**Final Project Paper: Branch App**

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**Executive Summary**

Branch App is a Minneapolis bank that was created to give hourly workers the opportunity to address scheduling needs and cashflow issues. The problem that we are addressing is the payment methods that Branch could use to maximize profitability.

We present three models – fixed payment, percentage-based, and a monthly fee. The way we solved this problem was through non-linear optimization by utilizing Solver within Excel. From our in-depth analysis, it is projected that the monthly fee based model is the most profitable, optimizing profits to $863,205,463.88 for the next five years. For this reason, we recommend that Branch App uses this model in the future. To explain how we got to this conclusion, we will go more in-depth with our business problem and how we set up an analytical problem and solution.

**Business Problem (Question) and Analytics Problem Framing**

As stated before, Branch App is a bank that was created to give hourly workers the opportunity to address scheduling needs and cashflow issues. The app is more than a personal finance tool- allowing users to get paychecks in advance, look at their work schedule ahead of time, and pick up extra shifts. For hourly workers, being able to access already earned wages reduces extra stress from negotiating work, managing personal finances, and budgeting for unexpected payments. Allowing employees to access these features is also beneficial for employers who can use the app to increase worker efficiency.

When the app launched, they followed a fee-based withdrawal where employees could either pay a $3.99 fee to get their money before the scheduled payday or wait three days for a free advance. The amount employees could access depended on how many hours they’ve worked, with a maximum withdrawal of $150 per day and $500 per pay period. If an employee decided to take their money out before the payday, they were given a payback date that was typically the same day as the next paycheck which was then deducted from their account.

However, the company is now trying to target growth more than profitability. By switching their business from the fee-based withdrawal model to a transaction-based model, the Branch app is now partnering with companies where employees have free access to withdrawals, but Branch makes a profit on the bank transfers, and debit card transactions. During the fee-based withdrawal system, Branch was servicing over 1,000,000 clients, and now with the transaction-based plan they are servicing closer to 40,000. We will analyze which business model is more profitable and compare the model to what their competitors are doing, as they significantly cut down on the number of clients during the transition between business models. Their competitors use a monthly subscription rate service, and we will compare it to the percentage-based transaction structure.

The stakeholders of Branch App are the people that are affected by the growth of the business. These people are the investors, employees, and customers. For Branch App the two major stakeholders are the investors and the employees. These people are going to be the ones that are most affected by the growth of the business. In the case of the stakeholders, as the company grows the better their investment will be. For the employees as the business grows, they will have better job security as well as potential benefits that they will get for the business succeeding. Customers are also stakeholders because they are affected if Branch App decides to change their business model. This can be in a good way or a bad way, allowing customers to pay less or more for their service.

Figuring out which model is the most profitable for Branch is an important problem that has an analytical solution. By comparing the optimal performance of the different models, we can conclude which model is the best fitting for Branch to use in the future.

One of the constraints for the problem is the inflation rate. Inflation rate is something that is out of the control of the business, so we made a standard rate between the different models that we compared. Additionally, the number of customers is a constraint, as it is something that is given, however can change throughout the model as growth does occur. Another constraint that we used were logical percentages in our percent fee-based model, so that the fee percentage returned was reasonable. Similarly for the monthly fee-based model we set up a logical maximum fee per month, with the assumption being that the fee shouldn’t be extremely high as then it would be irrational. The same applies for the fixed rate fee structure as a super high fixed rate fee would be unrealistic.

Some of the pros of Branch App’s fee-based withdrawal model are that there are no interest or membership fees, and if it is wanted, a same-day funding option is available for a small fee. Users of Branch App are able to withdraw up to $500 per pay period, and there is no credit check for eligibility. Some cons of Branch App are there is a 3-day wait period for the free advance option, and the advance received is based off how many hours a person has already worked. Branch App has a limit to the amount of money that people can access early. For additional amounts of advanced wages there is a service fee.

One of the pros of the Branch App’s transaction-based model is that they will gain revenue every time a customer uses their service. So, this means if a customer uses their service enough times in a month, they will gross more than they would if they just used a monthly fee. Another pro to the transaction-based model is that it could potentially gain more customers compared to the monthly fee. This is because there could be some customers that don’t use the service that often but want it when they need to use it. The transaction-based model will allow them to only pay when they need to use it.

As a new company, Branch App is targeting growth now more than profitability. Branch App recently switched their business model from the fee-based withdrawals to a plan where they partner with companies and the employees have free access to early withdrawals, but Branch makes a profit on external bank transfers, and debit card transactions. The change of business model occurred in the beginning of 2021. The bank transfer fee is $2.99 per transfer of funds to a different bank. We will analyze which business model is more profitable, as they significantly cut down on the number of clients during the transition between business models. During the fee-based withdrawal system, Branch was servicing more than the transaction-based plan, with 1,000,000 clients as opposed to 40,000, with current growth of around 10,000 additional customers a month. Their app now also offers scheduling systems to the companies that use it.

Some of the inputs to consider when approaching this business problem include the form of the payment required to withdraw money, such as a flat monthly rate, a percentage-based payment, or a fixed payment per withdrawal. It is also important to consider what it costs the company to provide their services to their clients, so overall revenue can be assessed. The amount of clients that the company provides services for also affects what the optimal payment would be to withdraw money. Within each type of payment, it is important to consider the average number of withdrawals that customers would make depending on what type of subscription they had. One of the main factors in making this analysis is knowing how many customers pay to use the instant withdrawal system instead of the free withdrawal with a waiting period. This will have to be assumed in the model.

The outputs that we need to consider mainly have to do with profitability of the company. For example, we need to analyze how much the company profits per customer using the various payment methods during the fee-based business model. Another output to analyze would be how many clients they would need to gain under their new business model to become more profitable than they were during their previous business model.

In order to complete the analysis of the problem, a lot of assumptions will need to be maintained. First, we are assuming that the customers were using the instant withdrawal system which required a fee. We will have to assume how many clients that the company has, and how many customers they have per client. We will assume that if they were to use a monthly flat rate, or a percentage-based rate, they would use rates similar to their competitors. We will also assume the profits they make per bank transfer and debit card transactions under the new model based on companies who profit from similar business models, such as Venmo.

The main metric of success we will be looking for is how Branch App can be more successful in their business model. This means looking at the upcoming years of each model and how it will allow for the most growth as well as the most revenue gained. This will involve using the various inputs mentioned above which need to be assumed, some of these can drastically affect how the business will grow in the future. Growth and revenue are a major part of how a business measures its success. Every business wants to grow because with growth comes an increase of revenue. This is due to the fact their customer base will grow as the company grows. Measuring these in our models will allow for Branch App to see how they can be a more successful business in the future of their company.

**Data Acquisition**

The sources we used were Statista, a Branch employee, competitors’ data, WalletHub.com, and the Federal Reserve Economic Database. How we used each source is described below.

Statista provides users with market and consumer data, which is constantly updated by experts. We found data that helped with some of our assumptions we had to make for this project. It gave us data on a wide variety of topics. For example, we needed to assume the rate at which people would use the paid service for Branch app for our fixed rate model. This website also allowed us to find our competitor’s data and find companies data that are closely related to our company and rates they have been using in the past years.

Our next data source is directly from a Branch employee. Some of the main data points that were utilized from this person were more generalizations around the data. This included the number of users who paid for the advanced paycheck service while it was still around, versus the number who use the free advanced paycheck service now. Additionally, this included information on the number of people who do bank transfers, as this could affect the amount of bank holds and the amount that the bank can expect to make from transfer fees. Additional information that was acquired for communication from a branch employee were general fee structures, including the original $3.99 fee for advancements on paychecks, and $2.99 fee for bank transfer. The number of customers was also acquired form the employee. The number of employees was also a crucial factor for our models that we got form the employee, as it directly relates to the companies' expenses. The partnership with Mastercard, and details on that were also acquired from the employee. Learning about the change in the business model, and the logistics surrounding that was also acquired from this source.

We also looked at competitor’s data (such as apps like Venmo, Brigit, and Possible Finance) which gave us a better understanding of assumptions when modeling our data. Since Branch App is a smaller bank, the data we were able to access was limited. Because the company recently switched their model from their fee-based withdrawals to a plan where they partner with companies and the employees have free access to withdrawals, data about their new model is even more limited. By using data from competitors, we were also able to get information on our monthly fee-based model, as it isn’t something that Branch does, however we wanted to explore the possibility.

Another source in which we used for gathering data was WalletHub.com. Primarily the data from this was to get information on debit card transaction fees. We mainly used this information to set a baseline for the amount that Branch could make off a debit card transaction. WalletHub mainly has information regarding debit card and debit cards and provides comparison data between different cards and companies.

The Federal Reserve Economic Database is a database maintained by the Research division of the Federal Reserve Bank of St. Louis. They provide a deep dive into economic statistics in the US. This site offers a multitude of data sources that helped us with some of the assumptions that come with modeling a percent-based payment system by assimilating with credit card rates in the US. The main piece of data that we were able to acquire using this source was general information regarding interest and inflation rates. In our models we ended up deciding on using a 2% inflation rate, as suggested by research that was performed using the Federal Reserve Economic Database. The inflation rate was used throughout all of the models that we used. It was crucial to make sure that used an inflation rate in order to make a multi-year model more realistic.

**Model Development and Testing**

The modeling methodology we are using for our problem is non-linear optimization. We felt that optimization would be the best fit for comparing the three plans that Branch has applied or can apply to their business model. The two plans that Branch has used are fee-based withdrawal systems, and a transaction-based plan. The last plan that Branch could apply to their business model is that of their competitors, which is a monthly fee-based program. We used Solver to produce the highest 5-year profit given the data we found for each model individually, then compared each model to identify optimization.

By using Solver within Excel, we were able to output the optimal plan for Branch. The different business models were our decision variables: a flat monthly fee that Branch’s competitors use, a flat rate per withdrawal that Branch used to use, and the percentage-based transaction fee that Branch uses now.

The objective function that we were trying to optimize was the total revenue of the company based on each of the three plans. This tells us which plan has the highest profitability, and therefore picks the best plan for Branch to use in the future. Solver allowed us to set up possible constraints we want to use such as what budget or a range of possible percentage rates that allow us to easily see the changes on the overall profit and thus pick the optimal plan. Some of the constraints we have are the maximum dollar amount allowed per pay period to be borrowed as well as the maximum allowed amount per day. We wanted to make sure the model is accurate in the future. To account for this, we optimized the revenue across a 5-year period and adjusted rates accordingly with projected inflation. We also needed to account for a varying customer base as rates change – since less people would use Branch’s services if the rate increased. We used an exponential formula to set this up based on the total market size, and the landed cost per customer. When paired with a negative exponential factor, this made the customer base marginally decrease as the rate increased. When properly set up, the optimization of each model’s revenue also shows what specific rate Branch should use for each business plan.

With Solver providing us Branch’s optimal plan, the effectiveness of the optimization modeling methodology is demonstrated. It helps us conclude which plan is most profitable, and how to make each plan the most profitable. Our model can only be as accurate as our assumptions are – with the help of various databases and our contact at Branch, we can minimize error with realistic assumptions. However, when all the input data is decided, solver will accurately tell us the revenue of each business plan.

We made three individual models for each of the payment methods that we thought that Branch could use to optimize its profitability. For all our models we included number of employees and salary expenses as our main expense. We calculated this off the number of employees that were needed off a particular level of customers and multiplied it by the average salary that was adjusted annually for inflation.

The first model was a fixed payment model. In this model we used solver to identify the optimal fee for an advanced paycheck. For this model our inputs included the average percentage of customers that receive their payments in advance, an average number of withdrawals per period, the total number of customers, the recurring inflation rate, and a logical maximum fee that would be charged.

The second model we used was a percentage-based fee structure. Revenue was made by a percentage off of credit card transactions. In this model we used solver to identify the optimal percentage that should be used for transactions. Inputs included the average amount a withdrawal included, the average number of withdrawals per month, the number of customers, an inflation rate for employee salary, and a logical minimum and maximum percentage that was used.

The third model was a monthly fee structure. This model incorporated a monthly fee that was optimized with solver for maximum profit.  Inputs included the market size, the number of customers, the inflation rate, and a logical maximum that the monthly rate could be.

**Conclusion and Recommendations**

To summarize our findings, we will begin with the monthly fee model, and describe its performance. Most important is the profitability, and for the next five years this model had a projection of $863,205,463.88 with the monthly fee being $8.48. This fee is 15% lower than Branch’s competitors’ rates. Based on the assumptions made, the best strategy to optimize this business model is to balance the customer base with a middle ground fee.

For the transaction-based model, profitability was $806,645,890.94 over a five-year span with varying percentages from 1-1.08%. This was $56,559,573 less than the monthly fee model. While this model significantly decreased the total number of customers from 1.8 million to around 60,000, it still produces a revenue comparable with the monthly fee model. Using the transaction-based model would be a good business decision for Branch App, allowing for customers to only pay when they want to use it. Choosing the monthly fee model over the transaction-based model would significantly increase their company’s overall profit. The transaction-based model is the current business model for Branch app, and it is a reasonable model. If they stick with this model, the best strategy would be to minimize the rate as much as possible. Even though the landed cost per customer would decrease, the amount of customers they could gain would outweigh the lost revenue. Maximizing market capture is very important for this business model.

Lastly, the fixed monthly fee model had a profitability of $77,469,258.89, significantly lower than the other models. This was Branch app’s old business model, and it was smart to move away from it. Profit for this model was maximized with a $3.66 fixed fee, which is less than the old business model’s fee of $3.99. However, because of its low profitability, it is crucial to stay away from this plan.