

Flix2You Proposal



IST 210-005V

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Level 12 LLC

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Table of Contents

Executive Summary	1
Project Overview	3
Scope of Work	3
Project Management	5
Project Plan	5
Project Resources and Budget	6
User Analysis	7
Users	7
Database Access	8
Organization of Data	11
Existing database analysis – Identifying relationships	11
Existing database analysis – Normalization Approaches	13
Database Administration	18
Database Backup and Recovery	18
Data Access and Security	19
Database Dashboard and Analytics	22
Legal Issues	24
List of References	26

Executive Summary

Flix2You is facing a problem many business are beginning to face in this world of mass data. The business interacts with customers and reaps lots of data about sales,

purchases, and browsing habits of its users, but has not yet fully realized what it can do with the data in order to optimize business functions. The purpose of this document is to propose a solution to that problem.

For better use of the database, users would have different limitations toward the new database and different roles would have different responsibilities. We identified the various users with hierarchical database access.

To solve the problem, we analyzed the existing Entity Relationship Diagram that the Flix2You company already had. According to the changing business needs of the company, we advanced the diagram. Then, we used the normalized approach to create tables based on the new ERD we structured. As there is no transitive dependencies, we chose the third normal form (3NF). In addition, we used SQL statements to create tables, including primary keys and foreign keys referencing to related tables, and we inserted some sample data into these three tables. The new entity relationship is more functional and simpler.

The database administrator (DBA) has an important job and this plan helps to simplify it to its core. Instead of focusing on maintaining both the software and hardware aspects of the database we will be proposing that the database hardware is maintained by third party vendor, which will be Amazon Web Services in this proposal. This enables the DBA to focus on the database design and ease of data access for the employees and does not need to spend as much time on hardware maintenance and troubleshooting.

The DBA will also make use of Zoho Analytics to create a clean dashboard for users to access the data stored in the database. This dashboard is the link between the data stored in the database and the employees that require this data for their job, which is why the focus of the proposal is to give the DBA the most time making this clean and customized, instead of worrying about the uptime of the hardware.

In terms of access and security protective measures, Flix2You will utilize various best practice precautions such as multi-step encrypted passwords, firewalls, malware and anti-virus software, automatic log-outs, and least privilege. They will also backup their data in the cloud and have a detailed employee disclaimer, terms and conditions of use, website disclaimer, and privacy statement.

Project Overview

Scope of Work

Flix2You has found success in its field of renting movies to users, and through its years in business it has been gaining data about its sales and customer habits. The problem that Flix2You faces is having the ability to turn this data about their inventory and customers into usable information with which the company can use to make effective business decisions. The purpose of this proposal is to transform the existing database and analytic environment into something that can be used for years to come.

Flix2You has an existing database that is currently being used. However the current database did not match the ambition of the company. Flix2You is looking forward to provide more download through its website and include video games and apps in the future. The database ERD needed to be reorganized and redesigned to indicate the new relationships that can exist between instances of those entity types.

Currently Flix2You runs an in house server and database that employees are not too familiar with. The current database design also makes it somewhat difficult to reap the information that you wish to understand. The new system will need a better database design that enables users to query the information they need for their specific role in the company.

A new personnel that the company is going to require in order to make good use of their data is a database administrator as well. Flix2You is then faced with the problem of understanding what type of person to hire and what roles and responsibility they will take on. In this proposal we hope to minimize the extra responsibilities for the administrator to face, so they can focus on the core task of presenting the company with dense and rich information with which to make decisions.

Flix2You is also facing scalability concerns. The company is getting 20,000 daily hits to the website already and that may increase in the future. There was also the prospect of adding games and apps for download to the services provided. This requires that our solution to the problem not only be effective in the current environment, but also be able to be scaled as the company grows to a larger size.

One important aspect of carrying this proposal into a successful project is the project management. In order for this project of upgrading current data systems to be cost effective, the project needs to be carried out in a methodical manner. With a pre proposed timeline, budget, resources, and personnel that are going to be used to

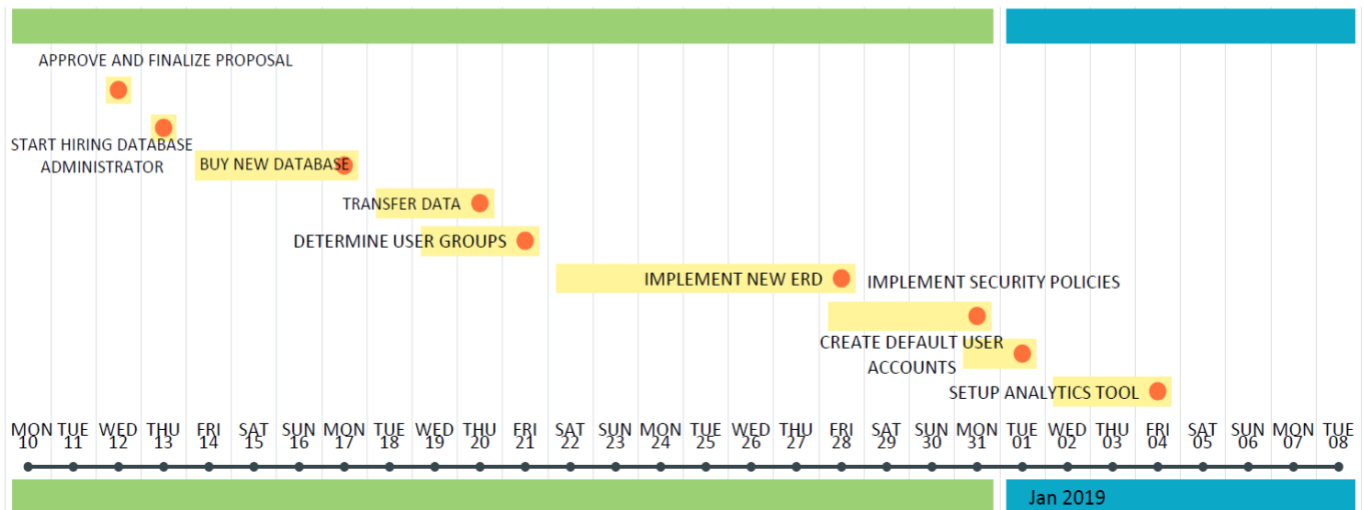
implement the project we hope to help provide a good direction for the project manager to go.

To help the employees understand the relationship and connection between customer and product, a database dashboard is necessary for the Flix2You company to represent their data through visual analysis and become a clear form that is easy to understand. Employees can use the database dashboard to visually track, analyze, and display key performance indicators, metrics, and key data points to monitor the health of the business, department, or specific process.

Project Management

Project Plan

PROJECT TIMELINE



ENTER START DATE: 12/10/2018

ACTIVITY	START	END	NOTES
Approve and Finalize Proposal	12/12/2018		Finish reviewing proposal needs and finalizing tasking required. Start the project at this point.
Start Hiring Database Administrator	12/13/2018		Since this will take the largest and is perhaps the most important task this should be started first.
Buy New Database	12/14/2018	12/17/2018	Purchase Relational Database plan from Amazon Web Services
Transfer Data	12/18/2018	12/20/2018	Migrate data from existing server to AWS. This will be migrated to a copy of the existing table structure.
Determine User Groups	12/19/2018	12/21/2018	Determine user groups and permissions needed. A preliminary analysis has already been completed.
Implement New ERD	12/22/2018	12/28/2018	Create the new table structure in the AWS database. Then transfer data from the old tables to the new ones.

ACTIVITY	START	END	NOTES
Implement Security Policies	12/28/2018	12/31/2018	Set up security policies using user group analysis.
Create default user accounts	12/31/2018	1/1/2019	Create default user account and permissions based off implemented security policies.
Setup Analytics Tool	1/2/2019	1/4/2019	Purchase a plan from Zoho Analytics to use their data visualization software.
Create User Views	1/4/2019		Create custom views on Zoho for the different users using the system.
Create pipeline for analytics	1/4/2019	1/7/2019	Test out whether plugging the AWS database to Zoho or creating the viz through SQL data would be better and implement that plan.
Finalize Legal Disclaimers	1/1/2019	1/8/2019	Finish reviewing legal disclaimer with a legal professional.
Project End	1/8/2019		Everything should be finalized with just the need for a DBA to be hired. The proposal team will be done setting up the new database environment.

Project Resources and Budget

The database administrator uses specialized software to store and organize data. We need a DBA who has sufficient skills in SQL and can collect the information to export it to the database for the users to access. Their role includes capacity planning, installation, configuration, database design, security, as well as backup and data recovery. A database administrator has an average hourly pay of 39.29 USD. Since we are hiring them annually, we can calculate their price for 261 working days which would be **261*39.29*8= \$82,037.52**.

We need a third party to have our backup support for which we use the Amazon web services which typically cost us **\$1-3 per month**. The database instances range from **4 cents an hour to 9.30 an hour** for the largest version. This allows for scalability and the company would probably want to go for pricing at 6 cents per hour per 2GB of memory.

To prevent a leak of security, only the people with a valid username and password can access the data and hence they will be requiring a two step authentication process. This is free and can be downloaded on their mobile phones. We also need the authorized personnel to enter the door with a certified card they are given. We need malware software to protect the computer from viruses. This will cost about **\$40 per year**. For further protection we need to buy antivirus software Norton which cost about **\$30-50** to protect from basic viruses and hackers intrusion. These need to be renewed annually. Further Flix2You uses encryption, firewalls, military-grade backup, multi-step logins, and many more best practices to secure user's information.

We need Backblaze to backup the data in the cloud and to have a detailed employee disclaimer. Backblaze costs about **\$50 per computer** for unlimited backup storage, with a five computer minimum. The organization employs 50 employees out of which 12 are upper-level management and administrative support, 18 are mid-level management and 20 are hourly employees working in warehousing and logistics. The users of the upper level management will be human resources, marketing, and communication. The mid-level management will include customer service, marketing, and product and transportation team management. The users who are on an hourly wage are the product and the transportation teams.

We will allow a refund to the users who cannot see any media content, but if the site is down for a small period of time, say one hour in a month, no refunds are made. If a user dislikes the movie they selected or did not watch it in their allotted rental time frame, there will be no refund or exchange made for them. All the pricing done will be made in U.S. currency (dollars) and only dollars will be accepted as payment, either via check, debit, or credit card and we will accept American Express, MasterCard, Visa, and Discover.

The cost of setting up everything will :

- Database of latest version: $\$ 0.15 \times 730 = \109.5 .
- Amazon Web Services: \$3 /month
- Malware software : \$40/year
- Antivirus software (Norton): \$30
- Backblaze for software backup: \$50/computer

The average cost of the DBA: \$854.55/month (21.75 working hours*39.29)

User Analysis

Flix2You company currently has 50 employees.

- 12 employees are upper-level management and administrative support.
- 18 are mid-level management
- 20 are hourly employees working in warehousing and logistics.

The purpose of using a database is for better understanding data, which means employees from different departments should have different limited access to the database.

Users

- Visitor: Only visiting

- Customer: Have a account and has the potential to purchase products
- Database administrative personnel: Security and manage the entire database.
- Upper level management: General Counsel
- Upper level management: HR
- Upper level management: Marketing and Communication
- Mid level management: Customer services
- Mid level management: Marketing
- Mid level management: Product & transportation team management
- Hourly employees: Product & transportation teams

Database Access

Every user should definitely not access the same information, for the security and safety of company information consideration. Users should only have access to information that directly relates to their job function and nothing more, utilizing the principle of least privilege.

User's View Access

	A Name	Headshot	Can Access
1	DB Administrative personal		Entire Database
2	Upper: General Counsel		Entire Database
3	Upper: HR		Delivery_Detail Game Movie Apps
4	Upper: Marketing and Communication		Entire Database
5	Mid: Customer Services		Customer Delivery_Detail Membership Delivery Payment_Methods Account_Information Financial_Transactions Customer_Rentals Customer_Rental_Contents
6	Mid: Marketing		Entire Database
7	Mid: Product & Transportation team managem...		Entire Database
8	Hourly: warehousing and logistics		Customer Delivery_Detail Membership Delivery Financial_Transactions Customer_Rentals Customer_Rental_Contents Game Movie Apps
9	Customer		Membership Customer Delivery_Detail Delivery Payment_Methods Account_Information Search_History Actor Game Media Movie_Cast Movie Apps
10	Visitor		Actor Game Media Movie_Cast Movie Apps

User's Edit Access

	A Name	He...	Can Edit
1	DB Administrative personal		Entire Database
2	Upper: General Counsel		Customer Payment_Methods Account_Information Customer_Rentals Game Media Movie Apps
3	Upper: HR		None
4	Upper: Marketing and Communication		Customer Delivery Delivery_Detail Membership Account_Information Payment_Methods Financial_Transactions Customer_Rentals Customer_Rental_Contents Game Media Movie_Cast Movie Apps
5	Mid: Customer Services		Financial_Transactions Delivery_Detail Delivery Membership Customer Payment_Methods Account_Information Customer_Rental_Contents Customer_Rentals
6	Mid: Marketing		Actor Game Media Movie_Cast Movie Apps
7	Mid: Product & Transportation team management		Customer Delivery_Detail Membership Delivery Account_Information Customer_Rentals Customer_Rental_Contents
8	Hourly: warehousing and logistics		Customer_Rentals Delivery_Detail Delivery
9	Customer		Membership Customer Payment_Methods Account_Information Customer_Rental_Contents Customer_Rentals
10	Visitor		None

User Org. Chart



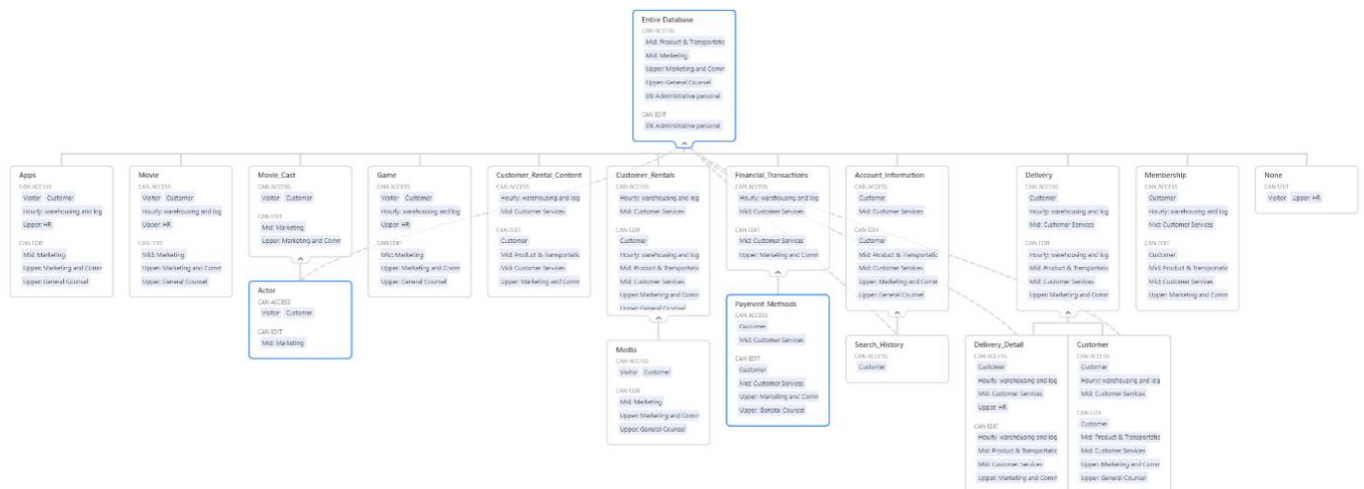
For Entity Can View

	Name	Can Access
DEPARTMENT	Count 17	
1	Apps	Visitor Customer Hourly: warehousing and logistics Upper: HR
2	Movie	Visitor Customer Hourly: warehousing and logistics Upper: HR
3	Movie_Cast	Visitor Customer
4	Media	Visitor Customer
5	Game	Visitor Customer Hourly: warehousing and logistics Upper: HR
6	Actor	Visitor Customer
7	Search_History	Customer
8	Customer_Rental_Contents	Hourly: warehousing and logistics Mid: Customer Services
9	Customer_Rentals	Hourly: warehousing and logistics Mid: Customer Services
10	Financial_Transactions	Hourly: warehousing and logistics Mid: Customer Services
11	Account_Information	Customer Mid: Customer Services
12	Payment_Methods	Customer Mid: Customer Services
13	Delivery	Customer Hourly: warehousing and logistics Mid: Customer Services
14	Membership	Customer Hourly: warehousing and logistics Mid: Customer Services
15	Delivery_Detail	Customer Hourly: warehousing and logistics Mid: Customer Services Upper: HR
16	Customer	Customer Hourly: warehousing and logistics Mid: Customer Services
17	Entire Database	Mid: Product & Transportation team management Mid: Marketing Upper: Marketing and Communication Upper: General Counsel DB Administrative personal

For Entity Can Edit

	A Name	Can Edit
DEPARTMENT	Count 17	
1	Apps	Mid: Marketing Upper: Marketing and Communication Upper: General Counsel
2	Movie	Mid: Marketing Upper: Marketing and Communication Upper: General Counsel
3	Movie_Cast	Mid: Marketing Upper: Marketing and Communication
4	Media	Mid: Marketing Upper: Marketing and Communication Upper: General Counsel
5	Game	Mid: Marketing Upper: Marketing and Communication Upper: General Counsel
6	Actor	Mid: Marketing
7	Search_History	
8	Customer_Rental_Content	Customer Mid: Product & Transportation team management Mid: Customer Services Upper: Marketing and Communication
9	Customer_Rentals	Customer Hourly: warehousing and logistics Mid: Product & Transportation team management Mid: Customer Services Upper: Marketing and Communication Upper: General Counsel
10	Financial_Transactions	Mid: Customer Services Upper: Marketing and Communication
11	Account_Information	Customer Mid: Product & Transportation team management Mid: Customer Services Upper: Marketing and Communication Upper: General Counsel
12	Payment_Methods	Customer Mid: Customer Services Upper: Marketing and Communication Upper: General Counsel
13	Delivery	Hourly: warehousing and logistics Mid: Product & Transportation team management Mid: Customer Services Upper: Marketing and Communication
14	Membership	Customer Mid: Product & Transportation team management Mid: Customer Services Upper: Marketing and Communication
15	Delivery_Detail	Hourly: warehousing and logistics Mid: Product & Transportation team management Mid: Customer Services Upper: Marketing and Communication
16	Customer	Customer Mid: Product & Transportation team management Mid: Customer Services Upper: Marketing and Communication Upper: General Counsel
17	Entire Database	DB Administrative personal

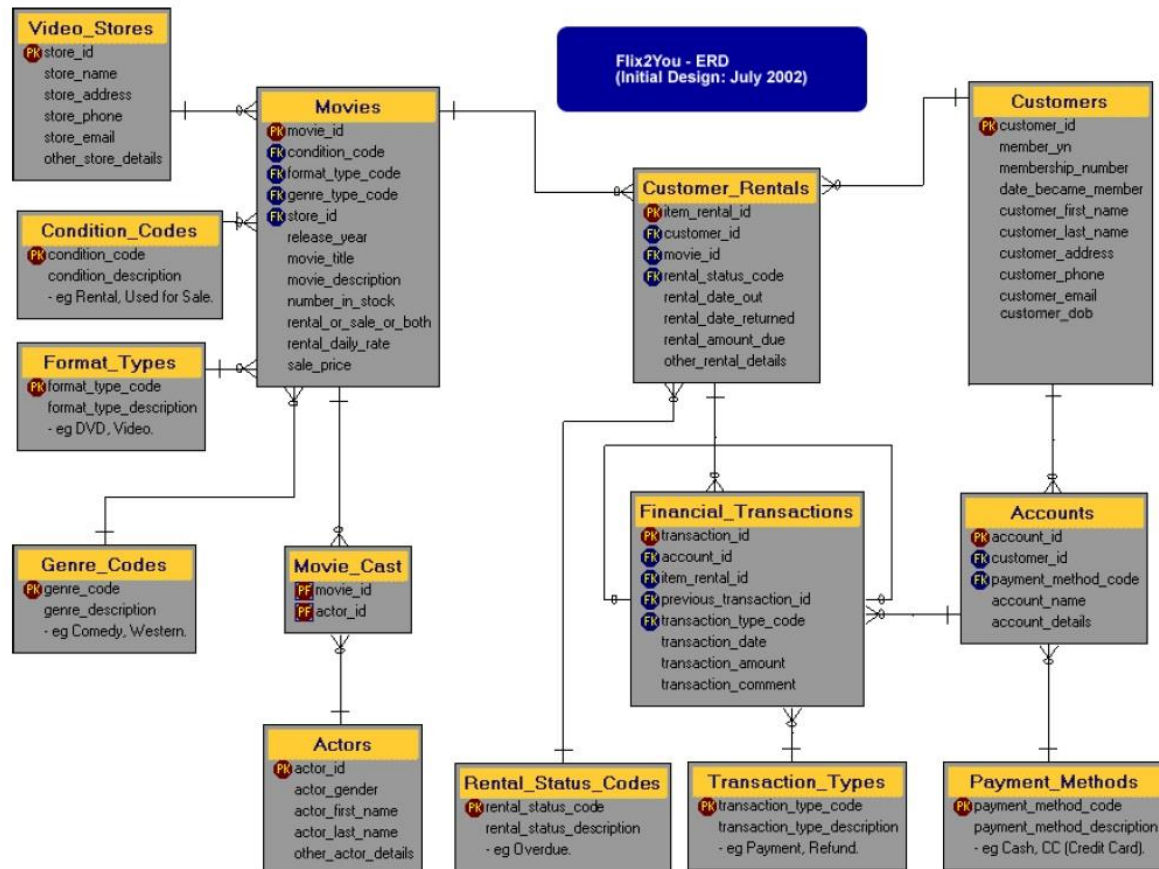
Entity Org. Chart



Organization of Data

Existing database analysis – Identifying relationships

The existing database schema



The relationships between these entities

One video store can have many movies, and each movie can be rented, used, or for sale. Each movie has a different type (DVD, Video), and each movie belongs to a different genre (Comedy, Western, etc.).

Different movies have different actors, and different actors perform in different movies.

One movie can have many actors, and one actor can occur in many movies.

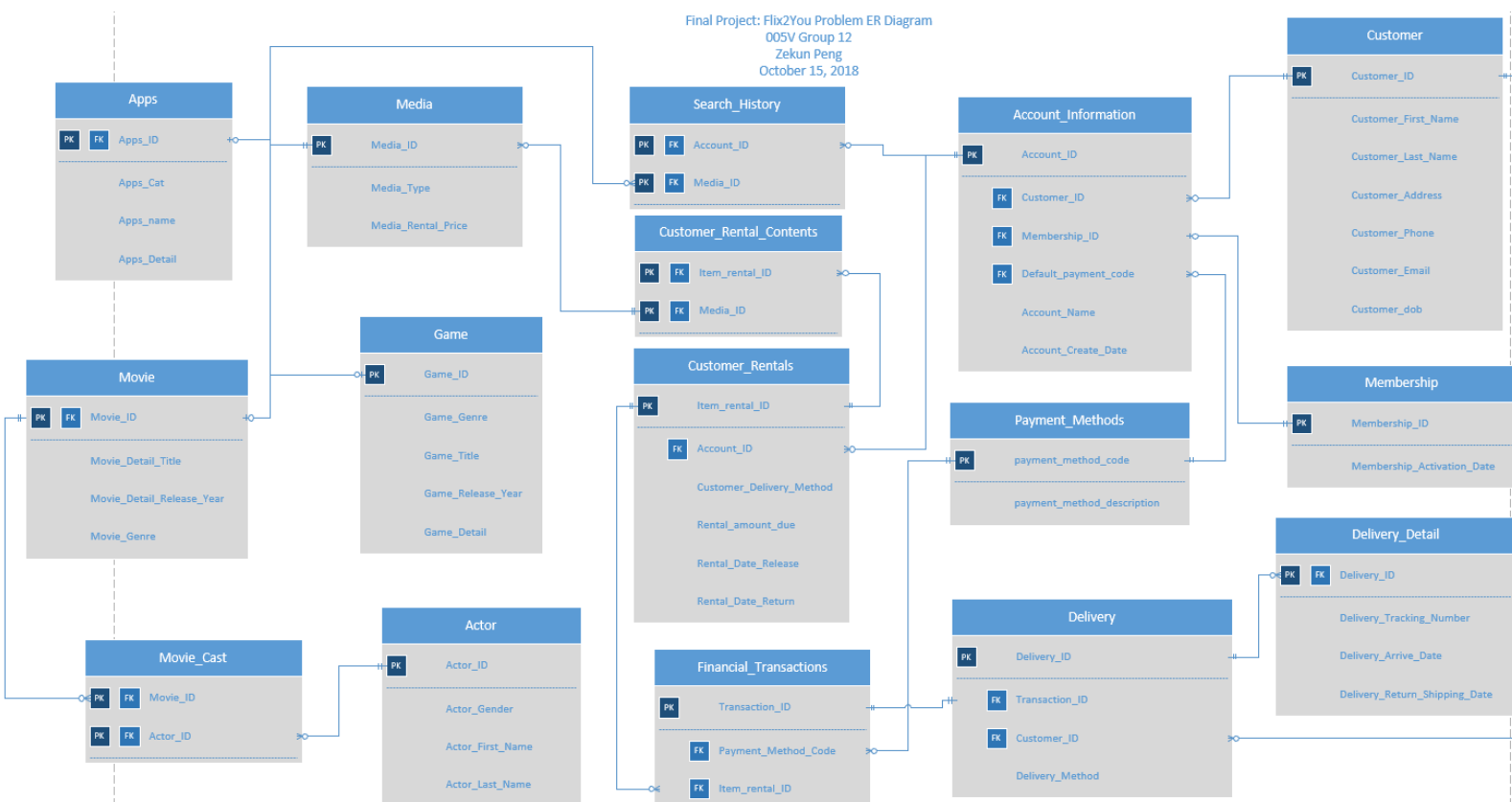
Customers are able to borrow movies using their accounts. One can borrow many movies each time, and the customer can borrow many times as long as the previous rental status is not overdue.

Each customer can use different payment methods to borrow movies, such as cash or cards.

Once the payment is done, the transaction record will occur in the system.
If one returns the movie within a certain number of days, the customer will get a refund, and the transaction also will be recorded.

One customer can have several accounts, and each account records the customer's name, contact information, and the date they became a member. The rental system records the rental date, the rental status, and the financial transactions.

There are fourteen tables and with one to many relationships to others in the schema. However, the relationships are redundant and some foreign keys are unnecessary. We advanced the schema. Here is the new ERD.



Since the company closed its brick and mortar locations, we deleted the Video_Store table and some irrelevant entities. Considering that Flix2You rents and sells movies online, we added the Delivery_Detail table and the Delivery table to track the delivery status. In addition, as the company anticipates offering more downloads via its website,

including video games and apps, we added the Apps table, the Game table, and the Media table.

The Movie table is no longer the main part of the diagram, but only is similar with the Apps table and the Game table. These three tables are belong to the Media table, each Media_ID corresponds to each Apps_ID, Game_ID, or Movie_ID. The Movie_cast table and the Actor table remain, but the tables such as Condition_Code, Format_Type, and Genre_Codes were deleted. These functions are not necessary to exist as tables, so we put them under other tables as small part of entities. Similarly, we deleted the Rental_Status_Codes table and combined such functions under other tables.

Since one of Flix2You's major concerns is to understand who is coming to its site and what movies or what types of downloads would be good, we added the Search_History table connecting the Account_Information table and the Media table. The company will be able to record every customer's search history and understand what media they like better.

We added one new table, Membership, related to the Account_Information table, and we added the Customer_Rental_Contents table connected with the Customer_Rentals table and the Media table. It is more convenient for the company to track customers' rental details.

The new schema has sixteen tables. It contains some new functions such that it allows Flix2You to sell and rent movies, video games, and apps online, and it allows the company to record customers' searching history and track their delivery details.

Existing database analysis – Normalization Approaches

3rd Normal Forms:

Table name: Apps

Apps(Apps_ID, Apps_Cat, Apps_name, Apps_Detail)

Final Project: Flix2You Problem 3rd Normal Form
005V Group 12
Yuan Meng
November 05, 2018

Table name: Media

Media(Media_ID, Media_Type, Media_Rental_Price)

<u>Apps_ID</u>	Apps_Cat	Apps_name	Apps_Detail
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<u>Media_ID</u>	Media_Type	Media_Rental_Price
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Table name: Movie

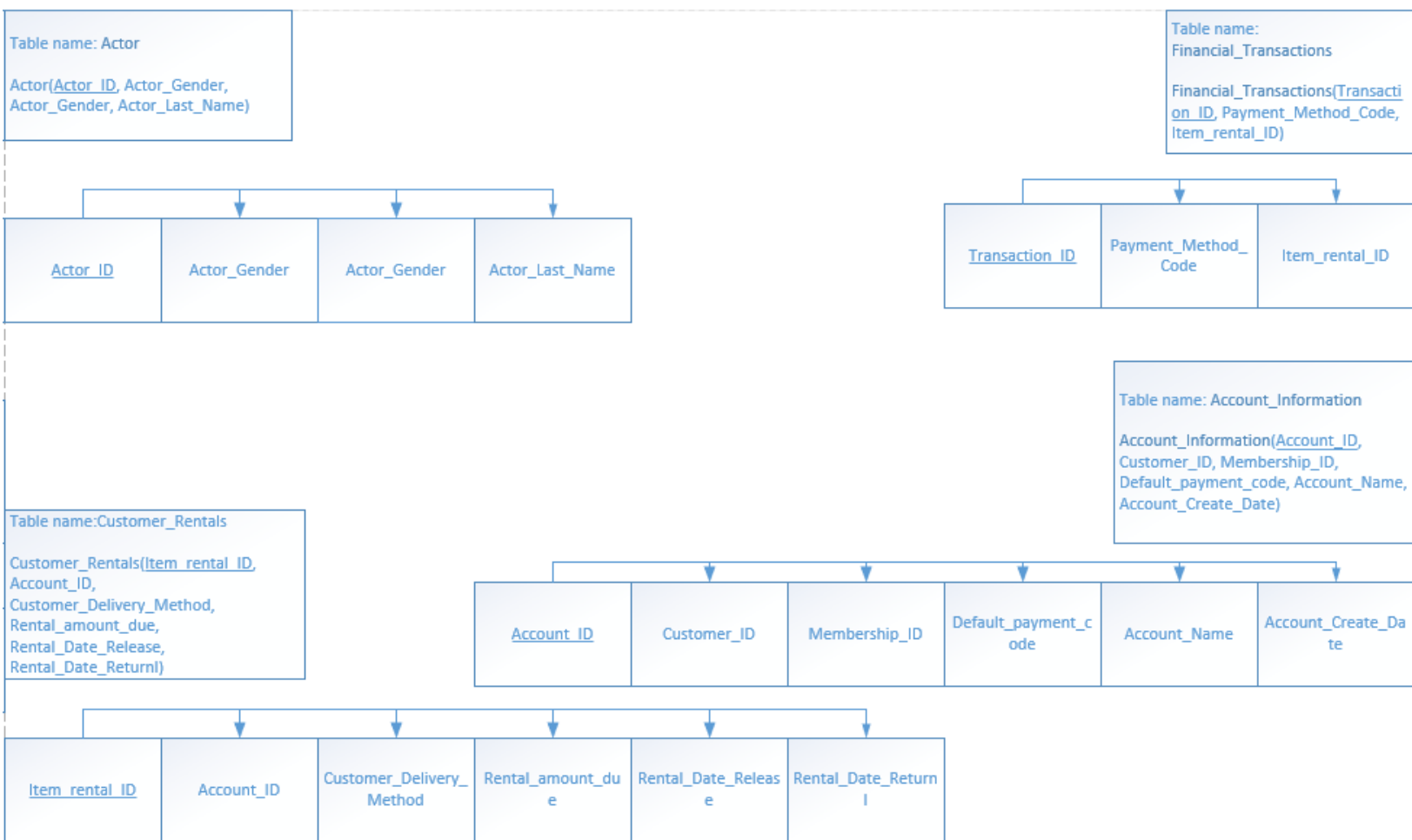
Movie(Movie_ID, Movie_Detail_Title, Movie_Detail_Release_Year, Movie_Genre)

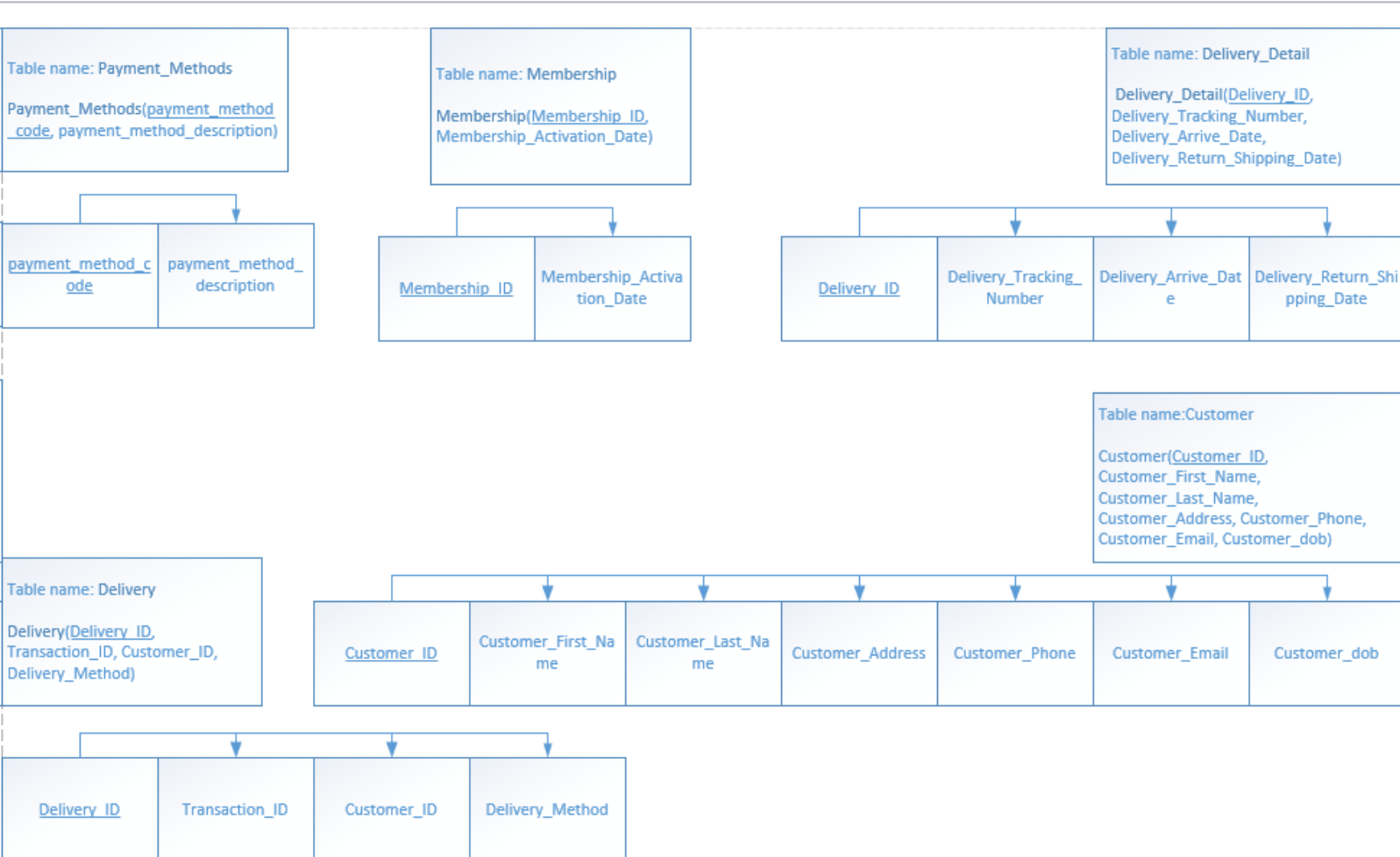
Table name: Game

Game(Game_ID, Game_Genre, Game_Title, Game_Release_Year, Game_Detail)

<u>Movie_ID</u>	Movie_Detail_Title	Movie_Detail_Release_Year	Movie_Genre
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<u>Game_ID</u>	Game_Genre	Game_Title	Game_Release_Year	Game_Detail
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We used third normal form because there is no transitive dependencies.

SQL statements

```
/* create tables */
```

```
/* Media */
```

```
CREATE TABLE Media(
    Media_ID int NOT NULL,
    Media_Type varchar(128) NOT NULL,
    Movie_Rental_Price money NOT NULL);
```

```
/* Apps */
```

```
CREATE TABLE Apps(
    Apps_ID int NOT NULL,
    Apps_Cat varchar(128) NOT NULL,
    Apps_name varchar(128) NOT NULL),
```

```

        Apps_Detail varchar(1024) NOT NULL;
/* Movie */
CREATE TABLE Movie(
    Movie_ID int NOT NULL,
    Movie_Detail_Title varchar(128) NOT NULL,
    Movie_Detail_Release_Year date NOT NULL),
    Movie_Genre varchar(128) NOT NULL;
/* Game */
CREATE TABLE Game(
    Game_ID int NOT NULL,
    Game_Genre varchar(128) NOT NULL,
    Game_Title varchar(128) NOT NULL,
    Game_Release_Year date NOT NULL),
    Game_Detail varchar(1024) NOT NULL;
/* create primary keys */
ALTER TABLE Media ADD CONSTRAINT pk_Media PRIMARY KEY (Media_ID);
ALTER TABLE Apps ADD CONSTRAINT pk_Apps PRIMARY KEY (Apps_ID);
ALTER TABLE Movie ADD CONSTRAINT pk_Movie PRIMARY KEY (Movie_ID);
ALTER TABLE Game ADD CONSTRAINT pk_Game PRIMARY KEY (Game_ID);
/* end of primary key creation */
/* create foreign keys */
ALTER TABLE Apps ADD CONSTRAINT fk_Apps FOREIGN KEY(Apps_ID)
REFERENCES Media (Media_ID);
ALTER TABLE Movie ADD CONSTRAINT fk_Movie FOREIGN KEY(Movie_ID)
REFERENCES Media (Media_ID);
ALTER TABLE Game ADD CONSTRAINT fk_Game FOREIGN KEY(Game_ID)
REFERENCES Media (Media_ID);
/* Insert sample data for table Media */
INSERT INTO Media VALUES (1676, 'Movie', 4.99);
INSERT INTO Media VALUES (112, 'Movie', 0.99);
INSERT INTO Media VALUES (90981, 'Game', 58.99);
INSERT INTO Media VALUES (80234, 'Game', 27.00);
INSERT INTO Media VALUES (5001, 'App', 2.50);
INSERT INTO Media VALUES (5003, 'App', 1.99);
/* Insert sample data for table Apps */
INSERT INTO Apps VALUES (5001, 'Education', 'DNA Play', 'This app allows you to
create your own funny monsters and transform them in real-time buy building and
tweaking their DNA. ');
INSERT INTO Apps VALUES (5003, 'Productivity', 'Forest-Stay focused', 'This app

```

```

allows you to stay focused with the cutest gamified pomodoro timer.');
```

```

/* Insert sample data for table Movie */
INSERT INTO Movie VALUES (1676, 'Avengers: Infinity War', '08/14/2018', 'Action');
INSERT INTO Movie VALUES (112, 'The Adventures of Pluto Nash', '12/24/2002',
'Adventure');
/* Insert sample data for table Game */
INSERT INTO Game VALUES (90981, 'Action-adventure', 'The Legend of Zelda:
Breath of the Wild', '03/03/2017', 'This video game let you explore the wilds of Hyrule
any way you like—anytime, anywhere! You'll battle towering enemies, hunt wild beasts
and gather ingredients for the food and elixirs you'll make to sustain you on your
journey.');
```

```

INSERT INTO Game VALUES (80234, 'Action role-playing', 'Assassin's Creed
Odyssey', '10/05/2018', 'LEGENDARY SPARTAN HERO Embark on your journey from
outcast to legendary Spartan hero. ANCIENT GREECE AWAITS Explore an entire
country full of unexpected encounters in untamed environments and bustling ancient
cities.');
```

```

/* END OF SCRIPT */
```

Database Administration

For personnel it is important that a database administrator with the proper skills is employed. For our proposal, the database administrator would need to know the design/layout of the database, the ability to query information via SQL, and aggregate information to export to the database dashboard for users to access. Since we are going with third party options for both database backup and database dashboard option, the Database Administrator will need effective communication skills to talk to these third party vendors in the case services go down or other support is required.

The two priorities for the administrator is uptime of the database and effective aggregation of information within the database to the database dashboard. This calls for a largely software role. This DBA (database administrator) will not have to interact with any physical hardware. Instead with third party options the administrator can focus on implementing the database design and properly aggregating information to present to database users, which is the main goal of this project.

Database Backup and Recovery

In order to outsource the work concerning hardware systems, we are proposing that the Flix2You company employs the use of Amazon Web Services. With this method, all uptime and hardware support is done through Amazon and they historically have good

uptime and support. This is also a very scalable and cost-effective option. Since it is not imperative that the data is housed in house, having it hosted on AWS only requires the company to pay for the traffic and storage that it uses and upkeep costs and investment in the hardware itself is not needed.

Through AWS Flix2You would use Amazon's Aurora services. The Aurora service is a cloud-based MySQL or PostgreSQL server that has support for migration from Microsoft SQL servers, which Flix2You currently employs. The database instances range from 4 cents an hour to 9.30 an hour for the largest version. This allows for scalability and the company would probably want to go for the serverless pricing at 6 cents per hour per 2GB of memory. One of the best parts of this plan is Amazon handles the database backup itself, which is included in every Aurora plan. With 6 copies across 3 different availability zones it is highly unlikely the data will ever be lost.

One important aspect to note when using the Aurora database plan is the aspect of security. Usually when using third party vendors, you lose customizability of security, but with the Aurora service all database instances are created through Amazon Virtual Private Cloud. With the private cloud the database administrator can set many security settings to determine who is able to access the database, so security knowledge would also be important when deciding on who to employ as the database administrator, but not the most important, since all other aspects of security is handled by Amazon itself. This is a nice compromise between giving away security options when using third party services and complete control and responsibility of the database.

Although there are some physical resources being used including a physical database and an IT service, moving to a third-party vendor would not be a large waste of resources. The physical database could be used as a backup as well if we wish to do so, and the IT company does not already have an intimate knowledge of the existing database, so we are not wasting any prior experience or knowledge of the existing system either.

Insertion and updating of data in this database option would work the same as an in house database. Data can be inserted and update via SQL queries, and with parallel queries and database snapshots, there is minimized risk of encountering data corruption or deadlock when updating the database. This essentially means the process of adding database as traffic through the site occurs can happen in real time.

Data Access and Security

In order to secure the database so only people with a valid username and password can access the data, we will require a two step authentication process. This means that

users will have to login with both a username and password, as well as answer a security question. Employees of Flix2You will also need a physical access card to be able to edit the database. This will help prevent unauthorized users from accessing the database. Furthermore, passwords must be at least eight characters long, must include an uppercase letter, lowercase letter, at least one number, and at least one special character (ex. !@\$%^&*). In addition, passwords must be changed at least every six months. Three incorrect log-in attempts will freeze the account. For all employee computers, there will be an automatic log-out after three minutes of inactivity. It will be company policy to lock one's workstation if they are leaving their computer for any reason. Employees will not be permitted to edit the database offsite or in their homes. One last security measure is that Flix2You will enforce the concept of least privilege. Employees will only have access to the data that is absolutely necessary to perform their job responsibilities, nothing more. For example, an employee who uploads new movie content will not have access to customer names, phone numbers, or addresses because this information is not essential to his/her function. These are common best practices for database security (New York University, 2017).

Flix2You should encrypt all of their data and web access, which will be done through the amazon web service platform. All company computers will have malware protection and anti-virus software to help protect against hackers. These softwares will perform automatic updates when necessary to ensure they are always functioning at maximum effectiveness. Flix2You will perform regular audits to see if someone could easily hack into the database (New York University, 2017). In addition, Flix2You will separate the database server from the website server. This is an added layer of protection because even if a hacker is able to access the web server account, they still will not have access to the database (Nordic Backup, 2018).

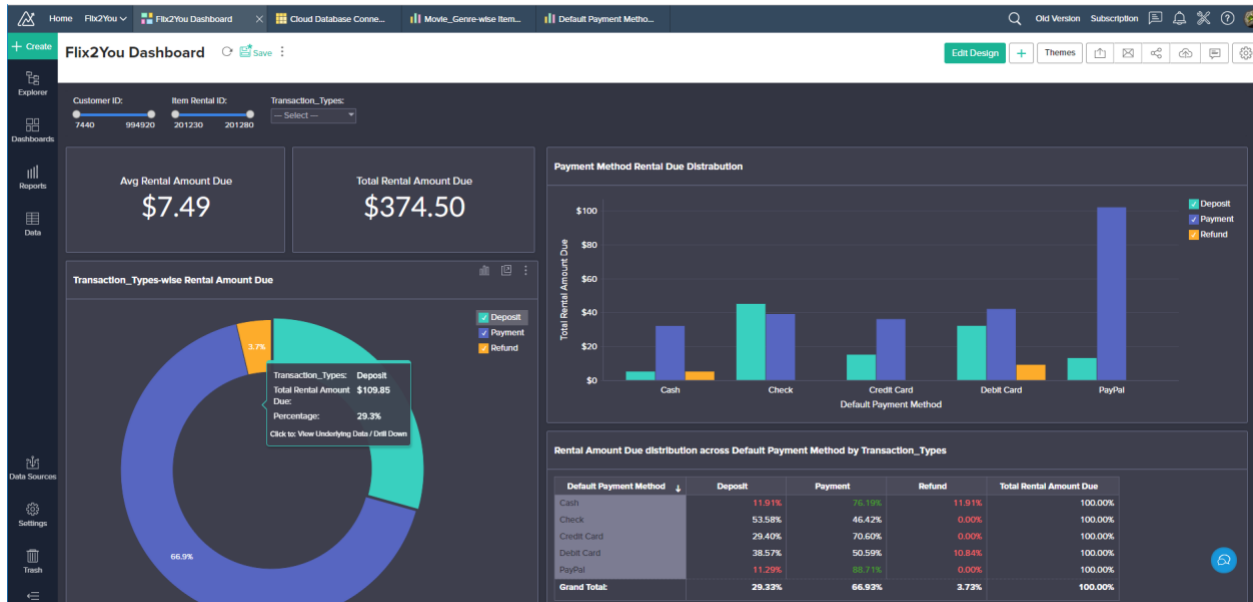
Flix2You can add an additional backup by utilizing a cloud backup company, such as Backblaze, Crashplan, and Nordic Backup. These services offer "military-grade security" and are encrypted (Nordic Backup, 2018). We have ultimately selected Backblaze because it best suits the needs of our business. Backblaze is a very inexpensive option and is easily scaled. They charge \$50 per computer for unlimited backup storage, with a five computer minimum (Backblaze, 2018). Flix2You easily has over five computers, and with our need to store movies digitally, we really need unlimited storage. Backblaze will automatically backup all files and is very simple to use. The backup will be encrypted and will be utilized to recover previous file versions should they be accidentally edited or deleted by mistake. This will also be useful if a hacker were to go in and erase all of our data, but I do not see a reason for this extra backup cost as the same backup benefits will take place on our database plan with AWS as mentioned before.

Flix2You always maintains an "on-call" website administrator 24/7 to address any technical difficulties with our website. Commonly experienced issues may include duplicate content, slow loading times, incorrect redirect links, website crashes, and dead links. Flix2You's staff are trained on addressing all of these issues and run reports daily on the incidences of these errors so they know what to fix. Flix2You also has a FAQ page on their website to address common technical errors on the user site, such as a poor internet connection or recommendations for browsers to use. In addition, Flix2You also has a 24/7 hotline users can call if they are experiencing difficulty. Flix2You utilizes Google PageSpeed Insights to keep track of the speed users can access our site and find room for improvement (Bhattacharya, 2018). Our staff also regularly uses the Google Search Console to see which links are "dead" and receiving a 404 error (Bhattacharya, 2018). Lastly, Flix2You uses SiteLiner and Copyscape to see where we have duplicate data and information (Bhattacharya, 2018).

The employee disclaimer will read as follows:

"Flix2You takes the privacy and security of our data very seriously. By signing the employee handbook and logging in to our computers, you are agreeing to our terms and conditions. Your complete online history will be tracked when on using a company computer and we will audit employee usage regularly. Flix2You is the sole owner of all information aggregated on its computer systems and management information systems. We will not sell your information to anyone or share it with any third parties, and will only use it for business purposes. Your information is protected and will only be available to database administrators and top level executives within the company. You are only to access the data which you have a relevant need for. You may not access any data that does not directly relate to your job function, and as such, you may be restricted from accessing certain parts of the database. You may not share any customer information with anyone, even fellow employees within Flix2You. As an employee, you have a responsibility to protect the integrity of customers' data."

Database Dashboard and Analytics



For the database dashboard we highly recommend the third party application called Zoho Analytics. This application can import data through a variety of sources and the best part is you can import data directly through Amazon Relational Database Services such as the Amazon Aurora service that we recommended. Zoho then enables users to create customized reports so different employees can have different views depending on the data that they need to view. The DBA simply needs to provide connection details to the Amazon Aurora database and then you can choose the tables desired and aggregate the data through the Zoho application.

Not only does Zoho take care of querying data for the database and enabling you to view your data in a meaningful way, it also provides support on mobile apps on both iOS and Android devices. This makes the dashboard easily accessible on the go, which could be quite valuable to upper level management who may have to travel for various meetings.

Since Zoho provides options to import data such as excel documents and csv files, the dashboard can also be generated through SQL commands written internally, so you can view your data however you wish. Some example of SQL commands you could use to aggregate your data are listed below.

The bottom line is that with Zoho we can create whatever visualization of the data that we want. Whether they are visuals that are created directly through Zoho's connection to the database or a customized SQL query, Zoho enables us to have a nice clean

visual with the same user interface for any different views that we require. We can even create separate views of the data for the different positions.

Below are some sample SQL queries that can be used to view that data:

Movies in catalog:

```
SELECT movie_name FROM movies
```

Amount of open rentals:

```
SELECT count(id) FROM customerRentals WHERE status = active
```

Revenue for the current quarter:

```
SELECT sum(amount_due) FROM transactions WHERE date BETWEEN start AND  
GETDATE()
```

Number of new members (past month):

```
SELECT count(customer_id) FROM customers WHERE date BETWEEN  
CAST(DATEADD(date, -30, GETDATE())) AND GETDATE()
```

Aggregate data showing customer spending

```
CREATE TRIGGER tr_customer_total_spending
```

```
ON transactions FOR INSERT
```

```
AS
```

```
BEGIN
```

```
UPDATE customers
```

```
SET amount_spend = amount_spent + (SELECT amount_due FROM INSERTED)
```

```
WHERE customer.customer_id = (SELECT customer_id FROM INSERTED)
```

```
END;
```

This also would require adding the column amount_spend:

```
ALTER TABLE customers
```

```
ADD amount_spend money NOT NULL default 0
```


Legal Issues

Terms and Conditions for Use: "All sales through Flix2You are final. Please view all Flix2You policies before making any purchases. Refunds or exchanges will only be made if the error is through the fault of Flix2You. For example, users can get a refund if the website is not allowing them to view any media content. If the site is only down for a limited period of time, say one hour out of the whole month, no refunds will be made. If a user simply disliked the movie they selected or did not watch it in their allotted rental time frame, there will be no refund or exchange. Users are subject to all regular annual pricing updates, which will likely be similar to increases in inflation. All pricing will be listed in U.S. currency (dollars) and only dollars will be accepted as payment, either via check, debit, or credit card. We accept American Express, MasterCard, Visa, and Discover. Users who violate the terms and conditions will be suspended indefinitely from all Flix2You services without refund or exchange. Violators may be subject to legal ramifications if they have violated local, state, or federal law."

Below is Flix2You's privacy statement that will be posted on their website:

"The privacy policy will be updated annually and as needed. Users will first agree to the full privacy statement when they sign up for Flix2You's services, and subsequently are agreeing to our privacy statement whenever they login to their account or use our services.

Flix2You has put several security measures in place to protect the privacy and integrity of your information. This privacy statement will help you learn why we collect your information and how we protect it. By signing below and using our services, you are agreeing to our privacy and security policy.

Your personal data, such as email, phone number, address, and age will only be used for business purposes such as shipping, dispersing information, and to follow up to business inquiries. We also voluntarily ask for your native language, gender, race, ethnicity, and age so we can best cater video and media content towards your preferences. You may opt out of answering these questions. We track your browsing and viewing history to suggest further content you may enjoy. This may include words searched, videos watched, categories browsed, comments written, etc. We suggest you always use a secure connection (https) to use our services to best protect your connection. On our administrative end, any unique identifiers such as name, phone number, address, etc. are blocked for employees to see unless we need to contact you directly due to an inquiry. We are able to run general reports without violating your personal privacy.

Flix2You also tracks your location so we can best ship to you and recommend geographically or culturally relevant content. We do track the number of movies you rent and the length of time that you rent them for.

In addition, we collect data regarding any bugs or errors you may encounter. This allows us to discover the source, timing, and nature of the error so we can investigate the occurrence and prevent it from happening in the future.

You can always review your personal account information on your user home page on our website and update your privacy settings there. We will never share your personally identifiable information with any third party or outside source, unless required by law or government request.

Flix2You's services are designed with the best security practices in mind to have multiple layers of protection for your data. We use encryption, firewalls, military-grade backup, multi-step logins, and many more best practices to secure your information. We regularly review our security policy to ensure it is meeting the current needs of our customers, business, and the regulatory environment. Our most up-to-date policy will be posted on our website, emailed to you, and will appear when you make a purchase whenever there are any changes.

The data we collect allows us to provide more efficient and relevant content for you as a customer. We strive to provide the best customer experience possible and use reports and your feedback to make meaningful improvements. To learn more, please visit our website."

Flix2You's website disclaimer will display the following:

"All information posted on this website is to be used only for general information purposes. Flix2You strives to keep all information accurate and up-to-date, but cannot guarantee the full accuracy of any information or media. All users are utilizing our services at their own risk and acknowledge such a risk by agreeing to our terms and conditions. All states in the United States have laws requiring notification of clients for significant breaches of their personally identifiable information. In Pennsylvania, this is Title 73 PS 2303. Flix2You will provide written notice via mail within 30 days in the incidence that users' personally identifiable information has been breached by an unauthorized user or is suspected of breach (Thomson Reuters Westlaw, 2006). Flix2You will take extensive measures to investigate any and all breaches and to reinstate the database's integrity as soon as possible. Flix2You will not be held liable for any harm or damages that come to you as a result of using our services. All users are fully responsible for protecting their password and for all activity taking place on their account. If any suspicious activity is suspected, please notify us right away at help@Flix2You.com or 123-456-7890. The content posted by Flix2You does not represent our political views or any other aspect of our values. We strive to provide a diverse collection of media for our viewers, and as such it is possible you may find some content offensive or unwelcome. Flix2You does its best effort to prevent and address any errors, but cannot be held liable for any website crashes or other technical difficulties."

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