

# Planterbox Inc Case Study Acquisition of Saastras

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## Problem specification:

Strategic workforce allocation for optimizing revenue growth at Saastras.

The purpose of this analysis is figuring out how to grow SaaSastras revenue and determining where 20 people will work each month for the next 24 months to maximize the cumulative revenue generated over the entire period.

## Variables to Consider

### **TimeFrame:**

Grow revenue in 24 months by efficient human resource allocation

### **Human resources:**

20 people skilled in three roles

- New Business Acquisition: These employees are responsible for bringing in new customers.
- Account Management: These employees help existing customers, drive revenue growth from these customers, and improve retention.
- Support: These employees solve customer problems and improve retention for any active customer.

Each of the 20 can only perform one role at a time

Each of the 20 can switch to another role at the start of any month

One person could cycle through every job without a loss in productivity

## **Specifics of the 20 people**

Each new business acquisition employee can bring in 5 new customers a month

Account Managers can increase revenue by 20% each month for up to 6 months for the customers they manage, the increase compounds each month.

Each account manager can manage 25 customers

Each support agent increases CSAT by 1 percentage point and each point of CSAT reduces churn by 15%

## **Current State of metrics after acquisition**

The current situation of planterbox inc after acquisition of SaaSfras is as follows

1. Total of 1000 customers
2. Gains 25 organic new customers every month through branding and referrals
3. Loses 10% of customers each month due to churn
4. Separate standalone support team whose customer satisfaction score has been steady at 70% (how many are they?)
5. Every customer pays \$100 a month for the core product

The existing team is flexible but experiences low productivity due to lack of specialization in their roles across new business acquisition, account management and support. The employees want to work in one role so as to focus and increase productivity.

The main goal is need to enhance revenue generation strategies so that we can achieve a high cumulative revenue return from SaaSfras.

# Main Tasks

For month 1 to month 24, Determining how many people will work in

1. New business acquisition (x)
2. Account Management (y)
3. Support (z)

Why will they work there?

What is the one variable to improve going into year 3? How would you approach changing that variable? (Core metrics: customer acquisition, CSAT, revenue increase, relative churn decrease)

## Assumptions

The problem specification makes no mention of any changes to market trends or political trends or economic trends that might affect customer acquisition or retention other than the specified numbers provided. Therefore in the solution we will assume that the metrics provided are constant.

Competitive landscape changes have not also been outlined in this case study other than the fact the customers might turn to specialized solutions and churn is at 10% due to this.

We are also assuming that there is potentially enough budget in order to accommodate the needs of both the product manager, the 20 people gained during the acquisition and the extra support team.

The current goal has not been specified explicitly i.e increase revenue by x% instead it is a generalized "maximize the revenue in 24 months"

The \$100 paid by the customer is fixed and there are no deductions to fees such as payment processing fee for example stripe's \$2.9c + 0.30 per transaction or bank fees.

The CSAT does not fluctuate and is a steady 15% churn rate reduction

The churn rate is a fixed 10% and cannot be reduced or increased.

There are no external expenses considered, thus churn is the only way of losing money.

# Analysis Methodology using Mathematical Techniques

## Sample Solution

Given the above problem specification and the variables provided. We need to solve how to allocate human resources in order to maximize revenue of a period of 24 months.

We will proceed by breaking down the problem into smaller problems which we can easily solve.

We need to first understand the current state of planter box inc with the new acquisition.

The variables at acquisition provided are:

- Total Customer Base: 1000 customers
- Monthly Organic customer acquisition: 25 customers
- Monthly churn rate: 10% of total customers
- Baseline Revenue per customer: \$100 per month
- CSAT (customer satisfaction score) 70%

For a holistic understanding, we run a projection of revenue gained if there are no changes to the status quo in order to develop strategies to increase revenue, here is what we have:

## Current Metrics at acquisition

### Monthly Case scenario

The following is a calculation of the current status quo of saasfras is maintained and human resources are not allocated efficiently

- Monthly Churn = current customer base \* churn rate

$$1000 * 0.10 = 100 \text{ customers lost every month}$$

- Monthly net customer gain or loss = Customers acquired organically - monthly churn

$$25 - 100 = -75 \text{ customers}$$

- Monthly recurring revenue = current customer base \* revenue per customer

$$1000 * 100 = \$100,000$$

- Revenue lost to churn = monthly churn \* revenue per customer

$$100 * 100 = \$10,000$$

- Revenue per month after churn = monthly recurring revenue - revenue lost to churn

$$100,000 - 10,000 = \$90,000$$

- Customer lifetime value = revenue per customer / churn rate

$$100 / 0.10 = \$1000$$

Assuming no changes are made to in the allocation of the employees and given the above metrics and constant churn and acquisition rates and the assumptions made above:

We want to know

1. What will be the total customer base at the end of the 24 month period?
2. How many customers will we have lost over that period?
3. What will our monthly recurring revenue be at the end of the 24 month period?
4. What will be our cumulative revenue at the end of the 24 month period?

Calculations performed using this script: `maintained_status_quo.rb` (see folder and instructions to run it).

You can also view the charts (see data visualization folder and instructions to run it)

**\*The decimal values are truncated for ease of reading and quick estimations**

Month 1:

Starting Customer Base: 925.0

Monthly Acquisition: 25

Monthly Churn: 100.0

End Customer Base: 925.0

MRR: \$92500.0

Cumulative Revenue: \$92500.0

Revenue Lost to churn: 10000.0

Month 6:

Starting Customer Base: 692.87

Monthly Acquisition: 25

Monthly Churn: 69.29

End Customer Base: 648.58

MRR: \$64858.08

Cumulative Revenue: \$466277.33

Revenue Lost to churn: 6928.68

Month 12:

Starting Customer Base: 485.36

Monthly Acquisition: 25

Monthly Churn: 48.54

End Customer Base: 461.82

MRR: \$46182.22

Cumulative Revenue: \$784360.06

Revenue Lost to churn: 4853.58

Month 24:

Starting Customer Base: 316.47

Monthly Acquisition: 25

Monthly Churn: 31.65

End Customer Base: 309.82

MRR: \$30982.48

Cumulative Revenue: \$1221157.65

Revenue Lost to churn: 3164.72

### **Final summary if status quo is not changed**

Final Customer Base after 24 months: 309.82

Final Monthly Recurring Revenue (MRR): \$30982.48

Cumulative Revenue over 24 months: \$1221157.65

Total cumulative revenue lost due to churn: \$129017.52

From the above we see a need to find the best combination of new acquisition of customers, support of the customers and obvious strategy needed to offset the rate of churned customers.

# Strategies to increase revenue

Given we have 20 new employees who are multitalented. In new business acquisition, account management and support.

## Reviewing the Team Capabilities

### Conditions

1. *Each New Business Acquisition team member can acquire 5 new customers a month.*
2. *“Account Managers increase revenue by 20% month-over-month for accounts they manage up to a cap of 6 months. To be clear, this revenue increase compounds by 20% each month up to the 6th month, at which point it maxes out and remains flat for the remaining duration of time that the customer has an account manager (for example, if a customer has an account manager in month 1 they’ll pay \$120, in month 2 they’ll pay \$144, etc). If a customer has an account manager and then loses the account manager their metrics (revenue per month) return to the baseline, but there isn’t a negative consequence. Each Account Manager can carry 25 customers.”*
3. *Each support agent increases CSAT by 1 percentage point. Each point of CSAT leads to a 15% relative decrease in churn.*
4. *While each person will only perform one role at a time they can switch to another role at the start of any month - one person could cycle through every job without a loss in productivity.*
5. *Monthly Organic customer acquisition: 25 customers*
6. *Monthly churn rate: 10% of total customers*
7. *Baseline Revenue per customer: \$100 per month*

## Possible Solutions

### Solution 1: Mathematical optimization using Brute Force Permutations

Brute Force Permutations to find the ultimate combinations for highest revenue and least churn

By considering the above conditions, we can use permutations of the roles over time to find the best way to maximize revenue:

This is a brute force way of going through as many combinations so we can get the very best combinations for high revenue and least churn and least revenue lost to churn.

The solution to reach this is in the folders: **best\_allocation\_permutations.rb**

*From month 1 to month 24, Determining how many people will work in*

*New business acquisition (x)*

*Account Management (y)*

*Support (z)*

*Why will they work there?*

Given the huge number of computations for obtaining the best combinations, this might not be the best approach. If we run the calculations using a fixed distribution, to bypass the computation cost for best combinations for maximum revenue, we will have the following distributions

A Sample combination for highest revenue and least lost revenue:

New Business Acquisition Employees:

[11, 11]

Account Management Employees: [0, 0]

Support Employees: [9, 9]

This distribution is very aggressive and assigns a large number of team members to new business acquisition and support employees.

The following is a breakdown of the revenue generated using the above distribution of employees:



Highest Cumulative Revenue: \$3837434.0  
Lowest Cumulative Revenue Lost to Churn: \$4684.0

Monthly metrics for the best combination:

Month 1:

Starting Customer Base: 1000.0  
Monthly Acquisition: 80  
Monthly Churn: 23.16  
End Customer Base: 1056.84  
MRR: \$105684.0  
Cumulative Revenue: \$105684.0  
Revenue Lost to Churn: \$2316.0

Month 6:

Starting Customer Base: 1271.33  
Monthly Acquisition: 80  
Monthly Churn: 29.45  
End Customer Base: 1321.88  
MRR: \$132188.0  
Cumulative Revenue: \$714859.0  
Revenue Lost to Churn: \$2945.0

Month 12:

Starting Customer Base: 1557.61  
Monthly Acquisition: 80  
Monthly Churn: 36.08  
End Customer Base: 1601.53  
MRR: \$160153.0  
Cumulative Revenue: \$1607776.0  
Revenue Lost to Churn: \$3608.0

Month 24:

Starting Customer Base: 2022.46  
Monthly Acquisition: 80  
Monthly Churn: 46.84  
End Customer Base: 2055.62  
MRR: \$205562.0  
Cumulative Revenue: \$3837434.0  
Revenue Lost to Churn: \$4684.0

Using brute force permutations might not be the best solution here and carries the risk of ignoring the potential revenue growth and compounding effect from account management of existing customers and therefore not a great solution for this.

## Solution 2: Improving on the permutations. One Month Simulation

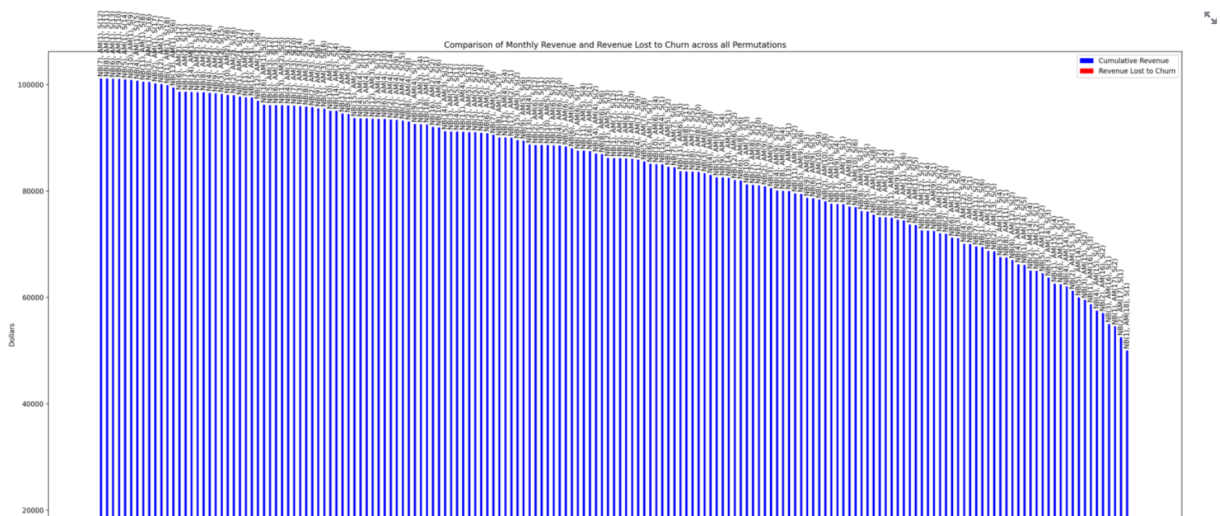
Taking the idea from the brute force permutation approach of trying to calculate the entire set of 24 months which is computationally expensive, we can work with one month of permutations to see which combination of new business acquisition employees, account manager employees and support employees. This way using a small sample scenario we can determine the highest cumulative revenue based on these combinations.

We use the calculation found in `improved_permutations_one_month.rb`

The data visualization of single month earning comparisons can be seen in `data_visualization` folder `app.py`

The permutations comparison is as follows:

### Best Staff Allocation Combination for Max Revenue - One Month View



Following the calculations in the improved permutations script, these are the best combinations for the highest revenue per month starting month 1:

Best scenario metrics:

Permutation: "7-1-12",

Starting\_customer\_base: 1000,

New Business Acquisition Employees: 7,

Account Manager Employees: 1,

Support employees: 12,

Monthly acquisition: 60,

Monthly churn: 14.22,

End\_customer\_base: 1045.78,

Mrr: 102578.0,

Cumulative revenue: 101156.0,

Revenue\_lost\_to\_churn: 1422.0

Therefore from the above calculation based on permutations, the combination of 7 new business acquisition employees, 1 account manager and 12 support employees is the best strategic combination to attain the highest cumulative revenue based on analysis.

*What is the one variable to improve going into year 3? How would you approach changing that variable?*

Moving on to Year 3, the most significant variable would be customer lifetime value, where we identify the most valuable and profitable customers and segment them and tailor a combination which ensures no churn.

Customer Lifetime Value is a critical metric that estimates the total revenue a business can reasonably expect from a single customer account throughout the business relationship. By year three, a company can calculate CLV with greater accuracy because it has multiple years of data on customer spending habits and retention rates.

Arriving at this metric is based on assessment of historical performance. By the 3rd year we will have accumulated enough data on customer behaviors, preferences, and revenue generation. Analyzing this data allows us to identify trends and patterns.

We can then easily segment customers into various groups based on their value and allocate our employees efficiently across the customer segments.

