



DATATHONS – A NEW WAY OF LEARNING FROM CLIENTS



INTRODUCTION

As microfinance institutions become more digitally advanced, they have increasing amounts of data at their disposal. The everyday use of this data has the ability to speed up internal processes, but in-depth analysis is still sometimes out of reach. Deeper research into microfinance client data improves understanding of loan recipient behavior: finding common patterns and relationships allows microfinance providers to better respond to recipient needs, and drive increased overall impact.

WHAT IS A DATATHON

A Datathon is an event where participants gather to solve practical problems through the application of data science tools and techniques, by working together in teams to generate insights and potential solutions. Similar to a hackathon, participants are challenged to use their creativity and data science skills to build, test, and explore solutions using a rich dataset in the limited time frame, usually 24 or 36 hours. Datathons focus on real-world issues in any discipline, from corporate performance to medicine and social issues.

MASTERCARD DATATHON WITH KMF AND MFC

The objective of the Datathon with KMF was to support a large microfinance institution in answering key strategic questions related to their social mission, by using a rich database of client data collected by KMF during their lending process.

To achieve this, Mastercard partnered with KMF and Microfinance Centre (MFC) over the course of many months, in preparation for a 24-hour pro-bono Datathon engagement that ran from 27th to 28th September 2021.

PARTICIPANTS

Mastercard Datathons bring together Mastercard’s consultants, data scientists, and engineers in a collaborative, data driven project in service of a social mission. Datathon programs aim to provide recommendations to philanthropic organizations that are in need of analytic capabilities and on a path to becoming more data-driven.

Established in 1997, KMF is the largest non-bank microfinance provider in Kazakhstan, serving over 200,000 clients, predominantly in rural areas, with a focus on women and self-employed. KMF provides business, agricultural, green and consumer loans to individuals and microenterprises covering the whole territory of Kazakhstan.

Microfinance Centre (MFC) is a membership-based social finance network with a mission to empower individuals and sustain communities through innovative social finance and microfinance. MFC supports its members in constantly learning, testing, improving their operations, so that the financial system works for all people and all communities in a responsible and fair way.

The Mastercard Center for Inclusive Growth advances equitable and sustainable economic growth and financial inclusion around the world. The Center leverages Mastercard’s core assets and competencies, including data insights, expertise, and technology.

RESEARCH QUESTIONS

The Datathon focused on the key drivers of portfolio performance: customer lifecycle management, repeat business marketing effectiveness, and credit risk. Specifically, KMF sought to answer the following questions:

- How can we better understand the risk profile of our clients?
- How can we improve customer retention?
- What is the impact of different customer interaction campaigns?
- How can we improve customer acquisition?

PROCESS

The Datathon was implemented in the following steps:

- **Preparation:** A series of online meetings and email exchanges occurred during the period of 6 months leading up to the Datathon. Initial discussions covered the scope of the Datathon and its potential to answer research questions. Further discussions focused on the availability, quality, and completeness of the data. Finally, KMF formulated research questions, before the team designed an analytical framework and agreed on final data requirements.
- **Dataset composition:** Data pulled out by KMF from different parts of the database were compiled into one dataset, and transferred to the Mastercard team.
- **Kick-off meeting:** A virtual meeting officially initiated the 24-hour analytical sprint by bringing together all involved parties and re-stating the strategic questions.
- **Analysis:** Across the 24-hour sprint, a combination of various tools and analytics, including Test & Learn methodology, propensity modelling, segmentation, and other statistical and econometric tools, were used to evaluate the key questions. The Mastercard team consisted of 17 professionals from Mastercard's Data & Services division, ranging from consultants to product managers, grouped into three workstreams. During this 24-hour period, KMF were also available via email to answer clarifying questions from the Mastercard team.
- **Read-out meeting:** A virtual readout was organized to present the key results at the end of the Datathon. This was then followed by discussion and more information exchange on the particular findings of the research, after KMF and MFC had some time to review the outputs and findings in more detail. The research outputs, such as detailed results and analytical models, were shared with KMF and MFC by the Mastercard team, ensuring these outputs can be used internally in the future.

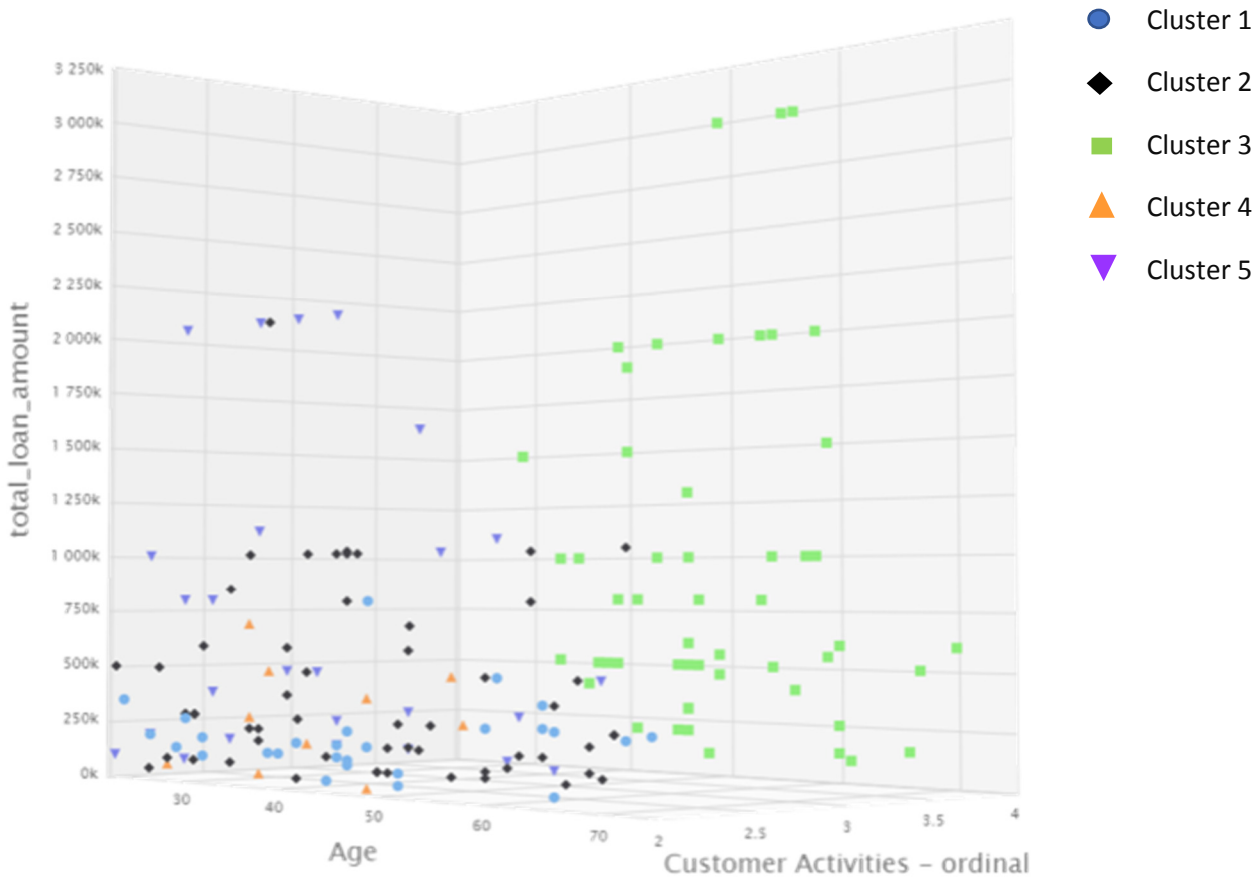
RESULTS

As a result of the Datathon, KMF has been equipped not only with knowledge and findings from the analyses, but also with the tools and capabilities to continue with similar analysis in the future. The Mastercard team shared a credit risk model, customer segmentation, a customer propensity model for loan acceptance, and analysis of retention and responsiveness communication campaigns. Each of the outputs will help KMF to become more customer-centric and data-driven, and to better fulfill their social goals.

CUSTOMER SEGMENTATION

For the customer segmentation, 5 key customer clusters were identified, based upon characteristics such as age, loan purpose and size, and type of loan. The rules for identifying these clusters were shared with KMF, allowing them to categorize new customers into their appropriate cluster. These clusters can be used for tailoring outreach and products.

FIGURE 1: CLUSTER VISUALIZATION



CUSTOMER RETENTION

Amongst other factors, customers more likely to take up an additional loan were identified as those who: used their first loan for making a purchase or repairs; acted as sole entrepreneurs (as opposed to individuals); and had more historical interactions with KMF.

A logistic regression model was built, based on these characteristics, to predict customers' likelihood to take up additional loans. The details of this model were shared with KMF in an Excel format, allowing KMF to calculate likelihood scores for new customers. Customers with higher scores should be prioritized for outreach on additional loans, as they fit the profile most likely to require subsequent loans.

FIGURE 2: CUSTOMER PROPENSITY MODEL



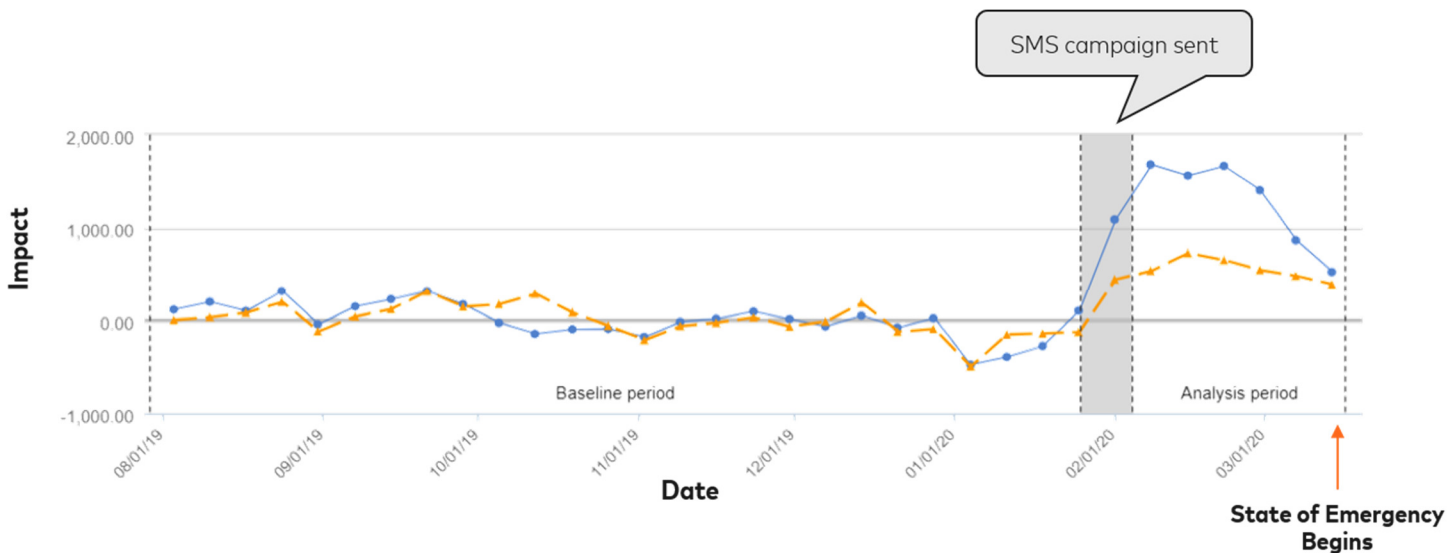
ANALYSIS OF COMMUNICATIONS CAMPAIGNS

KMF ran a series of SMS campaigns with the aim of re-engaging with customers who had previously taken loans. The results of two of these campaigns – in January and May 2020 – were analysed using a test versus control methodology to isolate the impact of the campaign from other factors.

The results showed that customers receiving the January message saw a 66% increase in loan applications, above what would be expected without the campaign, while those receiving the May message saw a 23% lift. The highest percentage increase was seen in loan application for consumer loans (over 6 times more applications). However, as this product is used only by a small number of customers, the largest impact was on the take up of working capital loans, with over 500 incremental loan applications per week. The campaign had the strongest impact for customers who were older and had more prior engagement with KMF.

Based on these findings, the Mastercard team recommended to KMF to continue with SMS campaigns for older clients with long track record and experiment with other communication channels to re-engage younger customers who use KMF loans sporadically. Where possible, KMF is also exploring implementing holdouts to future communications campaigns, enabling them to analyse campaigns in a similar manner.

FIGURE 3: LOAN UPTAKE BY TEST AND CONTROL GROUPS



CREDIT RISK MODELLING

Both logistic regression and random forest models were developed when modelling customers' likelihood to default on their loans. Random forest modelling was found to be the best methodology, with customer likelihood to default influenced by characteristics such as age and loan tenure.

The Python model was shared with KMF, along with extensive documentation on how to use the notebooks. Additionally, an easy-to-use tool was developed, where new customers' credit risk scores can be generated in two steps (inputting their details into Excel, followed by running a Jupyter Notebook which creates a new Excel file, containing the new customers' scores).

CONCLUSIONS

The Datathon results showed how insightful and actionable the transaction and demographic data proved to be, as well as how data-driven insights can be used to strengthen the quality of microfinance institutions' services.

KMF now has a more rigorous analytical approach, with advanced models to assist them in outreach and loan origination, and a newly-developed Test & Learn mentality that will enable more insight and action in the future.

The project was implemented as part of the partnership between Mastercard Center for Inclusive Growth and Microfinance Centre for a new international support programme for small businesses and microfinance institutions in Europe and Central Asia. The partnership will enable micro-finance institutions to pivot, adapt and embrace digitization.

The Mastercard Center for Inclusive Growth advances equitable and sustainable economic growth and financial inclusion around the world. The Center leverages the company's core assets and competencies, including data insights, expertise and technology, while administering the philanthropic Mastercard Impact Fund, to produce independent research, scale global programs and empower a community of thinkers, leaders and doers on the front lines of inclusive growth. For more information and to receive its latest insights, follow the Center on Twitter, @CNTR4growth, LinkedIn and subscribe to its newsletter.

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MICROFINANCE CENTRE

ABOUT MFC

The Microfinance Centre is a social finance network that promotes fairness, inclusion, equality and responsible service. We unite 113 organisations (including 77 MFIs) across 36 countries of Europe, Central Asia and beyond, who together deliver responsible microfinance services to over 1,000,000 low-income clients.

OUR MISSION

Our mission is to empower individuals and sustain communities through innovative social finance and microfinance

OUR VISION

Our vision is a financial system that works for all people and all communities in a responsible and fair way.

Our members and partners are guided by the principles of fairness, inclusion, equality and ethical service delivery. They acknowledge and contribute to the MFC's values of empowerment, forward-thinking and mindfulness.