NYU STERN
NEW YORK UNIVERSITY · LEONARD N. STERN SCHOOL OF BUSINESS

SurpriseDate

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Develop and Design Web & Mobile Applications

Professor Norman H White

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Executive Summary

The project will be based on the following procedure.

I. Introduction

-Problem / Solution

II. Description of the Project

-Idea / Features / Functionality

-Architecture

-E/R Diagram

III. Market Analysis

-Overview of overall mobile app business

-Lifestyle / Dating app business

-App business profit model trends

IV. Financial Projection

-Revenue / Income Statement / Cash Flow Projection

V. Problems encountered

-Technical Challenges

-Solutions

VI. Lessons learned

-Custom python libraries

-Inequality of RESTful APIs

-Cost of some functionality

VII. Next Steps

VIII. Conclusion

IX. Appendices

-Curl request

-Table designs

-Mobile app pages

-Financial projection detail

I. Introduction:

Our group's first task in developing a mobile app idea was defining what the problems are for people living in New York City (NYC). Throughout the brainstorming process, we selected three major problems that are relevant to the dating trend in NYC, which was the growing popularity of dating apps. They have been steadily in demand by single NYC residents who are looking for dates within the city over the past years. For those who plan on dating within NYC, the first problem was that there are too many restaurants in the city, causing confusion in making their choice for dating venues. Second, not only are there too many events such as concerts or parties in NYC, but single people also need to spend their time to find out the what, when and where about said events. The third problem was that people need to adjust their choices and schedule their dating plan of having a meal together and going to an event on the same day based on their preferences/time/location. Considering these problems, our group made decisions about our mobile app idea, which we named SurpriseDate. The idea is that the platform would find appropriate restaurants and events based on user preference/time/location, and that users would be able to schedule their dating plans based on the platform's recommendation. Furthermore, in order to enhance user convenience and add more value for the users, our group decided to add two more features: adding transportation service through Uber and capturing photos of the occasions. More detailed features and functionalities about the app will be explained in the next session of this report.

II. Description of the Project:

SurpriseDate takes the “where do we go” out of event planning. If you have ever had the problem of deciding where to go, either by yourself or with a large group, our app is for you. Given a small number of preferences, our app books a restaurant and suggests an event nearby to help you plan your event with ease. With only a few choices to make our app makes decision fatigue a thing of the past.

Our app has five key features. First is signup, which is where users can create an account and input their preferences. Second is the plan a date page, which allows the entry of date and time, budget, and location. Next is travel, where we help you get to where your date is with Uber, an on demand car service. Fourth is the confirmation page that summarizes all the details. Our last feature allows for the capturing of photos to help people who use the app make memories of the occasion.

Figure 1: Features

Feature Name	Functionality
Sign Up page	Create an account , ask about their interests
Login page	Allows the users to login with user name and password
Plan a date page	Enter date/time slot/budget / location
Book an uber	Travel
Confirmation page	To display a confirmation message with pick up details
Click photos	Capture memories

Figure 2: Architecture

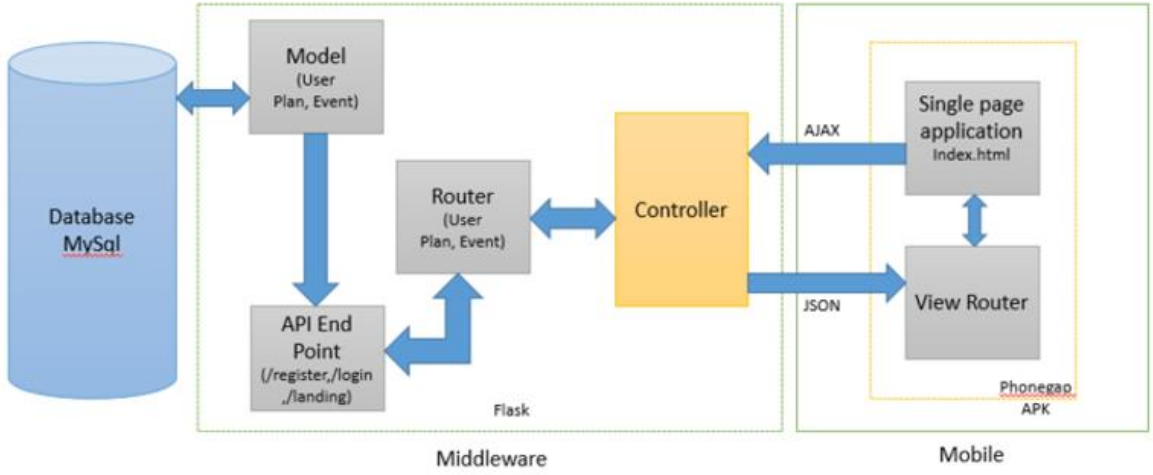
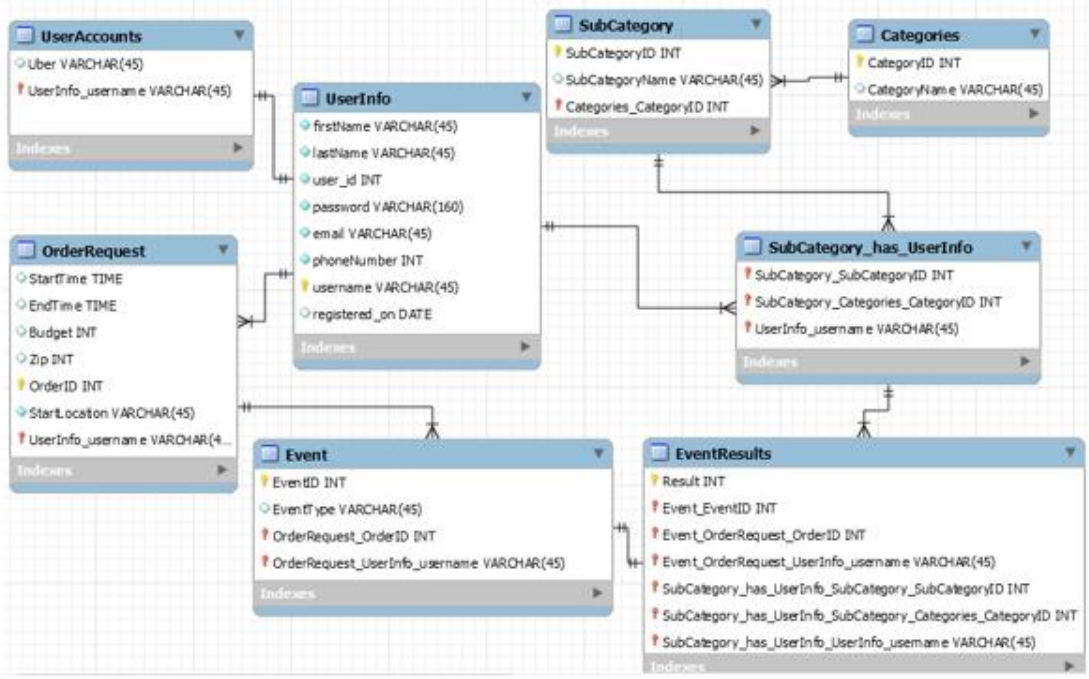


Figure 3: Entity-Relationship Diagram



Our Entity Relationship Diagram (figure 1) lays out the basic structure of our database, which is MySQL. Our database schema allows for both rapid scale and extensibility in both the number of users and the kinds of events our app can plan. We also collect a large amount of information on each interaction that can be

monetized at a later date through a variety of means, such as selling the information to advertisers or partners.

III. Market Analysis

To anticipate whether SurpriseDate has growth potential and decide which revenue model would be suitable, our group conducted market analysis to investigate three trends in the mobile app industry. First, we investigated the growth trend in mobile app usage as a whole. Second, we examined the usage and revenue growth trends of dating and lifestyle apps, under which SurpriseDate could be categorized. Lastly, we looked into the growth trends of each type of revenue model in the mobile app business. According to the data from Statista, the number of mobile app downloads worldwide will reach up to 28.69 billion by 2017. The number was 2.52 billion in 2009, so the compound annual growth rate from 2009 to 2017 is 35.53%, demonstrating that the mobile app usage worldwide has been steadily growing over the years. With the high growth trend in mobile app usage, lifestyle apps were the fourth most popular category out of 21 defined categories in March, 2016. This result is based on the share of all active apps in the Apple Store from Statista. The number of all active lifestyle apps took up 8.72% in the overall app categories. Also, percentage differences between the second and third ranked app categories were very small; business apps took up a share of 10.31% and education apps took up 8.72%. Findings from Jupiter Research clearly supports the above statistics, showing that the mobile app revenue is expected to reach $99 billion by 2019, while dating and lifestyle apps will be the fastest growing app categories. Along with the circumstances that show the huge growth potential

of dating and lifestyle apps, In-App Advertising and Freemium revenues in the app business are growing fast, expected to take lead over other app business models. According to the data from App Annie & IDC, In-App Advertising and Freemium revenues grew by 71% and 72% respectively from 2013 to 2014 while Paid and Paidmium revenue declined by 19% and 24%. The major advantage of this In-App Advertising and Freemium is that both models eliminate up-front costs and create ongoing revenue streams.

IV. Financial Projection

In order to conduct financial projection, first we assumed that we will focus on drawing a certain number of users until the end of 2016. After 2016, we will add more features to SurpriseDate to generate revenues. Based on the market research and characteristics of SurpriseDate, we chose three revenue models, which are In-App Advertising, Sponsor, and Freemium revenues. By 2017, In-App page spaces for In-App Advertising, search algorithm to recommend sponsored restaurants, and more features for users to provide Freemium will be ready. We used CPM (Cost per Thousand, receive $ 4.00 per thousand of impressions), CPC (Cost per Click, 30 cents) and CTR (Click throuh Rate, 0.2% of clicks per impression) to Calculate In-App Advertising revenue. For Sponsor revenue, we assumed that we will receive $100 for each restaurant. Freemium revenue is assumed to earn $20 for each customer with 2% users who will subscribe. The number of users and restaurant sponsors by 2017 are assumed to be 250,000 and 100 respectively, with a 100% growth rate of the number of users and a 20%

growth rate of the number of restaurant sponsors. Based on the assumptions made above, SurpriseDate will generate $3,257,536 of total revenue by 2021. More assumptions are made to calculate the cost side for income Statement and Cash flow projections are:

Labor: $ 20,000 / year & labor, 1 labor (2017~2018), 2 labor (2019~2020), 3 labor (2021)

Marketing exp.: $6,000 (2016~2017), $2,000 (2018~2021)

Utiltities exp.: $2,000 each year

Server costs: 1GB for each user, 10 cents costs for 1GB

Finance $ 37,000 investments from venture capital in 2016

As a result, SurpriseDate will generate $2,392,536 of Operating Profit by 2021 with 73% of Operating Margin. Net Cash Flow of each year will steadily increase and reach $1,201,856 by 2021. A more detailed outlook of the financial projection will be presented in appendices.

V. Problems encountered

We encountered several issues. Most of our issues concerned the use of Application Program Interfaces (APIs). We used APIs extensively to gather information about possible restaurants and events. The first issue we faced as how to query events for a specific geographic area. We solved this issue by using the EventBrite API, which allows for semi-complex queries, including by location. Another issue we encountered was event times. While a fair amount of the information in EventBrite is accurate, some of it is inputted by users and does not include a time. We solved this issue by only returning results with a date/time included. Thirdly, we found that the Yelp API does not include price tier

information in the free API that we are using. If our app was in production, we could solve this issue by upgrading our license.

VI. Lessons learned

We learned several important lessons while developing SurpriseDate. We learned that both Yelp and EventBrite have custom python libraries for accessing their APIs. This greatly reduced development time. We also learned that not all APIs are created equal; the Uber API is much more cumbersome to implement due to its enhanced authentication provisions. Even though all the APIs we used were RESTful APIs, some are more comprehensive and intuitive to query. The Yelp API is very straightforward. The EventBrite API is less so. However, the Yelp API has a free tier and a paid tier; we learned that some APIs restrict functionality by frequency of use and features. If we wanted to use the Yelp API at scale and with full features, we would have to pay.

VII. Next Steps

There are several possible next steps for our application. Firstly, we could enhance our APIs and add new ones for increased functionality. We could create a web scraper for selected event posting sites and blogs which would increase the number of events available to our users. We could also integrate the MTA Trip Planner to help our customers get information about public transit to and from the date without opening another app. We could include movie times and booking through Fandango, which would add a new category of event to our app. We could expand to other cities and areas, such as Boston, Washington D.C., Los Angeles,

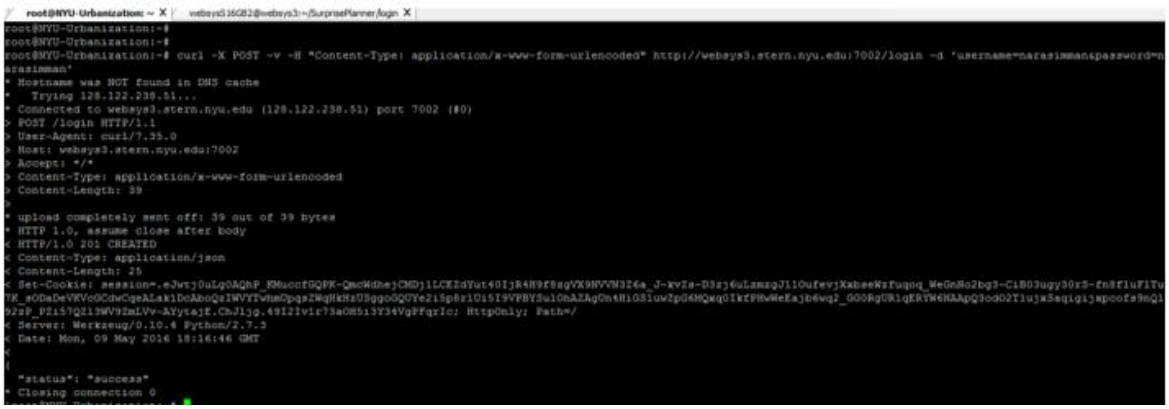
and San Francisco. We could also integrate with online dating applications, such as Tinder, OKCupid, and Hinge, which would allow us to connect people for blind dates. Lastly, we should create more features and services for those will use Freemium services, create advertising space in the app's page and modify search algorithm to make recommendation for restaurant sponsors.

VIII. Conclusion

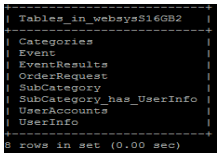
SurpriseDate takes the confusion out of planning a great date. A great date combines a good restaurant and a fun event. However, picking these events is time consuming and annoying. With our app, users can enter preferences, pick time and locations, and get a restaurant and event that matches their preferences automatically. We also have the ability to book uber taxis and take photos directly from the app. With all of these features, users will find that SurpriseDate can be a great way to plan a date in NYC.

IX. Appendices

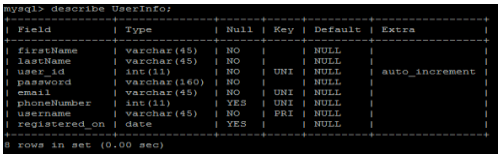
Curl request



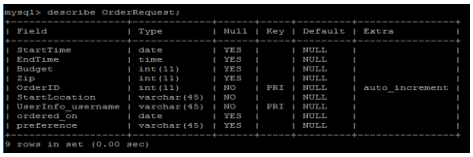
Tables



```
+-------------------------+
| Tables_in_websysS16GB2  |
+-------------------------+
| Categories              |
| Event                   |
| EventResults            |
| OrderRequest            |
| SubCategory             |
| SubCategory_has_UserInfo |
| UserAccounts            |
| UserInfo                |
+-------------------------+
8 rows in set (0.00 sec)
```



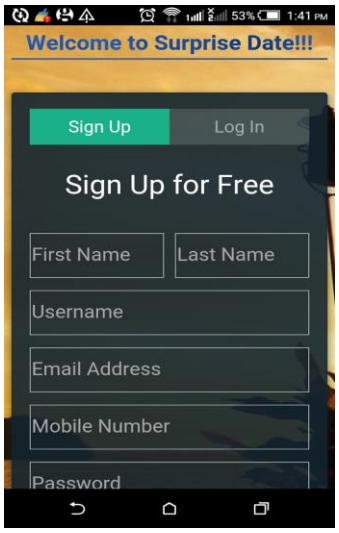
```
mysql> describe UserInfo;
+---------------+-------------+------+-----+---------+----------------+
| Field         | Type        | Null | Key | Default | Extra          |
+---------------+-------------+------+-----+---------+----------------+
| firstName     | varchar(45) | NO   |     | NULL    |                |
| lastName      | varchar(45) | NO   |     | NULL    |                |
| user_id       | int(11)     | NO   | UNI | NULL    | auto_increment |
| password      | varchar(160)| NO   |     | NULL    |                |
| email         | varchar(45) | NO   | UNI | NULL    |                |
| phoneNumber   | int(11)     | YES  | UNI | NULL    |                |
| username      | varchar(45) | NO   | PRI | NULL    |                |
| registered_on | date        | YES  |     | NULL    |                |
+---------------+-------------+------+-----+---------+----------------+
8 rows in set (0.00 sec)
```

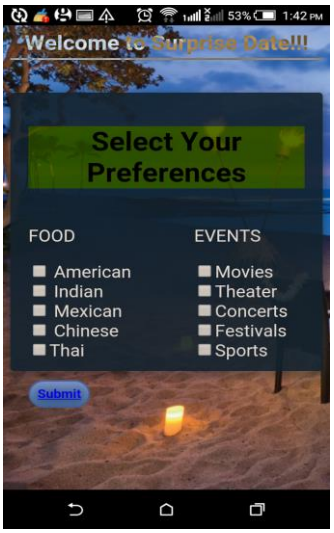


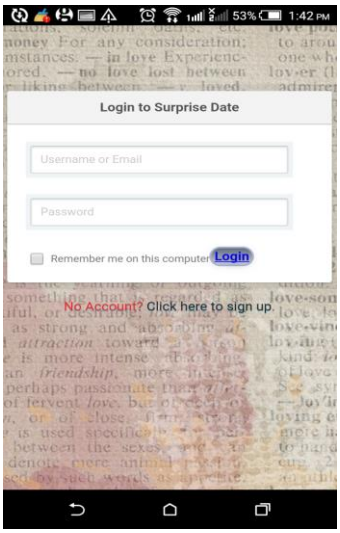
```
mysql> describe OrderRequest;
+------------------+-------------+------+-----+---------+----------------+
| Field            | Type        | Null | Key | Default | Extra          |
+------------------+-------------+------+-----+---------+----------------+
| StartTime        | date        | YES  |     | NULL    |                |
| EndTime          | time        | YES  |     | NULL    |                |
| Budget           | int(11)     | YES  |     | NULL    |                |
| Zip              | int(11)     | YES  |     | NULL    |                |
| OrderID          | int(11)     | NO   | PRI | NULL    | auto_increment |
| StartLocation    | varchar(45) | NO   |     | NULL    |                |
| UserInfo_username| varchar(45) | NO   | PRI | NULL    |                |
| ordered_on       | date        | YES  |     | NULL    |                |
| preference       | varchar(45) | YES  |     | NULL    |                |
+------------------+-------------+------+-----+---------+----------------+
9 rows in set (0.00 sec)
```

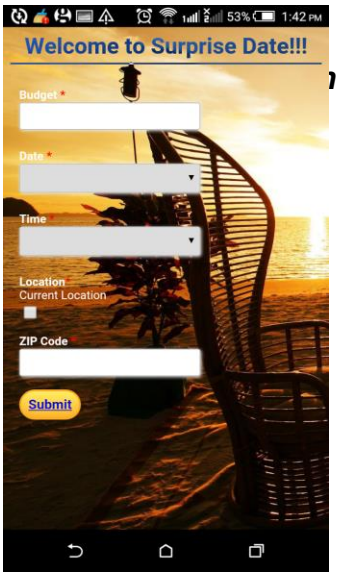
```
mysql> select * from OrderRequest;
+-------------+---------+---------+-------+---------+---------------------+---------------------+-------------+-------------+
| StartTime   | EndTime | Budget  | Zip   | OrderID | StartLocation       | UserInfo_username   | ordered_on  | preference  |
+-------------+---------+---------+-------+---------+---------------------+---------------------+-------------+-------------+
| NULL        | NULL    |       4 | 7306  |       1 |                     | niha                | 2016-05-06  | NULL        |
| 2016-01-04  | NULL    |      10 | 7306  |       2 |                     | niha                | 2016-05-06  | NULL        |
| 2016-06-08  | NULL    |      44 | NULL  |       3 | Times Square, NY    | niha                | 2016-05-07  | NULL        |
| 2016-05-18  | NULL    |      10 | NULL  |       4 | Times Square, NY    | niha                | 2016-05-07  | NULL        |
| 2016-06-02  | NULL    |      89 | NULL  |       5 | Times Square, NY    | niha                | 2016-05-07  | NULL        |
| 2016-08-24  | NULL    |      11 | NULL  |       6 | Times Square, NY    | niha                | 2016-05-07  | NULL        |
| 2016-05-07  | NULL    |     100 | NULL  |       7 | Times Square, NY    | niha                | 2016-05-07  | NULL        |
| 2016-05-07  | NULL    |     100 | NULL  |       8 | Times Square, NY    | niha                | 2016-05-07  | NULL        |
| 2016-05-15  | NULL    |    1000 | NULL  |       9 | Madison Square, NY  | kuna                | 2016-05-07  | NULL        |
| 2016-05-09  | NULL    |     200 | NULL  |      10 | Madison Square, NY  | kuna                | 2016-05-07  | Indian      |
| 2016-05-10  | NULL    |     100 | NULL  |      11 | Madison Square, NY  | kuna                | 2016-05-07  | Indian      |
| 2016-05-12  | NULL    |     300 | NULL  |      12 | Madison Square, NY  | niha                | 2016-05-07  | Indian      |
| 2016-05-13  | NULL    |     150 | NULL  |      13 | Times Square, NY    | kuna                | 2016-05-07  | Indian      |
| 2016-05-07  | NULL    |       3 | NULL  |      14 | 10012               | narasimman          | 2016-05-07  | indian      |
| 2017-01-04  | NULL    |       2 | NULL  |      15 | 10012               | narasimman          | 2016-05-09  | indian      |
| 2018-01-01  | NULL    |       5 | NULL  |      16 | 10012               | narasimman          | 2016-05-09  | indian      |
+-------------+---------+---------+-------+---------+---------------------+---------------------+-------------+-------------+
16 rows in set (0.00 sec)
```

Mobile App Pages (Final product may have different looks)









Financial Projection

Assumptions

Advertising Revenue		
CPM	*$ 4.00*	
CPC	*$ 0.30*	
CTR	*0.20%*	
Sponsor Revenue		
Price	*$ 100.00*	per Restaurant
Freemium Revenue		
Price	*$ 20.00*	per user
% users who subscribe	2%	

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
# of users		*250,000*	*500,000*	*1,000,000*	*2,000,000*	*4,000,000*	*8,000,000*
	(% Growth)		*100%*	*100%*	*100%*	*100%*	*100%*
# of Restaurant Sponsors			*100*	*120*	*144*	*172.8*	*207.36*
	(% Growth)			*20%*	*20%*	*20%*	*20%*

Forcasted Revenue ($)

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Advertising Renenue	-	$ 2,300	$ 4,600	$ 9,200	$ 18,400	$ 36,800
Sponsor Revenue	-	$ 10,000	$ 12,000	$ 14,400	$ 17,280	$ 20,736
Freemium Revenue	-	$ 200,000	$ 400,000	$ 800,000	$ 1,600,000	$ 3,200,000
Total Revenue	**-**	**$ 212,300**	**$ 416,600**	**$ 823,600**	**$ 1,635,680**	**$ 3,257,536**

Assumptions

Labor	Hire 1 labor from 2017~2018, 2 labors from 2019~2020, 3 labors in 2021
Marketing expense	$6,000 from 2016 to 2017, $2,000 for the rest
Utilities	$ 2,000 for each year
Server costs	$0.1 / 1GB & 1GB / user

Forcasted Income Statement ($)

	2016	2017	2018	2019	2020	2021
Revenue	**-**	**212,300**	**416,600**	**823,600**	**1,635,680**	**3,257,536**
Labor	0	20,000	20,000	40,000	40,000	60,000
Server costs	25,000	50,000	100,000	200,000	400,000	800,000
Utility expense	2,000	2,000	2,000	2,000	2,000	2,000
Marketing expense	6,000	6,000	2,000	2,000	2,000	2,000
Miscellenous	1,000	1,000	1,000	1,000	1,000	1,000
Total Costs	34,000	79,000	125,000	245,000	445,000	865,000
Operating Profit	**-34,000**	**133,300**	**291,600**	**578,600**	**1,190,680**	**2,392,536**
Operating Margin	0%	63%	70%	70%	73%	73%

Cash Flow Table ($)

	2016	2017	2018	2019	2020	2021
Amount raised/needed	**37,000**					
Revenue	0	212,300	416,600	823,600	1,635,680	3,257,536
Total costs	34,000	79,000	125,000	245,000	445,000	865,000
Cash in	37,000	212,300	416,600	823,600	1,635,680	3,257,536
Cash on hand	3,000	133,300	291,600	578,600	1,190,680	2,392,536
Net cash flow	**-34,000**	**130,300**	**158,300**	**287,000**	**612,080**	**1,201,856**