

# Bailian Group Member System Data Analysis Plan

**Background:** Bailian Group has core businesses such as shopping centers, commercial supermarkets and department stores, etc. But at present, the growth rate of China's total retail sales has slowed down, and the proportion of online retail is rising. Bailian Group is facing tremendous competitive pressure. Under the offline business model the property and labor costs continue to grow, the demand for single store turnover is getting higher and higher. Lack of perception of offline customers and a good customer system make high-value customers lose contact. Actually, this is because the lack of digital vision of customer, no customer value mining. In order to integrate online and offline, improve single store performance, and achieve precise marketing to enhance customer loyalty, Bailian Group established an omni-channel e-commerce company in 2015. The member/marketing-integrated online data, coupled with in-store smart wifi, smart shelves, and a variety of smart camera applications, created the full link of people, goods, fields.

## I Define the Business Problem

- Whether the member system is positive for Bailian Group business growth or not
- Why the sales get better after setting up member system
- How to accelerate the growth more (i.e. get more customers to join the member, make member spend more in Bailian and enhance their dependence)
- If the member system dose benefit for business, then need data mining to optimize the member system so that can accomplish the specific sale

## II Data Collection and Assessment

- Find out what data need to collect (i.e. sales info like daily&monthly amount/area, product info like category/brand/SKU, member info like id/age/gender/register time, shop info like shop area/customer number/stay time etc.)
- Use SQL to do data collection, join, integration, and then check the data integrality by total sale amount and the customer quantity, check data time by sales date, as well as data uniformity and accuracy by checking max/min value of amount and its distribution

## III Data Diagnosis and Manipulation

- Check and solve data exception, if there are outliers and missing value. For outliers need to check the original table and know how we get the data, judge if real outlier or not then handle this kind of data by using statistic method; for missing value can look up data dictionary or communicate and confirm with relevant colleagues
- Recode for necessary data uniformly, i.e. purchase time and date can use week instead, or else can be classified by weekdays and weekends, set a proper customer age gap. Figure out the derived variables

## IV Data Visualization

- Thermodynamic Diagram: customer info (age, gender, member or not, area, shopping time and interval, staying time, etc.) as horizontal axis, sales info (customer id, sales amount, product id and category, brand, transaction id, etc.) as vertical axis, find their correlation
- Line Chart: time (before/after member system set) for independent variable, sales amount for dependent variable, to show if the sales amount got obvious increasing after member system set up
- Histogram: purchase amount as independent variable, customer quantity (group by member and non-member) as dependent variable
- Box Plot: total sales amount for dependent variable vs member/non-member, to show the amount difference between member and non-member
- Scatter Plot: sales increasing amount vs member increasing quantity, show how the member quantity' s increasing impact the sales amount, if it' s positive or not

## V Data Modeling and Business Decision

- Group customers by their consuming habits and predict their shopping tendency
- Define high-value customers like those who have very high total purchase amount, and whose average transaction amount low but purchase frequency is high.
- Rank these customers and predict the possibility they will use the discount, send discount coupon/voucher specifically
- Keep tracking these customers spending status, analyze their spending motivation and users requirements