Database for FakeMovies Cloud Video Services

MIS 766 - Database Management

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A. BUSINESS PROBLEM

FakeMovies has a line of streaming movies that it also partners with multiple studios to provide high quality content. The service has been in operation since 2018, has experienced an exponential growth of customers since its creation. Their unexpected increase in customers and customers' demand took the company by surprise and now their initial database design cannot meet their reports needs nor can it manage effectively their customers' membership transactions. The company needs a completely new database which can handle large datasets and produce meaningful information for decision making process.

B. DATABASE FRAME

+ Options

Table	Create Table
MOVIE	CREATE TABLE `MOVIE` (`MOVIE_ID` int(10) NOT NULL AUTO_INCREMENT, `MOVIE_TITLE` varchar(255) CHARACTER SET utf8 COLLATE utf8_unicode_ci NOT NULL, `MOVIE_LENGTH` smallint(3) NOT NULL, `MOVIE_RATING` varchar(5) COLLATE utf8_unicode_ci NOT NULL, `CATEGORY_ID` smallint(2) NOT NULL, `MOVIE_YEAR` smallint(4) NOT NULL, `AUDIO_LANGUAGE` varchar(10) COLLATE utf8_unicode_ci DEFAULT NULL, `DISTRIBUTOR_ID` smallint(3) DEFAULT NULL, `REGION_ID` int(10) DEFAULT NULL, PRIMARY KEY (`MOVIE_ID`), KEY `CATEGORY_ID` (`CATEGORY_ID`), KEY `DISTRIBUTOR_ID` (`DISTRIBUTOR_ID`), KEY `REGION_ID` (`REGION_ID`), CONSTRAINT `MOVIE_ibfk_1` FOREIGN KEY (`CATEGORY_ID`) REFERENCES `CATEGORY` (`category_id`), CONSTRAINT `MOVIE_ibfk_2` FOREIGN KEY (`DISTRIBUTOR_ID`) REFERENCES `DISTRIBUTOR` (`distributor_id`), CONSTRAINT `MOVIE_ibfk_3` FOREIGN KEY (`REGION_ID`) REFERENCES `REGION` (`region_id`)) ENGINE=InnoDB AUTO_INCREMENT=101 DEFAULT CHARSET=utf8 COLLATE=utf8_unicode_ci

Fig.1. Create Movie Table Query

Table	Create Table
CUSTOMER	CREATE TABLE `CUSTOMER` (`CUSTOMER_ID` int(10) NOT NULL AUTO_INCREMENT, `CUSTOMER_FNAME` varchar(32) COLLATE utf8_unicode_ci NOT NULL, `CUSTOMER_LNAME` varchar(32) COLLATE utf8_unicode_ci NOT NULL, `ZIP_CODE` int(5) NOT NULL, `CUSTOMER_STATUS` smallint(1) NOT NULL, `CUSTOMER_ADDRESS1` varchar(32) COLLATE utf8_unicode_ci NOT NULL, `CUSTOMER_ADDRESS2` varchar(32) COLLATE utf8_unicode_ci DEFAULT NULL, `CUSTOMER_ADDRESS3` varchar(32) COLLATE utf8_unicode_ci DEFAULT NULL, `COUNTRY` varchar(32) COLLATE utf8_unicode_ci NOT NULL, `EMAIL` varchar(255) CHARACTER SET utf8 COLLATE utf8_unicode_ci NOT NULL, `CUSTOMER_PHONE` char(12) COLLATE utf8_unicode_ci NOT NULL, `USERNAME` varchar(32) COLLATE utf8_unicode_ci NOT NULL, `PASSWORD` varchar(32) COLLATE utf8_unicode_ci NOT NULL, `membershipID` bigint(12) DEFAULT NULL, PRIMARY KEY (`CUSTOMER_ID`), KEY `FK_ZIPCODE` (`ZIP_CODE`), KEY `membershipID` (`membershipID`), CONSTRAINT `CUSTOMER_ibfk_1` FOREIGN KEY (`membershipID`) REFERENCES `MembershipDetails` (`membership_id`), CONSTRAINT `FK_ZIPCODE` FOREIGN KEY (`ZIP_CODE`) REFERENCES `ZipCode` (`zip_code`)) ENGINE=InnoDB AUTO_INCREMENT=1001 DEFAULT CHARSET=utf8 COLLATE=utf8_unicode_ci

Fig.2. Create Customer Table Query

Table	Create Table
STREAMING	CREATE TABLE `STREAMING` (`STREAMING_ID` bigint(12) NOT NULL AUTO_INCREMENT, `MOVIE_ID` int(10) NOT NULL, `CUSTOMER_ID` int(10) NOT NULL, `STREAMING_STARTTIME` datetime NOT NULL, `STREAMING_STOPTIME` datetime DEFAULT NULL, PRIMARY KEY (`STREAMING_ID`), KEY `MOVIE_ID` (`MOVIE_ID`), KEY `CUSTOMER_ID` (`CUSTOMER_ID`), CONSTRAINT `STREAMING_ibfk_1` FOREIGN KEY (`MOVIE_ID`) REFERENCES `MOVIE` (`movie_id`), CONSTRAINT `STREAMING_ibfk_2` FOREIGN KEY (`CUSTOMER_ID`) REFERENCES `CUSTOMER` (`customer_id`)) ENGINE=InnoDB AUTO_INCREMENT=1001 DEFAULT CHARSET=utf8 COLLATE=utf8_unicode_ci

Fig. 3. Create Streaming Table Query

Fig.4. Complete database

+ Options

	MEMBERSHIP_ID	MEMBERSHIPTYPE_ID	MEMBERSHIP_STARTDATE	MEMBERSHIP_STATUS
Edit Copy Delete	1	2	2019-12-15	0
Edit Copy Delete	2	4	2020-03-22	1
Edit Copy Delete	3	3	2019-09-20	1
Edit Copy Delete	4	4	2019-10-19	1
Edit Copy Delete	5	4	2019-06-29	0
Edit Copy Delete	6	4	2019-08-05	1
Edit Copy Delete	7	2	2019-09-10	0
Edit Copy Delete	8	2	2020-01-15	1

Fig.5. Data loading completed for MembershipDetails Table

See some examples of data loaded into a selected group of FakeMovies database tables below:

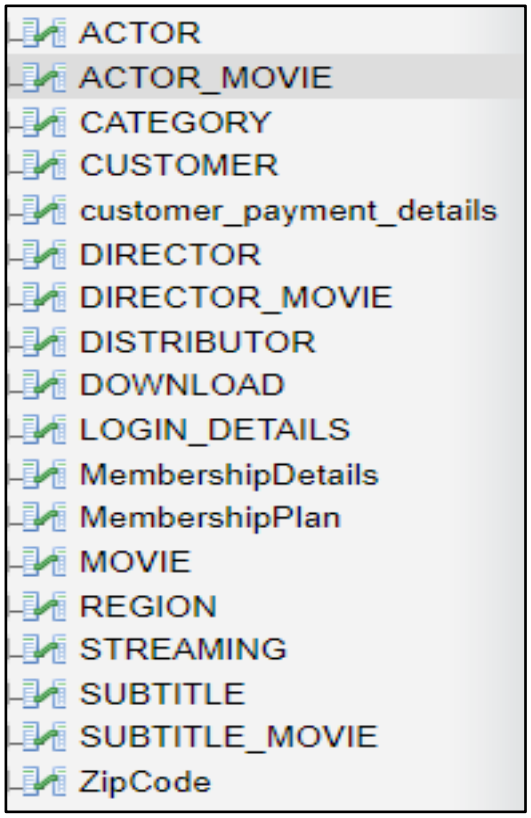


Fig. 6. FakeMovies Database Tables

MOVIE_ID	MOVIE_TITLE	MOVIE_LENGTH	MOVIE_RATING	CATEGORY_ID	MOVIE_YEAR
1	No Flesh Shall Be Spared	175	7.8	3	2013
2	Monterey Pop	190	6.6	9	1982
3	Father of the Bride Part II	81	4.9	1	1986
4	Chelsea Girls	143	8.6	2	2000
5	Good Morning, Vietnam	158	1.7	8	1989
6	Twins	117	2.5	2	1988
7	Godsend	117	2.0	14	1990
8	Spawn	66	2.6	12	1997
9	Little Mermaid: Ariel's Beginning, The	71	6.1	7	2019
10	Tickets	134	1.1	9	1980
11	La dama boba	98	1.1	12	2016
12	Closed Circuit	178	8.0	5	1988
13	Michael	105	5.3	13	1986
14	School Daze	152	1.3	3	1981
15	Independencia	176	8.9	12	2018
16	Secret, A (Un secret)	82	8.9	3	2007
17	Darling Lili	179	8.4	9	2020
18	Air Raid Wardens	106	9.8	3	2007
19	Day of the Falcon	72	4.8	13	2011
20	Guelwaar	127	8.7	12	2005
21	State Property	168	3.7	13	1985
22	Bambi Meets Godzilla	123	8.5	12	1985
23	A Run for Your Money	137	6.2	4	2011
24	Expect No Mercy	167	9.5	8	2001
25	Tevye	148	9.5	9	2010

Fig. 7. FakeMovies Database Movie Table

membershipTypeID	membershipType	membershipPrice	resolution	number_of_user
1	Platinum	19.95	UHD	4
2	Gold	12.99	HD	2
3	Basic	5.99	SD	1
4	Free	0.00	SD	1

Fig. 8. FakeMovies Database MembershipPlan Table

DIRECTOR_ID	DIRECTOR_FNAME	DIRECTOR_LNAME
1	D.W.	Griffith
2	Robert	Flaherty
3	Erich von	Stroheim
4	Buster	Keaton
5	Howard	Hawks
6	Josef Von	Sternberg
7	David	Hand
8	Victor	Fleming
9	George	Stevens
10	Ernst	Lubitsch
11	Orson	Welles
12	Michael	Curtiz
13	Vincetne	Minnelli
14	Edward	Dmytryk
15	Fritz	Lang
16	William	Wyler
17	Frank	Capra
18	Jacques	Tourneur
19	Robert	Rossen

Fig. 9. FakeMovies Database Director Table

CATEGORY_ID	CATEGORY_TYPE
1	Action
2	Animation
3	Comedy
4	Crime
5	Drama
6	Experimental
7	Fantasy
8	Historical
9	Horror
10	Romance
11	Science Fiction
12	Thriller
13	Western
14	Other

Fig. 10. FakeMovies Database Category Table

C. QUERIES/REPORTS GENERATED

Some of the queries developed were with the goal in mind of providing and extracting useful information for management. As mentioned before, the company is planning to implement data analytics thus, the need to retrieve data to generate input information for this new system to make more accurate predictions on the streaming industry trends.

One of the most important questions at FakeMovies was: what is the number of active memberships at any given time? The below figure shows the query designed by our team to answer this question.

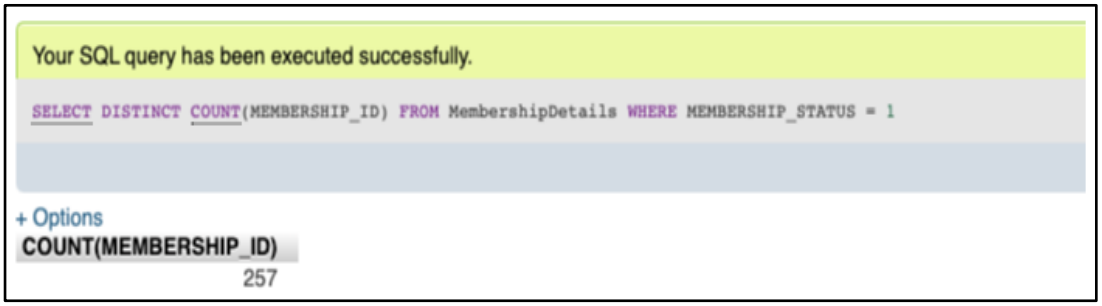


Fig. 11. FakeMovies Active Membership Query

Another question FakeMovies needed answered was: what is the number of active memberships since January 1st., 2020? From here, FakeMovies can compare the active number of members with the previous record for an estimation of loss/gain memberships. The below figure shows the query designed by our team to answer this question.

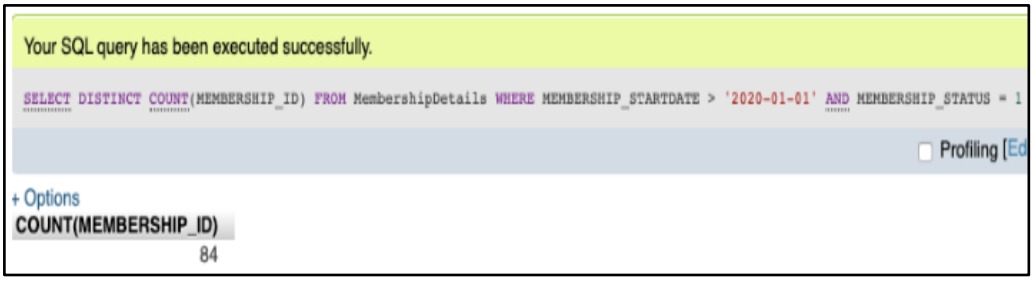


Fig. 12. FakeMovies Active Membership Since 01/01/2020 Query

Important as well for FakeMovies is to know the number of memberships by membership type in order to understand customers' preference for the membership pricing scheme. The below figure shows the query designed by our team to answer this question.

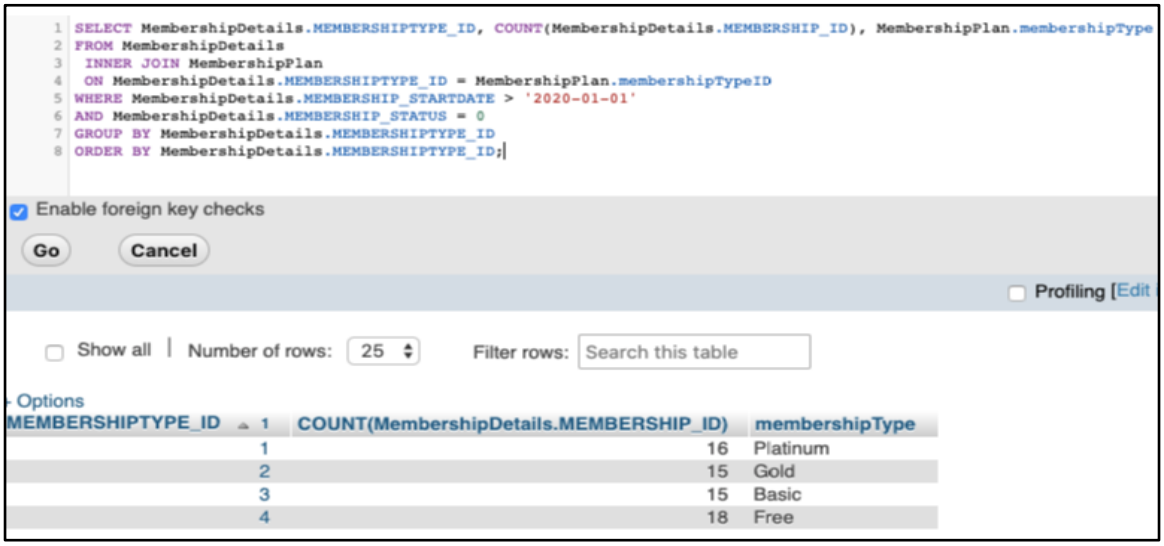


Fig. 13. FakeMovies Number of Membership by Membership Type Query

Knowing the top 10 movies streamed the most is very important to FakeMovies, as this will help determine which type of movies need an increase of content. This query needs to be executed periodically, as the movie trend has a seasonality component. Figure 9 shows the query designed by our team to answer this question.

```
1 SELECT STREAMING.MOVIE_ID,COUNT(STREAMING.STREAMING_ID), MOVIE.MOVIE_TITLE
2 FROM STREAMING INNER JOIN MOVIE ON STREAMING.MOVIE_ID = MOVIE.MOVIE_ID
3 GROUP BY STREAMING.MOVIE_ID
4 ORDER BY COUNT(STREAMING.STREAMING_ID) DESC
5 LIMIT 10
```

Enable foreign key checks

Go Cancel

Options

MOVIE_ID	COUNT(STREAMING.STREAMING_ID)	MOVIE_TITLE
2	20	Monterey Pop
3	20	Father of the Bride Part II
51	20	Private Function, A
36	18	Land That Time Forgot, The
45	18	Bridge to Terabithia
8	17	Spawn
81	17	Gatekeepers, The
75	17	Farewell My Concubine (Ba wang bie ji)
67	16	Biker Boyz
61	16	Voices

Fig. 14. FakeMovies Top 10 Movies Streamed Query

Being able to understand customers' preferences is a top priority for FakeMovies, looking into the data and learning which movie categories are the most liked will provide very useful information to act upon, when replenishing movie inventory. Like the top 10 Movies Streamed Query, this query needs to be executed periodically to accommodate customers' preference in time. With the mindset that FakeMovies will expand internationally in the future, the queries addressing customers' streaming trend per region are especially important. Figure 15 shows the query designed by our team to provide this information to the company.

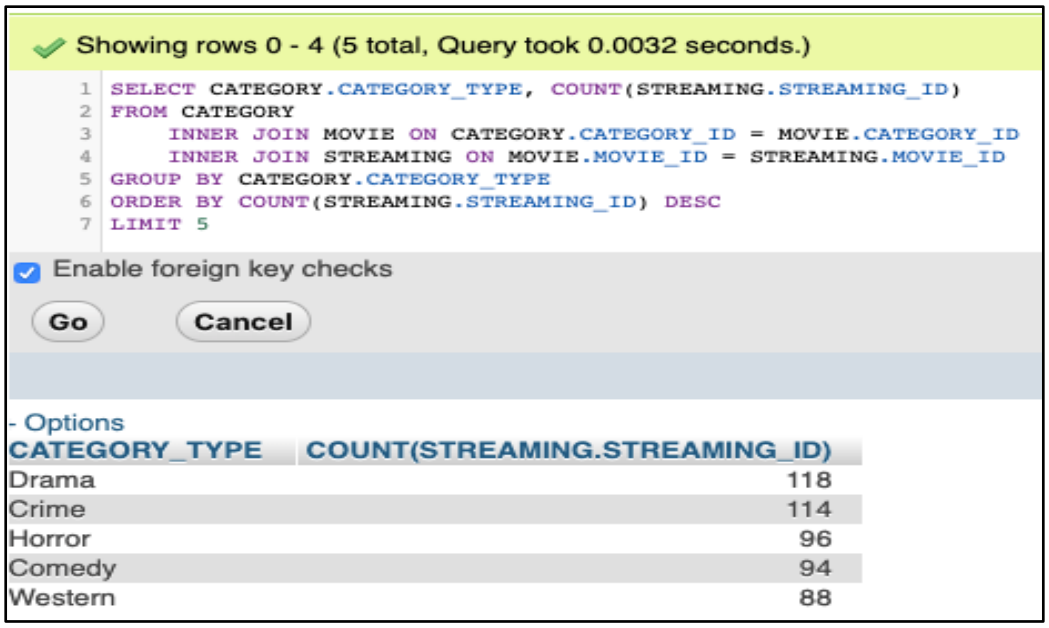
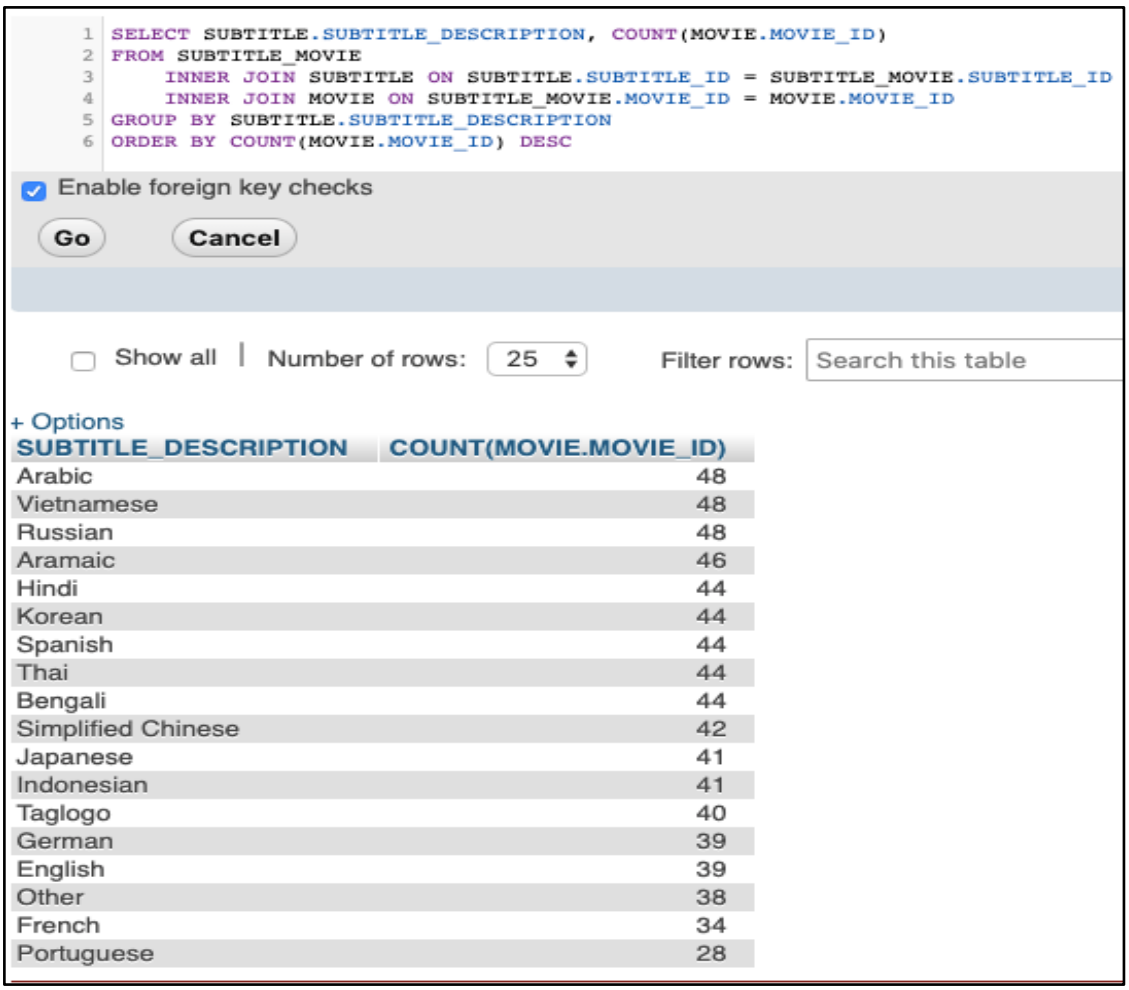


Fig. 15. FakeMovies Top 5 Movie Genre Query

Understanding the choices available for customers, regarding existing movies with foreign subtitles, is also important to know not only as the US market has a diverse customer base but also as the company is preparing to launch in the international market. Figure 16 shows the query designed by our team to answer this question.



```
SELECT SUBTITLE.SUBTITLE_DESCRIPTION, COUNT(MOVIE.MOVIE_ID)
FROM SUBTITLE_MOVIE
    INNER JOIN SUBTITLE ON SUBTITLE.SUBTITLE_ID = SUBTITLE_MOVIE.SUBTITLE_ID
    INNER JOIN MOVIE ON SUBTITLE_MOVIE.MOVIE_ID = MOVIE.MOVIE_ID
GROUP BY SUBTITLE.SUBTITLE_DESCRIPTION
ORDER BY COUNT(MOVIE.MOVIE_ID) DESC
```

Enable foreign key checks

Go Cancel

Show all | Number of rows: 25 Filter rows: Search this table

+ Options

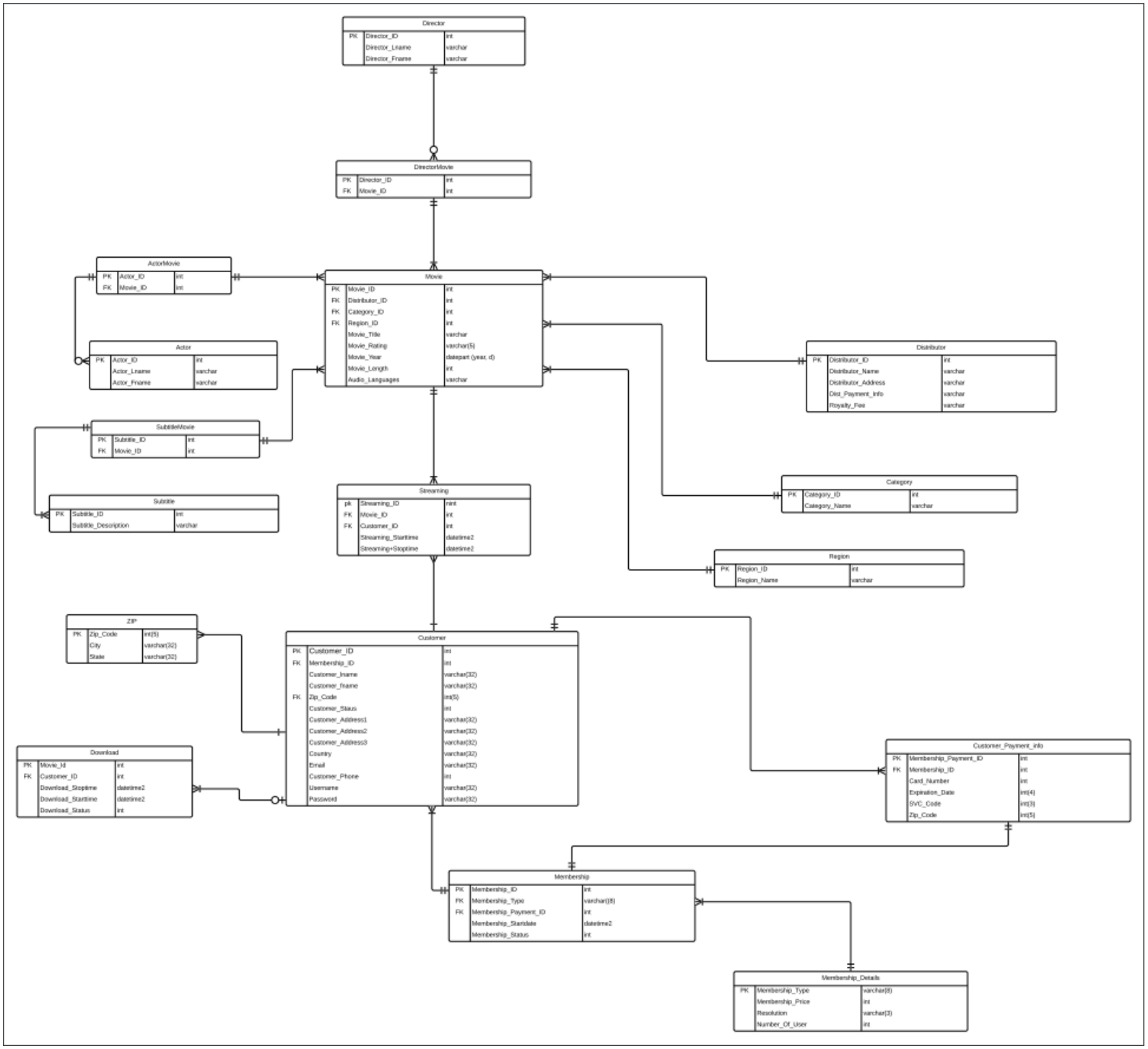
SUBTITLE_DESCRIPTION	COUNT(MOVIE.MOVIE_ID)
Arabic	48
Vietnamese	48
Russian	48
Aramaic	46
Hindi	44
Korean	44
Spanish	44
Thai	44
Bengali	44
Simplified Chinese	42
Japanese	41
Indonesian	41
Taglogo	40
German	39
English	39
Other	38
French	34
Portuguese	28

Fig. 16. FakeMovies Available Subtitles Query

Being able to project monthly revenue is an important piece of information that will allow the management team, and especially the Finance Department at FakeMovies plan for expenses and forecast revenues. Figure 17 shows the query designed by our team to answer this question.

Fig. 17. FakeMovies Estimates Monthly Revenue Query

FakeMovies ERD



FakeMovies Data Dictionary

DataDictionary Fake Movie Cloud Video Service

TABLE NAME	ATTRIBUTE NAME	CONTENTS	TYPE	FORMAT	RANGE	REQUIRE	PK OR FK	FK REFRENCED TA
MOVIES	MOVIE_ID	Unique Movie Identification ID	Integer(Unsigned(10)	##########	1 to 4294967295	Y	PK	
	MOVIE_TITLE	Movie Title	VARCHAR(50)	Xxxxxxxxxx	N/A	Y		
	MOVIE_LENGTH	Movie length	Time	HH:MM:SS	0:05:00'-'838:59:59'	Y		
	MOVIE_RATING	Movie Rating	VARCHAR(5)	XXXXX	G,PG, PG-13,R, NC-17	Y		
	CATEGORY_ID	Movie Category identification	SMALLINT(2)	##	1-99	Y	FK	CATEGORY
	MOVIE_YEAR	Movie Year of Production	SMALLINT(4)	####	1-9999	Y		
	AUDIO_LANGUAGES	Movie Audion language	VARCHAR(10)	XXXXXXXXX	N/A			
	DISTRIBUTER_ID	Distributer identification	SMALLINT(3)	###	1-999		FK	DISTRIBUTER
	REGION_ID	REGION IDENTIFICATION	Integer(Unsigned(10)	##########	1 to 4294967295	Y	FK	REGION
CATEGORY	CATEGORY_ID	Unique Movie Category identification ID	SMALLINT(2)	XX	1-99	Y	PK	
	CATEGORY_TYPE	Movie Category Type	VARCHAR(15)	XXXXXXXXXX	N/A	Y		
DIRECTOR	DIRECTOR_ID	Unique Director Identification ID	SMALLINT(5)	#####	1-65535	Y	PK	
	DIRECTOR_FNAME	Director First Name	VARCHAR(15)	XXXXXXXXXX	N/A	Y		
	DIRECTOR_LNAME	Director Last Name	VARCHAR(15)	XXXXXXXXXX	N/A	Y		
ACTOR	ACTOR_ID	Unique ACTOR Identification ID	Integer(Unsigned(10)	##########	1 to 4294967295	Y	PK	
	ACTOR_FNAME	Actor First Name	VARCHAR(15)	XXXXXXXXXX	N/A	Y		
	ACTOR_LNAME	Actor LastName	VARCHAR(15)	XXXXXXXXXX	N/A	Y		
DIRECTORMOVIE	DIRECTOR_ID	Unique Director Identification ID	SMALLINT(5)	#####	1-65535	Y	PK, FK1	DIRECTOR
	MOVIE_ID	Movie Identification	Integer(Unsigned(10)	##########	1 to 4294967295	Y	PK, FK2	MOVIES
ACTORMOVIE	ACTOR_ID	ACTOR Identification	Integer(Unsigned(10)	##########	1 to 4294967295	Y	PK, FK1	ACTOR
	MOVIE_ID	Movie Identification	Integer(Unsigned(10)	##########	1 to 4294967295	Y	PK, FK2	MOVIES
REGION	REGION_ID	REGION IDENTIFICATION	Integer(Unsigned(10)	##########	1 to 4294967295	Y	PK	
	REGION_NAME	REGION Name	VARCHAR(35)	XXXXXXXXXX	N/A	Y		
DISTRIBUTOR	DISTRIBUTER_ID	Distributer identification	SMALLINT(3)	###	1-999	Y	PK	
	DISTRIBUTER_NAME	DISTRIBUTER NAME	VARCHAR(20)	XXXXXXXXXX	N/A	Y		
	DISTRIBUTER_ADDRE	Distributer Address	VARCHAR(20)	XXXXXXXXXX	N/A	Y		
	DIST_PAYMENT_INFO	Distributor payment information	CHAR(1)	X	N/A			
	ROYALTY_FEE	Royalty fee for distributor	DECIMAL(6,2)	####.##	N/A			
SUBTITLE	SUBTITLE_ID	Unique Subtitle Identification ID	SMALLINT(3)	###	1-999	Y	PK	
	SUBTITLE_DESCRIPTIC	Subtitle Description	VARCHAR(15)	XXXXXXXXXX	N/A	Y		
SUBTITLEMOVIE	SUBTITLE_ID	Unique Subtitle Identification ID	SMALLINT(3)	###	1-999	Y	PK, FK	SUBTITLE
	MOVIE_ID	Movie Identification	Integer(Unsigned(10)	##########	1 to 4294967295	Y	PK, FK	MOVIES
STREAMING	STREAMING_ID	Unique Streaming identification ID	BIGINT(12)	##########	0-999999999999	Y	PK	
	MOVIE_ID	Movie Identification	Integer(Unsigned(10)	##########	1 to 4294967295	Y	FK	MOVIES
	CUSTOMER_ID	Customer Identification	Integer(Unsigned(10)	##########	1 to 4294967295	Y	FK	CUSTOMER
	STREAMING_STARTTI	Streaming Start Time	DATATIME	YYYY-MM-DD HH:MI	'1000-01-01 00:00:00' to	Y		
	STREAMING_STOPTIM	Stoping Stop Time	DATETIME	YYYY-MM-DD HH:MI	'1000-01-01 00:00:00' to			
ZIP	ZIP_CODE	Postal Zip Code	INTEGER(5)	#####	1-99999	Y	PK	
	STATE	State	VARCHAR(32)	XXXXXXXXXX	N/A	Y		
	CITY	City	VARCHAR(32)	XXXXXXXXXX	N/A	Y		
MEMBERSHIP_DETAIL:	MEMBERSHIP_TYPE	Membership Type	VARCHAR(8)	XXXXXXXX	N/A	Y	PK	
	MEMBERSHIP_PRICE	Membership Price	DECIMAL(5,2)	###.##	0.0-999.99	Y		
	RESOLUTION	Resolution	CHAR(3)	XXX		Y		
	NUMBER_OF_USER	Number aof user can use this membership	SMALLINT(1)	#	1-9	Y		
CUSTOMER	CUSTOMER_ID	Unique Customer Identification ID	Integer(Unsigned(10)	##########	1 to 4294967295	Y	PK	
	CUSTOMER_FNAME	Customer First Name	VARCHAR(32)	XXXXXXXXXX	N/A	Y		
	CUSTOMER_LNAME	Customer Last Name	VARCHAR(32)	XXXXXXXXXX	N/A	Y		
	ZIP_CODE	Postal Zip Code	INTEGER(5)	#####	1-99999	Y	FK	ZIP
	CUSTOMER_STATUS	CUSTOMER STATUS, Active, inactive, susp	SMALLINT(1)	#	1-9	Y		
	CUSTOMER_ADDRESS	Customer Address 1	VARCHAR(32)	XXXXXXXXXX	N/A	Y		
	CUSTOMER_ADDRESS	Customer Address 2	VARCHAR(32)	XXXXXXXXXX	N/A			
	CUSTOMER_ADDRESS	Customer Address 3	VARCHAR(32)	XXXXXXXXXX	N/A			
	COUNTRY	Country	VARCHAR(32)	XXXXXXXXXX	N/A	Y		
	EMAIL	Customer Email Address	VARCHAR(32)	XXXXXXXXXX	N/A	Y		
	CUSTOMER_PHONE	Customer Phone Number	CHAR(12)	XXX-XXX-XXXX	N/A	Y		
	USERNAME	Customer User Name	VACHAR(32)	XXXXXXXXXX	N/A	Y		
	PASSWORD	Customer Password	VACHAR(32)	XXXXXXXXXX	N/A	Y		

MEMBERSHIP	MEMBERSHIP_ID	Unique Membership Identification ID	BIGINT(12)	##########	0-999999999999	Y	PK	
	CUSTOMER_ID	Customer Identification	Integer(Unsigned(10)	##########	1 to 4294967295	Y	PK, FK	CUSTOMER
	MEMBERSHIP_TYPE	Membership Type	VARCHAR(8)	XXXXXXXX	N/A	Y	FK	MEMBERSHIP_DETAILS
	MEMBERSHIP_STARD	Membership Start date	DATE	YYYY-MM-DD	'1000-01-01' to '9999-12-3	Y		
	MEMBERSHIP_STATU	Membership Status	SMALLINT(1)	X	1-9	Y		
CUSTOMER_PAYMENT	MEMBERSHIP_PAYMI	Unique Membership payment identification ID	BIGINT(12)	##########	0-999999999999	Y	PK	
	MEMBERSHIP_ID	Membership Identification	BIGINT(12)	##########	0-999999999999	Y	FK	MEMBERSHIP
	CARD_NUMBER	Credit Card Number Used to pay the fee	BIGINT(12)	##########	0-999999999999	Y		
	EXPIRATION_DATE	Expiration Date of The Credit Card	SMALLINT(4)	####	0101-1299	Y		
	SVC_CODE	SVC Code of the Credit Card	SMALLINT(3)	###	000-999	Y		
	ZIP_CODE	Postal Zip Code	INTEGER(5)	#####	1-99999	Y	FK	ZIP
DOWNLOAD	MOVIE_ID	Movie Identification	Integer(Unsigned(10)	##########	1 to 4294967295	Y	PK, FK	MOVIES
	CUSTOMER_ID	Customer Identification	Integer(Unsigned(10)	##########	1 to 4294967295	Y	PK, FK	CUSTOMER
	DOWNLOAD_STARTTII	Download Start Time	DATATIME	YYYY-MM-DD HH:MI	'1000-01-01 00:00:00' to	Y		
	DOWNLOAD_STOPTIM	Download Stop Time	DATETIME	YYYY-MM-DD HH:MI	'1000-01-01 00:00:00' to			
	DOWNLOAD_STATUS	DownLoad Status, Completed, In Process, T	SMALLINT(1)	X				
LOGIN_DETAILS	LOG_ID	Unique log in identification	INT			Y	PK	
	CUSTOMER_ID	Customer Identification	INT(10)			Y	FK	CUSTOMER
	LOGIN_TIME	latest log in time	DATETIME			Y		
	LOGOUT_TIME	latest log-out time	DATETIME			Y		
	IP_ADRESS	latest IP used	VARCHAR(20)			Y		