



Inclusive Cashless
Payment Partnership



IMPLEMENTING INNOVATION THROUGH AN ECOSYSTEM “LEARNING AND SOLVING BY DOING” APPROACH



CATALYST aims to significantly expand the use of digital payments between low-income consumers and merchants. Achieving this vision requires the identification, development, testing and implementation of innovative business models that are also scalable and sustainable. It also requires a conducive policy environment and a significant behavior change from consumers. Given the numerous stakeholders in the payments value chain, scaling new digital solutions requires that multiple coordination problems be addressed. Through this, the need arises for a context-specific approach, and a rigorous well-defined “learning and solving by doing” methodology. Such a methodology captures the adaptive process of innovation in real world settings where intractable challenges are being addressed. This note outlines the method that is specific to such a setting and underlines CATALYST’s learning process comprising rapid, data-driven, test-learn-and-build cycles with the aim to validate various innovative business models around digital payments that can further be scaled.

An ecosystem approach

CATALYST, through its multiple partnerships, serves as an incubator of innovative business models built around digital payments as well as policy field experiments in real-world settings. This ecosystem approach is core to its ability to achieve sustainable impact on the longer-term and catalyze systematic change.

Complex problems, such as digital payments, often remain unresolved, despite the will to address them. This is because the challenges in resolving them result from interconnectedness and complexities of different actors and aspects. Such challenges need to be studied through the lens of the ecosystem in which they exist. Many actors and factors can influence uptake of digital payments between merchants (supply) and low-income households (demand), or within supply chains. Failure to take into aspects such as the regulatory environment, technology innovation, customer need and constraints, as well as available infrastructure, among other aspects, into consideration would yield very limited impact. Central to the philosophy is blending an entrepreneurial innovative way of thinking with a grass root level approach to doing, to infuse transformative change.

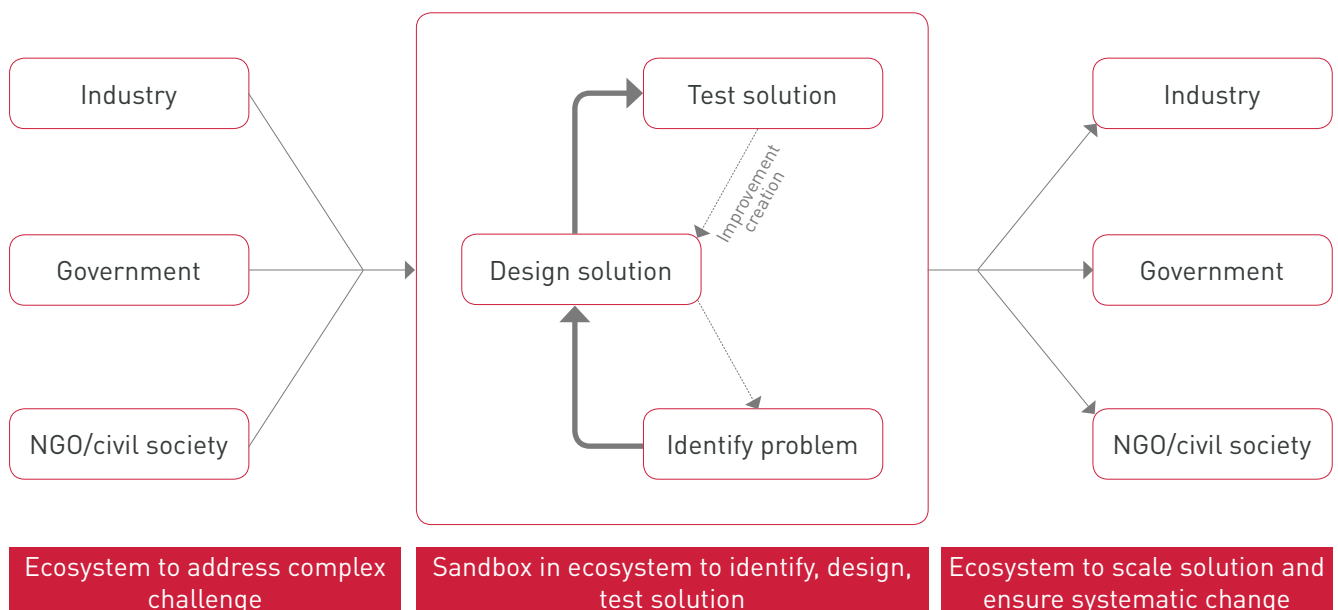
“Learning and solving” by doing model

Addressing issues in real-world ecosystem settings through innovation requires an exploratory as well as an action-oriented method. This allows potential solutions to emerge and their iterative testing until evolution into an optimal solution. Key to the success of this process is a well-defined learning plan and testing in the intended use environment. It is characterized by incremental knowledge production and collaborative learning among various experts (researchers, practitioners, government, technology experts, etc.).

The process features the following broad steps:

- 1. Identification:** Focus on identifying persistent pain-points from multiple stakeholders’ perspectives.
- 2. Solution Design:** Collaborative approach to designing a solution and a commitment to an iterative process that allows continuous refinement of the solution. The solution design is based on developing assumptions from theory, practice as well as ensuring a well-defined plan for learning.
- 3. Testing and Systematic Inquiry:** Implementing and testing the solution with the relevant partners and in the environment in which it is intended to be further replicated. This step involves systematic inquiry as learnings are derived and iterated accordingly. Clearly defined metrics are put in place to systematically evaluate, implement and improve the digital payment landscape. Information regarding the methods, tools and metrics used in this exercise are detailed in Appendix. A wide range of methods such as pre-post analysis, information triangulation, A/B testing, experimental and participatory research techniques. Research tools such as surveys, interviews, focus group discussion, etc., are used to gather context-rich information and data that are backed by evidence.
- 4. Scaling and Replicating:** Devising a plan for scaling and replicating the optimal solution outcome and catalyzing a systematic and sustaining change in systems.

Figure 1: Learning and solving by doing framework



Merapaper: subscription model for digital payments case study

Background and context

Merapaper (now Bix42) is a micro Enterprise Resource Planning (ERP) solution, a mobile application that provides digital invoicing and payment service to micro vendors. It focuses on attracting micro vendors whose business has a subscription model of payment. As the first step in this endeavor, it worked towards digitizing billing and invoicing for newspaper vendors, a prominent use case in any geographical area. The solution allowed vendors to keep a track of their consumer base and their respective balances. It generated automatic bills at the end of each month, which reduced the manual labor of maintaining ledgers. In addition, it enabled vendors to send bills to customers via multiple channels of communication such as WhatsApp, email and Short Message Service (SMS). The sections below described the learning by doing process followed by Catalyst.

Identification

A digital solution such as the Merapaper application that enables remote payment can ease out the pain in payment collection and accounts reconciliation in a subscription business model. The belief is that, through such a systemized digital subscription-based payment mechanism, distributors can realize the value proposition of adopting digital payment mechanisms, thereby eventually growing their business and consumers' sustain usage as well as adopting digital payment mechanisms for other expenses as well.

Newspaper distribution is a laborious manual process including daily distribution, invoicing and payment collection. While doorstep newspaper distribution is a streamlined process with a low error rate, the billing for it is largely a paper-driven process, one that is onerous and labor-intensive and can take-up to 10-12 hours every month. The monthly collection of payments is equally cumbersome and requires at least three or four repeat visits to each household. In reality, it takes 20-22 days for a newspaper vendor to recover the revenue for a given month. This also includes manual reconciliation and cash accounting for bookkeeping. A newspaper vendor works on moderate margins and relies heavily on timely consumer payments to maintain business cash flow. There is also an overhead spillage of up to 5 percent due to transportation charges and wages of staff engaged in invoice distribution and payments collection. Lack of awareness about the availability of digital payment options was a major reason for such a low percentage of digitally paying customers.

Merapaper's business model targets small vendors who generally belong to low- to middle-income households, and work more than 16 hours every day. Such vendors maintain a daily product purchase cycle. However, the subscription-based customer payment happens once every month or at longer intervals. Hence, these vendors continue to service consumers while extending a minimum of one month's credit period. It is critical for these vendors to generate enough cash on a daily basis to run their business, make supplier payments and remain afloat.

The business case for newspaper distributor to go digital

The newspaper business is an ideal sector for payment and invoice digitization. The following section highlights the challenges faced by newspaper distributors that could be resolved with a solution such as the Merapaper app:

- 1. Manual process of invoice generation and payment collection:** Newspaper vendors deliver newspapers on a daily basis to consumer households. They must visit each consumer household in person to collect the payments. Payment collection takes about 20-22 days from the date of invoice generation. And a distributor must allocate three to six hours daily and make two to three repeat visits to successfully complete payment collection for the month. Only 2-3 percent of the consumer base pays digitally.
- 2. Manual recording of receipts and reconciliation:** Newspaper vendors maintain ledgers with details regarding bill payments and due amount. This task is a challenge due to its time-intensive nature and

has the potential to disrupt a vendor's working capital if mistakes are made.

- 3. Resource allocation and overhead cost:** Big newspaper distributors hire temporary employees to complete the monthly payment collection. Along with employee salary, transportation costs chip away at the thin margins of a newspaper business.

Solution design

CATALYST worked with Merapaper to test the possibility of digitizing subscription-based payments. In addition to pilot testing the Merapaper application, we also aimed to test if the Unified Payment Interface (UPI) platform was appropriate to digitize newspaper subscription payments.

Theory of change

Collecting payments from consumers is a time- and resource-consuming activity. Distributors struggle with several inconveniences due to cash collection. For example, costumers are sometimes unavailable or low-income subscribers may not have the payment amount available with them.

Figure 2: Theory of change

Input

Training and onboarding for vendors and consumers on to the Bix42 app



Output

Vendors send out e-bills remotely and consumers pay digitally for newspaper subscription



Outcome

Improved efficiency and cost reduction for vendors in terms of reduced manual labor



Objective

In the wake of the given opportunity to digitize payments to newspaper vendors, the objective was to:

- i. Test whether UPI-based remote digital payments are an effective solution for newspaper payments;
- ii. Test whether consumers adopt the UPI payment mechanism for newspaper payments;
- iii. Understand the impact of UPI-based remote payment mechanism in creating value for distributor and consumer;
- iv. Build a process workflow for the newspaper bill payment use case, which can help Merapaper to build a sustained business model; and
- v. Validate if Merapaper's business model provides value to its distributors as an effective and user-friendly solution with a proposition to scale.

Focus areas

The pilot was focused on peri-urban communities with household incomes in the range of INR 15,000 to 20,000 per annum with most of the residents employed as daily wage laborers, taxi drivers, and household helps. Four locations with this category of consumer base were suggested to provide a vendor connect in the given location. Of the three vendors engaged, two dropped out half way through the pilot due to a lack of availability. The pilot was finally executed in the Kanakpura locality of Jaipur.

Stakeholder engagement

Within the subscription-based digital payment ecosystem for newspapers, we engaged with the following key stakeholders.

- i. Newspaper vendors:** To introduce digital payment option through the Merapaper mobile application and promote incentives and other pilot levers to the consumer base across the identified low-income communities. In addition, vendors also evaluate payment solution during the pilot and adopt a commercial/sustainable business model based on pilot success, during as well as post pilot.
- ii. Solution provider (Merapaper):** To train vendors on application usability; provide a single channel for troubleshooting and grievance redressal; carry out periodic review of progress; and evaluate the need for any iterative change to the process. Finally, based on pilot learnings, the solution provider must develop scalable and sustainable models for large-scale roll out.
- iii. Consumer:** To interact with the vendor to evaluate the need for the solution and to provide feedback on solution features, value-added services and ease of use.



Testing and systemic inquiry

An iterative process of learning was followed where field implementation and data-driven decision making was efficiently combined for optimal impact. The focus of this approach was to identify means of instilling a behavior shift from cash to digital payments among consumers and small vendors. Presented here is the phase-wise description of the experiment designed for the pilot.

Phase 1: Merchant identification and onboarding

Phase 1 was initiated with the one-time set up of the process for UPI payment flow, vendor onboarding and registration of the selected distributor. CATALYST had an active role in this phase involving training of the distributor on the usability of UPI apps and onboarding activities.

Methods: Pre-post analysis backed by triangulation of information for validation.

Tools: In-depth interviews with vendors, distributors, etc. Surveys were conducted to gather preliminary information.

Metrics: Merchant information, business information, consumer base, payment collection data, etc.

Phase 2: Sampling and consumer onboarding:

To enhance the pilot's focus and efficiency, CATALYST, along with the distributors identified a few colonies

with a high concentration of the customer base where we could engage with a sample of 300 households.

Payment collection through UPI: The distributor then shared his Virtual Payment Address (VPA) along with the monthly invoice to collect payment from the consumer.

Consumer onboarding and activation: The distributor along with a CATALYST agent, conducted his daily payment collection beat, where he introduced the agent to his customers after which the agent briefed these consumers about the benefits of the UPI app and helped them onboard the apps.

Methods: A participatory research technique was employed to gain context-rich insights from the vendor for the solution design. Information collected through the surveys was incorporated into the pre-post analysis.

Tools: Consumers were introduced to enumerators for the preliminary survey and awareness creation; in-depth interviews and non-participatory observation were also carried out to understand motivation and perception.

Metrics: Consumer household data, vendor consumer-base information, payment practices, etc.

Phase 3: Handholding and triability

Upon successful registration on UPI, consumers were nudged by the vendor to make their current month’s payment using UPI apps.

Payment reconciliation: Merapaper used consumer details (name and VPA) recorded during onboarding to manually reconcile the UPI payments daily and then reflect and update the same information on the distributor’s MeraPaper balance sheet (dashboard).

Methods: A/B testing was incorporated to understand adoptability and usability of the mobile application and UPI payment triangulation of data to understand digital payment viability for subscription-based payments.

Tools: Focus group discussions with the vendor and consumers were conducted; participatory and non-participatory observation of payment and collection behaviour was conducted.

Metrics: Transactional data; payment practices; mobile application and UPI adoption and usage, etc.

Phase 4: Behavioral shift and monitoring

Sending out bulk automated invoices: The vendor generates automated invoices for all 200 consumers in the sample and sends them to the consumers using WhatsApp/SMS.

Sending out bulk automated invoices:

- a. Distributor 1: In order to test if incentives increase solution usage and uptake, the distributor shall provide incentives to consumers through discounts on the next month’s billing cycle, for payments made through UPI. Subject to uptake of the solution based on the incentive trigger, the incentive amount shall be incremented, if required.
- b. Distributor 2: To test the most effective way to trigger remote digital payments to send a collect request using UPI apps or to rely on self-initiated transactions to facilitate payments through the UPI apps, consumers will be divided in batches of 100.

Methods: Experimental research techniques used to test responses to the mobile app, UPI payments as well as incentives introduced to encourage adoption; pre-post analysis by comparing pre-implementation data with post-implementation data.

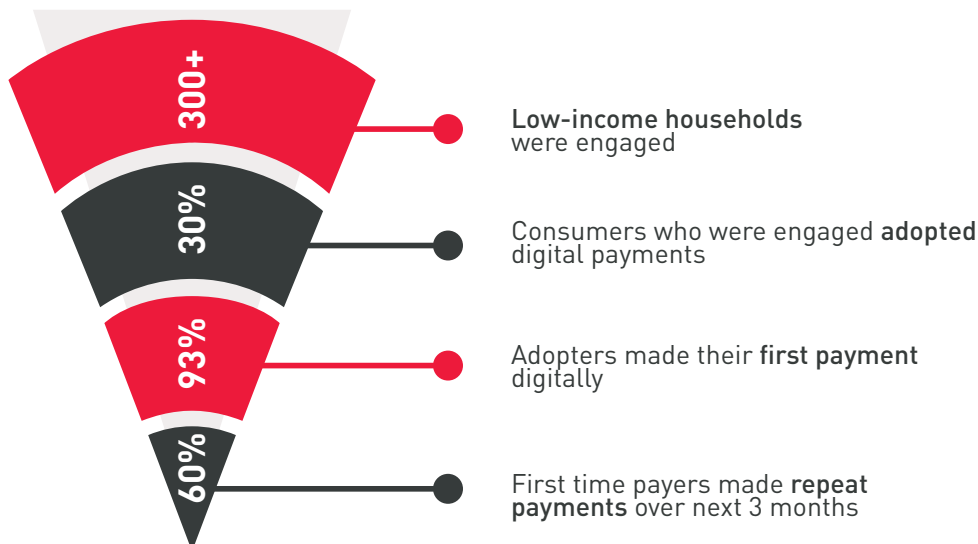
Tools: Surveys, interviews, observations and focus group discussion.

Metrics: Transaction data; information regarding sustained usage; incentive impact

Conversion funnel

Figure 3 represents the consumer conversion funnel, i.e., the proportion of consumers engaged with through vendors who were successfully onboarded and sustained digital payments for newspapers.

Figure 3: Conversion funnel



Scaling and replication

Key findings

- During the three-month long door-to-door campaign, we engaged approximately 300 consumer households in the experiment; 30 percent of these households adopted either a mobile-wallet or an UPI application.
- The revenue from digital payments for the partner vendor increased 10-fold in the months following this active field engagement.
- We saw 2 percent payment digitization in September 2017 which increased to 20 percent in January 2018. As of April 2018, i.e., close of experiment, approximately 60 percent of the vendor's payments had been digitized.

Key challenges

- **Vendor and consumer onboarding difficulties:** Onboarding vendors onto the Merapaper application was a cumbersome and labor-intensive process. At the time of the experiment, the vendor needed to make a one-time effort of manually add all his/her consumer contact and other details on the application to start their subscription payment

services. This lowered the speed at which the solution could achieve scale.

- **Business model niche:** A typical newspaper vendor serves to 500-2,000 customers and a tier II city like Jaipur has, on average, 2,000-3,500 vendors. The newspaper vertical is a small niche use case that is fit for this solution. As the Merapaper model is specifically aimed at subscriptions and charges a small fee per transaction, operating in such a niche raises the risk of Merapaper's financial sustainability. It opens up the potential to expand into subscription-based business such as milk, cable television and tiffin services.
- **Challenges with generic name:** The name "Merapaper" made it difficult for the solution provider to scale to other verticals as the name literally translates to 'my newspaper'.
- **Language barrier:** During the experiment period, Merapaper supported three major Indic languages apart from English. It is crucial for solution providers to develop apps in local languages and dialects because of the low literacy rate among adults.

Summing up

The Merapaper experience thus becomes an illustrative example of the learning-by-doing approach where the key challenges become the identified problems in the next iteration. The solution design incorporates changes based on the identification of the challenges. While it was part of CATALYST's "Fintech for the Last Mile" incubation program, Merapaper rebranded itself as Bix42 to incorporate a range of other subscription-based services such as cable television and water cans, among others. It also continued to test its application's User Interface (UI) to check if it was appropriately suited to the various services that were added to the platform.

The rebranding and UI overhaul tackled the business model niche, the generic name and the language barrier challenges for Merapaper. At the same time, this started the next round of iteration where,

under CATALYST's incubation program, the team's innovation strategies met an exploratory action-oriented method. CATALYST facilitated the emergence of potential solutions to counter challenges at every stage of product development to arrive at a near-optimal solution. A well-defined learning plan as well as a testing and feedback mechanism facilitated by CATALYST were instrumental in not just improving the solution but also ensuring that the experiment had considerable intended impact – that of promotion of digital payments and digital financial inclusion of micro entrepreneurs.

The experiment demonstrated how incremental knowledge production can result from collaborative learning among various stakeholders such as researchers, practitioners, technology experts and ultimately benefit the end-user.

Annex 1

The Annex features different research methodologies and tools that can be used to gather informed insights backed by evidence and data.

Learning methodologies	
Type	Description
Pre-post analysis	Evaluate the impact of an intervention by capturing information before and after the intervention is implemented
A/B testing	Test the difference in the impact of versions of a product, service or an incentive on the target audience to understand which intervention is most effective in achieving the intended result
Triangulation method ¹	<p>Understanding a particular phenomenon in detail by validating it through multiple, perhaps even mutually exclusive, perspectives and data sources. This can be done in two ways:</p> <ul style="list-style-type: none"> i. Data triangulation: By validating a phenomenon using information regarding a specific item from different sources. If different sources provide the same information, then the phenomenon is said to be validated ii. Methodology triangulation: By validating information gathered by different methods. If information captured through all methods is the same, then the phenomenon is valid
Meta-analysis ²	Synthesis of results from multiple studies to determine the average impact of a similar intervention across the studies. This method is best suited to identify a common effect and discern the validity of a hypothesis or intervention, across different situational and environmental factors
Experimental ³	Comparing a group that gets a particular intervention with another group that is similar in characteristics but did not receive the intervention – can be random or otherwise
Participatory research ⁴	Combining inquiry with action: through this technique, the power of identifying the research agenda, process, and solutions is handed over to the participants, generally community members. This allows for context-specific decision making and solution designing for an identified research question or gap

¹http://www.ie.ufrj.br/intranet/ie/userintranet/hpp/arquivos/texto_7_-_aulas_6_e_7.pdf

²https://www.meta-analysis.com/pages/why_do.php?cart=

³https://cirt.gcu.edu/research/developmentresources/research_ready/experimental/overview

⁴<http://participatesdgs.org/methods/>

Learning tools	
Type	Description
<p>Surveys⁵ To capture specific data points or information</p>	<ul style="list-style-type: none"> • Fact-based quantitative or qualitative option data capture • Can be done with larger set of users • Can be conducted through in-person interviews, telephonic surveys, mail surveys, etc.
<p>Key informant interviews⁶ To capture information from key stakeholders who are particularly informed about a phenomenon</p>	<ul style="list-style-type: none"> • Qualitative, open-ended conversation with the target user • Allows for context-specific interpretation of quantitative data • Selection of people to be interviewed important • To gain suitable insights while generating recommendations • Information gathered helps frame the design for a quantitative study
<p>Observation⁷ and ethnographies⁸ To gather information regarding inherent traits, beliefs and philosophies of groups that cannot be represented as a data point</p>	<ul style="list-style-type: none"> • Long-term engagement within the target community or research location with trust-building exercises • Cost and time intensive exercise • Methods and criteria for observation need to be clearly identified • Provide context-rich insights, on-the-scene learning • May be impacted by researcher bias • Can be based on participation or non-participation observation • A medley of interviews, observations, surveys, aloof-observation, etc.
<p>Focus group discussion⁹ To gather information about combined perspectives and opinions</p>	<ul style="list-style-type: none"> • Requires a strong moderator and a predetermined but flexible structure to the discussion • Participants must belong to a similar category of stakeholders • Allows identification of crux of issues, reflect upon problems and develop suitable solutions for a larger group/community • Can be done online (video conferencing, etc.) to overcome geographical barriers
<p>Document analysis To analyze secondary information available as records, census data, movies/documentaries, memoirs, etc.</p>	<ul style="list-style-type: none"> • Examining trends, correlations, causations from existing sources of data/information • Can be used to gather qualitative and quantitative information • Inexpensive and not time intensive • Lends a sense of legitimacy to information (in most cases)

⁵<http://www.pewresearch.org/methodology/u-s-survey-research/collecting-survey-data/>

⁶https://www.betterevaluation.org/en/evaluation-options/key_informant_interviews

⁷<http://www.qualres.org/HomeObse-3594.html>

⁸<https://www.spotless.co.uk/insights/ethnography-when-and-how/>

⁹<https://www.odi.org/publications/5695-focus-group-discussion>






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