How Data & Data Analytics Company Support Micro & Small Lending
About Bairong

◆ Founded in March 2014, Bairong is a CreTech (Credit Technology) company using advanced technologies such as AI, big data and cloud computing to innovatively provide full lifecycle managerial products and services for institutions in the area of credit, insurance, investment and asset management.

◆ Bairong is committed to becoming the largest fintech service provider in China. With the goal of spreading integrity culture and developing integrity ecology, we adheres to contribute to the construction of the national credit evaluation system and the realization of inclusive finance!
Difficulties in credit evaluation

- **Current status:** In China, the credit investigation report of the people’s Bank of China (PBOC) is an important basis for some enterprises to judge loan applications. The report includes the credit status of individuals and enterprises.

- **Problem:** Limited coverage, fewer than 50% of the population have adequate lending histories, appropriate third-party institutions are demanded to provide data & analytics services with the help of fintech.

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**Borrower quality deteriorates**

Low-income groups, high-risk groups joined.

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**Limited coverage**

Relying solely on the credit report of the PBOC cannot meet the credit demand of people with no credit record.

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**Slow approval**

For many SMEs, they have been relying heavily on offline due diligence of borrowers, with a long approval process.

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Data Recourse: China Banking and Insurance Regulatory Commission
Intelligent risk management solution can help financial institutions to build a life-cycle risk control strategy. We help institutions to greatly reduce the cost of manual review and achieve efficient and comprehensive risk management for applicants.

Full life-cycle Intelligent Risk Control Program

- Precision marketing
- Anti-fraud
- Mid-loan monitoring
- Pre-loan approval
- Post-loan collection
Precision marketing based on KYC

- With the help of big data and data processing technology, gradually change the business pattern from “product-centered” to “customer-centered”
- Marketing response model can effectively find highly responsive potential customers and narrow the marketing scope

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Big data  Data processing technology  Customer Profile  Application

Basic information  Consumption  APP behavior  Asset information  Other information

Model + Labeling

High value?  Possibility to loss?  Product preference  Risk level  …

Improve 30% conversion rate  Improve AUM
Fraud types using high-tech

- With the help of fin-tech, banks have realized online approval and real-time lending, but new fraud methods based on the characteristics of these products have also been continuously upgraded.
- While customers enjoy flexible and convenient services, bank’s fraud risks have become more hidden and professional.
Common types of fraud

- **Fake identity**: Use others' identity to apply
- **Fake information**: Fill in fake information to qualify for a loan
- **Bad history**: Overdue records
- **Group fraud**: Organized and premeditated activity

**Device fraud**

- Financial institutions
Supplementary anti-fraud & credit evaluation data

- We evaluate borrower’s behavior pattern from various dimensions in order to fully assess their risk. Through the multi-dimensional and all-round data, the pre-loan applicant portrait is created.

- **Job stability**
- **Income stability**
- **Consumption information**
- **Stability level**
- **Capital demand**
- **Debt Repay Stress**
- **Judicial information**
- **Usury application records**
Example – Multiple application, online game spending

- Higher amount of online game spending in the last 12 months, higher the possibility of default.
- Multiple application data is an important dimension of credit evaluation
Modeling architecture

Risk Level
- Very High Risk
- High Risk
- Medium Risk
- Low Risk
- Very Low Risk

Rule + Model
- Risk Control Rules
- Anti-fraud Score
- Credit Score

Algorithm
- Logistic Regression
- XGBoost
- Deep Learning
- SVM
- Online learning

Variable derivation
- VAR1
- VAR2
- VAR3
- VAR4
- VAR5
- ……
- VAR1884

Dimension reduction

Feature selection

Big Data
- Application
- Black list
- Stability
- Consumption
- Online shopping
- ……
- Others
Case: Credit evaluation score

- Examples of different scoring ranges and credit risk levels are as follows:
  
  - [300,650) High risk, **Reject**;
  - [650,720) Medium risk **Pending**;
  - [720,1000] Low risk, **Pass**

- Due to changes in macroeconomics or marketing strategy, model deviations are possible, and model monitoring and model tuning are required.

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**Score distribution**

**Score Distribution of unstable Model**

<table>
<thead>
<tr>
<th>Stability Index</th>
<th>&lt;0.1</th>
<th>0.1~0.3</th>
<th>&gt;0.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSI</td>
<td>Stable</td>
<td>Attention Alert: Check Model</td>
<td>Reconstruction scorecard</td>
</tr>
</tbody>
</table>
Case: Pre-Loan Approval Process Optimization

- Application
  - ID Verification
  - Bairong Antifraud
  - PBOC Antifraud
  - Internal Antifraud

- Automated Rejection Condition
  - Yes
  - PBOC Availability
    - Yes
      - PBOC Score
        - Reject
        - Accept
        - Manually Review
        - Accept
      - Reject
    - No
      - Bairong score
      - Bairong Strategy
      - Automated Approval
        - Reject
        - Accept

- Approval Rate Increased
  - Old Strategy: 80%
  - New Strategy: 90%
  - Improvement: 12.5%

- Automated approval rate
  - Old Strategy: 30%
  - New Strategy: 60%
  - Improvement: 30%

- Default rate decreased
  - Old Strategy: 5.54%
  - New Strategy: 2.19%
  - Improvement: 40%
Loan Monitoring – Strategy

- Using the rules and scorecard, the customers can be divided into A ~ D level. Grade A risk is relatively low, this part of customer can be transferred to cross-selling, Grade D risk is relatively high, early warning is needed in advance.

- The proportion of Grade D users is only 1.71% while the default ratio is **36.59%**.

- Monitor the quality of existing customers in real time, identify and deal with potential risks early, effectively reduce the monitoring cost.

### Behavior scorecard

<table>
<thead>
<tr>
<th>Rank</th>
<th>Interval</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(0,400)</td>
<td>0.43%</td>
</tr>
<tr>
<td>2</td>
<td>[400,450)</td>
<td>1.22%</td>
</tr>
<tr>
<td>3</td>
<td>[450,500)</td>
<td>5.96%</td>
</tr>
<tr>
<td>4</td>
<td>[500,550)</td>
<td>9.78%</td>
</tr>
<tr>
<td>5</td>
<td>[550,600)</td>
<td>9.78%</td>
</tr>
<tr>
<td>6</td>
<td>[600,650)</td>
<td>8.36%</td>
</tr>
<tr>
<td>7</td>
<td>[650,750)</td>
<td>9.78%</td>
</tr>
<tr>
<td>8</td>
<td>[750,825)</td>
<td>83.63%</td>
</tr>
<tr>
<td>9</td>
<td>[825,875)</td>
<td>83.63%</td>
</tr>
<tr>
<td>10</td>
<td>&gt;875</td>
<td></td>
</tr>
</tbody>
</table>

### Rules

- **Low-Risk Rules**
- **Medium-Risk Rules**
- **High-Risk Rules**

### Distribution

<table>
<thead>
<tr>
<th>Level</th>
<th>Proportion</th>
<th>Bad rate</th>
<th>Lifting rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>54.85%</td>
<td>3.26%</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>32.16%</td>
<td>5.31%</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>11.28%</td>
<td>12.18%</td>
<td>221%</td>
</tr>
<tr>
<td>D</td>
<td>1.71%</td>
<td>36.59%</td>
<td>660%</td>
</tr>
</tbody>
</table>

The overall bad debt rate of sample was **5.5%**.
### Post-loan management - strategy

<table>
<thead>
<tr>
<th>Pre-collection</th>
<th>Early collection</th>
<th>Mid-collection</th>
<th>Late-collection</th>
<th>Asset disposal</th>
<th>Professional team</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 week before</td>
<td>M1</td>
<td>M2-M3</td>
<td>M4-M6</td>
<td>M6+</td>
<td></td>
</tr>
<tr>
<td>IVR/SMS</td>
<td>IVR SMS/Call/Collection Robot</td>
<td>C card+customer profile/SMS/Call/Collection Robot</td>
<td>External methods/Legal action/Asset sale</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Guide to prepayment**: The combination of manual phone call and voicebot, timely locked the payment.
- **Internal**: adopt different collection methods on customers with different repayment ability/willingness and rationally allocate resources.
- **Internal + External**: Mainly solve high risk customers, within the scope of compliance, use various means to recover the loss.

**Differentiated collection strategies can be formulated to improve the overall collection efficiency.**
Post Loan Collection – Bai Xiaorong Collection Robot

Supported Scenarios
- Marketing
- Collection
- Remind
- Post check

Robot system
- Interactive (IVR)
- Translation (ASR)
- Synthesizer (TTS)
- Brain (NLP)

Supported Scenarios

<table>
<thead>
<tr>
<th></th>
<th>Voice bot</th>
<th>Manual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Answering rate</td>
<td>61.1%</td>
<td>57.7%</td>
</tr>
<tr>
<td>Complete answering rate</td>
<td>69.0%</td>
<td>72.5%</td>
</tr>
<tr>
<td>Commitment to repay</td>
<td>66.8%</td>
<td>75.1%</td>
</tr>
<tr>
<td>Recovery rate</td>
<td>47.79%</td>
<td>51.13%</td>
</tr>
</tbody>
</table>

Recovery rate
- 93%
- 5%

Efficiency
- 4.5X
- 1/6

Cost

Complaint rate
- 5%

Answering rate
- 61.1%
- 57.7%

Complete answering rate
- 69.0%
- 72.5%

Commitment to repay
- 66.8%
- 75.1%

Recovery rate
- 47.79%
- 51.13%
Thanks for watching!