

Big Data Consulting Project
Marketing Information Technology – MKTG 353 Fall 2016

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Executive Summary

BOL provides following Investment sales and service options:

- Mutual Funds
- Guaranteed Investment Certificates (GIC) and
- Continuous Savings Plans.

These services are offered through registered and non-registered options. Registered options include: TFSAs, RRSPs, RRIFs, Locked-In plans, RESPs and IPPs. But BOL has been not successful in increasing revenue. BOL wants to analyze its data and identify a right strategy to increase its revenue.

Careful analysis of data highlights the following important aspects of BOLs business:

- There is no major change in terms of revenue on a monthly basis.
- Product 1 balance increases gradually from month 1 to 4 and then it fluctuates from month 5 to 9 and suddenly falls thereafter. Same pattern is observed for next year.
- Product 2 balance grows very slowly until month 6 and then there is a sudden rise until month 12 and later the growth rate is almost insignificant.
- Product 3 balances grows gradually every month except for months 9 to 11
- All the customers of BOL can be categorized into 3 groups for real time marketing.

The insights gained from BOLs data can be used to build an effective marketing methodology and will help increasing the revenues. Marketing team will target customers by using the deposit detection algorithm. Also, the team will have a specific list of target customers for daily and monthly marketing campaigns.

Marketing team will prioritize the leads using the model created by the analysts and hit the right target on right time with the right amount of force to achieve maximum success.

Following are the important future recommendations that would help BOL succeed in its business ventures:

- BOL needs to implement data collection procedures that will help the analysts identify trends for Product 1, 2 and 3.
- Marketing is not the only factor to improve the business; a 360-degree system is needed in place to identify new growth opportunities based on market trends and technological evolution.
- A feedback system must be put in place to measure the success of a marketing campaign. The data generated by this system will be helpful to improve the marketing model.

Table of Contents

Problem Statement	4
BACKGROUND	4
PROJECT OBJECTIVE	5
DATA SOURCES AND DESCRIPTION	5
SOLUTION OVERVIEW	5
• TECHNOLOGY SELECTED.....	5
• SOLUTION DETAILS	5
• COMPANY DASHBOARD.....	6
INSIGHTS GAINED	7
Customer Segmentation:	9
Deposit detection algorithm:.....	10
Sizing daily/monthly target audience:	10
FUTURE RECOMMENDATIONS.....	11

Problem Statement

Bank of La La Land (BOL) wants to improve their customer relationship program by deploying an efficient marketing program. The program will be customized based on the customers' needs and will result in maximum sales. To build such a program BOL plans to use the historical data and draw insights about their customer's behavior; this analysis would help the marketing team know when it is about right, to approach a particular customer segment. It will also help BOL decide what products will be offered to which segment of customers.

BACKGROUND

Market size of Canadian investment banking is around \$278 billion in balances. The size grew by 3% between 4/2015 – 4/2016 but growth rate for BOL was ~7.5%². BOL provides following Investment sales and service options:

- Mutual Funds
- Guaranteed Investment Certificates (GIC) and
- Continuous Savings Plans.

These services are offered through registered and non-registered options. Registered options include: TFSAs, RRSPs, RRIFs, Locked-In plans, RESPs and IPPs.

Below graph is provided by BOL which explains the distribution of new customers by age for all investment and deposit products.

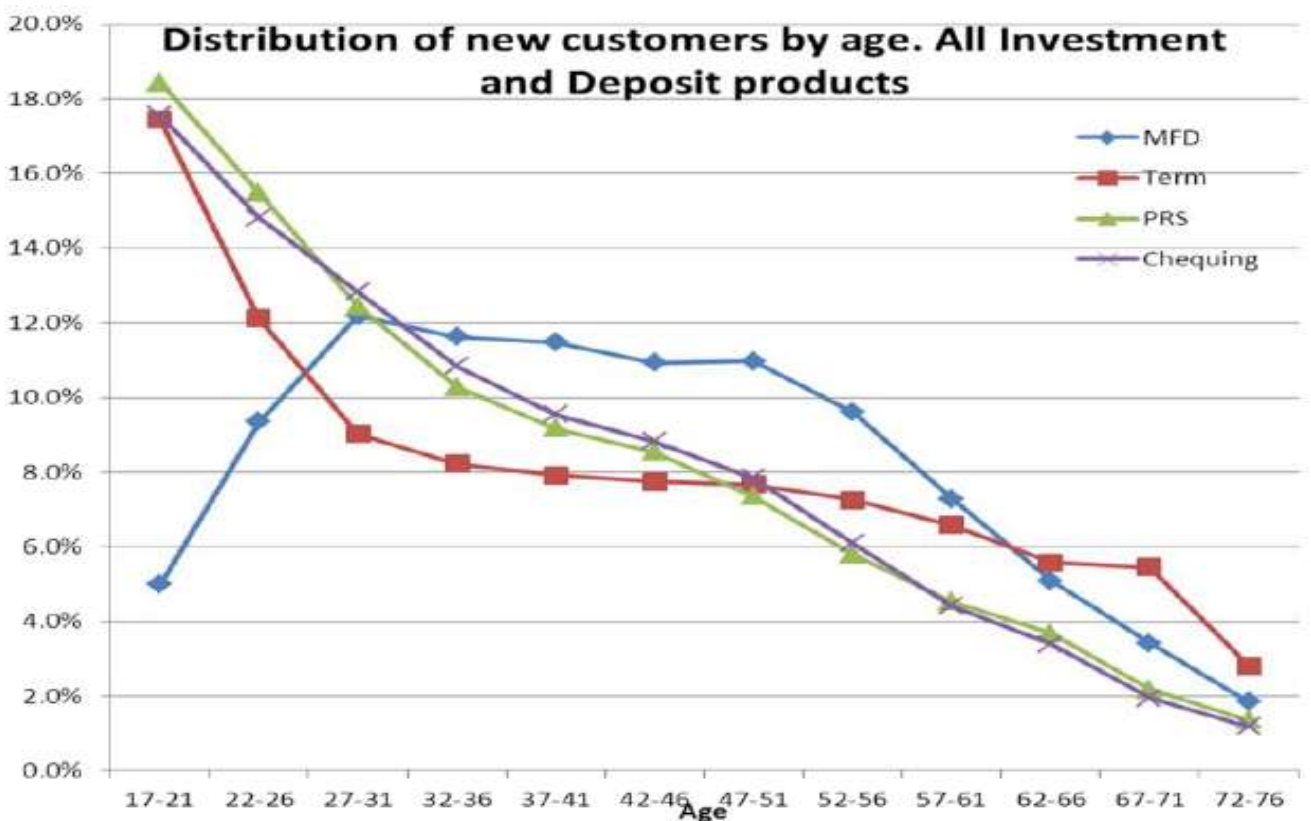


Figure 1. Distribution of new customers by age.

BOL's successful investment sales are mainly dependent on timely, proactive and relevant customer conversations. BOL needs to identify when these conversations are relevant based on cash flow and identifying when significant deposits occur.

Event driven marketing has major challenges. First the data comes in real-time and all the decisions must be driven based on the real-time data. This data comes in high velocity and in high volume. BOL needs to build a successful analytic approach that will help deliver an event driven marketing model.

BOL has existing systems that can deliver leads to prompt conversations. These systems use:

- Outbound channels – Branches and front line staff, customer centres, mail and digital channels
- Real time channels – Branch, ATM, online banking and IVR.

PROJECT OBJECTIVE

The final goal of this project is to help BOL build an effective marketing plan based on the analysis of historical customer data provided by BOL. To achieve the final goal following must be achieved:

1. Divide the existing customers into segments (Clustering) to prepare customized marketing solution for individual customer segment.
2. Building an algorithm to identify an incident for triggering a marketing event for customer(s).
3. Sizing daily/monthly targets of the customized marketing campaigns
4. Prioritizing leads based on customer deposits.

DATA SOURCES AND DESCRIPTION

The data used for analysis is provided by BOL. The data has 1067 features and more than 20000 observations. The features can be broadly classified into Revenue Balances, Product Balances, Sale and Deposits. All the features are further divided based on months (1-24).

SOLUTION OVERVIEW

• TECHNOLOGY SELECTED

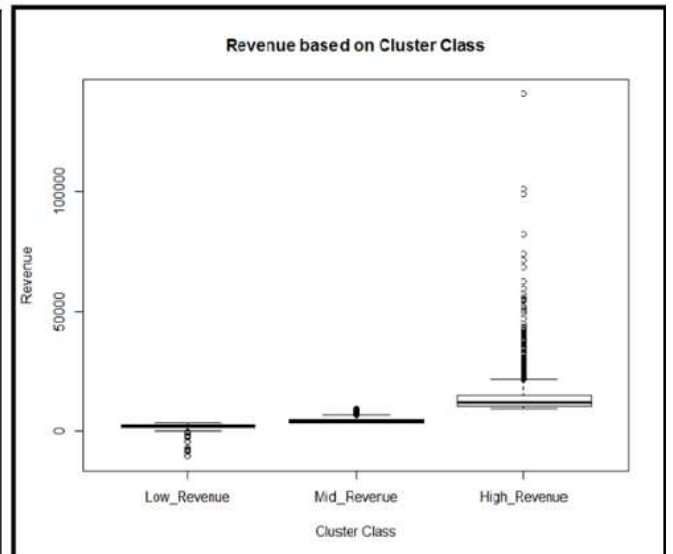
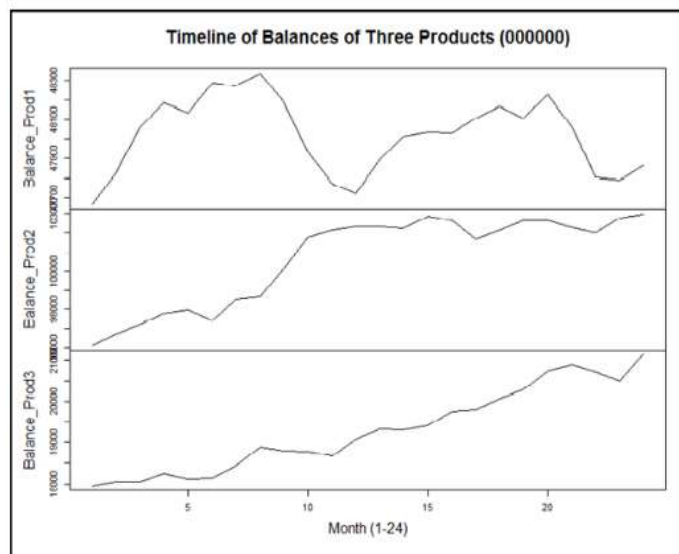
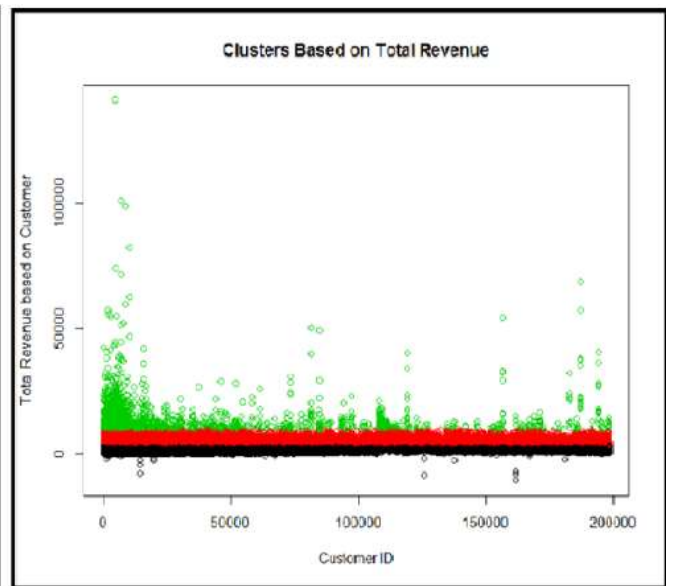
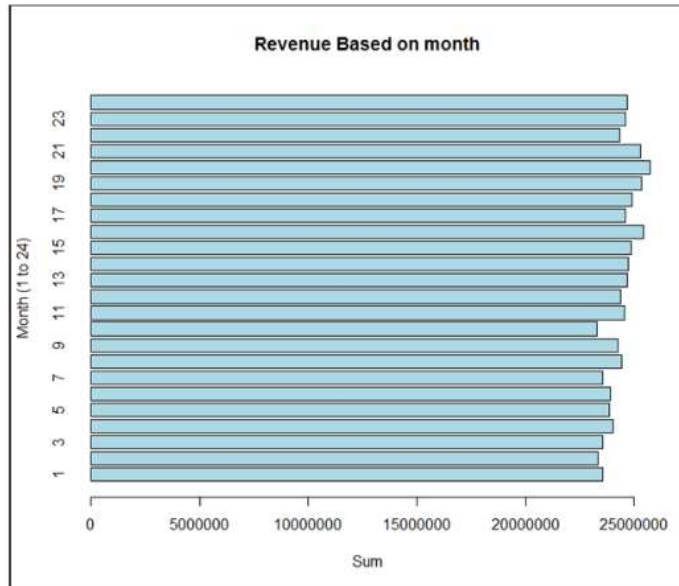
The technology used for analysis is R studio (R programming). I have used R programming to clean the data, analyze the data and for visualizing the data.

• SOLUTION DETAILS

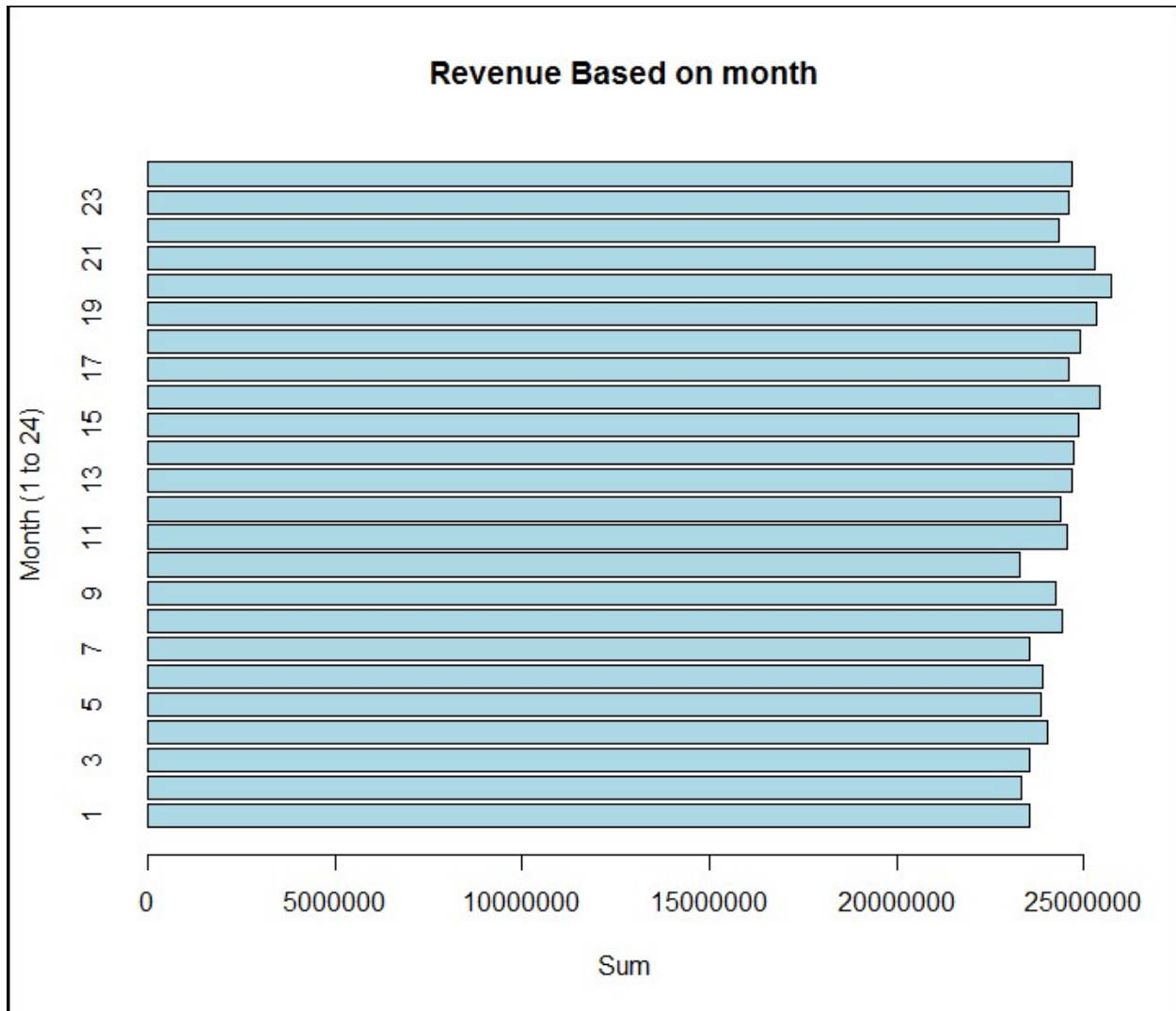
To improve the business and to encourage its customer to make right investment decisions based on deposits BOL must:

- i. Target the three different customer segments (displayed in the dashboard) as 3 separate entities.
- ii. Create a model based on the algorithm suggested after the analysis that will help BOL identify the right customers for marketing its services and products.
- iii. Create daily/monthly sales based on the suggestions made by the analyst and create marketing packages to offer to these clients in a timely manner.
- iv. Use the model created in step ii to prioritize the lead and hit the right target on right time with the right amount of force to achieve maximum success.

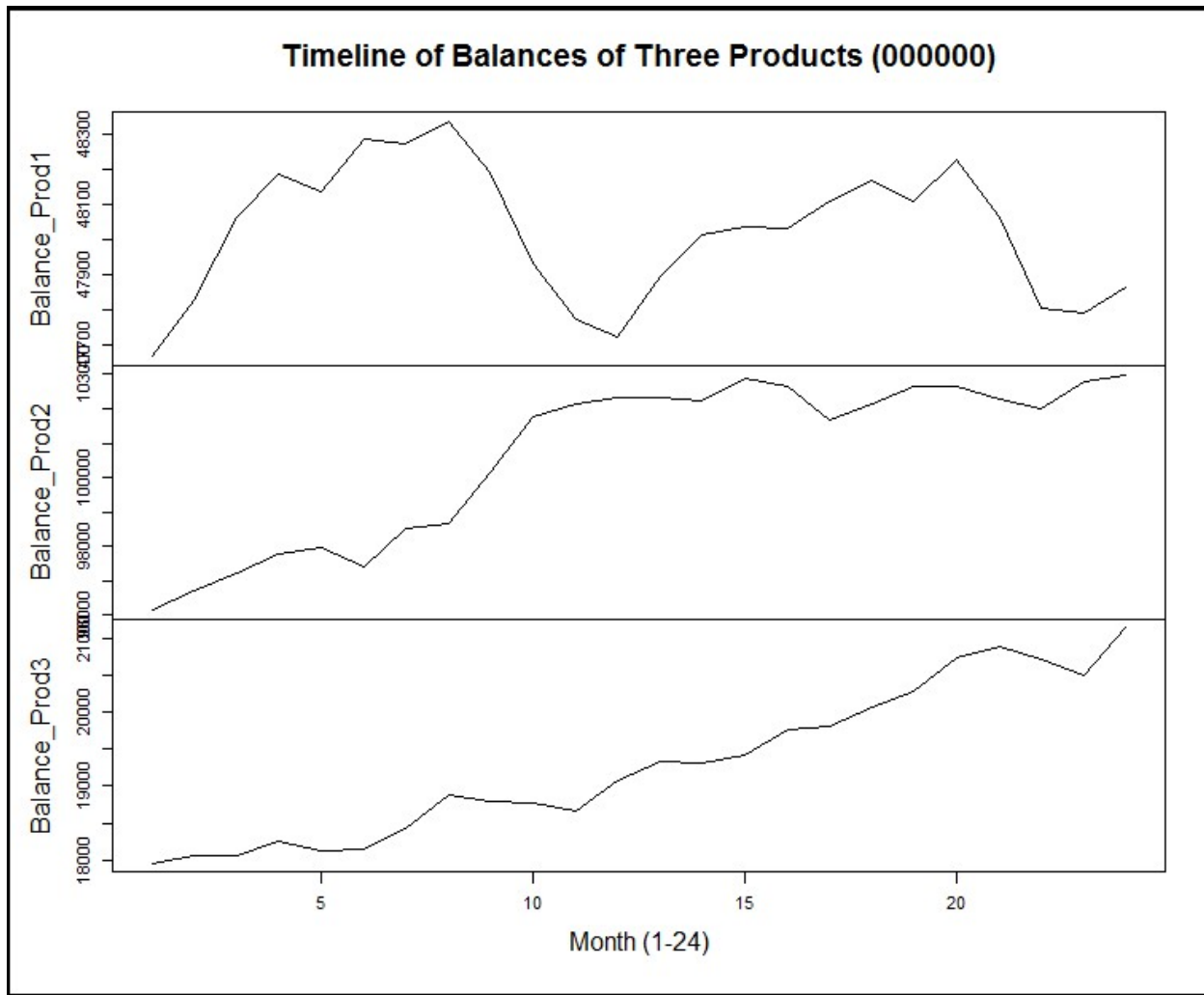
- COMPANY DASHBOARD



INSIGHTS GAINED



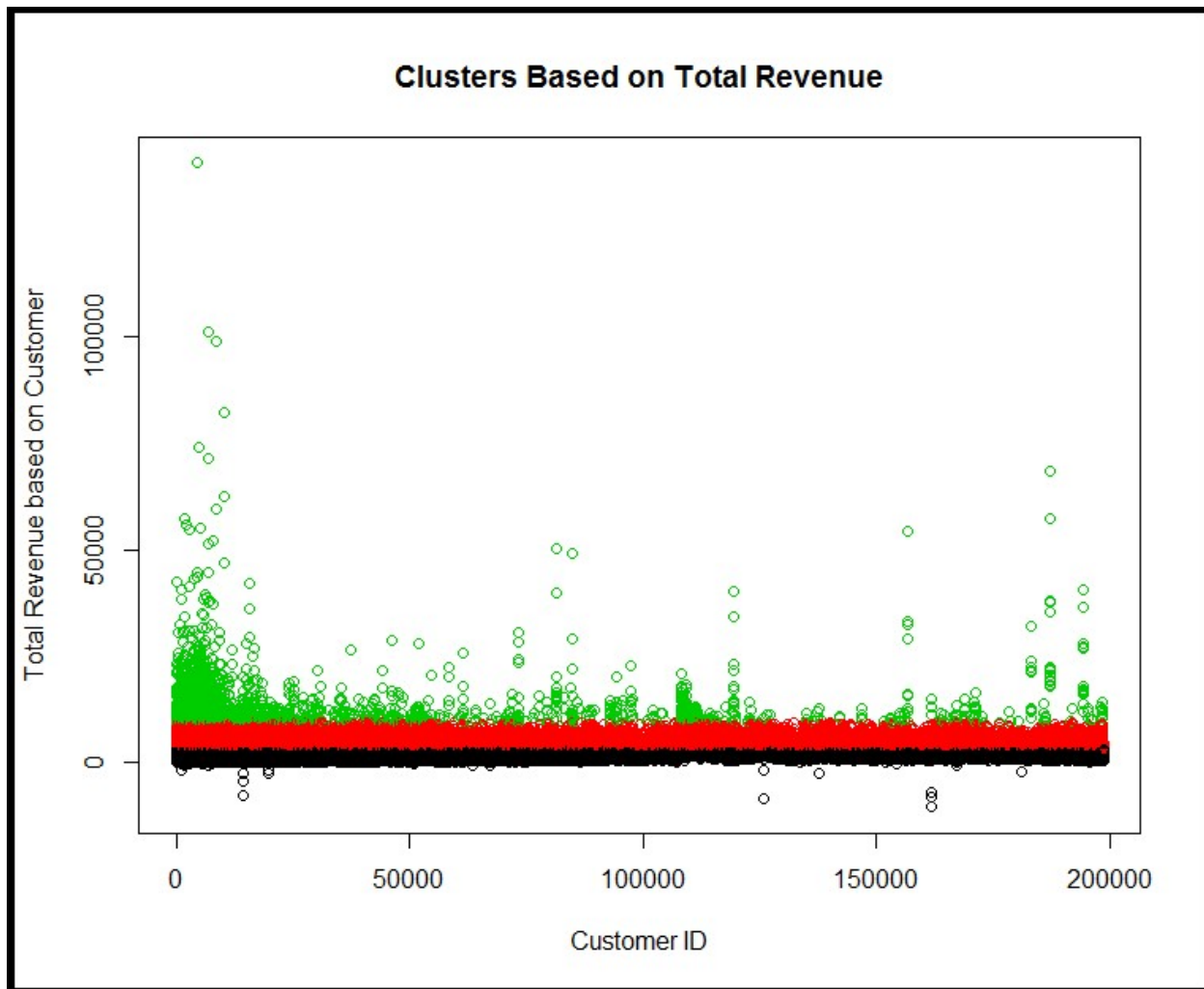
There is no major change in terms of revenue on a monthly basis; this could be one of the major reasons BOL wants to analyze its data. The market is growing but no major growth is reflected in BOL's revenue.



The data has details of three product's balances for 24 months and above is the monthly timeline:

- Product 1 balance increases gradually from month 1 to 4 and then it fluctuates from month 5 to 9 and suddenly falls thereafter. Same pattern is observed for next year.
- Product 2 balance grows very slowly until month 6 and then there is a sudden rise until month 12 and later the growth rate is almost insignificant.
- Product 3 balance grows gradually every month except for months 9 to 11

The graph indicates there is something during the second half of the year (month 6 – 12) where the product 1 balance falls. Product 2 balance has become almost stagnant and has a room for improvement. Also, Product 2 balance numbers are very high indicating it is a major revenue generator for BOL.

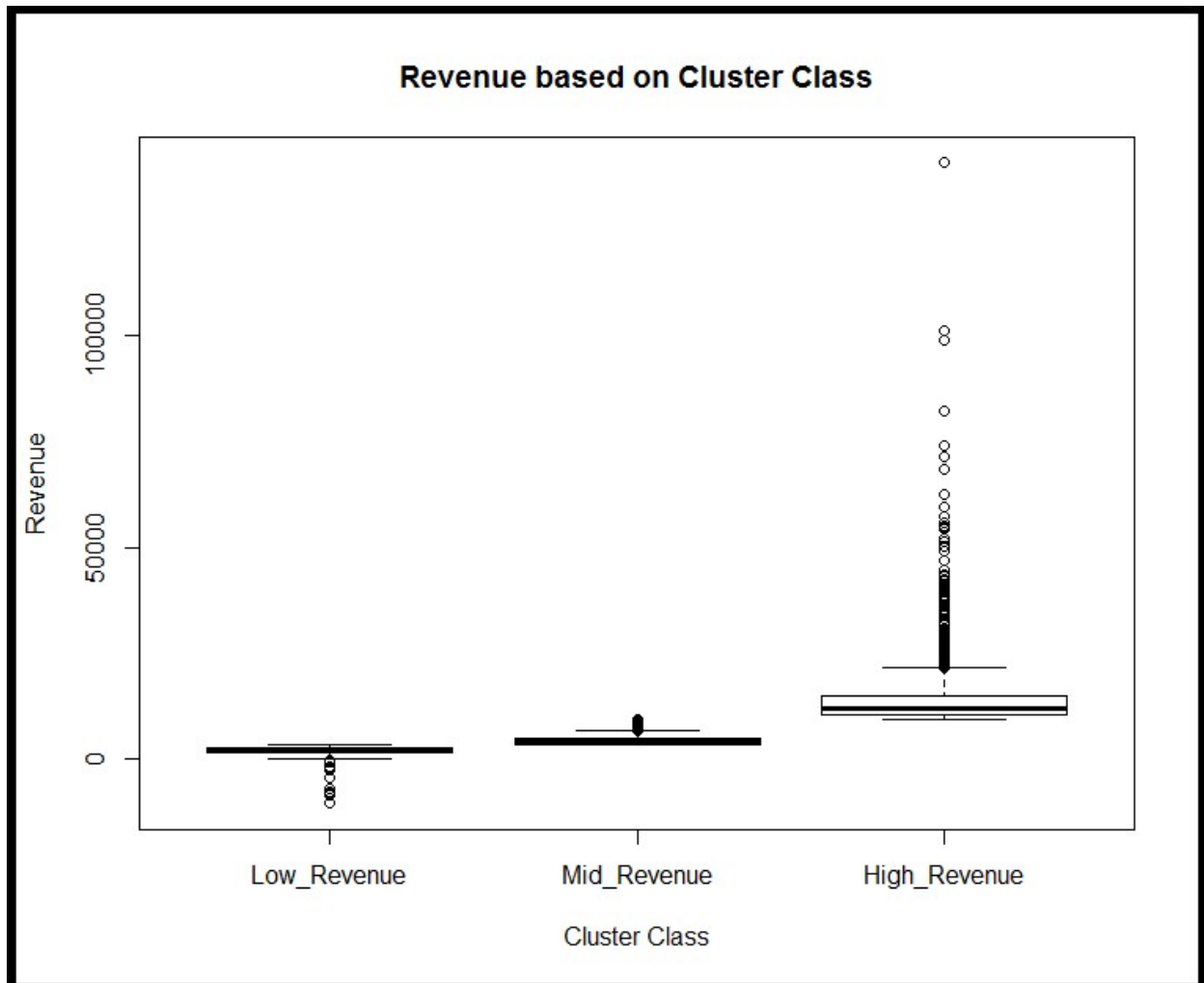


Customer Segmentation: 3 customer segments are created that will help BOL create customized marketing campaign for each segment.

As observed in the graph:

1. First segment of customers has the revenue values close to zero. Also, there are few negative values. Let's call this group as Low_Revenue group.
2. The next segment is above the first group which has all the positive revenue values. Let's call this group as Mid_Revenue group
3. The third segment is the group which has high revenues. Let's denote this group as High_Revenue group.

The distribution of revenue based on clusters is explained by the graphs below:



As observed from the graph above Low revenue and mid revenue cluster is left skewed whereas, the high revenue cluster is right skewed. This analysis helps us understand the three different types of customers.

Deposit detection algorithm: we now have classified the customers into three groups. If any customer deposits an amount higher than the monthly mean revenue of group he belongs, then that deposit will be the trigger for creating a customized package for the customer. Also, if the customer has purchased Product 2 (Can be identified using the Actual product 2 sale flag) then his campaign would not include details about Product 2.

Sizing daily/monthly target audience: In the data set provided by BOL, columns (features) 337 to 1067 indicate customer deposits starting from 8/31/2013 and until 4/30/2016. The sizing will be performed as follows:

- If the total deposits made by a customer in a month is more than 15 in number and the deposit sum is greater than the monthly mean revenue of customer group, he belongs; then the customer will be added to daily target audience list.

- If the total deposits made by a customer in a year is more than 100 in number and the deposit sum is greater than the yearly mean revenue of customer group, he belongs; then the customer will be added to monthly target audience list.

Note: A customer can be part of both the groups or none of the groups.

FUTURE RECOMMENDATIONS

- **Data Collection:** BOL needs to implement data collection procedures that will help the analysts identify trends for Product 1, 2 and 3. As observed from the analysis Product 1 and 2 does good for few months and then they start performing badly. More data will help identify the root cause and will benefit BOL in long run.
- **Data Analysis:** Marketing is not the only factor to improve the business; a 360 degree system is needed in place to identify new growth opportunities based on market trends and technological evolution.
- **Feedback:** A feedback system must be put in place to measure the success of a marketing campaign. The data generated by this system will be helpful to improve the marketing model.