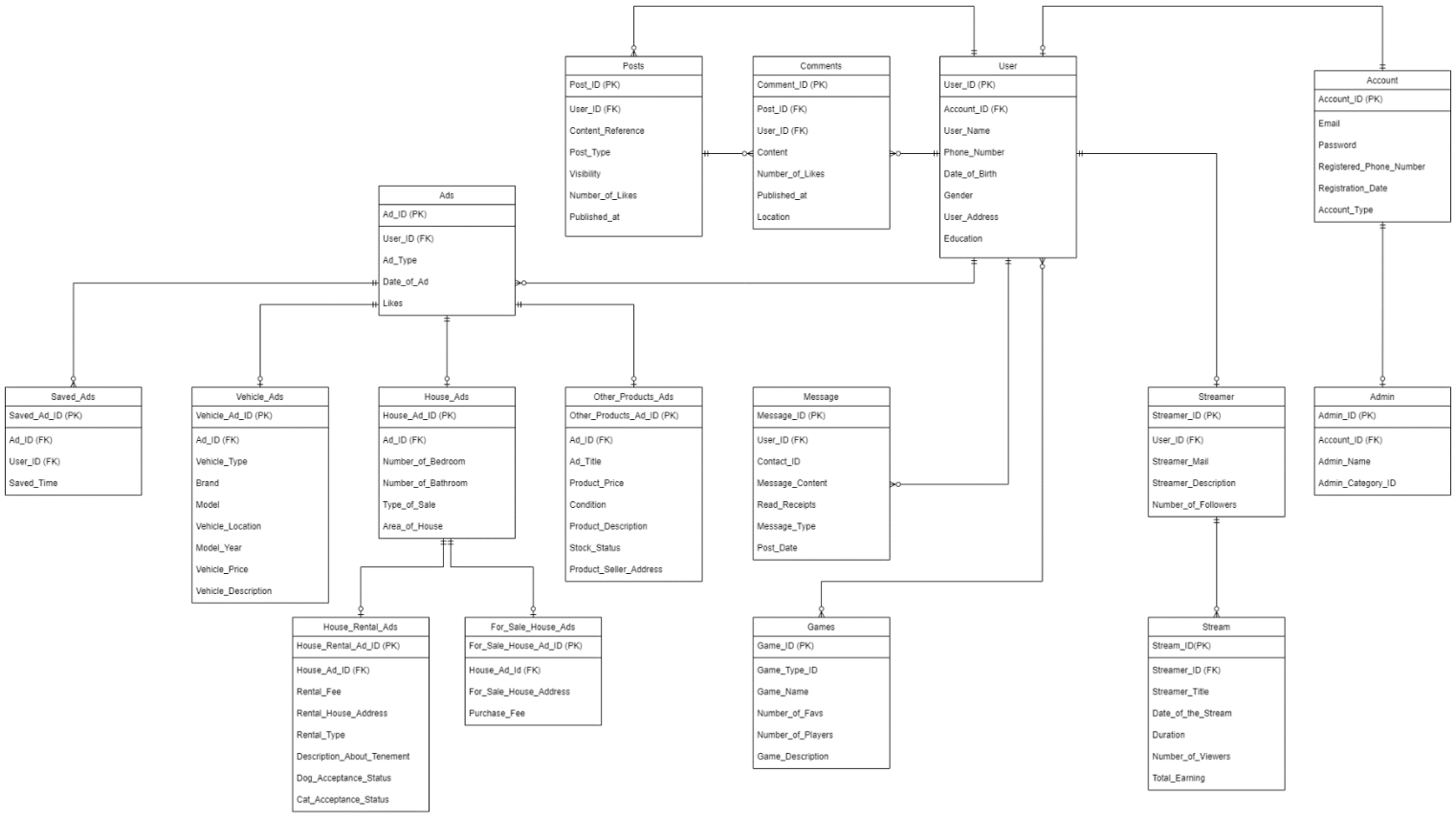
	Time_Stamp	Date/Time	This shows when the user started the game.
GAMES	**Game_ID (PK)**	Auto Number	This ID is automatically assigned to the game by the database and this feature gives the games a sense of distinctiveness.
	Game_Type_ID	Number	There are different types of games on Facebook. In order to represent them, they have different category numbers (Such as 1 denotes board games, 2 denotes sport games etc.).
	Game_Name	Short Text	This is the name of the game.
	Number_of_Favs	Number	This is the number of games saved by the user.
	Number_of_Players	Number	This is the number of users enrolled in one game.
	Game_Description	Short Text	This is the explanation of the game. Game producer is able to edit the game description to improve the context of the game.
STREAMER	**Streamer_ID (PK)**	Auto Number	This ID is automatically given to the streamer by the database to ensure their uniqueness.
	User_ID (FK)	Auto Number	This ID is automatically assigned to the user by the database and this feature ensures uniqueness for the users.
	Streamer_Mail	Long Text	This is the contact mail of the streamer.
	Streamer_Description	Short Text	This is the detailed information about the streamer itself and its content type.
	Number_of_Followers	Number	This shows the amount of people who follow this particular streamer.
STREAM	**Stream_ID (PK)**	Auto Number	This ID is automatically assigned to the stream by the database to ensure its uniqueness.
	Streamer_ID (FK)	Auto Number	This ID is automatically given to the streamer by the database to ensure their uniqueness.
	Stream_Title	Short Text	This is the title of the stream set by the streamer.
	Date_of_the_Stream	Date/Time	This shows the date the stream was made.
	Duration	Number	This indicates the duration of the stream.
	Number_of_Viewers	Number	This shows the number of viewers watching the broadcast.
	Total_Earning	Number	Some streamers can earn money via streaming, if they meet the monetization requirements of Facebook and Total_Earning shows the total money that a streamer earned from a stream.
MESSAGE	**Message_ID (PK)**	Auto Number	Database automatically assigns this ID to the message to provide uniqueness to every particular message.
	User_ID (FK)	Auto Number	This ID is automatically assigned to the user by the database and this feature ensures uniqueness for the users.
	Contact_ID	Auto Number	Database automatically assigns this ID to the contact to provide uniqueness. Actually, Contact_ID is an User_ID of the contact person.
	Message_Content	Long Text	This shows the content of the message created by the user.

	Read_Receipts	Number	This indicates whether the message has been read or unread (Such as if its value is 1; which means the message is not delivered to the contact user.).
	Message_Type	Number	There are different types of message options on Facebook such as text message, video message and Message_Type indicates the type of the message sent by the user (Such as 1 indicates text type of messages etc.).
	Post_Date	Date/Time	This shows the specific date and time of the message that was posted.
ADS	**Ad_ID (PK)**	Auto Number	This ID is automatically assigned to the ads by the database to ensure their uniqueness.
	User_ID (FK)	Auto Number	This ID is automatically assigned to the user by the database and this feature ensures uniqueness for the users.
	Ad_Type	Number	This information shows the type of the specific ad. There are three different types of ads on Facebook which are house, car and other products (Such as 1 represents house ads, 2 represents car ads.).
	Date_of_Ad	Date/Time	This gives a specific date of that given ad.
	Likes	Number	This shows the amount of likes for a particular post.
VEHICLE_ADS	**Vehicle_Ad_ID (PK)**	Auto Number	This ID is automatically assigned to the vehicles by the database to distinguish it from the others.
	Ad_ID (FK)	Auto Number	This ID is automatically assigned to the ads by the database to ensure their uniqueness.
	Vehicle_Type	Number	This indicates the type of a particular vehicle. There are 8 different types of vehicles on Facebook (Such as 1 represents car/truck ads, 2 represents caravan ads, 3 represents motorcycle ads etc.).
	Brand	Short Text	This shows the brand of the vehicle.
	Model	Short Text	This shows the model of the vehicle.
	Vehicle_Location	Short Text	This shows the location of a particular vehicle.
	Model_Year	Number	This shows the date when the vehicle was produced.
	Vehicle_Price	Number	This shows the price of a particular vehicle.
	Vehicle_Description	Long Text	This shows the given details of a particular vehicle.
HOUSE_ADS	**House_Ad_ID (PK)**	Auto Number	Database automatically assigns this ID to the house to provide uniqueness to every particular house.
	Ad_ID (FK)	Auto Number	This ID is automatically assigned to the ads by the database to ensure their uniqueness.
	Number_of_Bedroom	Number	This shows the amount of bedrooms in a particular house.
	Number_of_Bathroom	Number	This shows the amount of bathrooms in a particular house.
	Type_of_Sale	Yes/No	This indicates that the house is for rent or for sale.
	Area_of_House	Number	This shows an area of a particular house.

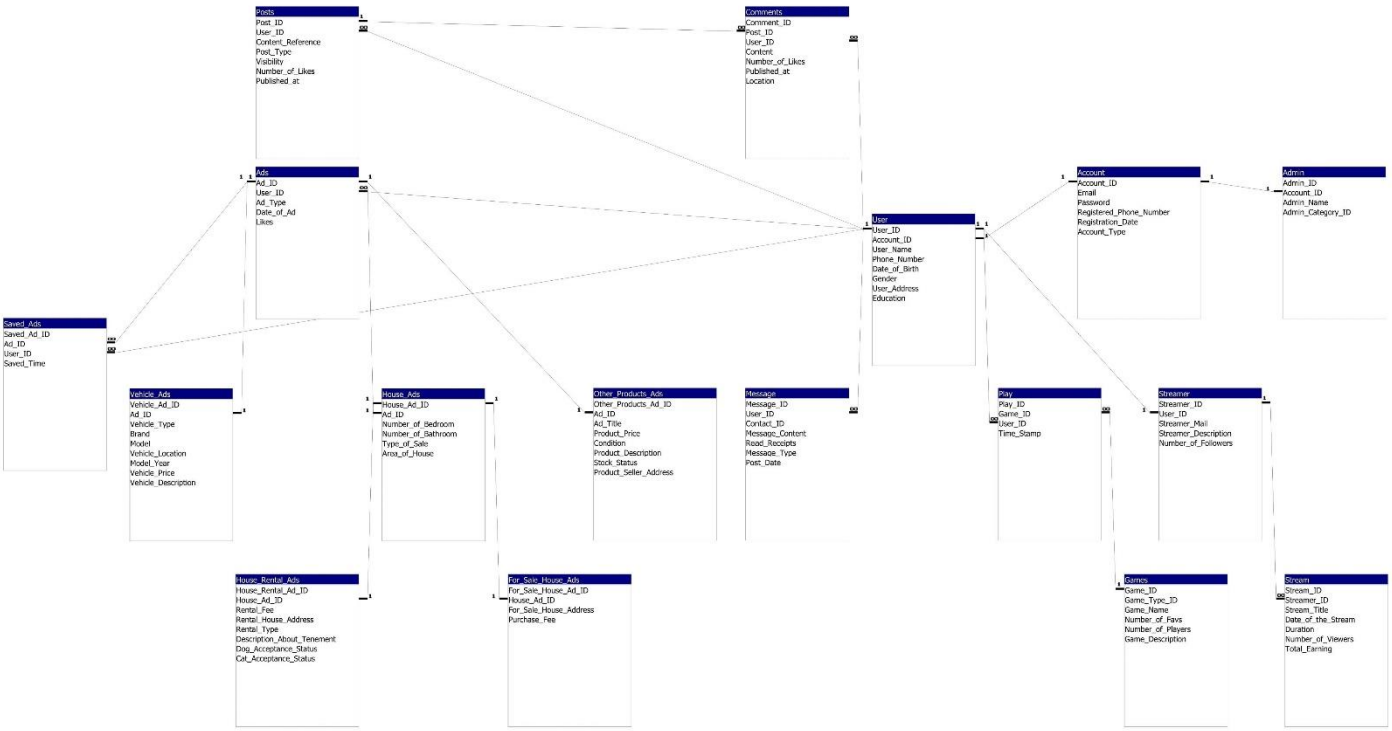
HOUSE_RENTAL_ADS	House_Rental_Ad_ID (PK)	Auto Number	This ID is automatically assigned to the rental house by the database to give each individual house rental ad some level of distinctiveness.
	House_Ad_ID (FK)	Auto Number	Database automatically assigns this ID to the house to provide uniqueness to every particular house.
	Rental_Fee	Number	This shows the required monthly payment in order to rent that particular house.
	Rental_House_Address	Short Text	This shows the address of that particular house which will be rented.
	Rental_Type	Number	This shows the type of the house which will be rented (Such as 1 represents house ads, 2 represents townhouse ads, 3 represents apartment ads etc.).
	Description_About_Tenement	Long Text	This gives specific information about that particular house.
	Dog_Acceptance_Status	Yes/No	This shows whether a dog is accepted or not.
	Cat_Acceptance_Status	Yes/No	This shows whether a cat is accepted or not.
FOR_SALE_HOUSE_ADS	For_Sale_House_Ad_ID (PK)	Auto Number	This ID is automatically assigned to the for sale house by the database to distinguish it from the others.
	House_Ad_ID (FK)	Auto Number	Database automatically assigns this ID to the house to provide uniqueness to every particular house.
	For_Sale_House_Address	Short Text	This shows the address of the house for sale.
	Purchase_Fee	Number	This shows the required payment in order to buy that particular house.
OTHER_PRODUCTS_ADS	Other_Products_Ad_ID (PK)	Auto Number	Database automatically assigns this id to the other products to provide uniqueness to every particular product.
	Ad_ID (FK)	Auto Number	This ID is automatically assigned to the ads by the database to ensure their uniqueness.
	Ad_Title	Short Text	This shows the title of that particular ad.
	Product_Price	Number	This shows the price of that particular product.
	Condition	Number	There are 4 different condition options on Facebook marketplace (Such as 1 represents brand new products, 2 represents used items but in good condition etc.).
	Product_Description	Long Text	This shows the given details of a particular product
	Stock_Status	Yes/No	This shows whether that particular product is in stock.
	Product_Seller_Address	Short Text	This shows the address of the user who owns that particular product.
SAVED_ADS	Saved_Ad_ID (PK)	Auto Number	This ID is automatically assigned by the database to the saved ads to ensure their uniqueness.
	Ad_ID (FK)	Auto Number	This ID is automatically assigned to the ads by the database to ensure their uniqueness.
	User_ID (FK)	Auto Number	This ID is automatically assigned to the user by the database and this feature ensures uniqueness for the users.

	Saved_Time	Date/Time	This shows the saved date of the ad.
POSTS	**Post_ID (PK)**	Auto Number	This ID is automatically assigned to the every new published post by the database and this feature ensures uniqueness for the posts.
	User_ID (FK)	Number	This ID is automatically assigned to the user by the database and this feature ensures uniqueness for the users.
	Content_Reference	Hyperlink	Facebook or other social media platforms (Instagram, Twitter etc.) does not store posts in a blob format instead they store it in content distribution networks (in different servers all around the world) that can serve up the images to browsers based on closest location. They only store a path or a link to the related content of the post.
	Post_Type	Number	This information shows the type of the specific post. There are three different types of posts which are game, stream and user posts (Such as 1 represents games, 2 represents streams, 3 represents user posts.).
	Visibility	Number	This information shows the visibility type of the specific post. There are three different types of visibility option on Facebook which are Public, Friends, Only Me (Such as 1 represents Public, 2 represents Friends.).
	Number_of_Likes:	Number	This shows the amount of likes for a particular post.
	Published_at	Date/Time	This shows the specific publish date and time of the post.
COMMENTS	**Comment_ID (PK)**	Auto Number	This ID is automatically assigned to the every new published comment by the database and this feature ensures uniqueness for the comments.
	Post_ID (FK)	Number	This ID is automatically assigned to the every new published post by the database and this feature ensures uniqueness for the posts. In this entity, it shows which post the comment was made on.
	User_ID (FK)	Number	This ID is automatically assigned to the user by the database and this feature ensures uniqueness for the users.
	Content	Long Text	This shows the content of the comment.
	Number_of_Likes	Number	This shows the amount of likes for a particular post.
	Published_at	Date/Time	This shows the specific publish date and time of the comment.
	Location	Number	This information shows where the comment was made. There are three different types of posts that can be commented on, these are game, stream and user posts (Such as 1 represents games, 2 represents streams, 3 represents user posts.).

2.2. Entity Relationship Diagram



2.3. Relationships and Definitions



ACCOUNT-USER RELATIONSHIP (1:1): The relationship between the account and user is one to one relationship. An account can have at most one user. A user can be given by a particular account.

ACCOUNT-ADMIN RELATIONSHIP (1:1): The relationship between the account and admin is one to one relationship. An account can have at most one Admin. An admin can be given by a particular account.

STREAMER-USER RELATIONSHIP (1:1): The relationship between the streamer and user is one to one relationship. A user can be at most one streamer. A streamer can be at most one user.

USER-GAMES RELATIONSHIP (M:M): Relationship between user and games is many-to-many relationship. A specific user can play various games, while specific games can be play by various users.

USER-ADS RELATIONSHIP (1:M): Relationship between User and Ads is one-to-many relationship. A specific user can create various ads, while specific ads belong to one user.

USER-MESSAGE RELATIONSHIP (1:M): Relationship between user and message is one-to-many relationship. A specific user can message various people, while the messages sent belong to one user.

STREAMER-STREAM RELATIONSHIP (1:M): Relationship between streamer and stream is one-to-one relationship. A specific streamer can stream at most various stream, while a specific stream can be streamed at most simultaneous by one streamer.

POSTS-COMMENTS RELATIONSHIP (1:M): Relationship between posts and comments is one-to-many relationship. A specific comment can be in one post. One post can involve various comments.

USER-COMMENTS RELATIONSHIP (1:M): Relationship between user and comments is one-to-many relationship. A specific user can various comments one post. User who comment is one user,

USER-POST RELATIONSHIP (1:M): Relationship between user and relationship is one-to-many relationship. A specific user can create various posts, while specific post belong to one user.

ADS–VEHICLE_ADS RELATIONSHIP (1:1): Relationship between ads and vehicle ads is one-to-one relationship. A vehicle ad must be an ad and an ad can be a vehicle ad or not.

ADS–HOUSE_ADS RELATIONSHIP (1:1): Relationship between ads and house ads is one-to-one relationship. A house ad must be an ad and an ad can be a house or not.

ADS–OTHER_PRODUCTS_ADS RELATIONSHIP (1:1): Relationship between ads and other products ads is one-to-one relationship. An other products ad must be an ad and an ad can be an other product or not.

HOUSE_ADS–HOUSE_RENTAL_ADS RELATIONSHIP (1:1): Relationship between house ads and house rental ads is one-to-one relationship. A house rental ad must be a house ad and a house ad can be rental or not.

HOUSE_ADS–FOR_SALE_HOUSE_ADS RELATIONSHIP (1:1): Relationship between house ads and for sale rental ads is one-to-one relationship. A for sale house ad must be a house ad and a house ad can be for sale or not.

ADS–SAVED_ADS RELATIONSHIP (1:M): Relationship between ads and saved ads is one-to-many relationship. If we pick a saved ad, it must be an add but if we pick an add, there can be multiple saved ad related to that ad.

3. QUERIES&REPORTS

3.1. Queries

3.1.1. Saved by user X Query

Users save the ads they like and Facebook stores them in their database.This query is used to list which adds a specific user saved. Saved_Ads and User tables are used for this query (JOIN operation).

Code:

```
SELECT User.User_Name,Posts.Post_ID, Posts.Published_at FROM User INNER JOIN Posts
ON Posts.User_ID = User.User_ID WHERE User.User_ID = 4 AND Posts.Post_Type = 3
ORDER BY Posts.Published_at DESC;
```

3.1.2. To see who commented under a post and what they written Query

Users can comment on different users' posts and when a user clicks on any post while browsing facebook, they see these comments. Thanks to this query, related comments are displayed under the relevant post.

Code:

```
SELECT Posts.Post_ID, User.User_Name , Comments.Content FROM (Comments INNER
JOIN User ON User.User_ID = Comments.User_ID) INNER JOIN Posts ON Posts.Post_ID =
Comments.Post_ID WHERE Posts.Post_ID = 5;
```

3.1.3. Monthly Payment Query

Facebook pays streamers who earn over $100 per month at the end of the month. This query determines which streamers are eligible and how much should be paid. User, Streamer, Stream tables and aggregate function are used for this query.

Code:

```
SELECT User.User_Name as [Streamer Name] ,SUM(Stream.Total_Earning) AS
Amount_To_Be_Paid FROM (Streamer INNER JOIN User ON Streamer.User_ID =
User.User_ID) INNER JOIN Stream ON Streamer.Streamer_ID = Stream.Streamer_ID GROUP
BY User.User_Name HAVING SUM(Stream.Total_Earning) > 100;
```

3.1.4. Profile Segment Query

When any user clicks on any user's profile, it displays the posts shared by that user from recent history to the past. To achieve this, the following query is run by the server.

Code:

```
SELECT User.User_Name,Posts.Post_ID, Posts.Published_at FROM User INNER JOIN Posts
ON Posts.User_ID = User.User_ID WHERE User.User_ID = 4 AND Posts.Post_Type = 3
ORDER BY Posts.Published_at DESC;
```

3.1.5. Game Rewards Query

Facebook gives rewards to its users who play a specific game at the highest number of times, and can also send various notification emails. Thanks to this query, the two people who play a certain game the most can be detected together with their e-mail addresses.

Code:

```
SELECT TOP 2 User.User_Name AS Winners , Account.Email FROM (Account INNER JOIN
User ON Account.Account_ID = User.Account_ID) INNER JOIN Play ON Play.User_ID =
User.User_ID WHERE Play.Game_ID = 1 GROUP BY User.User_Name, Account.Email
ORDER BY COUNT(Play.User_ID) DESC;
```

3.2. Reports

3.2.1. Favorite Ads

Favorite Ads

Name of the Saver	Ad_ID
beril yazar	
	10
	4
	1

A report is created to show saved ads of a specific user sorted by date. With the help of this report Facebook can detect which user likes which kinds of ads more and with the help of these it can show related ads more.

3.2.2. Comments

Comments

Post_ID	User_Name	Content
5		
	batuhan saygın	manzara süper
	alper demir	mükemmell
	zeynep özcan	vayy burası neresi
	beril yazar	ne zaman kadar ordasın

A report is created to show comments of the users on a specific post. With the help of this report comments of a specific post can be seen immediately. Facebook also can perform data manipulations through public comments and sell their analysis to the companies.

3.2.3. Monthly Payment

Monthly Payment

Streamer Name	Amount_To_Be_Paid
Selin Demirci	33666.3
Kemal Kuruçay	15207.3
batuhan saygın	222.6

A report is created on which streamers will be paid at the end of the month and the amount of money will be paid. Thanks to this report, by looking only at this report Facebook can determine how much it should pay streamers at the end of the month, instead of looking at individual streams one by one.

3.2.4. Profile

Profile

User_Name	Post_ID	Published_at
batuhan saygın		
	10	1/10/2023
	9	12/9/2022
	4	12/2/2022

This report has been prepared for general analysis of posts shared by a user. Thanks to this report, the frequency of users' use of Facebook and why they use it can be understood more easily. In this way, Facebook competes more easily with other social media companies.

3.2.5. Game Rewards

Game Rewards

Winners	Email
zeynep özcan	zeynep76@gmail.com
batuhan saygın	batuhan01@gmail.com

A report is prepared to determine the reward winners of a specific game which gives rewards to their players according to the number of times they played the game in a specific interval. Thanks to this report, games can connect their players more to their games and increase in-game purchases, Facebook also makes a significant profit by taking commission from these sales.

4. REFERENCES

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