



Advanced Analytics solutions to Profile Customers & Arrest Churn for a leading Payday Loans business

Business:

Descriptive and Predictive Analytics

Domain:

Lending/ Financial Services

Tools:

Elasticsearch, R, Python, Logistic Regression, XGBoost, K-means clustering

Key Highlights

Key Success:

- » Effective user profiling led to an increase in the user acquisition rate by 10%.
- » Identifying and addressing the underlying reasons led to a churn reduction of more than 20%.
- » The combined power of an operationally and intuitive interface resulted in the surge in tip collections in the range of 6.5%.

Engagement

Offshore engagement with:

- » 2 Big Data Lead
- » 1 D3.js developer
- » 1 UI developer

Client

The client is a financial services company offering a streamlined mobile app that gives payday advances.

Overview

The client was embarking on a technological modernization program to improve business workflow, increase revenue and decrease costs. In consultation with the client, Indium Software planned the modernization roadmap and its execution. This involved first- highlighting and subsequently improving the performance of several business operations & legacy systems, and second- introducing new technological functionalities such as: Churn Analysis, User Profiling, A/B Testing, Product Analytics, Data Visualization Maintenance (on existing systems), Employee Data Clean Up and Python Code Linting. Descriptive and Predictive Analytics were applied to the client's business operations to streamline workflows, increase customer retention, lower costs through loan losses and increase 'tips' (the source of revenue).

1 Status Quo

The client is a financial services company offering a streamlined mobile app that gives payday advances. Their revenue model includes customers offering an optional tip with each transaction. The application has premium/ smart features that help customers avoid overdrafts and maintain optimum bank balance.

The application uses data from the following sources:

Zendesk - which holds customer IT support data

Adjust - which records user session logs and events

PostgreSQL - database which holds user details, bank account information, cash outs, activations etc.

Periscope - Data visualization tool

2 Business Requirements

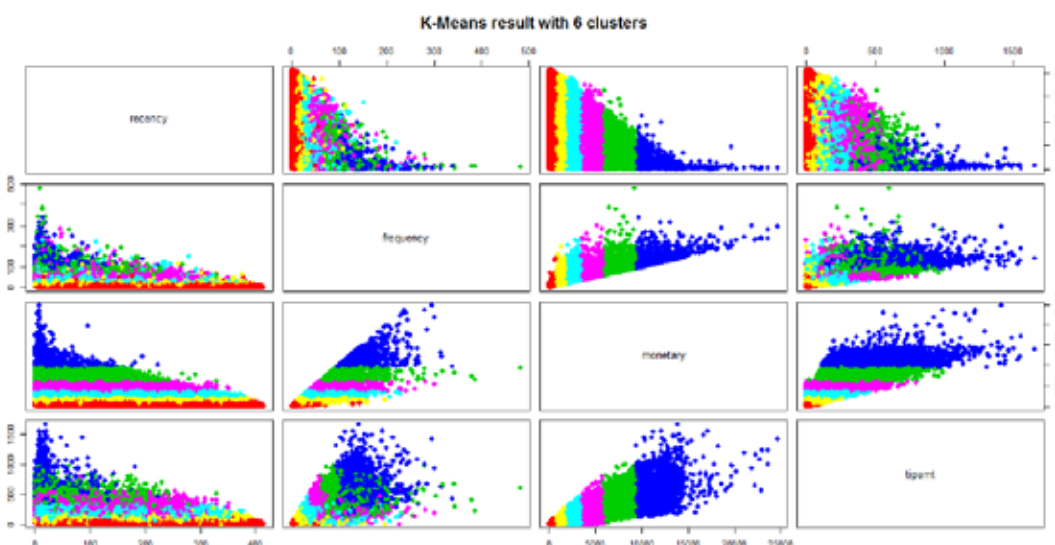
- » User Profiling
- » Churn Analysis
- » A/B Testing
- » Product Analytics
- » Data Visualization maintenance (Periscope)
- » Employee Data Clean Up
- » Python Code Linting

3 Solution

User Profiling

- » Characterised user behaviour based on transaction details such as amount cashed out, tip, number of cash outs, RFM Analysis, demographic details such as gender, region, user details such as employer details, income, pay type etc.
- » Created a concise data set with available data points.
- » Data Manipulation performed in Excel and Python resulting in 200k records.
- » Used K-means clustering to group the users based on their activity.

Clustering Results by User

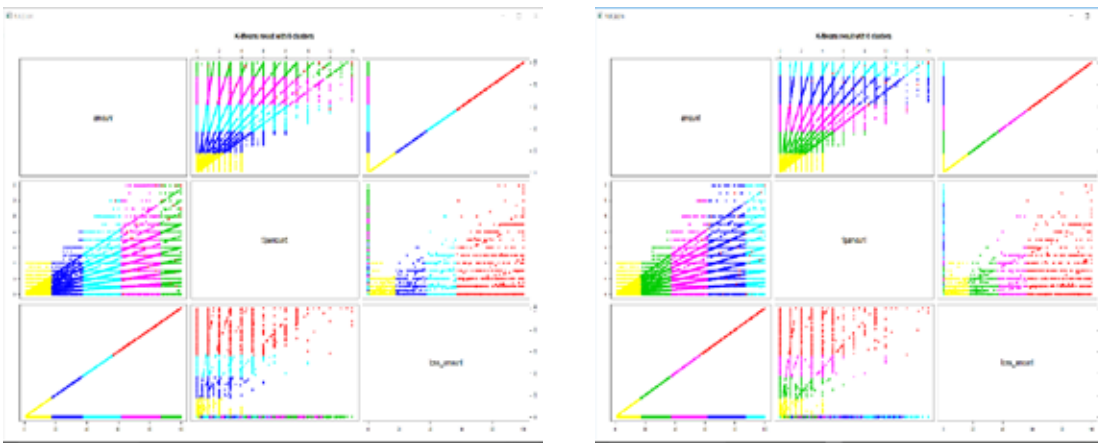


The clusters represented in blue and green represent users cashing out higher amounts in higher frequencies and tip more.

Results showing the performance of good clusters



Clustering Results by Transactions



Month on month comparison results. These can be extrapolated

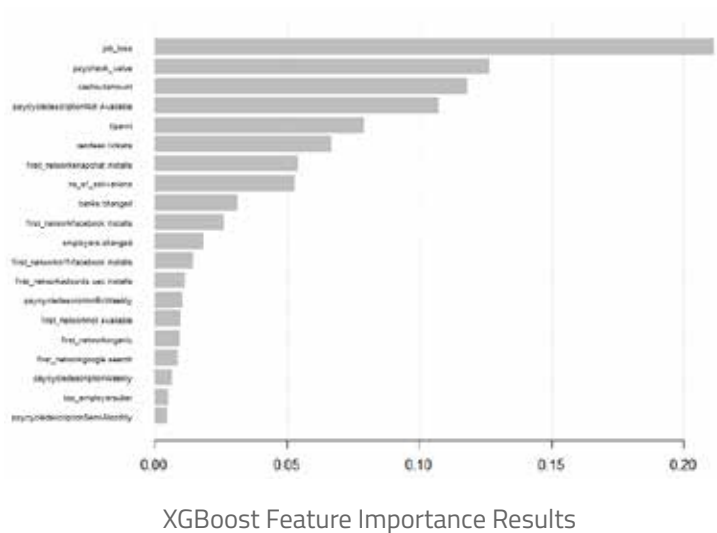
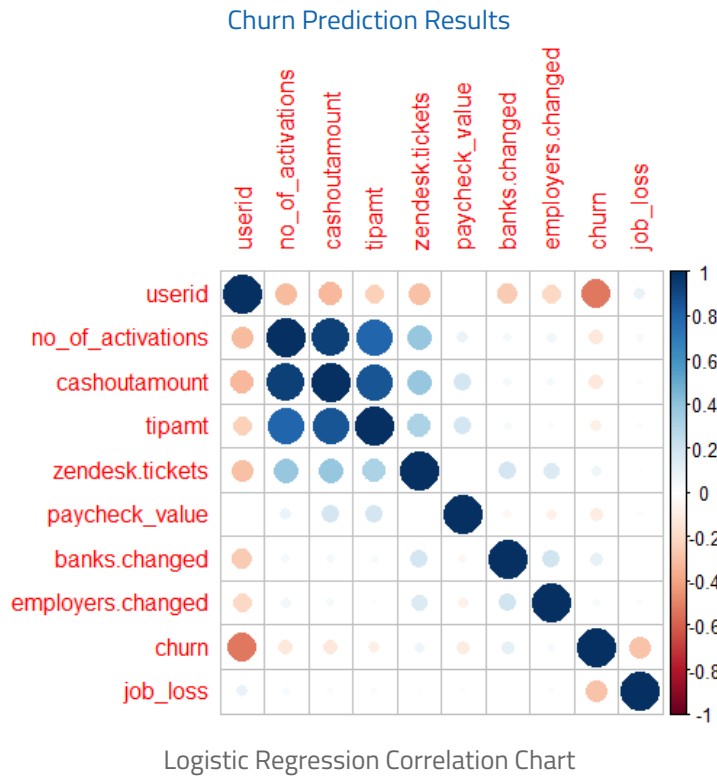
4 Key Insights Provided

- » App users were **segmented into Categories** and the % of users from each category was derived.
- » Caveats can be sought from users cashing out above a threshold amount.
- » **Recommended reward programs** for users who have cashed out more and tipped high to induce a sense of exclusivity for **targeted marketing**.
- » **Create ad hoc risk rules** based on recent user performance while cashing out. For example, if a user has paid back in the last 5 transactions, then he is risk-free.
- » Deploy **targeted messaging** for customers with high recency but the low frequency and low cash-out values.

User Churn Analysis

- » Identify users who could churn out from the system over a period of time using data available at the user level.
- » Data Points:
 - Transaction Data – Amount Cashed Out, Tip Amount, Number of cash-outs
 - Employer Data – Employer Names, Number of Employers Changed, Job Loss
 - Lead Source Data – How did the user come into the system
 - Bank Data – Employee Income, Number of Banks Changed
 - Zendesk – Number of Zendesk Tickets

- » Performed Employer Data Clean up - indexed Employer names in Elasticsearch reducing bad data of about 5K records.
- » Missing values in categorical data were handled by creating a new label of "Not Available" data.
- » Employed Logistic Regression for Churn Prediction. Achieved an accuracy of 71.89%.
- » For better accuracy, speed and performance used XGBoost algorithm. Achieved an accuracy of 73.24%.
- » Predicted feature behavior analysis.



5 Key Insights Provided

Data Insight:

- » Job loss is one of the biggest contributing factors for churn.

Action:

- » When the user makes a bank connection, if previous transaction data is available, data for the last 3-4 months can be considered and if the user does not have a paycheck for more than 30 days during this period, then he can be flagged in the system when he enters.

Data Insight:

» There is a strong correlation between the number of Zendesk Tickets created and user churn.

Action:

» When the Zendesk ticket is resolved and if the issue is with Customer support, they can offer a zero tip cash out option during the next activation and the same can be conveyed to the user as a promotion.

Data Insight:

» Users who have done less than 25 activations tend to churn out more.

Action:

» When the user does not perform activations for a long period of time (about 15-20 days), an appreciation mail/ message can be sent with some basic stats about their transactions.

» To prevent users from churning out, promotions and in-app notifications can be offered to make them use the app more frequently and cash out.

A/B Testing

» The App's unique selling features Balance Shield and Lightning Pay was A/B tested by the client.

» Indium Software helped formulate a code framework in R to determine whether the addition of these features led to an increase in conversion rates tests.

6 Business Impact

User profiling

» The client was able to segment the customers better.

» The segments had clear attributes and the spectrum of values defining these attributes.

» This helped them perform effective marketing for acquiring new customers who could make use of the service thereby increasing their customer base.

» The bottom line of effective marketing being increase in the user acquisition rate by 10%.

Customer churn

» The client was able to arrest customer churn.

» They were able to determine the reasons for churn which helped in taking actions such as flagging users who did not have paychecks for more than 30 days and making the customer support process quick and efficient.

» This helped them reduce the churn by 20% of the earlier churn metric.

A/B testing

» A/B testing of the user interface in the app helped in zeroing on a better interface for increasing the tip amount.

» The combined power of operational and cosmetically effective interface resulted in the surge of tip amount in the range of 6.5%.



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