BUILDING VALUE IN MICROFINANCE THROUGH DIGITIZATION

Lessons from loan automation pilots

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Acknowledgements

INTRODUCTION

C GAP HAS ARTICULATED KEY PRINCIPLES FOR SUCCESSFUL digitization[1] and successfully tested them through pilots. We have finished five pilots in loan renewal automation; helped over 20 microfinance institutions (MFIs) produce over 90 dashboards to inform their strategic thinking about their digital implementation; identified cases of successful digital implementation and synthesized them into practical insights. This report summarizes CGAP's experience with the aim of enabling MFIs and other industry players such as funders, to follow a similar approach.

A growing number of MFIs have invested significant resources into digital technology in the past decade. The investment has been part of a strategy to gain efficiencies and economies of scale that most MFIs have struggled to achieve with their traditional, high-touch and branch-based, operational models. This struggle has been part of the microfinance industry for decades. MFIs have developed a largely unrivaled model for delivering productive credit to smallholders and low-income entrepreneurs, and a handful have evolved into industry leading banks. But for most MFIs, the high cost of operations and limited distribution models have constrained services far short of the demand from the broader mass market. In addition, the emergence of fintech lenders and digital banks focusing on mass market customers in recent years has created competition for MFIs. Some MFIs may consider investment in technology as a competitive response to a rapidly changing market for mass market financial services.

CGAP's past research revealed that many MFIs have struggled to build measurable customer and business value with their investments in technology (CGAP 2022), but also highlighted notable successes and the key practices that drove them (Flaming and Jeník 2021). Those practices were anchored in the concept of incremental success and included a strong focus on the core business of credit services, use of simple technology and the Minimum Viable Product (MVP) approach. They also included a holistic measurement of return on investment, change management that starts with C-suite (senior executives) competency and measuring customer behavior as a proxy for value measurement. The findings highlighted automation of credit decisioning for follow-up loans as a significant opportunity for MFIs to achieve efficiencies and scale through digitization.

Inspired by these findings, CGAP hypothesizes that MFIs can use digitization to strengthen their competitive advantage over new digital lenders. While those new lenders keep increasing

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1   For this work and report we have defined 'digitization' as a broad and fluid concept where design and delivery of financial services is –to a significant extent¬– assisted by technology. The broad definition allowed the necessary flexibility to work with a variety of MFIs with their own, often distinct definitions.

market share among the digitized segments of the mass market (Kaffenberger, Totolo and Soursourian 2018), they have not found a substitute for the MFI core competency in high-touch loan origination, especially for first-time borrowers. Digitization can help MFIs continue to lead the difficult business of productive lending to mass market, including micro- and small entrepreneurs and smallholder farmers, as they overcome the traditional challenges of operational inefficiency and limited scale. For instance, by leveraging the data from their own portfolio to automate follow-up lending processes, MFIs can improve their business performance, as illustrated in this report.

The above findings inspired us to combine the most successful practices we found in our research and to test them all through practical implementation. We distilled our previous findings into five core principles for successful digital implementation. Then we invited five MFIs to test those principles in an implementation to develop an automated follow-up loan product. These actionable, core principles are listed in the order following an agile product development cycle:

1. Deploy agile product development teams to drive the digital implementation.

The product team develops the product concept into operational and commercial form, through a process of iterative testing. The team takes the product to market. Management delegates authority to the product team to lead the action and provides the resources and support needed for it to be successful.

2. Define and measure the expected value to be generated from the digital implementation.

Use clear metrics to measure how value is created for the customer and the company. Develop the business intelligence capacity to track the customer behavior change that is associated with value creation.

3. Prioritize the product features that create value.

Use customer research and business case analysis to identify the specific product features that will generate customer and business value. Prioritize those features on the product roadmap in a sequence of product development tests that prove concept before scale-up.

4. Prototype and test solutions with simple technology.

An MVP approach streamlines implementation, contains cost, and minimizes technology and data challenges during the initial product tests.

5. Design for a good user experience for staff and customers.

Customer and staff satisfaction are the primary drivers of product adoption and value creation. The customer experience drives customer adoption while the staff user experience is a key driver of internal change management.

This report explains the principles, shows how they have been applied throughout the CGAP pilots, and highlights key lessons learned about the role digitization plays in helping MFIs create value for their customers. The report complements other CGAP publications on microfinance digitization produced over the past two years.

TESTING THE PRINCIPLES: APPROACH OVERVIEW

B ETWEEN FEBRUARY 2022 AND MARCH 2023, CGAP ENGAGED WITH five MFIs to test a structured approach to creating customer and business value, by automating the loan renewal process. The potential for customer and business value creation makes loan automation one of the most important technology-enabled solutions that MFIs can implement. Loan renewals are a significant source of MFIs revenue. At the same time, for customers who are often microentrepreneurs and sole proprietors, automated renewals smooth their access to finance.

CGAP decided to test a single credit scoring solution, using a Software-as-a-Service (SaaS) provider Rubyx.[2] The selected solution was "plug-and-play," and as such did not require investment in acquisition of new technology. We partnered with five MFIs to develop, launch, and test an automated loan product in 12 months. Their performance was impressive: all five MFIs were able to build out a solution and launch a lending pilot in six months, some in less. In 12 months, each of them had launched and most completed their pilots to test their automated loan decisioning models. Their experiences with the different steps in the process apply universally to digital product development initiatives and illustrate practical applications of the five principles listed in the introduction.

To manage a diverse group of MFIs (different location, size, market conditions) and promote peer exchange, CGAP organized them into a community of practice (CoP). After the first year of pilots, CGAP expanded the CoP to engage a second cohort of 22 MFIs. The second cohort consisted of MFIs that were at least 12 months into their own digital implementation of various use cases. The cohort focused on developing business intelligence practices to support the existing digital implementation by extracting, warehousing and analyzing their customer data to create five core customer behavior dashboards (Flaming, Jeník and Nyein 2023). The immediate objective of this second cohort was to gather more data on MFI experiences with digital implementation and value creation and facilitate group discussions with practitioners on these experiences. The second cohort also tested an efficient approach to building data analytics capacity and collecting core data on customer behavior across a large group of institutions – an approach of interest to holding companies and funders interested in digitizing their large MFI portfolios.

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2   Rubyx offers a cloud-based, loan decisioning model designed specifically for automating MFI follow-up loans. Rubyx is a commercial brand of Prime Numbers Srl.

KEY LESSONS: PRODUCT DEVELOPMENT

THE CGAP TEAM DESIGNED THE PROJECT AROUND AN AGILE product development plan. This is the basic implementation framework used to operationalize the core principles. The *product roadmap* below (Figure 1) maps out the sequence of steps in the pilots. The roadmap also provides a framework to examine the key decisions that the MFIs made and explores the implications of what the MFIs did and did not do during their pilots. We draw from their experiences to illustrate the challenges that MFIs face in digital product development, together with the most successful approaches to implementation. A similar product roadmap could be applied to other digital implementations.

FIGURE 1. **Product roadmap**

Project set up
- governance
- team set up

Define the hypothesis
- define value creation strategy
- feasibility assessment

Business intelligence build out

Product design
- Product features
- Roadmap and release plans

MVP build out
- Tech/vendor selection
- Loan decisioning model build out
- Ops procedures
- Staff engagement

Sprint 1 Product feature test

Assessment

Sprint 2 Product feature test

Assessment

Sprint 3 Product feature test

Assessment

Scale up

Project set up

At the initial stage of project set up, senior management and board level champions establish important project dynamics by making decisions about resources, timelines and outcome expectations. The creation of a product owner and team signals management support for an *agile* iterative design process. In the best scenario, decision-making authority will be delegated to the product team. These early signals of management support are important to the longer-term change management process, when resistance develops to products that disrupt the status quo.

We observe that most MFIs compile ad hoc product development teams with little authority to innovate established procedures and policies in the core business. And this is why many MFIs struggle to make significant improvements in their status quo business. In an agile product development practice, product owners are authorized to innovate *in a development environment*, much like a typical IT department separates the development and production platforms. They can experiment with commercial, operational, technical, and risk management approaches, without pre-approval from the area C-suite managers. This is the key feature of an agile product development practice.

CGAP defined important project set up parameters to evaluate prospective partners from among MFIs to ensure consistency in pilot implementation (CGAP 2021). The 12-month implementation period reflects our conviction that product development initiatives need to prove concept in a short period of time to overcome the resistance and inertia that can choke expensive implementations that exceed short-term milestones. The short time frame implementation required an MVP approach and the SaaS model that reduced technology development and data management by the MFIs.

The selection criteria and evaluation favored MFIs with champions at the senior management or board level, a clear strategic vision for value creation, and willingness to establish a dedicated team for the 12-month period. The initial product roadmap and the Rubyx release plan (see Annex 1) were structured around an *agile product development cycle,* and the selected MFIs had prior experience with this practice.

Given the project design, CGAP defined the core elements and timing of the product roadmap prior to inviting the MFIs to participate. On their own, the MFIs would otherwise make decisions about the technology solution and timeframe in the first phases of the product development cycle. The MFI management sponsors resourced their product teams well and maintained support to the implementations throughout the pilots.

Defining the hypothesis

Good product development starts with a clear hypothesis about a problem that a product can solve. Human-centered design (HCD) has an array of tools for informing that hypothesis with deep understanding of user problems and use cases. Then an initial assessment of operational, financial, and regulatory feasibility informs the decision to move forward, and the content of the product roadmap.

FIGURE 2. **Monthly loan disbursements**
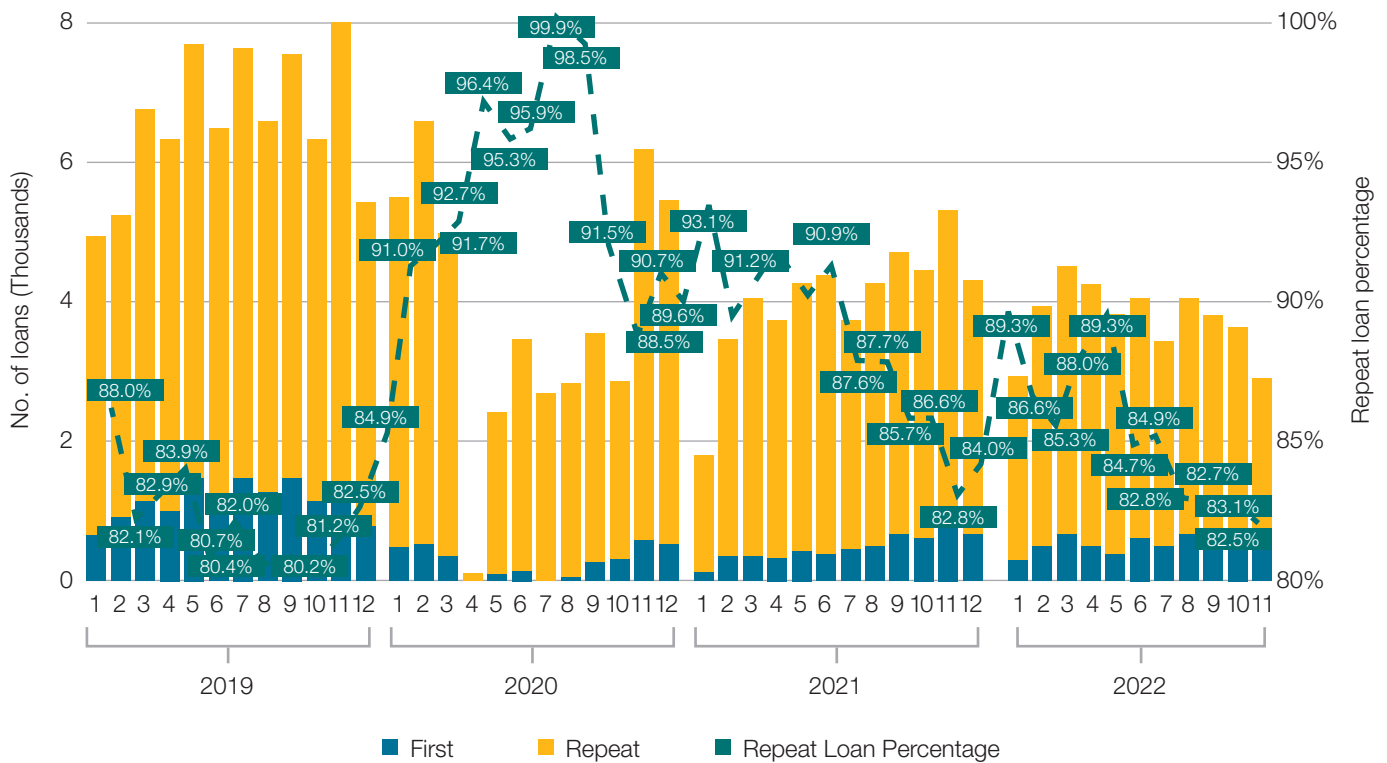
In some cases, stakeholder consensus forms quickly in support of a promising product idea. In these cases, it is sometimes faster to get convincing customer input with a quick test of the product prototype than to spend time and resources on an extensive HCD ideation exercise (CGAP Customer-Centric Guide). However, the hypothesis needs to be specific and concrete about what part of the product will generate customer value, and revenue for the company. This helps prioritize the most useful product features to test and focuses on the initial operational and regulatory feasibility assessment. Regulatory risk is a persistent threat and merits assessment early and often throughout the project.

DEFINING THE VALUE CREATION STRATEGY

CGAP launched the project with the high-level hypothesis that MFIs can build customer and business value by automating loan renewals. The request for proposals attracted MFIs with similar confidence in the hypothesis. However, each of the MFIs came to the pilot with unique strategic objectives about how they would create customer value and monetize that value in their respective business models.

For example, one MFI wanted to automate its follow-up loan origination process to free up loan officer time to cultivate more first-time borrowers. As their monthly disbursement dashboard indicates (see Figure 2), more than 80% of monthly loan disbursements were to clients renewing their loans. For this MFI, efficiency gains from automation would impact over 80% of their loan business. They also reasoned that loan officers could grow the overall portfolio by using the gained time on the more labor-intensive first-time borrower loan origination.

FIGURE 3. **Customer acquisition**
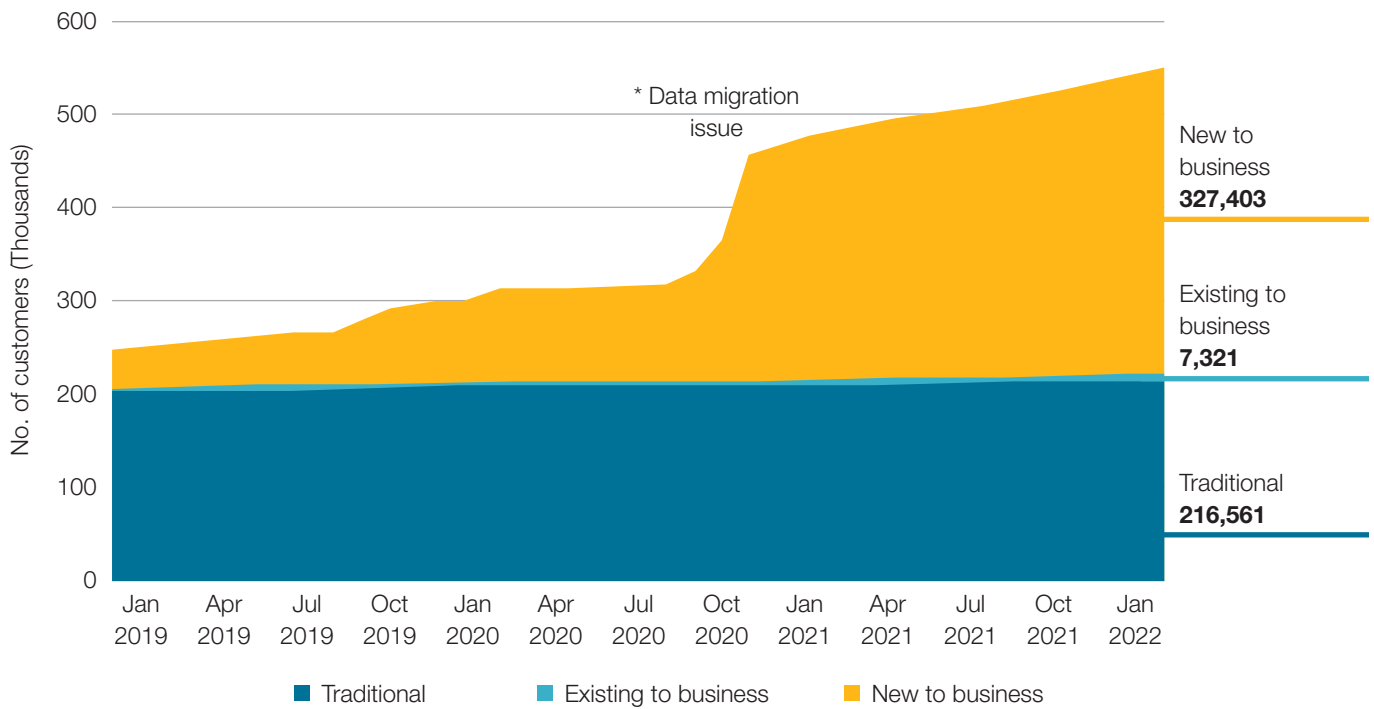
Another MFI wanted to revitalize its traditional loan business by adapting the automated loan process for nano loans –loans of extremely small monetary value– offered in partnership with a mobile network operator (MNO). The MFI had recently acquired over 300,000 customers from this partnership, while growth had stagnated in its traditional customer base (see Figure 3). The new digital customers were active borrowers, with a follow-up loan rate of over 80%, while the follow-up loan rate of traditional customers was around 10%. The MFI saw an opportunity to improve its traditional business with the technology driving its new digital business line.

A third MFI wanted to deploy the automated decisioning model to offer individual loans to its traditional solidarity group clients (most of its portfolio). The MFI believed that they could grow, and provide a better product to clients with individual loans, and they planned to use the automated decisioning platform to grow that individual loan business.

FEASIBILITY ASSESSMENT

CGAP organized the selection process as a feasibility assessment, to identify MFIs capable of implementing the solution. The core selection criteria were:

- Management and board commitment to the project
- A clear strategic vision for how to build customer and business value
- Staff experience with digital implementations and data analytics
- A structured product development practice
- Regulatory feasibility

The SaaS solution minimized the technology buildout and data analytics required of the MFIs, and this simplified CGAP's assessment of MFI capacity because it reduced the risk of an MFI languishing during the project set up, or failing during the solution buildout. The SaaS solution

and the tech provider's structured release plan were essential to the successful implementation of the pilots. For the MFIs, this reduced the technical requirements and provided more time to focus on product development, operationalization, and socialization efforts. For CGAP, this approach enabled a small team to implement this project in a reasonable time frame.

All the MFIs launched the pilots with a shared assumption that the time saved by the automated loan product would produce value for customer and company. MFI confidence came from their own extensive knowledge about approval times for loans and the effect of credit officer productivity on profitability. However, a simple financial feasibility assessment *during the hypothesis stage* might have informed better choices about what aspects of the product merited testing during the pilot – this is a key finding. CGAP eventually created a simple financial model to calculate income generation based on the pilot results (see below).

In the initial selection process, MFIs reported on any regulatory restrictions to uploading and storing anonymized customer data on a cloud-based platform and using that data for an automated credit decisioning model. The five cohort MFIs did not face such restrictions, but it is worth mentioning that several applying MFIs did. An MFI had to manage a regulatory requirement to verify customer income declarations prior to follow-up loan approval. Another MFI experienced a change in regulatory requirements during the pilot, which required three additional verification steps in the origination process. These regulatory requirements created significant challenges for the two pilots and both MFIs faced additional work to automate these required steps (see: a word on regulation).

Business intelligence buildout

Good product development requires good business intelligence on customer behavior. As the product roadmap takes shape, it is necessary to develop a data analytics practice to track the indicators relevant to the product test. This will be a new practice for many MFIs, and it is likely that the data analytics will generate insights about customer behavior that sharpens the MFI's focus on how to build value with the product. Ideally, these insights inform decisions about which product features will produce value, and therefore merit testing first in the product roadmap. The pilots showed that financial institutions tend to focus their innovation efforts on building new technology and mitigating lending risk. Customer behavior analysis draws attention to the primary driver of business value. For most MFIs this will reveal significant opportunities for increasing customer retention and customer motivation for good repayment.

Rubyx provided the pilot MFIs with detailed reports on the scoring results, loan offers and approvals, with disaggregation by product and branch. These served as core performance reports that saved the MFIs significant time and effort. In addition, four of the five MFIs decided to build out a library of dashboards to track changes in customer behavior as they implemented the new automated loan products. These MFI dashboards segment customers into the "digital"

FIGURE 4. **Follow-up loan rate**
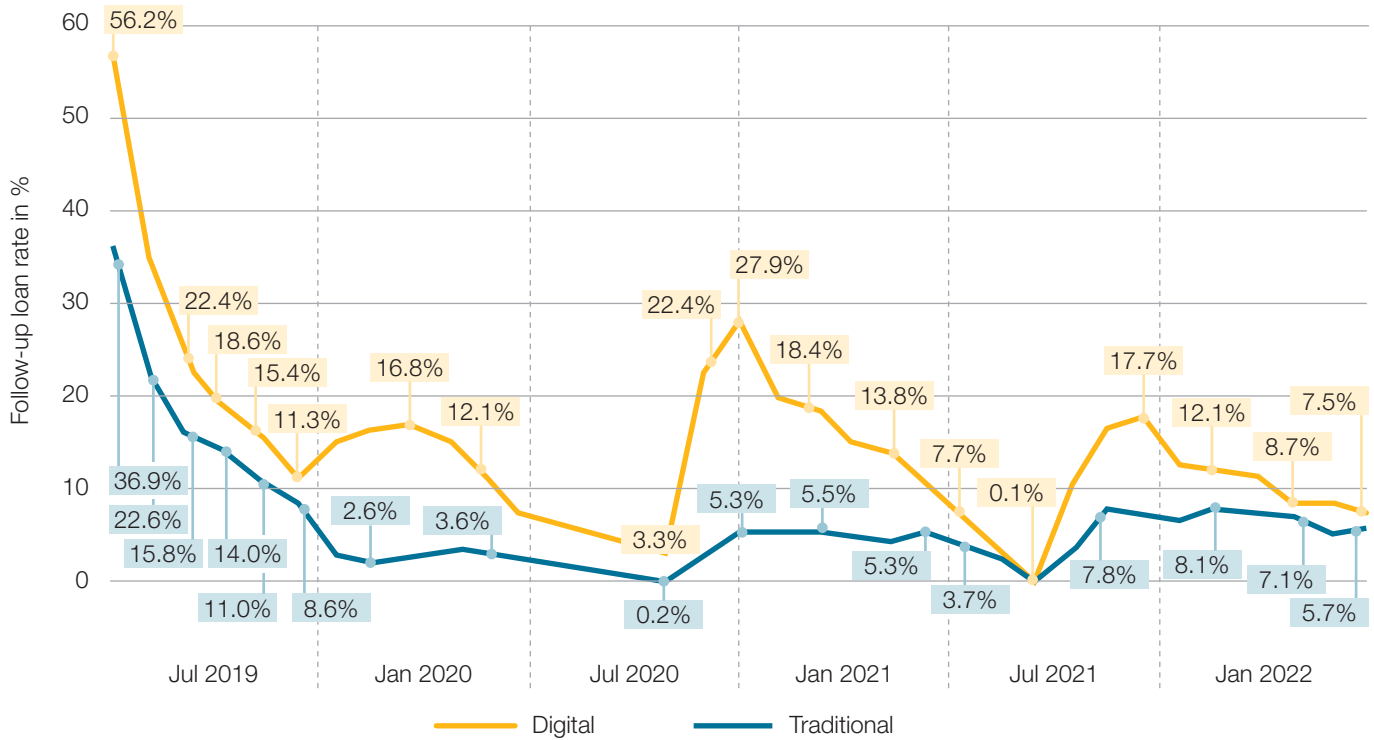
and "traditional," categories[3] and track customer acquisition and transactional, deposit and borrowing behavior over time (CGAP 2023).

The original purpose of the dashboards was to establish a baseline of historical customer behavior patterns from which to measure customer response to the automated loans and other digital products and channels. However, in many cases the dashboards captured customer behavior trends that revealed room for improvement in the core lending products. This provided important context for a loan automation initiative because it signaled the importance of improving the customer experience with the new automated loan product.

For example, the dashboard (see Figure 4) shows a steep decline in the follow-up loan rate[4] of one of the MFIs that begins in 2019 and persists to the present. The trend is similar for clients using digital and traditional channels. This draws attention to aspects of the loan conditions and eligibility requirements that require attention, in parallel to the improvements in the loan approval process.

The dashboard for a different MFI (see Figure 5) shows a stark difference between the loan renewal rates of the company's automated nano loan product and its traditional microfinance loan. The MFI aspired to improve its traditional product by adapting the automation and features of its digital product.

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3   Typically, the definition of digital vs. traditional is based on the channel used by the customer to transact with the institution.

4   The follow-up loan rate is the percentage of customers who paid off a loan in the previous six months and who now have an active subsequent loan.

FIGURE 5. **Follow-up by segment**
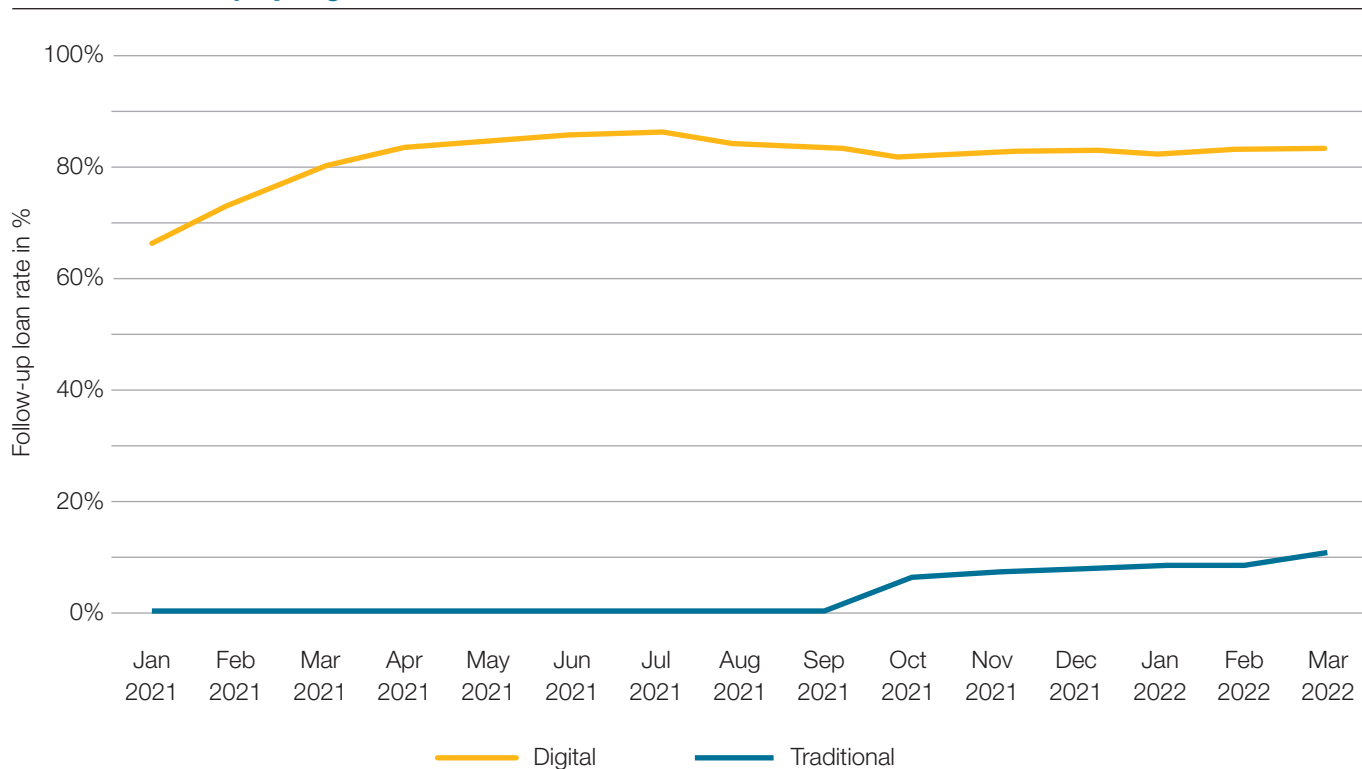
In another example (see Figure 6), we see an MFI whose active customer base declined even as the MFI added new clients. This indicates that a significant number of clients join the MFI, but do not transact. However, the following dashboard (see Figure 7) shows that the active clients are evolving into superusers, doing on average 12 transactions a month across a range of products and channels. This suggests that the MFI is doing very well with its more sophisticated customers, but has product improvements to make to retain the other segments.

These dashboard insights revealed value lost in the current business, and therefore opportunities to capture that value with the new product. MFIs came into the pilots focused on monetizing the efficiency gain from automating loan origination and controlling risk, and assuming customers would appreciate the automated process. However, the dashboards revealed very significant potential for increasing efficiency and scale of the lending business by increasing the loan renewal rate.

FIGURE 6. **Active versus inactive customers**
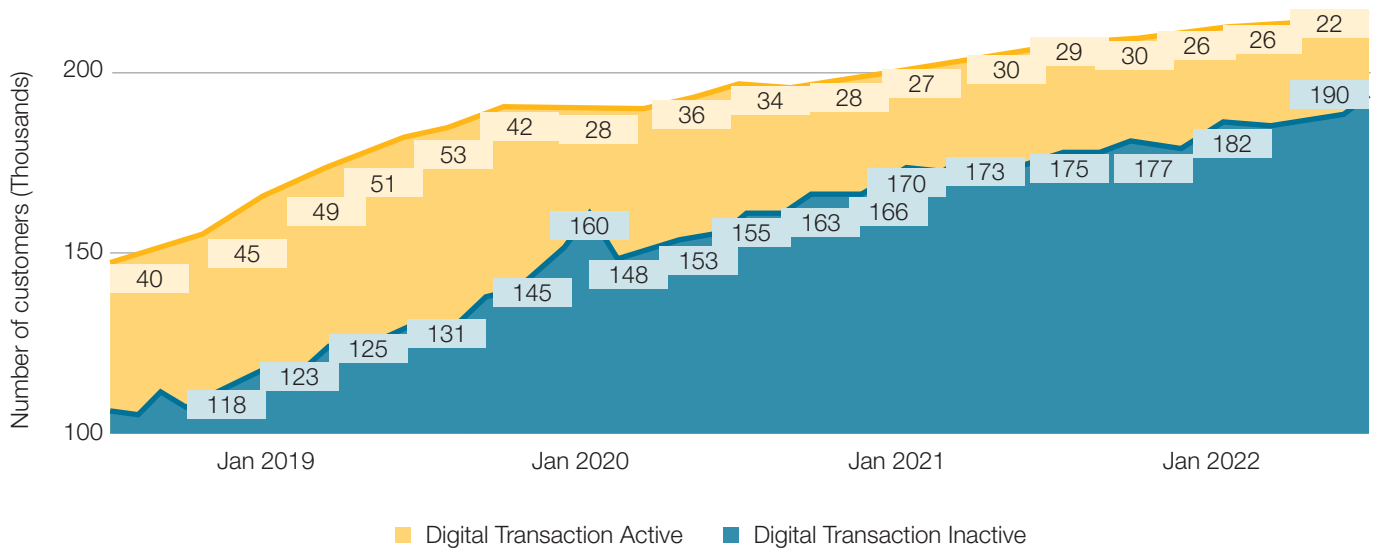
FIGURE 7. **Transacting behavior of active customers**
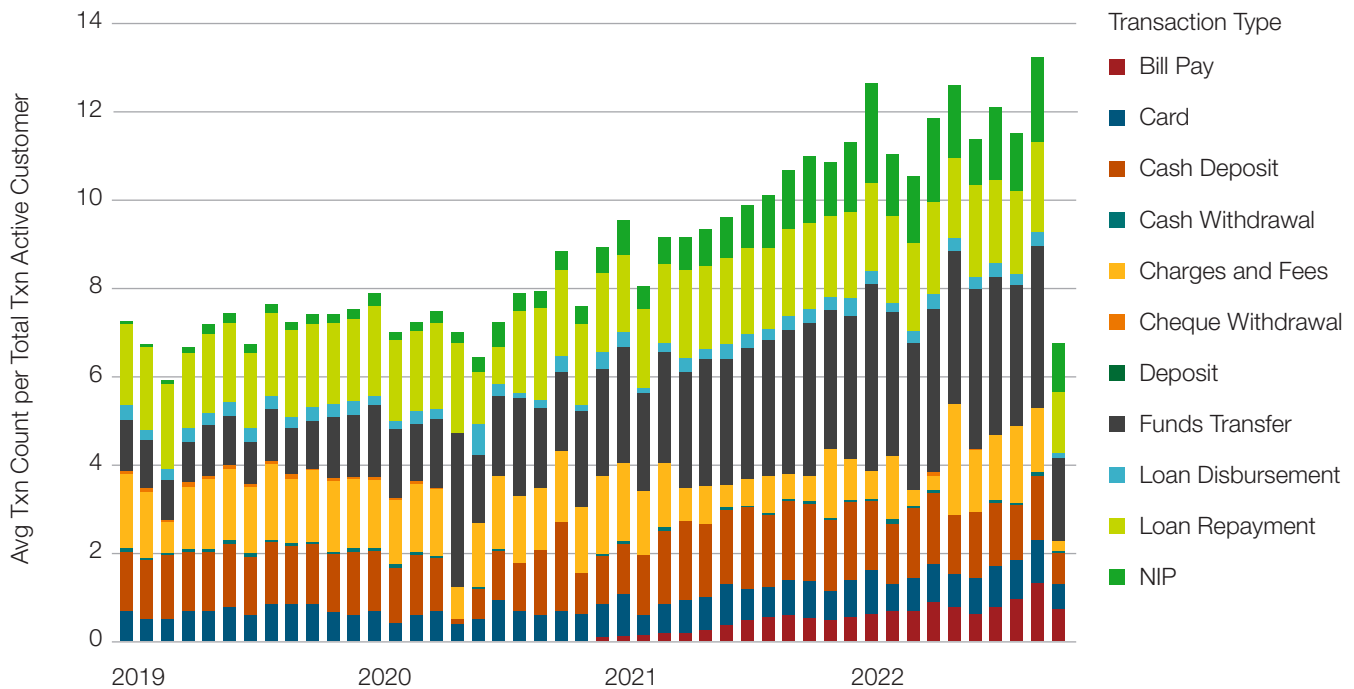
Product design

The product team's first task is to define the key product features, and then ensure that the prioritization is reflected in the product roadmap. Ideally, the team uses the business intelligence insights to refine the original hypothesis and prioritize the product features that will generate value. The team will also develop the release plans for the buildout and test of the product prototype.

The Rubyx platform scores an MFI's existing client based primarily on their repayment performance on previous loans (behavioral data). Each client is then categorized according to cut-off thresholds defined by the MFI on the scale from A (prime) to D (high risk). Rubyx customized each decisioning model around the eligibility requirements and business rules defined by the MFIs. All five MFIs defined their respective pilots *as a test of the repayment performance of the automated loans.* That is, to determine whether the automated approval loans repaid with less arrears and loss than traditionally originated loans. To minimize the risk of loss during the pilot, the MFIs limited eligibility to a select group of category A and B (high performing) customers. This meant that the MFIs extended automated loan offers to a limited number of the scored clients, ranging from 1% to 19% of the total scored. They also limited the size and tenor of the automated loans.

The decision of the MFIs to limit eligibility and loan conditions ultimately limited the scope of their tests, leaving many other potential eligibility criteria and product features untested. The MFIs extended pre-approved loan offers to the highest performing category of A and B clients. In all cases, this was a new experience for the MFI clients. However, the pilots did not test any significant improvements to the loan conditions. This decision reflects the priority that the MFIs placed on limiting the risk of loan loss while they tested out the decisioning model.

A simplified financial model illustrates one of the key insights of the pilots: to create business value, MFIs will have to automate at least 50% of (issued) loan renewals, and increase the total number of loan disbursements.

TABLE 1. **The business model analysis**

	Traditional Scenario	Loan Automation	Loan Automation + Growth
First loans	5	5	5
Traditional follow up loans	10	5	5
Automated follow up loans		5	25
Total loans	**15**	**15**	**35**
% Loan Officer (LO) FTE used	86%	64%	86%
% automation of follow-up loans		50%	83%
Loan disbursement growth		0%	133%

The traditional scenario above shows basic loan officer productivity indicators for the traditional loan origination process. Credit officers expend 1.25 full-time equivalent (FTE) to originate and manage a first loan, and 1.0 FTE for a follow-up loan. Each credit officer, on average, disburses five first time loans and ten follow-up loans monthly. This consumes 16.3 days of FTE, which is 86% of their average monthly net FTE of 19 days.

In the second scenario, we assume that the MFI can automate 50% of its loan renewals, and that the automation reduces credit officer FTE to 0.2. The time savings reduce the total FTE that the credit officer spends on loan origination to 64% of total monthly FTE. However, the time saving itself does not increase business value; in this scenario, the credit officer is still disbursing the same 15 new loans per month.

The final scenario models what is possible if the MFI can redeploy the saved time to increase the number of loan disbursements. The model shows that the credit officer could manage an additional 25 automated follow up loan disbursements. In this scenario, 83% of follow-up loans are automated, and this results in a 133% increase in monthly loan disbursements.

The pilots validated that category A and B clients repay with acceptable repayment performance (same or higher as through the traditional process). These results contributed to broad stakeholder confidence in the decisioning model itself. For this purpose, the pilots were very successful. In the business case, this proved that automated loans *will not generate loan losses on A and B clients.* However, to prove that automated lending can create additional revenue, the product needs to increase total loans. This can only be achieved by making most clients eligible; making the product more attractive to clients to increase demand, and using the time saved to disburse more loans each month.

The financial analysis also points to a way to increase the value of the initial product tests. The results of the automation pilots demonstrate that the repayment performance of existing loan products does not merit a dedicated test. In most scoring models, category A and B clients have, *by definition,* a history of excellent or very good repayment performance. The hypothesis that these customers will continue to perform well is already well supported. The risk of failure is very low, and the cost of a dedicated test is high. The alternative hypothesis that could be tested is the following: *"We believe that A and B customers will continue to perform well. We also believe that if we use risk-based pricing and more attractive loan conditions, we will increase demand for follow-up loans and incentivize C and D customers to improve their performance."* The test of this hypothesis would focus on customer response to product features that reward good performance, while validating the performance of A and B customers. This is a more valuable test.

The MFI's choice to minimize the risk of loan loss would resonate with the managers of many financial institutions. In fact, the CGAP findings reveal a tendency in financial institutions to focus their digital implementations on technology buildout and risk mitigation. This cautious approach prioritizes risk mitigation over the opportunity to test out eligibility criteria and product changes that generate greater value. Business intelligence and financial modeling can inform choices to test the product features that will maximize value creation.

In the broader research, CGAP has found many MFIs with modest loan renewal rates, some lower than 10%. The clients who borrow and then do not borrow again represent a significant opportunity for an MFI to leverage their competitive advantage in first-time business loan origination. More generally, improvements to *customer retention* will likely be a key revenue driver for most new digital products and channels.

MVP buildout

During buildout, the team prepares the prototype product for the test sprints. The prototype is built and ready for the tests, operational and risk management procedures are designed, and staff are prepared for their role in the tests. This is the phase where implementation can languish with prototype technology. The MVP approach minimizes technology requirements, and therefore the risk of delays.

Staff socialization is a key component of successful change management. Management will likely be most concerned with risk and revenue performance.

But front-line staff will focus on whether the new product makes their job easier. A successful pilot needs to improve customer and staff experience with the new product or technology.

The greatest risk to a pilot in loan automation is that it fails to demonstrate improvements to the client and credit officer user experience. To an initiative that aspires to change the way the company delivers its core business and manages risk, change management and staff socialization are very significant challenges. A pilot that delights customers and convinces staff that their work and lives will be better with the new product will generate strong motivation for improvement and change. Companies that fail to generate this experience in the pilot will likely struggle with the next phase.

Rubyx engaged each of the five MFIs with a 12-month workplan to develop and operationalize the decisioning model in five months, pilot the model with loan disbursements for six months, and wrap up and assess results in the final month (see Annex 1). All the MFIs completed the buildout and launched their lending pilots, though they did so in varied timeframes, at different rates and different levels of automation.

The MFIs dedicated a large part of the buildout phase to extracting and validating the data required for inputs to the decisioning model. While they could provide data for the pilot, the MFIs still faced a range of data-related challenges before they had a fully automated, daily data extraction and verification system. Some data challenges stem from the limitations of particular core banking system software; others relate to data consistency between different data sources.

Full loan renewal automation requires significant operational process reengineering to convert the loan decision into a loan offer, contract, and disbursement. The Rubyx model generated a daily list of automated loan offers. An MFI automated an SMS loan offer and created a USSD channel for clients to express interest in a loan renewal. However, all the MFIs used some manual processes to send the loan offer to clients, formalize the contract, and then disburse the loans. This was a calculated decision to minimize the technology required for full automation. However, these manual processes will need to be automated prior to a significant scale-up phase.

Two of the MFIs had to contend with regulatory underwriting requirements that could not be automated during the pilots, such as credit bureau checks, total debt burden verification, and personal or household income verification. While credit bureau consultations can be automated into the Rubyx platform, the MFIs do not yet have a data source to automate the last two verifications. Staff are conducting these verifications with on-site visits, thus limiting the overall efficiency to be gained from the scoring engine.

The type of financial services offered also affected the buildout stage. The MFIs with credit-only licenses that cannot offer their customers deposit accounts can only rely on withdrawals and repayments data. MFIs offering solidarity group loans may encounter challenges in scoring individual customers.

The buildout process concluded with staff training and familiarization with the automated decisioning results. Rubyx uses two conventions to build staff confidence with the automated approvals. First, the Rubyx team interviews the credit officers and incorporates their appraisal rules into the business rules of the decisioning model. Then in an initial test, credit officers

conduct a traditional loan appraisal on a group of loans and compare their results to the model decision. Credit officer confidence in the model increases as they understand that the decisioning model is applying the same rules that they apply during appraisal and generating the same results. Second, the credit officers can disqualify a client from the automated loan offer through the administration portal. This gives them adequate control over clients who they know are struggling with their current loan and require special attention before they receive a future loan.

The MFIs successfully deployed a version of the Rubyx platform that was suited to the sprint 1 test of customer repayment performance. However, the prototype version, with manual operating procedures, generally did not reduce the total workload of the loan officers. A more automated version can be tested in future sprint cycles. The business model analysis (Table 1) shows clearly that the value of automation derives directly from an increase in loan officer productivity. Early tests of the features that improve productivity will move the product towards a version that will be profitable at scale.

Sprint 1 assessment

A well-designed product test has a clear end point, and metrics to measure results. The post-test assessment is a stock take on the results and a decision about whether the hypotheses have been validated. During the first tests in a product roadmap, the results will typically be refined, with subsequent tests and changes to the product roadmap.

MFI	A	B	C	D	E
LENDING TEST PERIOD (months)	7	6	4	3	6
ELIGIBILITY					
Scored Customers	47,311	28,315	181,109	12,326	52,779
Eligible customers	13%	19%	1%	18%	17%
CUSTOMER ACCEPTANCE					
Accepted auto-renewal offer	10%	6%	3%	19%	42%
Opted for standard renewal	40%	16%	4%	13%	N/A
Standard renewal required	14%	3%	2%	5%	N/A
Did not renew	36%	75%	91%	62%	58%
PERFORMANCE					
Automated renewal %	16%	23%	37%	51%	N/A
PAR 0	3.60%	0.00%	0.00%	0.00%	0.00%
Better or worse than standard renewal	+	+	+	+	+

All the MFIs reached the lending stage at different rates and their loan pilot periods varied at the close of the project on 31 March 2023. One MFI disbursed their loan targets during the pilot; the others will continue with the pilot on their own.

A product roadmap anticipates iterative test sprints to refine product features and develop operational procedures capable of scale-up. In the 12-month pilot timeframe, the MFIs launched their prototype products and completed one test sprint – a significant achievement. For all the MFIs, the repayment performance of the automated loans was the primary metric for measuring the success of the pilot. At the end of the CGAP project period, all the MFIs had achieved satisfactory results. Only one MFI experienced any portfolio at risk (PAR 0) greater than 0%, and in all cases the automated loans outperformed the loans originated through the traditional procedures.

At the same time, the performance metrics provide clues to the product features that merit attention in the next tests. As noted previously, the eligibility criteria defined by the MFIs limited the automated offer to modest numbers of the scored clients. The eligible segments ranged from 1% to 19% of clients scored. We made the point in the business case analysis that the MFIs will have to make a larger portion of their existing clients eligible to generate business value.

The customer acceptance indicators also point to opportunities for increasing business and customer value with the automated loan product. Customer acceptance of the automated loan offers was modest in most cases. In three of the pilots, more customers opted to renew their loans through the traditional origination procedure, despite most of them accepting equal or lesser loan amounts. This suggests that automating the loan process, by itself, is likely not enough to make the loan renewal more attractive to customers. The high proportion of customers that did not renew at all, suggests opportunities for improving the overall follow-up loan conditions to make them more attractive to customers.

The biggest challenge is creating a product that customers and staff like enough to significantly change their behavior. For most MFIs, that means increasing demand for first loans, and increasing the loan renewal rate. The new product needs to be more efficient and generate more business value than the existing product. That is achieved through loan officer productivity increases. These are the product objectives that merit attention early on in the roadmap. The same applies to most digital implementations.

THE **BUSINESS CASE** FOR **FOLLOW-UP LOAN** AUTOMATION

EACH TEST SPRINT ASSESSMENT SHOULD ALSO REVISIT THE **business case assumptions. In a well-executed product roadmap, the test results will refine a financial model based on proven assumptions about the core revenue and cost drivers.**

CGAP worked with the MFIs to develop a financial model to project the potential business value of automating loan renewals. While the pilot samples were not large enough to generate measurable results, the exercise did clarify our understanding about the drivers of business value and the degree of automation and loan portfolio growth required to generate value.

A simple model, based on the key drivers of portfolio growth and loan officer productivity, helps to illustrate the business value potential. The example below shows the production of a single loan officer under different scenarios where the portion of automated portfolio and increases in loan disbursements vary. The illustration is based on the following assumptions about loan conditions, the time that the loan officers spend to disburse loans, basic income, and expense parameters:

First loan amount:	$2,000
First loan term:	9 months
Follow-up loan amount:	$4,000
Follow-up loan term:	12 months

First loan FTE:	1.25 days
Follow-up loan FTE:_	1 day
Automated follow-up loan FTE:	0.2 day

Monthly Portfolio Yield:	2.5%
Loan Officer compensation/month:	$1,250

The following table shows key performance indicators of the difference scenarios:

	Traditional (Base scenario)	Automation	Automation + first loan growth	Automation + follow up loan growth
Monthly loan disbursements/Loan officer (LO):				
First loans:	5	5	8.3	5
Follow-up loans:	10	5	5	5
Automated follow up loans:	0	5	5	25
TOTAL	15	15	18.3	35
% of LO FTE used:[a]	86%	64%	86%	86%
% automation of follow-up loans:		50%	50%	83%
Loan disbursement growth:[b]		0%	22%	133%
Steady state results:				
Outstanding loans:	165	165	194.7	405
Outstanding portfolio:	$313,500	$313,500	$346,170	$841,500
Portfolio and income growth:		0%	10%	168%
LO Expense/income ratio (Expense to income ratio)[c]	16%	16%	14%	6%

a   Total monthly FTE = 19 days.
b   From base scenario.
c   Here we only consider the loan officer compensation expense.

The first automation scenario in the second column shows the impact of automating 50% of loan renewals without loan growth. In this scenario, loan officers spend less of total FTE in loan disbursements, but do not leverage the time to make additional disbursements. Hence, there is no impact on portfolio growth or net income.

The second automation scenario in the third column assumes that the MFI automates 50% of loan renewals, and that loan officers use that saved time to make additional first-time loans. This increases the total outstanding portfolio by 10% and reduces the expense to income ratio (EIR) from 16% to 14%.

The final scenario also assumes that the MFI automates 50% of the original loan renewals, but then uses the saved time to maximize the number of loan renewals that the loan officer could manage with their FTE. This results in automation of 83% of all loan renewals, and significant growth in outstanding loans, the portfolio and income, which grow 168%. The EIR drops to 6%.

The scenarios illustrate the importance of making the loan product more attractive to clients and making most clients eligible for the automated loan product:

- An MFI will need to automate a significant percentage of loan renewals (at least 50%) to generate enough time savings to convert to more loan disbursements.
- If the time savings are used to disburse more first-time loans, the business value increase will be modest. This is because traditional underwriting requires a fixed amount of FTE and the time savings are only enough for a marginal increase in monthly loan disbursements.
- The greatest business value is achieved by maximizing the number of automated loan renewals. The scenario shows that loan officer FTE allows a significant increase. However, this requires a significant increase in the loan renewal rate (in other words, more demand for follow-up loans) and making a large number of clients eligible for the automated loan offers.

SECTION 4

BROADER LESSONS FROM THE PROJECT

AS NOTED EARLIER, CGAP ENGAGED WITH AN ADDITIONAL 22 MFIS to expand the CoP around a more diverse set of digital implementations. CGAP selected the second cohort of MFIs based on their interest and ability to produce five core customer behavior dashboards, and engage in CoP discussion of insights drawn from their own implementations. This was a test of an approach to build a standardized, built-for-purpose data analytics practice in 22 MFIs, with minimal CGAP FTE[5]. Seventeen of the 22 actively participated in the exercise and ten completed the dashboards to a level that made a significant contribution to the collective data set. The varied success of the MFIs with the dashboard buildout was revealing about MFI business intelligence capacity.

The effort yielded a significant return in the form of raw data on customer behavior in digital implementations. As such, this exercise is an efficient way to conduct due diligence on an MFI's readiness to launch a digital implementation. The MFIs with the most advanced digital implementations demonstrated the greatest competency with data analytics and the most developed business intelligence practice. This is consistent with findings from our earlier research: that behind successful digital implementations we find business teams that work with data analysts to track customer behavior. A necessary, but not sufficient, condition for success is therefore that business teams and data analysts work together.

Customer behavior indicators facilitate a granular and concrete assessment of what is working and what is not. For example, it is common for an MFI to report that "X% of all customer transactions are now in the agent network." This is indeed a meaningful indicator of how active clients are transacting. However, a graph showing that only 25% of all clients transact in the month, is more revealing, because it draws attention to the 75% of customers who are not transacting. Even more revealing is the graph below (see Figure 8) that plots customer behavior throughout their journey with the MFI. In this example, 74% of customers do not transact even in their first month with the company, and that segment grows to 88% by month 24. A small group of customers who do more than three transactions per month drive the company's

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5   In the first cohort, the average MFI required about 25 days FTE of support; in the second cohort, we aspired (and largely succeeded) to support all the 22 MFIs with a total of 25 days FTE.

FIGURE 8. **Transaction behavior by journey month**
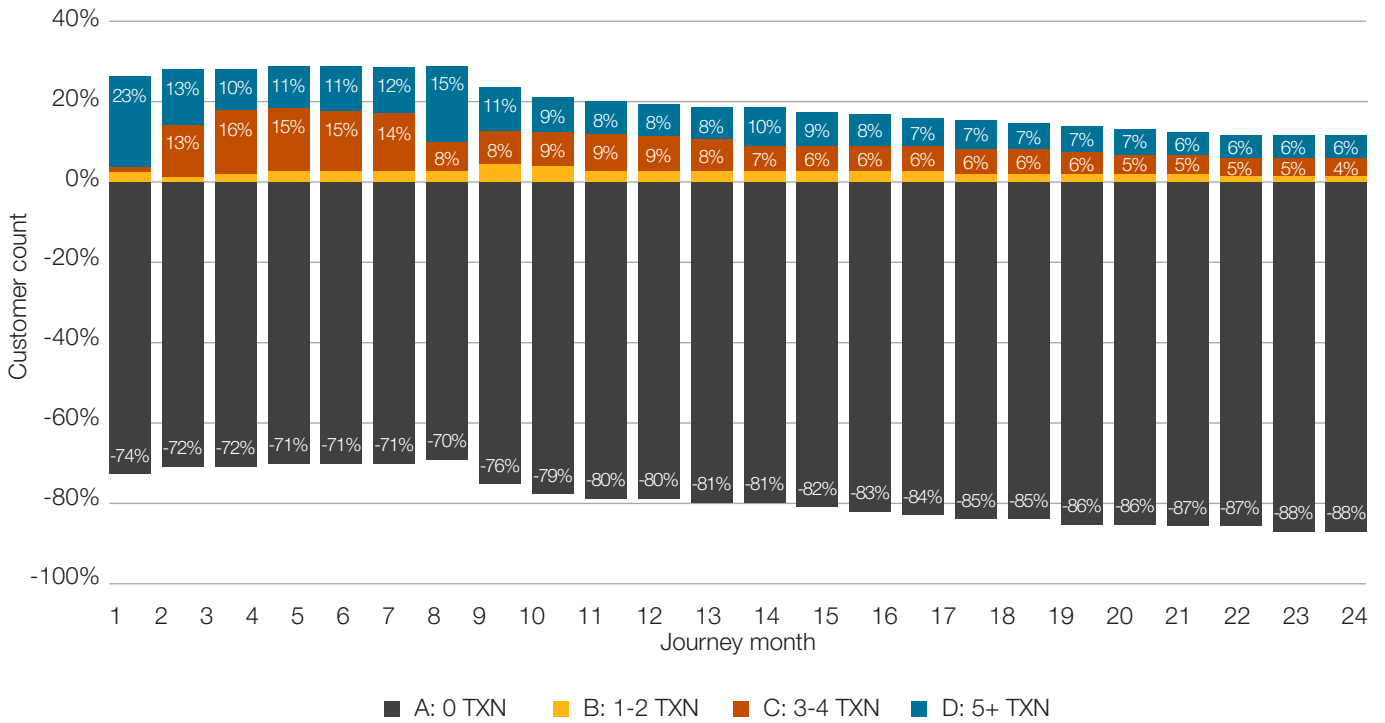
business. These insights facilitate meaningful customer segmentation, and different strategies for meeting the needs of those segments.

The exercise with 17 MFIs revealed familiar trends in customer behavior, both in the traditional customer segment ('traditional') and in the customers using digital products and channels ('digital'). In MFIs with well-developed digital products and channels, we see higher levels of customer transaction, borrowing and deposit behavior among clients who use digital products and channels, compared to the traditional clients who transact exclusively in the branches. But many MFIs have well over half of their customers inactive or with near zero deposit balances. And loan renewal rates are often less than 10%. These indicators point to significant opportunities for improving the customer experience with better products and channels.

SECTION 5
A **WORD** ON **REGULATION**

L EGAL AND REGULATORY FRAMEWORKS SET THE LIMITS FOR operation of MFIs – including the limits on their business models such as deposit-taking versus credit-only MFIs, and their capacity to digitize.[6] The anecdotal evidence from our pilots illustrates the impact that regulation can have on the industry's capacity to evolve and modernize.

1. *Data localization:* Implementation of both the credit scoring solution and the business intelligence analytics were greatly facilitated when MFIs could set up a cloud-based data warehouse. Due to data localization rules, not every MFI (either applying for or participating in the pilots) could set up such a warehouse or store all relevant data in it. For instance, in some jurisdictions where cloud computing is allowed in principle, the customer data subject to bank secrecy (e.g., transactional data) cannot be transferred outside the jurisdiction.[7]

2. *Creditworthiness test:* A mandatory requirement to check the borrower's or his or her household's financial standing as part of the underwriting process is sometimes imposed by regulators concerned with over-indebtedness. While an important consumer protection measure, it becomes a barrier to digitization if the creditworthiness test can only be performed onsite.[8] The onsite visit represents a significant slowdown in the otherwise streamlined renewal process and additional cost as experienced by at least two MFIs in our cohort.

3. *Prohibition on deposit taking:* The biggest regulatory barrier to value creation concerns the prohibition of deposit taking. While not suitable under all circumstances, the more options MFIs have to design new services, the more value they can offer to their customers. Regulation that sets the bar for deposit taking outside of an MFI's reach without considering the principle of proportionate and risk-based regulation, prohibits the MFI from mobilizing deposits; limits their business model; drives up the cost of capital and limits opportunities for value creation. As a consequence, MFIs may also be limited in how they use efficiency gains from digitization to grow their portfolio. In the CGAP pilots, the absence of deposit taking also constrained the application of behavioral analytics to repayment data only.

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6   This is also true for other external factors out of an MFI's control, such as infrastructure and market conditions.
7   For a more general discussion on the importance of cloud computing in financial inclusion see for example the case presented in CGAP 2019.
8   An onsite creditworthiness test is often performed where other alternatives are not easily available. For instance, informal income is not reported to authorities and thus not easily verifiable.

REVIEWING THE CORE PRINCIPLES (CONCLUSION)

T HE RESULTS OF THE PILOTS AND THE COP YIELD LESSONS IN support of the core principles of successful digital implementations. These principles make product development and change management possible, and apply to most digital implementations.

We find especially robust validation for the utility of simple technology. This practice reduces the technology challenge and creates time to focus on product development. We have an even greater appreciation for the importance of business intelligence, with a focus on customer behavior. To be clear, customer behavior is not in itself a complete measure of customer value. But it provides clues as to where and how value is being created for the customer. An MFI with a good product development culture will build more sophisticated feedback loops to better understand how customers are experiencing value. Without such insights, MFIs tend to prioritize operationalization and risk mitigation, instead of building a better customer experience with product features. The roadmap is an excellent tool for focusing on the product features that will generate value and designing the buildout and the tests within a short time frame.

While the individual principles define highly effective practices for product development, they are also components of an approach to change management that overcomes the resistance to change that many MFIs struggle with. For example, we noted above that the delegation of authority to a product development team reduces the ability of core business managers to interfere in the innovation process. MVPs reduce the risk of resistance that builds when the project languishes and goes over budget with the technology buildout. Finally, creating a good user experience, for customers and staff, is a key driver for successful change management. C-suite competency and leadership are certainly critical. At the staff level, the user experience of the customer-facing staff is the main driver of staff buy-in. The primary risk to change management is poor customer and staff user experience.

WHAT'S NEXT?

D UE TO THE NATURE OF THE PILOTS, THEIR DESIGN, ELIGIBILITY criteria and the overall selected approach, there are questions about digitization and the future of microfinance that remain unanswered.

First, should all MFIs embrace digitization? This question is pertinent for smaller MFIs that operate independently from large international networks, at a small scale, mostly manually, and yet play an important role in providing financial access to the most excluded and underserved communities. These MFIs are likely constrained in their access to resources necessary for successful digitization – including technology and human resources.

Second, assuming that the path of digitization is the only option for MFIs to survive, is the proposed approach feasible for all of them? Our work suggests that those small institutions described in the previous paragraph are unable to follow the approach unless assisted by an ecosystem of players, from consultants to investors and regulators.

Third, besides business intelligence and credit renewals, are there other use cases of a similar value and universal applicability? And is there a sequence in which these building blocks of digitization should be implemented that is driven by specific factors? As our pilot MFIs continue their work, we hope to see answers emerging.

The CGAP work demonstrates that significant improvements can be achieved through incremental steps. As opposed to the widespread idea of leapfrogging through digitization where technology overhauls an institution, CGAP argues that digitization is a process of building value-generating use cases and as such, is often incremental. It does not necessitate a bold investment in technology, but a bold vision, focus and consistency.

The incremental approach does not rule out a significant impact. The presented use case of credit automation, the underlying business intelligence and the proper productization can open new opportunities and speed up the process of change in the future. The direction of that change would vary, and we are likely to see more diversity the farther away the MFIs move from the core use cases such as credit automation. While business intelligence and credit renewal automation are the universal starting points[9], MFIs will make different choices in how they leverage the newly acquired capabilities and efficiency gains. The most obvious

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9   MFIs may decide to start their digitization process with a different use case as a matter of their strategic vision or constraints, such as capacity, or regulation.

choices will include: (1) growing their portfolio (i.e., customer acquisition, increased loan amounts, improved retention rates); and (2) expanding the service offering (i.e., new products, partnerships, licenses).

Besides those more immediate choices, we hypothesize there are three mid-term (3-5 year) scenarios that are not mutually exclusive:

1. **Incremental digitization of the existing operation.** MFIs that established the core business intelligence capabilities and successfully implemented the credit renewal use case will continue improvements such as expanding the dashboard library, introducing dynamic pricing, while gradually digitizing other parts of their operations, for example customer onboarding.

2. **Shift to a new business model.** Some MFIs may decide to focus exclusively on developing their digital value proposition to a certain segment of customers, for example, embedded finance focused on customers with strong digital data trails. Some MFIs have been successful in attracting a specific segment of users with their value proposition, who then generate times-higher return than an average customer. They may see it as an opportunity to further develop their business in that segment.

3. **Exploration of new partnerships in modularized financial markets**[10]**.** Digital MFIs will find it easier to enter partnerships with fintechs, e-commerce platforms, digital lenders, and others as their newly acquired digital capabilities will allow them to integrate with partners and create value for customers more easily.

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10 For more information on financial market modularization and its significance for financial inclusion see Zetterli, Peter. 2021.

PILOT RELEASE SCHEDULE

The schedule below was the pilot implementation and release schedule proposed by Rubyx. The actual pilot implementation for each participant varied.

	Duration	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.
Automated Renewal - Implementation plan	**259**												
Activity 1 - Project launch	**11**												
Project kick off	1	▉											
Desk review of MFI documentation	5	▉											
Staff interviews with ope, risk, IT team	4	▉											
Deliverable:													
* Validated project roadmap													
Activity 2 - Data warehouse implementation	**50**												
Presentation of Rubyx data model and requirements	5		▉										
Data requirements Q&A	5		▉										
Review and validation of data samples extraction	15	▉	▉										
Review and validation of full extractions	10			▉									
Dataflows automation	9			▉									
Data consistency verification	10			▉									
Data warehouse handover	5				▉								
Deliverable:													
* d6 warehouse running and updated daily													
* Data dictionary													

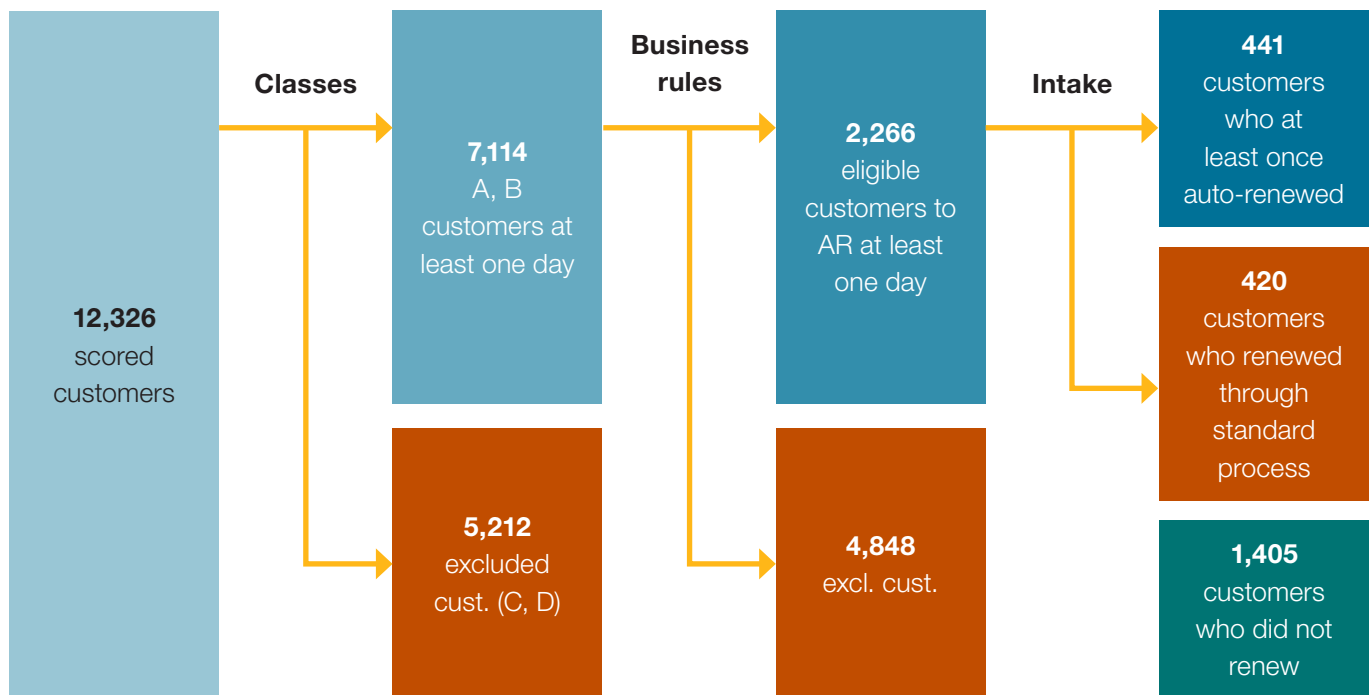|	Duration	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.
Activity 3 - Scoring design and implementation	**50**												
Scoring methodology introduction	5		▆										
Set up raw scoring strategy	5			▆									
Initial results presentation and scoring strategy workshops	5			▆									
Final scoring strategy and business rules validation	5			▆									
Crosscheck of scoring results with loan officers	10			▆									
Deployment of final scoring strategy on d6	5				▆								
Deliverable:													
* Daily scoring of the whole customer portfolio and loan amount recommendations for eligible customers													
Activity 4 - Process and pilot design	**25**												
Current renewal process review	5			▆									
Process and customer experience workshop	5			▆									
Pilot strategy design	5			▆									
Product book preperation	10			▆									
Deliverable:													
* Product book													
Activity 5 - Piloy	**195**												
Pilot operational preparation	20				▆								
Training of trainers	2												
Pilot launch	13						▆						
Pilot	140						▆▆▆▆▆▆						
Pilot assessment	40											▆	
Deliverable:													
* 5-months pilot													
* Pilot report													

(Source: The schedule below was the pilot implementation and release schedule proposed by Rubyx. The actual pilot implementation for each participant varied.)

LOAN RENEWAL PRODUCTION CASE

N THIS REPRESENTATIVE CASE, 82% OF THE SCORED CUSTOMERS were disqualified because of their C or D category, and business rules that further disqualified even A and B customers. Then, of the 2, 226 (or 18% of total scored customers) who received an automated loan offer, 441 (19.5%) accepted the offer, 420 (18.5%) opted to renew through the traditional process, and 1,405 (62%) did not renew. In sum, 4% of scored customers accepted an automated loan renewal offer, and this represented 51% of total loan renewals in the pilot.

12,326
scored customers

Classes

7,114
A, B customers at least one day

5,212
excluded cust. (C, D)

Business rules

2,266
eligible customers to AR at least one day

4,848
excl. cust.

Intake

441
customers who at least once auto-renewed

420
customers who renewed through standard process

1,405
customers who did not renew

(Source: Rubyx)

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