Technical Report and ERM

DataBase Foundations

Professor:

Eng. Carlos Andrés Sierra, M.Sc.

Author:

Montoya Amaya Oscar Santiago - 20212020076 Hernández Manosalva Adiel Valentín - 20201020144

Francisco José de Caldas District University
Faculty of Engineering
Systems Engineering
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Introduction

This report presents a detailed design of the Twitch database, the objective of which is to efficiently model the main entities and relationships that support the daily operation of the service. The primary focus is on identifying key platform components such as users, channels, videos, and messaging, as well as critical functionalities related to subscriptions, donations, and interactive events.

Throughout this document, the most important entities that make up the data model are broken down, along with their respective attributes, in order to provide a coherent and adaptable structure.

Steps

Designing an efficient and well-structured database for a platform as complex as Twitch requires a methodical approach. To ensure that all key aspects of the platform are properly represented and that the relationships between the various components are clear, several key steps are followed.

In this process, we begin by identifying the main components that define how Twitch works, such as users, channels, videos, subscriptions, and other critical elements. From these components, we proceed to define the entities that will be responsible for modeling these elements in the database, as well as the attributes that describe the specific characteristics of each entity.

Finally, the information is organized, assigning the corresponding attributes to each entity to ensure the consistency and integrity of the data model, where everything is seen.

1. Define components

- a. User Management
- b. Streaming
- c. Video (VOD) Management
- d. Chat System
- e. Subscriptions
- f. Followers
- g. Donations
- h. Moderation
- i. Emotes and Interaction
- j. Reports and Violations

2. Define entities

- a. Users (e1)
- b. Streams (e2)
- c. Videos (VODs) (e3)
- d. Categories (e4)
- e. Followers (e5)
- f. Subscriptions (e6)
- g. Chats (e7)
- h. Donations (e8)
- i. Emotes (e9)
- j. Moderators (e10)
- k. Reports (e11)

3. Define attributes per entity

a. Users

- i. username
- ii. email
- iii. password hash
- iv. account type (streamer/viewer)
- v. sign up date
- vi. profile picture v
- vii. bio

b. Streams

- i. title
- ii. category (game/creative/music/etc.)

- iii. start time
- iv. end time
- v. view count
- vi. status (live/offline)

c. Videos (VODs)

- i. video url
- ii. upload date
- iii. view count
- iv. duration

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d. Categories

- i. name
- ii. description

e. Followers

i. follow date

f. Subscriptions

- i. subscription date
- ii. subscription type (tier1/tier2/tier3)

g. Chats

- i. message
- ii. timestamp

h. Donations

- i. amount
- ii. currency
- iii. donation date

i. Emotes

- i. emote name
- ii. image url

j. Moderators

i. assigned date

k. Reports

- i. reason
- ii. report date
- iii. status (pending/resolved/closed)

4. Define relationships

	e1	e2	e3	e4	e5	e6	e7	e8	e9	e10	e11
e1		V	~	~	~	~	~	~	~	~	~
e2	~		~	~			~	~		~	
e3	~	~		~							
e4	~	~	~								
e5	~					~		~		~	~
e6	~				~						
e7	~	~						~	~	~	~
e8	~	~			~		~				
e9	~						~				
e10	~	~			~		~				~
e11	~				~		~			~	

5. Define relationships types

Types

- 1 to many (1--- M)
- many to many (M---M)
- 1 to 1 (1---1)

Users (e1):

- e1 to e2 (Streams): 1---M
- e1 to e3 (Videos): Indirect (through Streams)
- e1 to e4 (Categories): Indirect (through Streams)
- e1 to e5 (Followers): M---M
- e1 to e6 (Subscriptions): M---M
- e1 to e7 (Chats): 1---M
- e1 to e8 (Donations): 1---M
- e1 to e9 (Emotes): M---M
- e1 to e10 (Moderators): 1---M
- e1 to e11 (Reports): 1---M

Streams (e2):

- e2 to e3to e4 (C (Videos): 1---M
- e2 (Categories): M---1
- e2 to e7 (Chats): 1---M
- e2 to e8 (Donations): 1---M
- e2 to e10 (Moderators): M---M

Videos(e3)

• e3 to e4 (Categories): M---1

Followers (e5):

- e5 to e6 (Subscriptions): M-1
- e5 to e8 (Donations): M-1
- e5 to e10 (Moderators): 1—1
- e5 to e11 (Reports):M—M

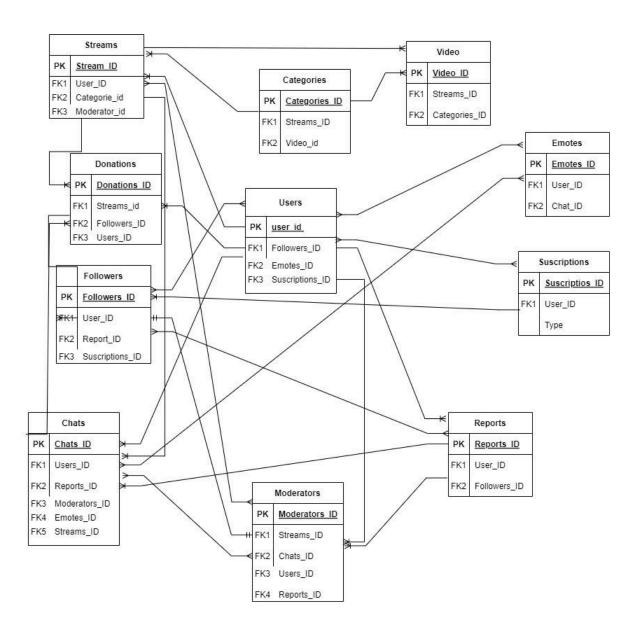
Chats (e7):

- e7 to e8 (Donations): 1—-M
- e7 to e9 (Emotes): M—M
- e7 to e10 (Moderators): M—M
- e7 to e11 (Reports): M−1

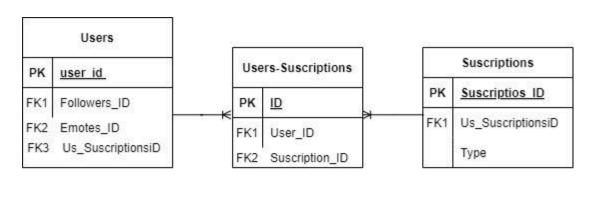
Moderators (e10)

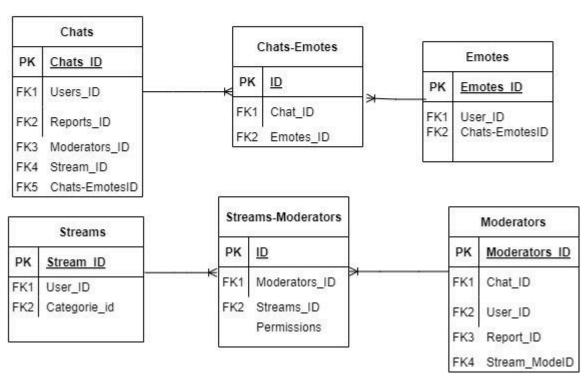
• e10 to e11(Reports): M−1

6. First Entity-Relationship Draw

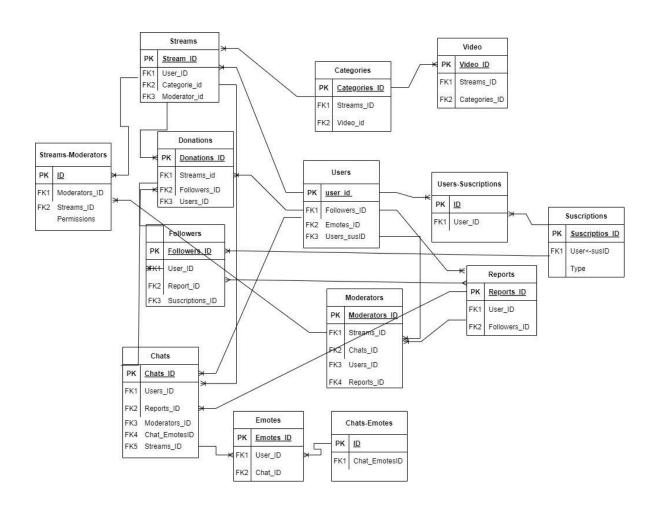


7. First Split Many-to-Many Relationships





8. Second Entity-Relationship Draw



9. Get Data-Structure E-R M

	Categories
PK	Categories ID
FK1	Streams_ID
FK2	Video_id
12	Name:String
	Description:String

Streams		
PK	Stream ID	
FK1	User_ID	
FK2	Categorie_id	
FK3	Moderator_id	
	title: String	
	StartTime:Date	
	endTime:Date	
	viewcount;Long	
	Status:String	

Users		
PK	user id	
FK1	Followers_ID:int	
FK2	Emotes_ID:int	
FK3	Users_susID:int	
	Username:String	
	email:String	
	Account_type	
	byography:String	
	Password:String	

Video			
PK	Video ID		
FK1	Streams_ID		
FK2	Categories_ID		
0	VideoUrl:String		
	upload_Date:date		
view_Count:Ion			
	duration:String		

	Followers	
PK	Followers ID	
FK1	User_ID	
FK2	Report_ID	
FK3	Suscriptions_ID	
	folloDate:Date	

Donations			
PK	Donations ID		
FK1	Streams_id		
FK2	Followers_ID		
FK3	Users_ID		
	amount:long		
	currency:String		
	DonationDate:dat		

PK	ID:int
FK1	User_ID:int

Suscriptions

FK1 User-susID:int

Suscriptios ID:int

Reports		
PK Reports ID		
FK1	User_ID	
FK2	Followers_ID	
	reason:String	
	ReportDate:Date	
	Status:String	

31	reams-Moderators
PK	ID:int
	Moderators_ID:int
2	Streams_ID:int
	Permissions:String

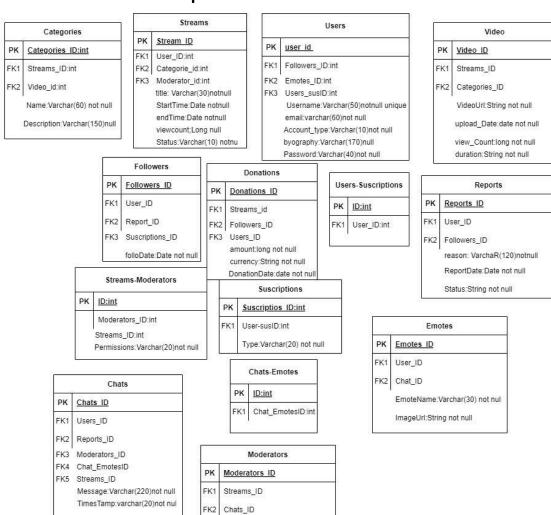
Moderators			
PK	Moderators ID		
FK1	Streams_ID		
FK2	Chats_ID		
FK3	Users_ID		
FK4	Reports_ID		
	ReportDte:date		

reams_ID		Type:String
nats_ID ers_ID		Chats-Emotes
ports_ID	PK	ID:int
eportDte:date	FK1	Chat_EmotesID:int
		50

	Emotes		
PK	Emotes ID		
FK1	User_ID		
FK2	Chat_ID		
,	EmoteName:String		
	ImageUrl:String		
	illageon.string		

Chats	
PK	Chats ID
FK1	Users_ID
FK2	Reports_ID
FK3	Moderators_ID
FK4	Chat_EmotesID
FK5	Streams_ID
FK5	Message:String
FK5	TimesTamp:String

10. Define Constraints and Properties of Data



FK3 Users_ID
FK4 Reports_ID

ReportDte:date not null