Data analysis to understand and predict loan behavior

About iluméxico

Iluméxico is a Mexican social enterprise funded in 2009 by 8 engineering students, with the mission of eradicating energy poverty with solar systems. We design and assemble solar systems to meet the needs and aspirations of individuals in three different aspects of rural life – family, economic activities and public spaces. Our business model is based in four strategic capabilities that are unique to us and that sets the opportunity to expand our products and services portfolio: Product configuration for off-grid needs, Last mile customer care, Inclusive financing, and exceptional customer experience. Our team has 80 employees working full time to provide products and services to more than 14,600 households, providing clean, affordable and reliable energy to more than 62,000 people, distributed in more than 1,350 rural communities in Mexico.

We are one of the leaders in the sector of social enterprises in Mexico and an example of growth and financial health around the world. We have had two rounds of investment so far (2012 and 2017) with international social impact funds, and we are a BCorp and GIIRS certified enterprise.

Our mission is to reach 1 Million people by 2025.

About our credit products

To ensure that we are affordable, we have innovated in flexible financing products that include cash payment, pure credit, service monthly instalment and pay to own technology so we can provide options for every context and economic circumstance. We have disbursed more than 29M MXN in credits, and now we have an active portfolio of +8M MXN[1].

Our sales are historically distributed as follows:

- 25% Cash payment: available for certain products.
- 48% Credit (personal or group loans): different loan products with 20%-30% upfront payment and installments of 3,6,9,12 months. We use a flat interest yearly rate of 45%.
- 27% Service: monthly payments that constitutes a rent that includes the technology, installed capacity scalability plan, maintenance, technical assistance, discounts on additions and in some cases, automatic battery replacement.

The payment options for our clients are:

- Telecomm Telégrafos- payment through a channel of telecom offices (state owned) that allows our customers to pay their installment with a unique client id.
- Pay-as-you-go meter- a digital financing technology that allows end-users to digitally pay for solar energy in daily/weekly/monthly/yearly instalments. The user reaches a sales agent with a unique system id and purchases the number of days of energy desired. The sales agent gives a unique code that the user inputs into the meter to the system to use it. The service is blocked automatically if the weekly/monthly/daily fee is not provided and cannot be used again until credit has been purchased. (still on pilot phase).

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[1] Includes service clients with the first 36-48 months of rent.

Internal Credit score
Based on payment behavior (expected vs collected), we have created an internal credit score that helps us evaluate future loan opportunities.

- 0 - delinquent
- 1 – Very late payments. Loan finished 50% above expected time.
- 2 – Mostly late payments, Loan finished on time or 25% over expectation.
- 3 – Payments on time and loan finished according to calendar.

The project

We have been collecting basic data for each one of our customers in other to understand better the market we serve. Since 2017, we have included a set of new data points that gives us the opportunity to better segment the base of the pyramid market. With that data, we can begin to understand how each of this data points influence the monthly instalment capacity, payment behavior and overall loan performance. This analysis will help us refine our financing options so they can better adequate to the economic capabilities, cash flow and opportunities; and improve our overall portfolio performance.

The data available

- Surveys 2016-2019: sociodemographic data points collected for each one of our customers
- Sales Data & Stats 2016-2019: all sales associated to each client, and loan stats of each sale
- Payment calendars 2016-2019: all loan calendars with payments expected and collected, associated with each sale

The initial questions we want to answer

- How does sociodemographic data (gender, age, type of home, land ownership, animals, etc.) relate to payment behavior?
- Is this enough data to create a logistic regression that enables us to have a valid credit score or payment probability?
- Which data points are more relevant for prediction or evaluation?
- Is our credit score rating reliable (0-3)?
- Is any data a good indicator of a correlation of the customers compliance to payment schedule?