

Flix2You

A solution proposed by The Copy & Pasters

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III. Executive Summary

The members of The Copy & Pasters are very eager to help the Flix2You Company become more competitive in today's fast, data driven, and overall cutthroat market. If chosen to take on the task, we will all agree that the best course of action would be to take the current database and redesign it. This will reorganize, recalibrate, and redevelop the current Flix2You data and make it a much more efficient, yet easily readable database. The Copy & Pasters are willing to work side by side with the Flix2You Company in order to meet the Flix2You standards. Our ultimate goal is to take the Flix2You Company to the next level and make it a top contender in the video rental services.

The solution that we have in mind will not only be cheaper, but it will be equally as effective as buying a whole new database system. By utilizing the current database, Flix2You will not have to worry about having to acquire a new costly database, but instead focus on fixing the database that they are all familiar with. This insures that all employees, who will be working with the database, will know how to use it from prior work at the Flix2You Company. The Copy & Pasters understand the image Flix2You wants to be portrayed as and at the same time implement a budget for them accordingly.

Our team is not only excited to help fix up the company, but we are also eager to be able to teach the company as well. We plan to make the database more modern in posture, and as a result, the training and utilization of the finished database should not require nearly as much time to operate at the simple employee level. Flix2You's willingness to learn will help our process go much more smoothly and help us help them. A positive attitude plus our new implementations will help Flix2You grow into a more competitive and more data driven company.

The Copy & Pasters understand that security is a very important factor and as such has implemented different security protocols. We understand that customer and company security is one of the most important factors to this company and as such, we will make sure that all aspects of our database will be secured. In case of an emergency we also have a backup and recovery plan which will encompass (but not limited to) multi RAID/locational backup(s). This insures our recovery plan will provide stability for the company against all data enemies' whether internal, or external.

Legal considerations have also been accounted for. The Copy & Pasters understand that privacy can sometimes be an issue, and as such we have decided the best way to take action is to abide by a joint privacy statement. We also agree that none of Flix2You's information will ever be released to public or private companies without documented permission being present. Our first order of business if chosen for the project will be to take all legal considerations into action to insure there are no miscommunications with the Flix2You Company.

IV. Project Overview

IV.I Scope of Work

In the business world the cold reality is this: you must meet your client's needs and strive to surpass them, you must change accordingly with the trends of the time, and most importantly you must constantly ensure that there isn't someone out there delivering the same product you are for cheaper. If these key points are not met, sooner or later your business will fail.

There are some industries out there that can afford to be less dynamic and less concerned with adapting their brand. Perhaps because the market they deal in is somewhat stable or because they've already proven themselves as a household name and they sell something that will always be a necessity to the consumer. The entertainment industry is not so lucky and in today's technological era it is paramount to the success of any company working in it that they understand their vulnerabilities and that they are constantly working to make sure their business stays as customer oriented as possible.

Ten years ago Blockbuster was a titan of industry. They had a short span of meager competition from stores like Hollywood Video or possibly locally owned stores in some areas but generally speaking they were at the top of their game. So how was it that a small startup company like Netflix could topple this giant originally just by using DVDs and the postal service? Probably for a collection of reasons including; but not limited to, poor leadership at the corporate level, poor marketing, and simply not enough focus on how to interact effectively with its' clients. Maybe Blockbuster was resting on its' laurels, overconfident in its staying power as a company. Although if one were to look at their premise now the idea of ever driving and renting a physical movie and returning it seems like it was obviously predisposed to failure. As technology got better and the options of how someone went about enjoying a rented video got more and more plentiful Blockbuster needed to stay competitive, but didn't. Meanwhile Netflix understood the needs and wants of their customer base. Netflix knew they had to have a service that was easy to use and easy on their customer's wallet.

Flix2You is a movie rental company similar to Netflix. Based in Scranton, Pennsylvania they are a small startup company that enjoyed significant growth originally but lately that has watched that growth become slowed. They do not want to end up like Blockbuster and realizing their weaknesses they have decided to take decisive action. They are looking for a team to propose a solution that will allow them to become a viable competitor in the industry and hopefully garner them success as a business. As in many areas of life the first step towards a solution is recognizing and admitting that there is a problem. Fortunately Flix2You realized early where they have some flaws and our team will effectively address these issues as well illuminate and correct some that are not as obvious. Throughout this document we will present solutions through a

workable model and demonstrate how they can successfully be implemented into their business.

First and foremost the Flix2You management team does not currently have access to their customer data. This is greatly hampering their ability to make well informed decisions and develop a feasible business plan. In order to become a thriving business Flix2You must hold on to their current customers, win over their competitor's customers, and establish new customers that are unfamiliar with the industry. In order for this to happen it's imperative that they understand the needs and wants of the consumers by forming a relationship and starting a dialog. They also must keep track of the demographics that use their business so that they can form a "who, why, and where" when it comes to their marketing campaign. All of this information is considered customer data and if this data cannot be efficiently used by Flix2You at the managerial level it is useless.

These managers need to be able to create hardcopy reports as well as access digital data via the website at any time. We will need to establish an administrative site and incorporate the current site and data into it. The current system is running SQL Server 2008 and PHP for the data powered web pages. Although this infrastructure may not be able to handle the company's anticipated growth with the possible addition of downloadable movies, the software in place will support scalability as we upgrade their system's hardware.

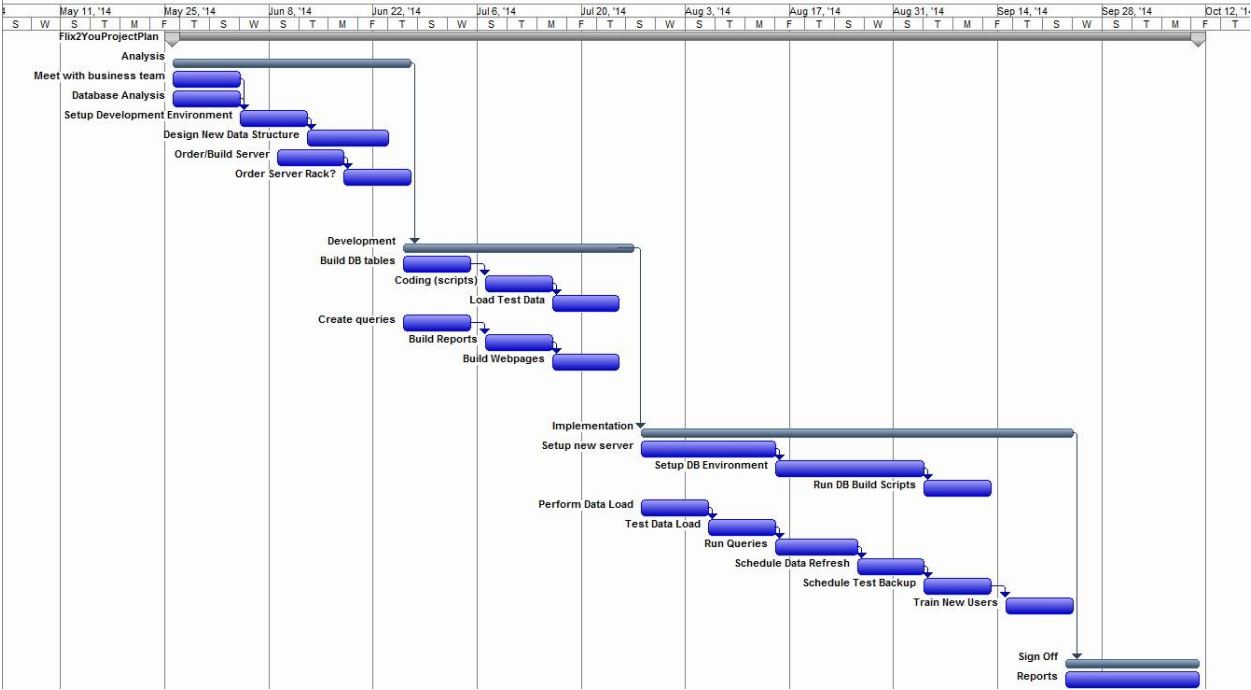
Flix2You is currently endangered but we believe through our database solution, that utilizes and expands upon the system already in place, we can turn the company's initial investment into a profit making business with a competitive edge. The Copy & Pasters will review all the data that already exists, as well as the database structure. We will thoroughly vet all current data to make sure it is useful to the company and then demonstrate how to run reports that effectively extract the data. Through this process we will turn what appears to be random data into useable knowledge. This will help Flix2You in a myriad of ways from expanding their target audience, to advancing the entire process of renting and delivering movies.

We plan to construct a separate storage space to house the corporate database away from queried data. A user friendly and intuitive table and relationship structure for the database will take on an optimal form as we load test data and run queries. The user system will consist of a data extraction interface as well as a secure database update form. The user system for running queries will work off of the extracted database, rather than the actual database, for security and data integrity management. This extracted database will be secured as if it were the actual database; the users will have a form installed on their individual profiles that will extract only the data necessary for their departments. Behind each form will be SQL statements that will run at a click of the mouse once user parameters are set. This system will keep users from accessing unnecessary data or data that they do not have the privilege to view.

A new server, database management system, software licenses and possible network enhancements will be needed. These network enhancements will be outlined later in this document.

V. Project Management

V.I Project Plan



Timeline Overview...

The project is scheduled for 100 days and its milestones/events are expected to be chronologically achieved in punctual manner. With this taken into consideration, the timeline was created and formed with parallel schedule expectancy. This allows for two sequences of deliverability to be progressed concurrently which should minimize the time and bolster the achievement speed of the overall project itself. Nonetheless, this form of parallel scheduling can create a linear cushion of elasticity from the plethora of potentially disastrous discrepancies that could come along the way. Let's consider the electrical engineering behind Christmas lights. There are two simple circuits, one being a series, and the other being parallel. In a series circuit if any of the bulbs is missing or burned out, no flow will continue and none of the lights will go on. This timeline is utilizing the latter, in which if one light burns out the parallel headway will continue you to move the project forward and the lights will continue to go on.

Analysis... 5/26/14 - 6/26/14(24 Days)

Analysis is the first step in the system development lifecycle and any project within the scope of technical engineering. Meeting with the business team and analysis of the database will take place simultaneously so that examination from a technical view

and a business view can progress synchronously. From a business standpoint, we will cover everything from the customer's innate expectancy to the Flix2You deliverability. Behind the scenes of the business progressiveness, the Copy & Pasters' programmers and data analysts will work determine the functional dependencies, multivalued dependencies, candidate keys, and each table's primary key. Also, they will look for possible foreign keys.

Development... 6/26/14 - 7/26/14(23 Days)

Database redesign is not an impossible task if the database's data is nonexistent. The true problematic situation lies where we have data, want to change the data, and make minimal impact on the instance of the data itself. The reality is that making colossal changes can have colossal positive and or negative effect. This is why we intend to entirely backup the complete database and work on a comprehensive replica of the functional system. By cloning, we can make change without worry. Once we have the clone; Tables, coding, testing, queries, and reports will be cycled through vigorously through the development of the new database. Potential database driven web pages and their querying abilities will start to develop utilizing SQL and PHP.

Implementation... 7/28/14 - 9/23/14(42 Days)

The implementation of the redesigned database will entail an overall training via presentation and more accurately, hands on training with each employee within their realm. The training will adhere to all different levels within the hierarchy including; programmers, developers, administrators, managers, and data processing professionals. The overall scope of the training will provide a comprehensive introduction to Microsoft SQL Server 2012. Employees will learn the techniques require operating adeptly within their craft. We will provide support and teach how to write SQL queries to retrieve and manipulate data, secure and backup databases with Management Studio, integrate SQL Server from Microsoft Office, and finally, how to transform data into useful and strategic information.

Hands-on experience will include but not limited to: Constructing tables and protecting data with constraints, retrieving and modifying data with SQL, moving data with the import/export utility, and automating tasks with the Maintenance Plan Wizard, Administering SQL Server security and resilience, and experience with designing reports.

V.II Project Resources and Budget

Labor Budget

Name	Role	Cost	Projected Hours	Extended Cost
John Earley	Project Manager	\$65/hour	320	\$20,800
Marty Ruane	Database Administrator	\$50/hour	320	\$16,000
Colin Sposto	Data Analyst/QA	\$60/hour	320	\$19,200
Sara Dukauskas	Programmer	\$55/hour	320	\$17,600
				\$72,800

The role of a Project Manager is to lead his team in completing the task at hand. A Project Manager should know about the people on his team and what their capabilities are. Knowing those capabilities, the Project Manager should assign specific tasks to certain individuals based on their skills. Scheduling is by far the most important task a Project Manager undertakes. He is to know how long it will take to complete certain tasks and when the deadline of the project will be.

The role of a Database Administrator is to design, create and maintain database management systems. Database Administrators focus on researching and analyzing the best methods of modifying the database(s) to suit specific user requirements. Database Administrators are crucial to e-commerce as they build and keep track of the databases which store customer information, inventory and other transaction data.

The role of a Data Analyst is to perform a variety of tasks related to collecting, organizing and interpreting statistical information. They also present data in the form of charts, graphs and tables. The Data Analysis then uses that data for designing and developing relational databases for an organization. They are acquired by companies to help achieve their business goals, expand their corporation or to enhance their business practices.

The Quality Assurance Analyst is responsible for creating an end-to-end plan, executing that plan and managing all activities in the plan to ensure that all the objectives are met and that the solution works as expected. This involves testing the solution in terms of performance, functionality and performance.

The role of a Programmer is to create programs for business applications. They use programming languages such as Visual Basic or Java to create software that performs a specific task. In most cases the Programmer designs a graphical user

interface (GUI) so that users can run the software through easy and menu-oriented modules. The GUI acts as a translator between the user and underlying software code created by the Programmer.

Supply Budget

Component	Detail	Price	Quantity	Extended Price
Server	Dell PowerEdge R620	\$2,160	3	\$6,480
Server Rack	Dell Enclosure Rack	\$760	1	\$760
Software	Microsoft SQL Server 2012 Enterprise	\$10,000	1	\$10,000
Dashboard	Klipfolio	\$1,995 + \$15/month	1	\$1,995 + \$15/month
External HD	Buffalo Link Station 420 6TB	\$500	4	\$2,000
Backup	Guardian Maximus Raid 1 Quad Interface	\$420	2	\$840
Router	Cisco Systems 2911	\$1,000	2	\$2,000
Remote Backup	Arvix Business Class Pro	\$35/month	1	\$35/month
				\$24,075 + \$50/month

When buying the Dell PowerEdge R620, we choose the enhanced version. This server maximizes power with an Intel Xeon E5-2620 processor, 16GB memory and 250GB hard drive. We feel these servers will give Flix2You an advantage over its competitors. The Cisco Systems router offers network agility through the intelligent integration of the market leading security, unified communications, wireless and application services. The Guardian Maximus Raid one is always guarding your data from being lost by writing the same information in real-time to two separate drives for a mirrored copy. It also protects you from costly system downtime and data restoring after a single hard-drive-equipped system crash.

Microsoft SQL Server 2012 Enterprise is designed for an unlimited amount of clients. This software provides mission critical confidence with super-fast speed and

enhanced security performances. This software also has a cloud-ready platform that will help Flix2You unlock breakthrough insights across their organization and build solutions to extend data. We made sure that all of our hardware products are compatible with our software products.

Total Project Budget: \$96,875 + \$50.00/month

VI. User Analysis

According to our research, the Flix2You Corporation has many different audiences that it appeals to. It only makes sense to let each group of people or workers in their department view what is only necessary. This will insure that all operations will remain secure, with no chance of unauthorized users being able to modify the database. Because our plans are to fix the current database using normalization, at this stage we will not have definite tables that each group will have access to. Instead we will give general ideas of which each group would be in charge of, if we are chosen to take on this task. We have created a list of user groups and a description of what they can view and modify.

Marketing...

The marketing team will have the privilege to view all parts of the database that have to do with customers and their purchasing activity. With the above information, the marketing team will be able to calculate reports and help decide on future endeavors the company may experience. If chosen for the task, a more accurate representation of what exact tables they will be in charge of will be made.

Customers...

Customer's privileges will be restricted to only being allowed to browse, purchase or rent the videos that the company has to offer, and they will also be allowed to make a profile and customize it to an extent. Customers will be able to access their rental history and videos that may be similar to ones they have already rented as well.

Customer Service...

Customer service is the department in which the staff will be able to provide help and guidance to customers who may have concerns or problems. They will be able to address problems that a customer may have that concerns payment, shipping and overall difficulties. This group will be able to modify tables that have to do with a customer's information but will not be allowed to make new tables. They will however be allowed to view all tables that have to do with the customer's transactions, such as payment methods and dates that the rentals occurred.

Human Resources...

Human resources are needed to securely maintain employee information in our database and will also be needed to address the problems that an employee may be concerned with. This branch of the company will be allowed to view all employee information and make changes as needed.

Operations...

While the customer service branch will be able to help a customer with shipping and transaction problems, the operations employees will be responsible for the actual process of transactions. They are in charge of billing the customers and shipping out the rentals. Because billing and shipping are two completely different processes, we have

decided to divide them up. People in charge of the shipping department will only have privileges to view customer's information (such as addresses) along with the movies they want to rent. They will also have to keep track of the customer queue, which will tell the order in which each user has rented a movie. The billing department will have the ability to view and modify a customer's information, their transactions, and their accounts, but will not have the ability to create tables.

Information Technology...

This group of employees will be in charge of the day to day operations of the corporation and will be able to maintain the daily functions of the database. Because this group will have a very broad job position, access to the database will be granted by the database administrator and will be assigned certain parts of the database depending on the job.

Management...

The management department will be just under the rank of the database administrator, and as such, will be able to view and edit all tables in the database including personal and sensitive information.

Database Administrator...

The database administrator is at the top of the employee pyramid. There is only one database administrator to insure that fewer errors will be added into the database due to confusion. They have access to all parts of the database which includes being able to edit, view and create tables. They also have the privilege to allow access to all other branches of the company on a case to case instance, such as deciding which parts of the database the IT department will be able to access per job. This person will also be able to address concerns or problems that the other departments might be having.

VII. Organization of Data

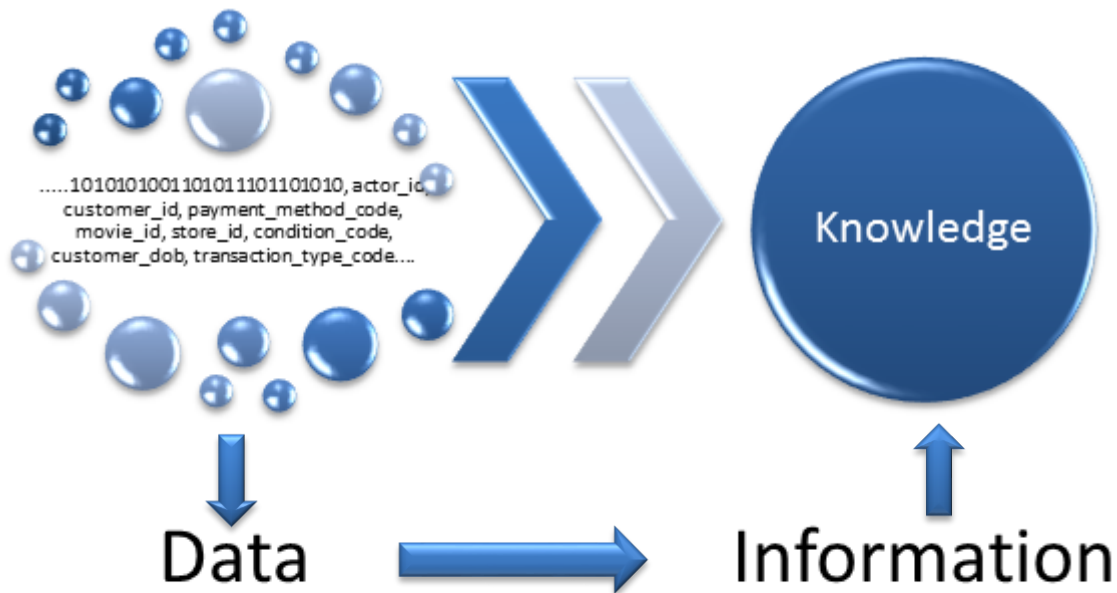
VII.I Existing Database Analysis - Identifying Relationships and Normalization Approach

In the eyes of The Copy & Pasters, the current Flix2You database structure consists of many errors. These pertain to an unstructured ERD design, modification anomalies and improper relationships. We plan on correcting these errors by putting all the relations in the ERD design into third normal form (3NF). We will also be combining data for a more neatly structured overall design.

A great majority of the table names in the Flix2You ERD design are plural. This is an error because table names should never be plural. There is also some unnecessary tables that can be joined together with other tables. After carefully analyzing the design, we realized that some of the relationships between the entities are incorrect or irrelevant. Our team will look at the minimum and maximum cardinalities of those relationships and adjust them to our likings. One example of an incorrect relationship would be the one between Customer Rentals and Customers. The relationship is said to be a one to many when it really should be a many to many. For our data modeling notation, we will be using crow's foot.

Putting the tables in third normal form will allow for a more neat design and better understanding and reading of data. Using normalization also allows us to eliminate modification anomalies, reduce redundant data and in the end save file space. Unfortunately there are some disadvantages as well, those include: more complicated SQL required for multi table sub queries and joins and extra work for DBMS, which can lead to slower applications. We will first determine all functional dependencies and the determinants of those dependencies. Then we will label all the primary keys, foreign keys and surrogate keys. After making a referential integrity constraint between specific relations, we will find and begin to eliminate all the anomalies by putting the relations in third normal form. A table is in first normal form if it qualifies as a relation. Some qualifications of a relation are: each column has a unique name, columns contain data about attributes of the entity and rows contain data about an entity. A relation is in second normal form if all of its non-key attributes are dependent on all of the primary keys. Finally a relation is in third normal form if it is in second normal form and has no determinants except the primary key.

VII.II Proposed Solution



Emerging technology is rapidly changing the economy, business, and nonetheless, the delivery of movie rentals. Internet streaming, ease of use, and enjoyableness are the main factors that will keep a modern media hungry clientele content. Deliverability of entertaining movies in a clean and punctual manner is the battle that must be won in the arena of the newly erupted colossal like Netflix and Hulu Plus. Thus, information systems are the backbone of the entire operation.

We understand that Flix2You is data rich and information poor. This is not a fatal situation, but an opportunity for a phoenix to rise from the ashes. The core of the solution will be that no other than a fast, functional, and readily reportable database engineering scheme. However, databases cannot simply operate in “the cloud”, and in fact, “the cloud” doesn’t exist. We will take a top down approach. Addressing the most dependent first, the database model/schema, followed by the next dependent, the backup, and finally down to the hardware itself. If you want to be competitive, top of the line hardware is paramount. In addition, vast data systems are also not impenetrable. Security of the system must also be paramount from an internal and external standpoint along with real-time multi-locational backup. And finally, the database structure itself (Displayed in the ERD) must be concrete, normalized, and ridded of any anomalies that would hurt the speed and productivity of Flix2You.

We propose to redesign the ERD in light of the 3 most important facts that should be of concern; the customers, the movies, and finally the transactions in-

between them. All data movement with economic impact will have transaction history; of that transaction history will entail customer, movie, and purchase/rental unique identification for all facets within the transaction. This will allow for data to be extrapolated in a plethora of diverse ways as Flix2You traverses into their new future.

The goal of database security is to ensure that only authorized users can perform authorized activities at authorized times. This is imperative and difficult; to make any progress at all we must determine the correct rights for the correct employees. Yet, the database hierarchy can easily be managed and enforced within Microsoft SQL 2012. Security will be made up of three levels; General Employee (1, lowest), Management Employee (2), and Administrative Employee (3, highest). General employees are allowed to enter new customer and transaction data, to change customer data, and to query any of the data. Management employees are allowed all of the permissions of general employees, in addition, they are allowed to enter/modify current products objects within the database (movie titles, genres, etc...). Management employees will also be allowed to propose a deletion request but the action must be executed at the next level. Administrative employees can grant processing right to other users; and he or she can change the structure of the database elements such as tables, indexes, stored procedures, and the like.

Backup of the database is equal if not more imperative than all other aspects in the design. The failsafe to all cataclysmic situations must be updated in real time and as close to invincible as possible. The reality, there are a plethora of disastrous situations that can happen to the database so we can only prepare for the worst. We can categorize backup reasoning into two categories: internal and external. Internal discrepancies take place within mental psyche of the database itself (hackers, worms, viruses etc...). External discrepancies take place on the physical realm of the database and are caused by hardware and/or network failure. To counter internal and external discrepancies, we propose a RAID 1 configuration. However, this will not counteract extreme situations such as giant power surges/outages, weather eruption (tornado etc...), or failed structural integrity of the building. To counteract this, we propose an additional RAID to be backed and located remotely unaffected by the elements of the geographical zone.

Changes made to the Flix2You ERD:

1. New Focus around Transactions, Customers, and Movies
2. Relationships predominantly focused around Transactions
3. Director in separate table, no longer part of cast, related through movie
4. Rentals & Purchases dependent and created of all Foreign Keys(besides unique Primary Key)
5. Added Password to account
6. Removed Video store since no physical stores exist anymore
7. Transactions Identified by all attributes contributing

Insert statements...

--Customer insert... Address needs to be broken up into city, state, country, and zip...

```
INSERT INTO customer (lastName, firstName, city, bDay, [state],
                    zip, country, phone#, email)
SELECT customer_last_name, customer_first_name, customer_address,
       customer_dob, customer_address, customer_address, customer_address,
       customer_phone, customer_email
FROM customers;
```

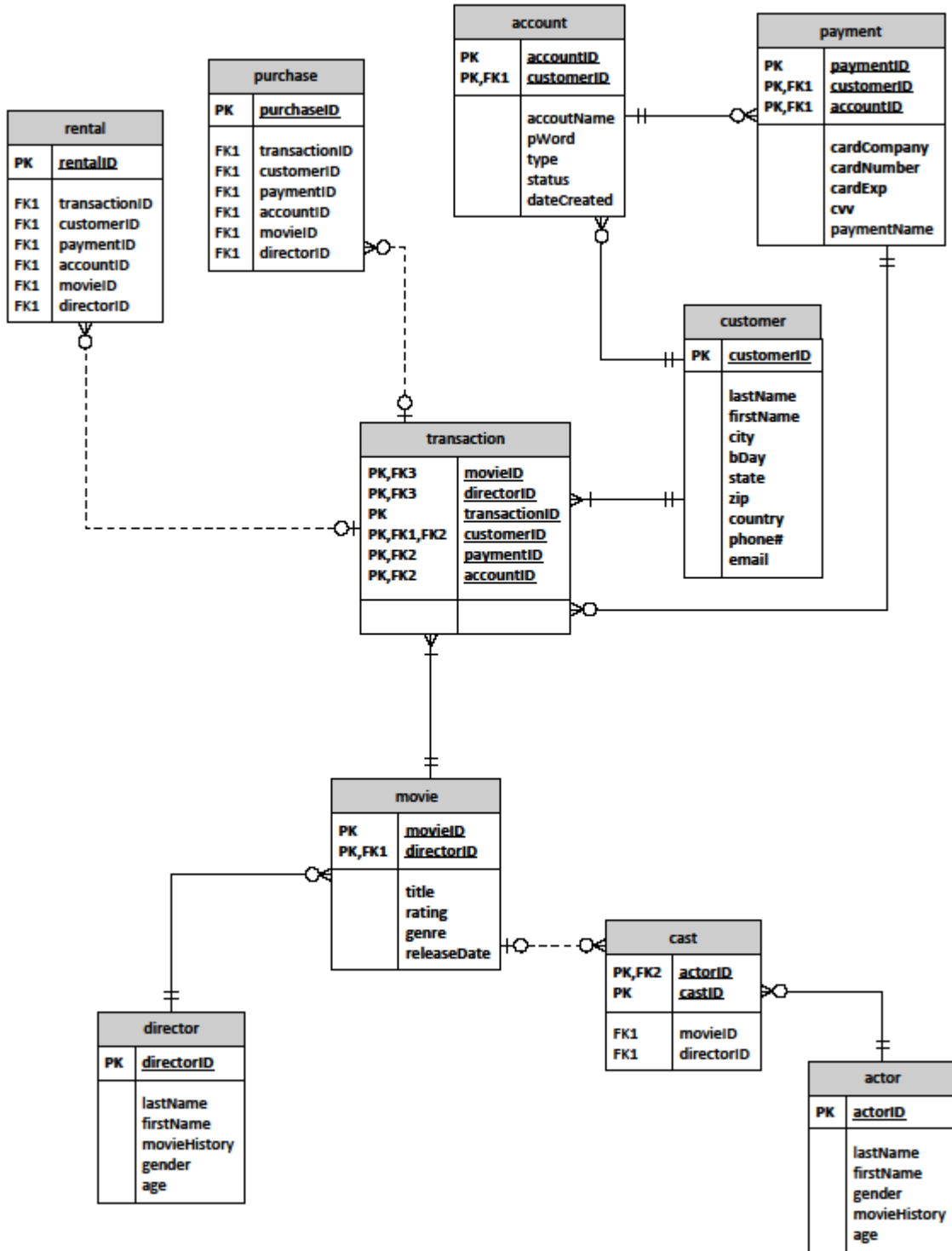
--Transaction insert... directorId needs to be created...

```
INSERT INTO [transaction] (movieID, directorID, transactionID,
                          customerID, paymentID, accountID)
SELECT movie_id, 'NULL', transaction_id, customer_id, payment_method_code,
       account_id
FROM movies, customers, accounts, financial_transactions;
```

--Movie insert... rating needs to be created...

```
INSERT INTO movie (title, rating, genre, releaseDate)
SELECT movie_title, 'Null', genre_code, release_year
FROM movies, genre_codes;
```

Proposed ERD...



VIII. Database Administration

The job of the database administrator is one of the most important jobs of the company. They are in charge of jobs such as, making policies when needed and going through procedures. Being able to do this will help protect and control the whole database. This includes managing changes within the database, and maintaining the applications along with hardware that are required for the database. They also take on the role of assigning database privileges to the individuals in each employee tier.

VIII.I Database Backup and Recovery

With the company heading in a new and more efficient manner, it only makes sense to be able to have a sound backup and recovery plan. There are many ways to do this, but our group has determined a solution that will work best for the Flix2You Company.

We first decided that we would take advantage of a remote backup service. A remote backup service provides services such as, backing up, storing, and recovering data. The reason behind this idea is simple. When you constantly backup your files on a remote server the chances of a major incident such as a natural disaster or theft is almost completely eliminated. The provider we decided on is Arvix. For the mere \$35.00 a month, you get unlimited storage and data transfer along with many other features as well. If for some reason in the future you decide to switch providers, Arvix provides free domain transfer to its loyal customers.

The second thing we thought would help with backup would be the purchase of a Guardian Maximus RAID-1. What this does is provides "live activity" backup/data redundancy of all of your data. How it works is that it writes the same information in real time to two separate drives for a mirrored copy. In the long run it could potentially save you from downtime and data restoring after a system crashes.

If that wasn't enough, SQL Server also provides multiple different ways of being able to back up your database. Commands such as:

`BACKUP DATABASE DatabaseName TO BackupDevice`
(Which will allow for a full backup of the database.)

`BACKUP DATABASE DatabaseName TO DISK = DiskName WITH DIFFERENTIAL`
(Backups any extent that has changed since the last "Full" backup was created)

`BACKUP DATABASE DatabaseName FILE = DatabaseName TO DISK = DiskName`
(Backups files independently instead of the whole database)

All of these commands can be very useful for daily database backup. We recommend doing some sort of backup every night to insure that everything is up to date and working.

VIII.II Data Access and Security

It's no secret that in any industry the competition will often go to some extreme measures to try to win customer's business. Unfortunately in today's world that can mean hacking into a company's system to try to steal their trade secrets or actually steal customer's highly sensitive personal information. Of course this is a serious crime and if caught they would be punished with the full force of the law but in many cases that can be too little too late. This is why the Copy & Pasters do not take security lightly. When using a web server that allows customers to submit sensitive data it is absolutely essential that the company has a no holds barred approach when it comes to defending itself from external as well as internal attacks. As sad as it may be there have been many cases of a competitor company enticing what was thought of as a loyal employee into betraying their company. We have concluded that the best way to combat this is through a hierarchy system. This would be a system that would allow users with different clearance levels to have more or less access to view or manipulate the data. Obviously those with the highest clearance would have the most freedom/privileges and those with less would be more restricted as the hierarchy progressed downward.

In addition to this we have concluded that it would be in the best interest of the company to separate the database and the web application on two separate servers. We will institute a security firewall between them to ensure added protection from malicious outside access. We will then configure it so that only those trying to access the data through a trusted IP address will be allowed access as well as ensuring that only the Flix2You database will connect to our secure server.

It will be the sole responsibility of the Flix2You database administrator to monitor any software updates and security scans. He or she must decide whom to assign from the Flix2You IT team to allow access to the database in order to perform updates on the system. It is crucial that only those trusted and qualified individuals are allowed this privilege. As stated earlier, corporate espionage is a very real threat in the business world and these decisions are not to be made without due consideration.

Because of these strong security risks and the high level of attacks that take place today, we would also strongly recommend that confidentiality agreements be required for each Flix2You employee. Our legal department will provide a document for you to consider effecting. This will be a basic confidentiality agreement to be included in all contracts of employment. Everyone can be assured that is now a standard practice in the industry and that it's nothing personal, strictly business. Basically this document would ensure that the company as well as the employees have it in writing and on record that they are being entrusted with sensitive customer information and that any misuse or unlawful distribution will result in their termination. Although it may seem like a scare tactic, every employee must know that if any of their actions appear to be

unlawful they will be prosecuted to the fullest extent of the law. As the old adage goes “you’re only as strong as your weakest link.” These are words to live by when it comes to protecting your business; as well as your customers who’ve trusted you with their personal information.

VIII.III Dataload

When it comes to backing up data, you can never be too safe. That is why we have added such a vast amount of security and backup services for the company. We recommend using this SQL command nightly:

```
BACKUP DATABASE DatabaseName TO DISK = DiskName WITH DIFFERENTIAL;
```

This will back up all data that has been changed since the last full back up has taken place. We recommend doing this around the hours of 2 am to 3 am to insure the backup is not occurring during a prime rental time.

We also recommend doing a full backup of the database weekly. While the RAID system will do it automatically in real time, you should still back it up on Arvix as well as using this SQL command weekly:

```
BACKUP DATABASE DatabaseName to BackupDevice;
```

A full backup should occur on Sunday nights around the hours of 2 am to 3 am. With this amount of care; the company should have no problems with loosing data.

IX. Accessing and Analyzing the Data

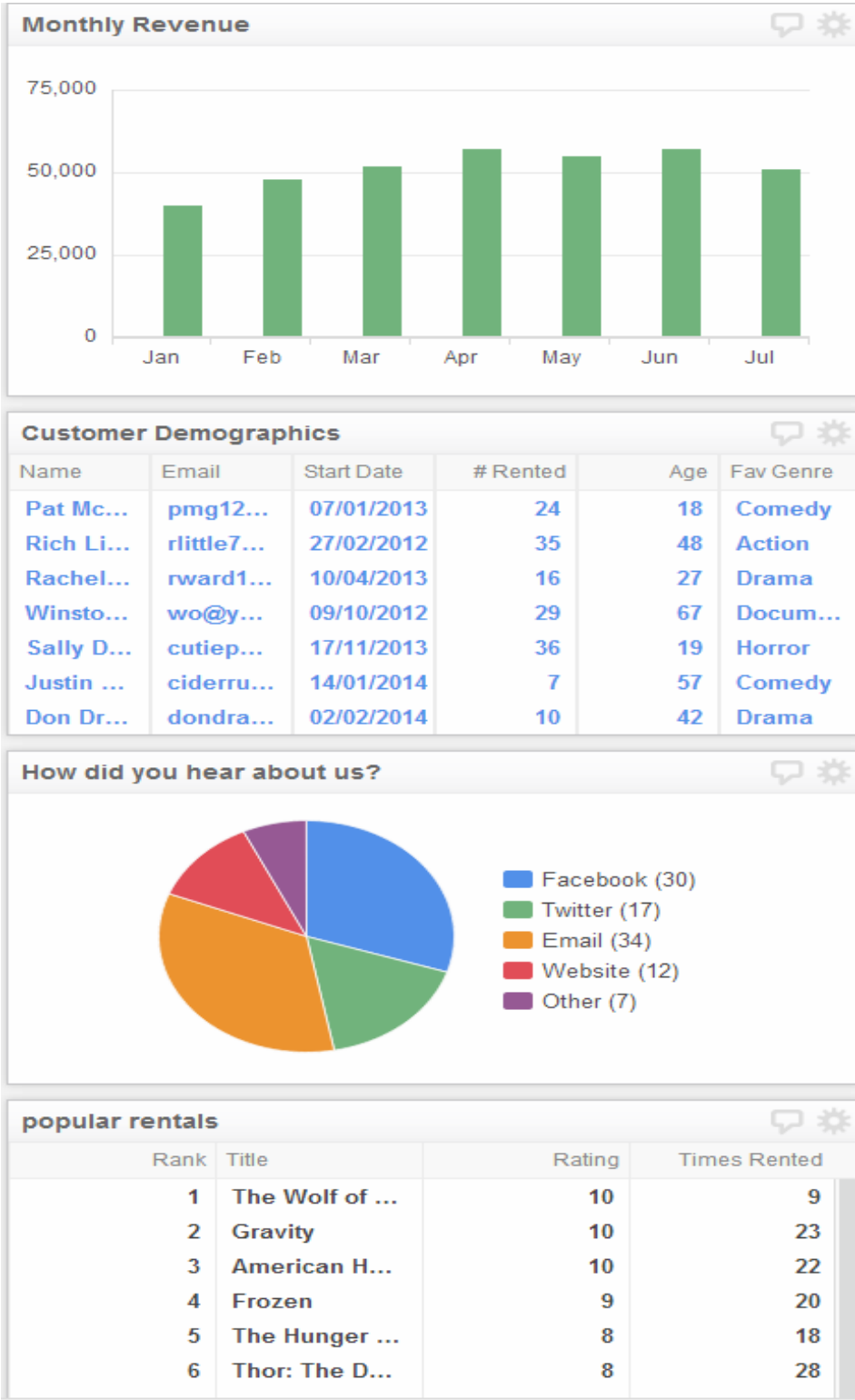
IX.I Database Dashboard

We first questioned whether or not we should create our own dashboard or purchase dashboard software that was already created. In order to arrive at this decision we had to consider what would be most cost effective on the part of flix2you as well the Copy & Pasters. The formula for deciding this resided upon establishing what our needs were. In our case we will need to track multiple aspects of the trends and growth comprised with flix2you. We will also need major security implementation because we will be operating with customers' personal and billing information. A few of the key questions we asked ourselves when considering developing internally or choosing already developed software were:

- Do we have the time, resources, and skills to do this?
- How much training will it take or will we have to hire out?
- Will we have a loss of productivity during the training stages?
- How long will it take us to develop, test, and roll out? What will the cost be?
- Will we be utilizing resources that are needed elsewhere?
- What development tools will we need and how much will they cost?
- Will the resulting product be up to par with current third party applications in the market?
- How will we manage on-going upgrades, support, etc.?

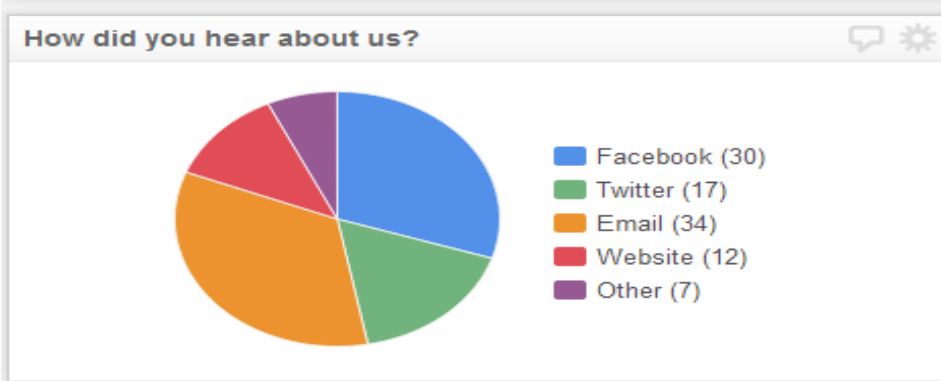
After reviewing and researching dashboards we chose to take advantage of an outside vendor to maximize productivity, focus our resources on other core aspects of the project, and work within the budget. The software we recommend purchasing is called Klipfolio. They are one of the leading vendors on the market and are extremely user friendly even at the novice level. Their flexible data retrieval allows for uploading from any source. It is easy to use and offers an undo/redo function to cut time while training or experimenting. All accessible resources are defaulted to refresh automatically every 30 minutes but can be altered to execute any command programmed up to every minute for real-time data sources. It also offers drill down reports and unlimited filters. Conditional threshold and goal indicators can be implemented to automatically execute whatever reaction you deem appropriate on your behalf without you having to physically press any buttons. Klipfolio dashboards are also created to appear visually appealing on any device and snapshot dashboards can be shared through automatic scheduled emails and downloaded as PDFS. Another key feature is that user specific roles can be assigned and customized to ensure security and efficiency. The cost is also low with an initial cost for start-up fees and licensure of \$1,995.00 and at \$15/month for 10+ users we have 30 employees that would require access.

Below are examples that reflect current services and portray intuitive information. They supply a quick summary of how Flix2you is performing. This data can be used for marketing advancements which in turn can increase our revenue. Klipfolio also allows us to easily add as many dashboards as necessary to measure our always changing metrics.



Customer Demographics

Name	Email	Start Date	# Rented	Age	Fav Genre
Pat Mc...	pmg12...	07/01/2013	24	18	Comedy
Rich Li...	rlittle7...	27/02/2012	35	48	Action
Rachel...	rward1...	10/04/2013	16	27	Drama
Winsto...	wo@y...	09/10/2012	29	67	Docum...
Sally D...	cutiep...	17/11/2013	36	19	Horror
Justin ...	ciderru...	14/01/2014	7	57	Comedy
Don Dr...	dondra...	02/02/2014	10	42	Drama



popular rentals

Rank	Title	Rating	Times Rented
1	The Wolf of ...	10	9
2	Gravity	10	23
3	American H...	10	22
4	Frozen	9	20
5	The Hunger ...	8	18
6	Thor: The D...	8	28

X. Legal Issues

During the Development...

The Copy and Pasters understand the full legality during the development process of the redesigned database. However, the Copy and Pasters do not except the responsibility of any erroneous and/or extraneous situation that could cause harm in any way shape or form to the data of Flix2You. With this understood; The Copy and Pasters except full responsibility limited to the four employees of the development team.

At no point during the analysis, development, and/or implementation phases will the database of Flix2You be modified in any way, shape, or form by that no other than John Earley, Colin Sposto, Sara Dukauskas, and Mary Ruane. If this agreement is broken at any given moment during the time above, all legality of the project is delegated to current ownership of Flix2You, Fred Aebli.

Budget Costs and project expenses will be fully funded one week prior to the analysis phase (5/19/14). In addition, The Copy and Pasters development team will be paid chronologically as we traverse the development lifecycle into the final database of Flix2You. With this understood; If payment is not on time, the Copy and Pasters reserve the right to cease further proceedings into the next stage of the development process.

The safe and expeditious transfer of data is of the utmost importance. Security measures are in place to autonomously backup the data in real time in case of any discrepancy. Of these measures include: Hardware, Software, and current data movement history that will not be hindered in anyway by that no other than John Earley, Colin Sposto, Sara Dukauskas, and Mary Ruane. With this understood; If this agreement is broken at any given moment during the time above, all legality of the project is delegated to current ownership of Flix2You, Fred Aebli.

After Completion...

The Copy and Pasters are no longer responsible for the safety, security, and/or legality of the database after completion. And thus, it is understood that the employees of Flix2You will be fully capable of managing their own database after completion of the redesigned database. The Copy and Pasters would like you to keep in mind all of the malicious menaces that unfortunately make up a large part of internet traffic today. These can include: SQL injections, virus installation, worm implantation, or even simple malicious cookies can act as a coy node of private information distribution.

XI. List of References

- Kroenke, David M. & Auer, David J. (2014). Database Processing: Fundamentals, Design, and Implementation 13th edition. Upper Saddle River, NJ. Pearson Education, Inc. Print.
- Wille, Allan. (August, 2001). Klipfolio. 7 April, 2014. <http://www.klipfolio.com/>. Web.
- Mehta, Ashish. (2012). How to: Create a Full Database Backup (Transact-SQL). 23 March 2014. [http://technet.microsoft.com/enus/library/ms191304\(v=SQL.105\).aspx](http://technet.microsoft.com/enus/library/ms191304(v=SQL.105).aspx). Web.
- Vennapoosa, Chandra. (2006). The Role of a Computer Programmer. 12 March, 2014. <http://www.exforsys.com/career-center/career-tracks/the-role-of-a-computerprogrammer.html>. Web.