

POLICY ANALYSIS EXERCISE

Inclusive Digital Transformation in India:

Improving Digital Financial Services for the Poor Through Human-centered Design

Emily Middleton

Master in Public Policy Candidate, Harvard Kennedy School



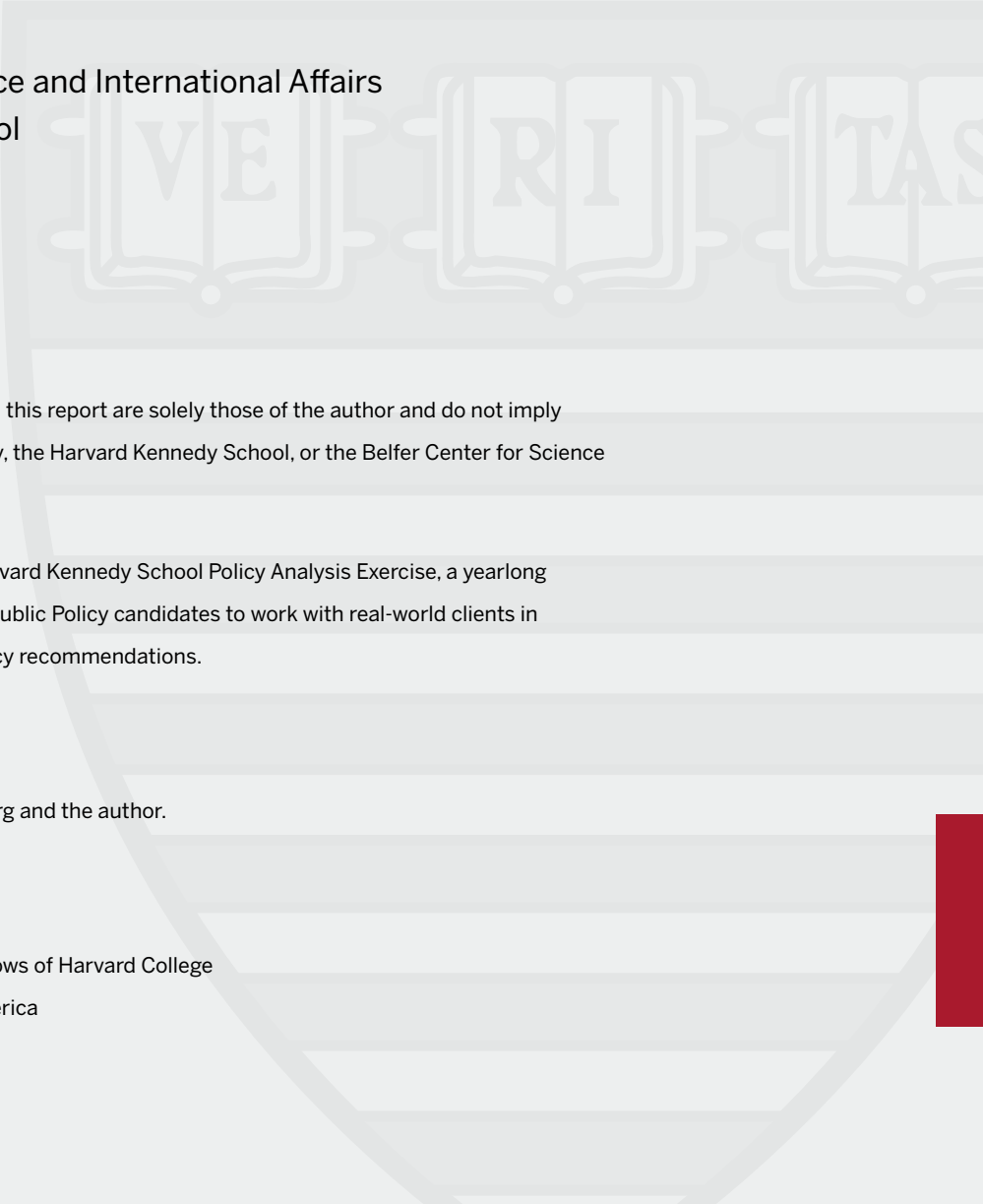
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Executive Summary

Access to formal financial services has been a major issue in India for some time. In a country where over half the population lives on less than \$3.20 (200 Indian Rupees)¹ a day,² financial services can help households manage income shocks and access finance. They can contribute to women's empowerment, and improve health, nutrition and education outcomes.³ The Indian government—in concert with technology and telecoms companies—is pushing a “digital revolution”. This transformation affords significant opportunities for improving financial health for the poor: services can be delivered more cheaply and quickly at scale, opening up new business models and reducing the need to travel to a bank branch. But people who are unable to access these services—disproportionately the poor and vulnerable—risk further marginalization.

The goal of this report, prepared for IDEO.org, is therefore to answer the following question:

How can IDEO.org use its expertise in human-centered design (HCD) to improve digital financial services for the poor in India, thus helping to make India's digital transformation more inclusive?

This is broken down into the following sub-questions:

- How many adults are excluded, by demographic and by stage of the user journey?
- What can we learn from India and other countries about which levers best improve financial health? And which products tend to have the greatest welfare impacts?
- What are the major barriers for poor people in accessing digital financial services?

1 207 rupees, based on market exchange rate on 26 March 2018

2 The World Bank, “India”; The World Bank Data, accessed March 12, 2018, <https://data.worldbank.org/country/india>.

3 Prina, Silvia, “Banking the Poor via Savings Accounts: Evidence from a Field Experiment”, *Journal of Development Economics* 115 (July 1, 2015): 16–31.

- What are the top opportunity areas for improving digital financial services for the poor?
- Which options should IDEO.org prioritize? How should these be developed? Beyond this project, how can IDEO.org maximize its impact on financial health for the poor in India?

This report recommends IDEO.org prioritize two opportunity areas: “Unblock Women” and “Activate Youth”. Section 8 includes implementation considerations. This report also suggests four complementary opportunities for IDEO.org to amplify its impact in India in the long term: (1) advocate for better consumer protection at a policy level, (2) build capacity in HCD within India’s digital financial inclusion ecosystem, (3) design for India’s agents (also known as banking correspondents), and (4) design for the most excluded, hard-to-reach populations.

Main findings in support

In India, 38 percent of adults do not have a bank account. More than one-third of those who have an account do not actively use it.⁴ This means that overall, only 34 percent of women and 47 percent of men have a bank account they use regularly.⁵

Field research, expert interviews and a literature review established eight main barriers to improving the use of digital financial services among the poor. In order of importance these are:

Demand-side barriers:

1. Restrictive gender norms
2. Not having enough money to make an account or a transaction worthwhile
3. Low tech literacy, confidence and access to tech

⁴ InterMedia, *India Wave 4 Report FII Tracker Survey*, InterMedia, June 2017, http://finclusion.org/uploads/file/reports/India%20Wave%204%20Report_8-Jun-2017.pdf

⁵ Ibid.

4. Low financial literacy and low awareness of options

Supply-side barriers:

1. Inadequate service point infrastructure
2. Unintuitive user experience (UX)
3. Inconsistent technical infrastructure
4. Unsuitable products for the poor

Field research also uncovered insights about how poor people in Mumbai and Bihar manage their money, which serves as a starting point for identifying opportunity areas to address each of the demand-side barriers. The design sprint resulted in four main options or opportunity areas:

- A. **Unblock Women**—Introduce women to digital financial tools by building on their existing savings behaviors.
- B. **Equip Entrepreneurs**—Provide business owners with the knowledge they need to be financially successful.
- C. **Activate Youth**—Ready the next generation of savers by teaching them healthy financial habits.
- D. **Connect Farmers**—Leverage the untapped potential of feature phones to reach rural markets.

The primary recommendation—to prioritize options A and C—is based on six criteria aligned to the three human-centered design dimensions of desirability, viability and feasibility.

Context for this report

In early 2018, IDEO.org conducted a design sprint to identify opportunity areas for improving digital financial services for the poor in India. This was done in collaboration with the financial inclusion consultancy MicroSave. This initial research (known as a “phase 0” project) was funded by the Gates Foundation’s Financial Services for the Poor program.

This report was prepared alongside that design sprint and is intended to be a complement to its outputs, which are available at www.pathtodigitalindia.com. Sections 3 and 4 of this report provided some of the secondary research for that site.

1. Introduction



Gandhali, a farmer from rural Bihar. Gandhali has a bank account, but hates traveling to the bank: “We have to spend five to ten rupees to get there, it’s far, we get tired... There are long queues [at the bank branch], and sometimes the bank says, ‘We don’t have cash, come back tomorrow.’”

1.1 Digital transformation in India

India is in the midst of a digital revolution. The Indian government’s Digital India program, an ambitious agenda to “transform India into a digitally empowered society and knowledge economy”,⁶ is projected to cost 113,000 crore rupees (or around \$17.5 billion)⁷. It comprises three main strands.⁸ The first is creating a digital public infrastructure, which includes high-speed internet access, “cradle to grave” digital identity; digital financial inclusion; and secure cloud storage for personal documents. The second is the digitization of government services—including the disbursement of government financial benefits—and the improved use of digital technologies and data to support decision-making. The third is the “digital empowerment” of citizens, which focuses on universal access to digital services, and universal digital literacy.⁹

6 Digital India, “About Digital India”, *Ministry of Electronics & Information Technology, Government of India* (webpage), updated March 23, 2018. <http://digitalindia.gov.in/content/about-programme>

7 Ibid.

8 Digital India, “What is Digital India?” *Digital India* (webpage), accessed March 25, 2018. <http://www.cmai.asia/digitalindia/>

9 Ibid.

1.2 The importance of digital financial inclusion¹⁰

Digitizing financial services and money flows is a critical element in this transformation, and features prominently in the first and second strand of the government's Digital India agenda. First, digital financial inclusion is a key aim of creating a digital public infrastructure, and particularly of two layers of the India stack: Aadhaar (the government's digital identity system) and Unified Payments Interface or UPI (a national digital payments system). Second, the digitization of government-to-person (G2P) payments is a core component of Digital India. Indeed, Prime Minister Modi has frequently spoken of his vision for India to become a "cashless" society.¹¹ He has also spoken of his commitment to expanding formal banking services for all and end what he termed "financial untouchability" during his election campaign.¹²

There is significant excitement globally about the potential for digital technologies to accelerate financial inclusion, primarily thanks to the new business models and improved customer experience they afford. However, given the government's agenda, the goal of increasing digital financial inclusion has acquired particular urgency in India.

If having digital financial services becomes a prerequisite to participating in India's "digitally empowered society and knowledge economy",¹³ then to be digitally financially excluded is to lose out on the country's broader societal and economic opportunities. Not having an accessible bank account could mean losing out on government subsidies, scholarships and welfare benefits. It could restrict access to business opportunities and information, as these increasingly become exclusively available online. These consequences are especially grave given India's stark inequality: the top 1 percent

10 The terms "financial inclusion" and "financial health" are used interchangeably in this report. "Financial health" is preferred, because it points to the development of healthy financial behaviors, and active using of financial services - not just the opening of a bank account.

11 Mendonca, Jochelle, and Variyar, Mugdha. "Modi government transforms India's digital engagement". *The Economic Times*, May 16, 2017.

12 West, Darrell M. "Modi's Financial Inclusion Push." Brookings (blog), May 22, 2015. <https://www.brookings.edu/opinions/modis-financial-inclusion-push/> and Kumar, Manoj, "Modi: Banking for All to End 'Financial Untouchability.'" *Reuters*, August 28, 2014.

13 Digital India, "What is Digital India?" *Digital India* (webpage)

of earners accrue 22 percent of the country's income.¹⁴ Economists Chancel and Piketty calculate that by this measure (the proportion of income earned by the top 1 percent), income inequality in India is at its highest ever level since 1922, when the Indian Income Tax was introduced.¹⁵

The technology and innovation expert Juma argued that “the case for inclusive innovation is even more urgent [as] income disparities around the world become increasingly associated with technological innovation.”¹⁶ This is certainly the case in India, today.

1.3 Enter IDEO.org

It is against the backdrop outlined above that IDEO.org was asked by the Gates Foundation to identify opportunities for improving digital financial services for the poor in India. IDEO.org conducted a very short “phase 0” project in January and February 2018 to scope out some initial opportunity areas. The design research was conducted in partnership with MicroSave, an international financial inclusion consulting firm with a large presence in India.

IDEO.org is a non-profit design firm, spun off from the global design company IDEO, and focuses exclusively on social impact work. Founded in 2011, its mission is to “use human-centered design to create products, services, and experiences that improve the lives of people living in poverty.”¹⁷

14 Chancel, Lucas, and Piketty, Thomas, “Indian income inequality, 1922-2014: From British Raj to Billionaire Raj?”. WID World Working Paper Series, 2017/11 July 2017, <http://wid.world/wp-content/uploads/2017/12/ChancelPiketty2017WIDworld.pdf>.

15 Ibid.

16 Juma, Calestous, *Innovation and its Enemies: Why People Resist New Technologies* (New York: Oxford University Press, 2016)

17 IDEO.org. “Approach”. IDEO.org, accessed 25 March 2018, <https://www.ideo.org/approach>

This report, therefore, concentrates on how human-centered design—and specifically IDEO.org—can improve digital financial services in India. It is focused on advancing this project, in the spirit that it represents the beginning of more work on digital financial health in India by IDEO.org. The question this report aims to answer is:

How can IDEO.org use its expertise in human-centered design to improve digital financial services for the poor in India, thus helping to make India's digital transformation more inclusive?

2. Approach & Methodology



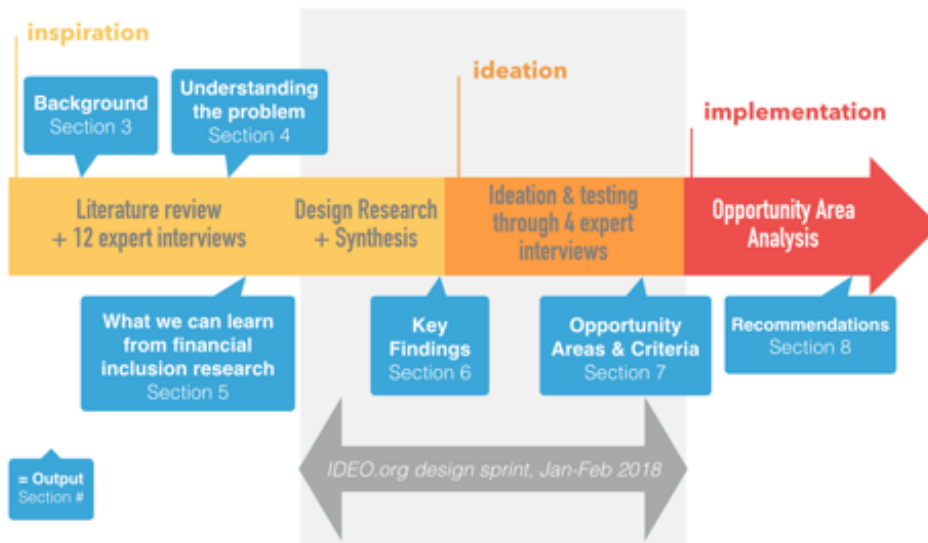
The first day of synthesis in Patna, Bihar

2.1 Approach

The approach for this report is based on the human-centered design (HCD) process, and is illustrated below. It follows the three main phases of HCD: inspiration, ideation and implementation. The middle bar shows the activities conducted in the creation of this report, which were more or less chronological. However, this was not a linear process, and iteration was important at every stage.

The blue callout boxes show discrete outputs or sections. Read sequentially, the outputs are designed to communicate the key insights and findings that led to the four opportunity areas and final recommendations.

The gray shading and arrow highlight the design sprint the author participated in with IDEO.org and MicroSave, the outputs of which are available at www.pathtodigitalindia.com. Sections 3 and 4 of this report also provided some of the secondary research for that site.



2.2 Methodology

Four main methods were used for this report: (1) a literature review, (2) interviews with policy experts and practitioners, (3) qualitative field research conducted in Bihar, India, (4) analysis of quantitative data about the use of digital payments and banking services.

2.2.1 Literature Review

The literature review for this report primarily included three types of literature. First, think-tank, donor and industry reports, research, blog posts, academic articles and government studies on financial inclusion and digital financial services in India. Second, peer-reviewed research on the efficacy of financial inclusion programs in India and comparable countries. Third, literature on the practice and theory of change of human centered-design.

2.2.2 Expert Interviews

The author conducted 18 interviews with policy experts and professionals working on digital financial inclusion or financial technology (FinTech) at foundations and nonprofits, think tanks and research institutions, FinTech companies and startups, and trade associations. Most of these actors were

based in India, or were US-based with India operations. A full list of organizations interviewed can be found in the appendix.

2.2.3 Qualitative field research

IDEO.org, with the financial inclusion consultancy Microsave, conducted two weeks of design research in Mumbai and Bihar. These locations were chosen to provide contrasts. Mumbai was chosen for its urban environment, and typically higher levels of financial inclusion and digital literacy. By contrast, 89 percent of Bihar's population of 100 million live in rural areas, according to census data from 2011.¹⁸ It is one of the poorest states in India, with a relatively low financial inclusion, and the country's lowest literacy rate at 62 percent.¹⁹

The author participated in this field research for one of the two weeks, in Bihar. Although this report draws on both weeks of the field research, most of the examples are based on the interviews, focus groups and experiences at which the author was present.

Design research mainly consisted of individual and group interviews. Around two-thirds of these were pre-arranged by Microsave. Recruitment was done in partnership with local microfinance institutions (MFIs), who had contacts in local communities.

Given that the recruitment of participants was done primarily through MFIs, there was a concern that a disproportionate number of interviewees would be financially included and engaged. To mitigate this, the team also conducted some intercept interviews. There may have still been some selection bias here, given that the communities we visited were typically those which were served by a microfinance organization. However, through intercept interviews researchers were able to speak to individuals with a broader range of experience with the formal financial sector, and with a greater range of financial and digital literacy levels.

18 "Bihar through Figures". Directorate of Statistics, Planning & Development Dept., Govt. of Bihar, accessed March 2, 2018. <http://planning.bih.nic.in/Figures.htm>

19 Ibid.

The four main types of field research were as follows:

- **Group user interviews:** These included a women's Joint Loan Group in a peri-urban area outside Patna, Bihar, and a group of young people aged 19-26 in a village in Bihar. Each group included approximately 8 individuals, and typically lasted for 2.5—3 hours.
- **Individual user interviews:** Interviews with one or two individuals at a time, generally in their own homes. Some were pre-arranged, and some were intercepts. These typically lasted 1—2 hours.
- **Experiential research:** Intended to understand the broader context of the users the team was trying to design for, and to build empathy. For instance, in Bihar the team visited an early-morning agricultural market (a mandi), a number of bank branches, payment banks and post offices, and tried digital payments products such as Paytm and Google Tez. The team also observed agents interacting with their customers in a small village.
- **Ecosystem perspective interviews:** Interviews with merchants, agents and financial service providers. These typically took place in the interviewees' places of work, and lasted from 30 minutes to 2 hours.

Interviews were semi-structured, and based on discussion guides (see Appendix C for an example). Group interviews also typically included activities designed to gain a better understanding of interviewees' attitudes toward financial services and technology, and their current behaviors. These activities also included co-creating early concepts and testing prototypes. A sample list of activities is included as Appendix D.

2.3 Methodology for the design sprint

The opportunity areas described in Section 7 of this report were developed by IDEO.org, based on their three-phase human-centered design methodology, as described in *The Field Guide to Human-Centered Design*²⁰:

1. *Inspiration*: The first phase is focused on learning about the people the team is designing for, and the part of their lives they are trying to improve. Its focus is on first hand interviews and activities with those people, and immersion in the community. It also includes secondary research, expert interviews and analogous inspiration.²¹
2. *Ideation*: The phase is focused on synthesizing the data gathered in the Inspiration phase, and generating design ideas. Some ideas are developed by creating prototypes, and are then iterated and refined—preferably using feedback from the people the team is designing for, or from experts if that is not feasible (as was the case in this project).
3. *Implementation*: Typically, the third phase of the process focuses on developing and operationalizing concept(s). In IDEO.org’s case, this is normally done in partnership with other organizations and service providers. Concepts are iterated and improved, and their impact assessed, using regular feedback from users. The implementation phase has not yet officially begun for this work (given that it was a “phase 0” project). However, this report aims to provide recommendations to help focus implementation.

20 IDEO.org, *The Field Guide to Human-Centered Design*, (IDEO.org, 2015)

21 “Analogous settings can help you isolate elements of an experience, interaction, or product, and then apply them to whatever design challenge you’re working on”. Ibid.

3. Background



Ashish, a banking agent and community leader based in Daniyawa, Bihar. Ashish helps people to access financial services, whether or not they are digitally literate. Ashish has a portable fingerprint scanner so that customers' identities can be verified for transactions.

The government has vigorously promoted India's national digital revolution. Prime Minister Narendra Modi has championed it personally. The success of the "India Stack", and the national digital identity scheme Aadhaar, have become significant sources of soft power for the country.²² Many low and middle-income nations around the world are trying to emulate India's approaches to digital identity and infrastructure: the World Bank is currently supporting 32 countries²³ to explore or implement national digital identity programs.

This transformation—and how it relates to financial inclusion—is made up of many mutually reinforcing government policies, regulations, and technology investments. Five initiatives were most frequently cited in expert interviews as relevant for this project:

- 3.1—Digital public infrastructure: the India Stack (identity and payments)

22 "Raisina 2018 | Digital Money: Innovating with India for the World", Better Than Cash Alliance (video), January 2018, <https://www.betterthancash.org/tools-research/videos>

23 The World Bank Group. Identification for Development 2017 Annual Report. World Bank, 2017. <http://pubdocs.worldbank.org/en/561391513609113984/2017-ID4D-Annual-Report.pdf>

- 3.2—Digital government, and the digitization of government-to-person payments
- 3.3—Demonetization (November—December 2016)
- 3.4—Payments bank regulation
- 3.5—The “JAM” trinity and the PMJDY account-opening program

This section briefly explores these elements to provide crucial background information; they are also referenced throughout the rest of this report.

3.1 Digital public infrastructure: the India Stack

The India Stack is an open technology stack on a national scale. The government conceives of this digital infrastructure as a “core utility to every citizen”. The most relevant layers for this project are Aadhaar and UPI, as they are incorporated into many digital financial services in India today.

The first layer, Aadhaar, provides every user with a unique digital identity—consisting of a set of biometrics (fingerprints and iris scans) and a unique number. This system enables other infrastructure layers—and the applications that are built on top of them—to be interconnected. This has the potential to dramatically improve the quality of services and the user experience.²⁴ The Unique Identification Authority of India (UIDAI), a statutory body, administers Aadhaar.

The Unified Payments Interface (UPI) is another critical layer of the Stack. It is run by the National Payment Council of India, which is a nonprofit consortium of Indian banks backed by the government.²⁵ UPI enables almost instant payments between providers, by standardizing every part of the electronic payments process.²⁶ Desai et al. note that it is transformative

24 Chen, Greg, and Raman, Anand, “Should Other Countries Build Their Own India Stack?”, CGAP (blog), April 6, 2017, <http://www.cgap.org/blog/should-other-countries-build-their-own-india-stack>

25 Ibid.

26 Desai et al., “Your Guide to UPI — the World’s Most Advanced Payments System”, *Wharton Fintech* (blog), May 2017, <https://medium.com/wharton-fintech/your-guide-to-upi-the-worlds-most-advanced-payments-system-b4e0b372bf0b>

in four respects.²⁷ First, it provides interoperability: through a set of application programming interfaces (APIs), it “links disparate user interfaces”.²⁸ Second, it can handle many different use cases, replacing much of the need for the “alphabet soup”²⁹ of other payments systems, some of which are used only for specific situations or devices. Third, authentication is much easier because it is done using the Aadhaar system. Sender authentication is satisfied by validation of biometrics (such as an iris scan or fingerprint) or a PIN number. Receiver identification is also easier. Rather than needing the recipient’s bank account details, the sender needs only the recipient’s “virtual payments address”, which looks much like an email address.

3.2 Digital government

The Indian government has launched an ambitious program to digitize many of its internal processes and citizen-facing services, leveraging the India Stack. As of March 2018, the government’s Digital India site listed 69 digital government services that are at various stages of development.³⁰ These include a location-based “Agrimarket App” to deliver near real-time information about crop prices at nearby markets to farmers; the “Mother & Child Tracking System”, a digital healthcare service for mothers and children; and the National Scholarship Portal, designed to digitize the end-to-end process of applying for and receiving government scholarships.

Digital government services offer significant benefits for citizens. They can significantly improve the user experience and reduce opportunities for fraud, by removing the need for in-person interactions with intermediaries. Digitization can also reduce the time and effort needed to travel to, apply for, and access government services.

However, there are also significant risks of exclusion. These come from four main sources. The first is a lack of digital literacy: if users are unable to use technology to access these services, they risk not being able to use them

27 Ibid.

28 Ibid.

29 Ibid.

30 Digital India, “About Digital India”

at all or being exploited by middlemen. The second is the lack of access to digital devices and connectivity. The third is being unable to access or use Aadhaar, which many of these digital government services rely on to verify the user's identity. The press has reported deaths from malnutrition among those who were unable to link their ration card to their Aadhaar number: these households were denied access to food at subsidized prices and suffered as a result.³¹ Research by Dreze et al. in 2017 found that 20 percent of households in Jharkhand failed to gain any grain at all where Aadhaar authentication was mandatory, compared to just 4 percent in areas where it was not.³² The fourth source: personal data privacy and security risks. Owing to misuse of the Aadhaar system, millions of people's Aadhaar numbers have been posted on more than 200 government websites,³³ and an investigative reporter claimed to be able to buy access to users' Aadhaar numbers and personal data (including home address, phone number and photo) for just 500 rupees or \$7.70.³⁴

In considering how to leverage the digitization of government services, it will be essential to keep in mind these risks of exclusion and identify ways to address them (see Section 8).

3.3 Demonetization and its impact on digital payments

On November 8, 2016, the Indian government suddenly announced that all 1000 and 500 rupee notes would be taken out of circulation. In the weeks that followed, the volume of electronic payments rose rapidly (from a total of 671 million transactions during November 2016, to 958 million in December 2017)³⁵. However, when most of the demonetization measures ended on 31 December 2016, the volume of electronic payments fell by

31 Khera, Reetika, "Why India's Big Fix Is a Big Flub", *The New York Times*, January 21, 2018. <https://www.nytimes.com/2018/01/21/opinion/india-aadhaar-biometric-id.html>

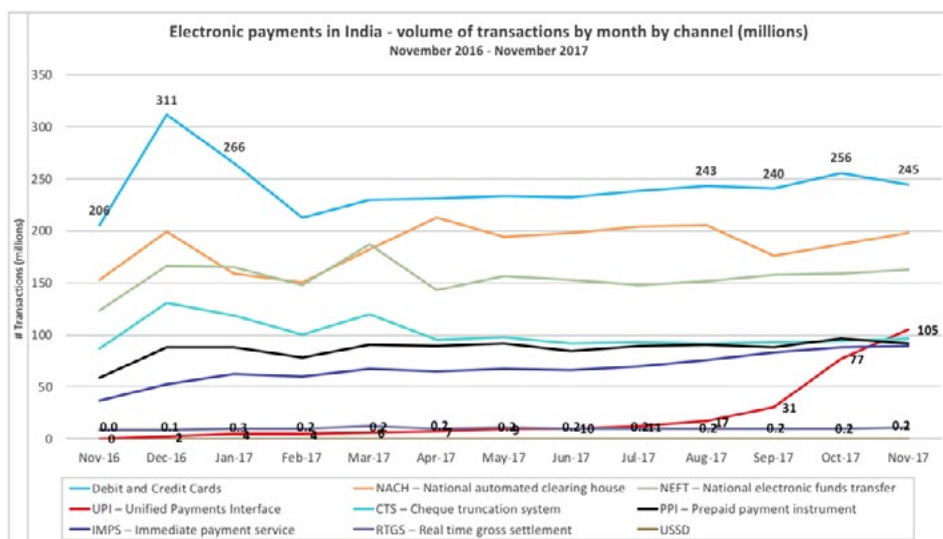
32 Ibid.

33 Ibid.

34 Khaira, Rachna, "Rs 500, 10 minutes, and you have access to billion Aadhaar details", *The Tribune*, January 4, 2018. <http://www.tribuneindia.com/news/nation/rs-500-10-minutes-and-you-have-access-to-billion-aadhaar-details/>

35 RBI. "Data Releases". Reserve Bank of India, Accessed January 5, 2018. <https://www.rbi.org.in/Scripts/Statistics.aspx>

about 20 percent over two months, to 763 million in March 2017, driven mostly by a sharp decline in card payments. The “new normal”, though, was a significantly higher use of electronic payments than before demonetization.³⁶ The policy does appear to have had some impact upon popular perceptions of digital money, and certainly has raised awareness of alternative payments methods.³⁷



Source: Reserve Bank of India (2018); author’s calculations³⁸

3.4 Payments Banks

Payments banks are a new regulatory framework announced by the Reserve Bank of India (RBI) in February 2014. RBI’s aim was to accelerate financial inclusion, and increase the use of digital channels. Payments banks can offer most of the same products as a traditional bank, except for credit. They present an opportunity for poor households to access financial services through a broader range of organizations, whom they may trust more. Hopes are particularly high for India Post, given its high levels of trust and enormous reach: it has 150,000 delivery points across

36 Centre for Digital Financial Inclusion, *Going Cashless? Perceptions, usage and behaviour towards digital payments in India: pre and post demonetisation*. (New Delhi: Institute for Financial Management and Research, 2017)

37 Ibid.

38 The data points highlighted in the chart are those for debit and credit cards, UPI, and USSD, as these payment channels are most relevant for this report.

the country.³⁹ Additionally, start-up payments banks have the advantage of much lower set-up costs. Field reps need only a smartphone and a fingerprint scanner (see Appendix E).

The first payments banks became operational in 2017, but many have struggled to start or to scale operations.⁴⁰ There are two significant challenges. The first is viability. Despite lower set-up costs, research by GSMA suggests that payments banks will need to pursue adjacent revenue streams to shore up profitability.⁴¹ This is unlike the case of mobile money providers in East Africa, for whom peer-to-peer (P2P) payments were both the main use case and drove revenues.⁴² However, cross-selling data and phone services (for mobile network operators), e-commerce services (for Paytm), and postal services (for India Post) offer opportunities to improve viability.

The second issue is that the scale needed to be a successful payments bank may be antithetical to the agility required for product and service innovation. For instance, interviewees noted that India Post is a legacy organization and will need “a major overhaul in the way they think, the way they work”⁴³ to provide accessible, customer-centric products and to use technology effectively.

3.5 The “JAM” trinity and the PMJDY account-opening program

The Indian government has stated its philosophy of increasing financial inclusion through three levers: basic bank accounts known as “Jan Dhan” accounts, Aadhaar, and greater access to mobile phones. Together, these three elements constitute the acronym “JAM.”

Jan Dhan accounts are being distributed to low-income individuals through PMJDY (*Pradhan Mantri Jan-Dhan Yojana*, or the Prime

39 Author’s interviews with experts, November 2017-February 2018

40 Ibid.

41 GSMA, *The business case for payments banks in India*, GSMA, December 2016

42 Ibid.

43 Author’s interviews with experts, November 2017-February 2018

Minister's Wealth Scheme). The scheme was announced in August 2014,⁴⁴ and has compelled banks in India to open zero-balance bank accounts for the poor (since minimum balance requirements can make having a bank account untenable for low-income people). The government has publicized these accounts. The results have been astonishing: as of 7 March 2018, 313.3 million accounts had been opened through the scheme,⁴⁵ and 236 million debit cards issued. These debit cards use RuPay, an Indian "open-loop, multilateral system", designed to offer similar services to MasterCard and Visa but at a fraction of the cost.⁴⁶ However, these figures mask wide variation in bank account usage (see Section 4).

44 InterMedia, *India Wave 4 Report FII Tracker Survey*

45 "Pradhan Mantri Jan-Dhan Yojana – Progress Report", *Department of Financial Services | Indian Ministry of Finance*, last updated March 14, 2018, <https://www.pmjdy.gov.in/account>.

46 Expert interview; National Payments Corporation of India. "RuPay". National Payments Corporation of India (webpage), accessed March 25, 2018. <https://www.rupay.co.in/>

4. Understanding the problem and where human-centered design can help



A facilitator from MicroSave with a women's loan group near Patna, Bihar

This section aims to answer the following questions:

4. 4.1—How many adults in India do not use formal financial services? How does this change across demographics and by stage of the user journey?
5. 4.2—Which of these stages is IDEO.org best positioned to address?

4.1 How many adults in India are financially excluded? How does this change by demographic and stage of the user journey?

Although 62 percent of Indian adults have a bank account, only 40 percent of adults below the poverty line have a bank account they actively use.⁴⁷

⁴⁷ InterMedia, *India Wave 4 Report FII Tracker Survey*

Over one-third of adults who have opened an account do not therefore actively use it. There are therefore 375 million adults in poverty who are considered unbanked or “underbanked”.⁴⁸ Given the scale of this problem—and the diversity of a country with twenty-nine states and more than twice the inhabitants of the European Union⁴⁹—it is helpful to understand how the problem of financial exclusion breaks down by demographic group and by stage of the user journey.

The table below comprises data from an extensive survey conducted by InterMedia in India 2016, on behalf of the Bill & Melinda Gates Foundation. InterMedia segments the customer journey into the following stages:⁵⁰

- **Preconditions:** the resources and knowledge and skills needed to be able to open and use an account.
- **Access & Trial:** the trial of any financial product or service, in the user’s name or a friend or family member’s. This includes transactions via mobile money agents, which do not always require the user to have a full bank account.
- **Account Opening:** the stage at which an individual opens a full-service bank account or mobile money account. This is the point where an individual is typically regarded as “financially included” in official statistics.
- **Active Use:** the regular use of a full-service bank or mobile money account. To be considered an active user, an individual must have “used his/her registered account to transfer money, save, or borrow within the previous 90 days.”⁵¹ This is already a low bar, and some experts in the sector prefer using a 30 day threshold.⁵²

48 Ibid.; The World Bank Group. “India”. The World Bank Data

49 “Raisina 2018 | Digital Money: Innovating with India for the World”. *Better Than Cash Alliance* (video)

50 InterMedia also includes “advanced active use”, but I have not included this here, given this is not a commonly used category among ecosystem players, and its definition is highly debatable.

51 InterMedia, *India Wave 4 Report FII Tracker Survey*

52 Author’s interviews with experts

Percentage of Indian adults included by demographic and by user journey stage

	Preconditions¹ <i>Necessary skills and resources</i>	Access & Trial <i>The use of a full service account, whether or not registered in user's name</i>	Account Opening <i>Registration/opening of an account</i>	Active Use⁴ <i>Own account used to transfer, save, or borrow within previous 90 days</i>
Overall		64%	62%	40%
Above poverty line ⁵		63%	61%	41%
Below poverty line ⁵		66%	64%	40%
Urban	Relatively high ²	66%	62%	45%
Rural	Relatively low ²	64%	64%	38%
Male	Relatively high ³	68%	66%	47%
Female	Relatively low ³	62%	60%	34%

%s indicate percentage of demographic group that has reached that stage of the user journey

1. Having the necessary ID, access to a mobile and connectivity, SIM card ownership, physical access to a bank branch or agent, financial literacy, numeracy and ability to text
2. Given mobile connectivity and physical access to a service point is typically higher in urban areas
3. Given mobile phone related prerequisites are significantly higher for men than women. Among men, mobile phone access is 18pp higher, SIM card ownership is 34pp higher, and the ability to send texts is 19pp higher than among women.
4. Based on bank not non-bank financial institution users
5. Poverty line is \$2.50 per person per day

Source for all data: InterMedia / finclusion.org (2017)

4.1.1 Preconditions

InterMedia’s survey data suggests access to some resources and skills is high: for instance, in 2016, 98 percent of adults had the necessary ID, and 97 percent had basic numeracy skills [not shown above]. However, mobile technology-related preconditions are more problematic and vary significantly by gender. While 76 percent of men have access to a mobile phone, only 58 percent of women do—a gap of 18 percentage points. And while the majority of men (56 percent) own their own SIM card, a minority of women do (22 percent)—which is needed for mobile payments. And although 35 percent of men know how to send and receive texts, only 16 percent of women do.

4.1.2 Access & Trial

InterMedia’s data suggests that almost two-thirds of the adult Indian population (64 percent) have tried a financial service. Although there is a gap between urban and rural areas (2 percentage points) and between genders (6 percentage points), these differences are relatively small.

4.1.3 Account Opening

InterMedia's 2016 survey data shows that account opening is now relatively high at 62 percent of the population. This proportion represents a very significant increase from just two years prior: the World Bank's 2014 Findex survey showed that only 43 percent of adults in poverty had a bank account.⁵³ However, this means that one third of adults still do not have a full-service financial account. Counterintuitively, the proportion of those with a bank account is slightly higher in rural than in urban areas (by 2 percentage points), and for those below the poverty line (3 percentage points). This is likely due to the government's PMJDY program (see Section 3), which launched in late 2014 and has often focused on the poor and those in rural areas. Indeed, World Bank data from 2014 shows that account opening among those in poverty was 10.2 percentage points lower than the average; and 3 percentage points lower among adults in rural areas than the average.⁵⁴

4.1.4 Active Use

The most significant drop-off comes in terms of actually using the account: of those adults who have opened an account, 37 percent do not actively use it. This drop-off is a particular problem for those in rural areas, and for women. Furthermore, although not shown in the table above, InterMedia reports that overall only 30 percent of people in India currently have *digital* access to a bank account.

53 The World Bank Group. "Financial Inclusion Data / Global Findex". The World Bank Data (2014), accessed March 12, 2018. <http://datatopics.worldbank.org/financialinclusion/country/india> – note this is based on World Bank's "lower–middle income" classification, which approximately corresponds to InterMedia's definition of "in poverty"

54 Ibid.

4.2 Which user journey stages should IDEO.org address? Initial hypotheses

An initial approach to honing in on the problem of financial exclusion is to ask which stage of the user journey IDEO.org seems particularly well-positioned to address, given:

- Where the most “space” is in the digital financial inclusion ecosystem—in other words, the extent to which a certain stage of the user journey is being addressed for the poor.
- Where human-centered design has the greatest potential to improve the user experience.

An initial assessment is shown below, based on qualitative analysis (author’s judgment and expert interviews), from low to high:

	Preconditions <i>Necessary skills and resources</i>	Access & Trial <i>The use of a full service account, whether or not registered in user's name</i>	Account Opening <i>Registration/opening of an account</i>	Active Use <i>Own account used to transfer, save, or borrow within previous 90 days</i>
Ecosystem “space” ie extent to which not already being tackled for users below the poverty line (and which actors within the ecosystem are most prominent)	Moderate (Indian government, MNOs, handset manufacturers, MFIs nonprofits)	Moderate (Financial service providers)	Low (Financial service providers, payment banks, Indian government)	High (Some payment banks, MFIs)
Estimated potential for improving through human-centered design	Mixed Possible to address skills and knowledge gaps, but not resources	Moderate Potential to design services, products, experiences to make products easier and more attractive to trial	Moderate Potential to make use cases for account opening more compelling to low income users, and improve UX and the experience	High Potential to use design make services more appealing and easier to use; improve overall experience and comfort with financial services ; tackle access challenges
Overall potential for IDEO.org to address user journey stage through HCD	Mixed	Moderate	Low	High

Source: Qualitative assessment by author, based on expert interviews, literature review, and interviews with users

Key:

High potential for IDEO.org
Moderate potential for IDEO.org
Low potential for IDEO.org

As indicated in the table above, this high-level analysis indicates that there may be a particular opportunity for IDEO.org to focus on enabling *active use* through technology. Field research should, therefore, aim to establish an understanding of how the poor manage their money today—especially women and those in rural areas, for whom active use rates are lowest.

5. What we can learn from financial inclusion research



Sita, a farmer from rural Bihar. Sita has not used her bank account in over a year because she believes she does not have enough money: "now with my family, I don't have enough to save".

This section summarizes what we can learn from research into the impact of five different financial product groups on users' welfare, in both India and comparable countries: government-to-person transfers, peer-to-peer payments, savings, credit and microinsurance. Given the previous section highlighted that **women** and those in **rural areas** may be particularly important groups for IDEO.org to focus on, this section tries to focus on the welfare impact and on "what works" for those groups in particular. Learnings from this section can help to inform (1) which product(s) IDEO.org should focus on, and (2) inform the design of products and services.

Before diving into the research, there are two main limitations to be aware of. First, there is a lack of peer-reviewed research on the welfare impact of digitizing some financial products for low-income populations—especially savings, microinsurance and credit. However, there is speculation from scholars that digital technologies can improve outcomes by expanding reach, reducing cost for providers, and enabling greater product and service design innovation.⁵⁵

55 Karlan, Dean et al., "Making Microfinance More Effective", *Harvard Business Review*, October 5, 2016, <https://hbr.org/2016/10/making-microfinance-more-effective>.

Second, there are few studies on the impact of providing *holistic* formal financial services to the poor, versus providing a specific product or service in isolation. This is important since it is unlikely that most users view financial services as separate “products.”⁵⁶ It is also conceivable that there are significant synergies between different digital financial products when bundled together, which may improve their value proposition to the user, and amplify their impact.⁵⁷

Summary of literature review findings

Financial product	Likely welfare impact on low-income users⁵⁸ Especially for women in rural areas	Quality of evidence for this project Comprehensiveness, and external validity/applicability to India
Government-to-Person Payments	High impact	Very good
Consumer Payments	High impact	Good Strong evidence, but mostly from Africa
Savings	Moderate to High impact Dependent on product design	Good
Microfinance and lending	Low impact Dependent on product design	Moderate Research gaps exist
Microinsurance	Uncertain impact Moderate for weather insurance	Poor Major research gaps

56 Author’s interviews with experts

57 However, research to examine this is being planned in southern India (Source: Expert interview)

58 This is necessarily a high-level, qualitative assessment based on the evidence available

5.1 Government-to-person payments

Likely welfare impact: **High**

Quality of evidence: **Very good**

There is growing evidence that government social protection transfers that are delivered digitally rather than through physical cash increase financial inclusion and welfare outcomes for recipients. For instance, when government payments are paid electronically into the recipient's account, it can increase financial inclusion by providing a use case for digital financial products. For instance, 91 percent of recipients of Colombia's Familias en Accion (a government social protection program) then obtained a card-linked bank account.⁵⁹ Another study in Mexico found that giving conditional cash transfer recipients a debit card (which allowed them to check their bank account balance more easily), increased bank and overall savings.⁶⁰

Significantly, there is also limited evidence that electronic payments made directly to women can improve their economic outcomes. A recent field experiment conducted by economists with the government of Madhya Pradesh, India found a number of benefits when women's wages from the government federal workfare scheme⁶¹ were paid directly into their bank accounts (rather than into a household account or their husband's). Women were more likely to engage in economic transactions and to work: their annual earnings from private sector employment increased by an average of 24 percent. The authors posit the scheme improved women's empowerment by improving "bargaining positions to push back against social norms internalized by men."⁶²

59 Bold, Porteous, Rotman (2012); in Maldonado & Tejerina IDB Technical Note 2010; as cited in Better Than Cash Alliance, "Why Digital Payments", *Better Than Cash Alliance* (webpage), accessed March 25, 2018, <https://www.betterthancash.org/why-digital-payments>

60 Bachas, P., P. Gertler, S. Higgins, and E. Seira (2016). Banking on Trust: How Debit Cards Help the Poor to Save More., as cited in Field et al., "An Account of One's Own: Can Targeting Benefits Payments Address Social Constraints to Female Labor Force Participation?"

61 Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS). This provides rural households with up to 100 days of work at a minimum wage

62 Field et al., "An Account of One's Own: Can Targeting Benefits Payments Address Social Constraints to Female Labor Force Participation?"

In addition to benefits for the end recipients, there are some important benefits for governments. There is evidence that digitizing government transfers reduces leakage. For instance, when social security pensions were paid using digital smart cards instead of cash handouts at the village level in India, there was a 47 percent lower incidence of bribe demands than with cash payments.⁶³ Digitizing government transfers often also reduces the *cost* of government social protection programs of between 20-80 percent compared with manual cash distribution, according to a study covering Niger, South Africa and Brazil.⁶⁴

5.2 Consumer payments

Likely welfare impact: **High**

Quality of evidence: **Good**

Recent research suggests that digital consumer payments are an important foundation for enabling a broader set of financial services for the poor. Consumer payments include peer-to-peer payments, bill payments and person-to-government payments (such as taxes). As McGowan and Jaisinghani note: “while not a silver bullet, developing widespread digital payment systems built on modern, open architecture is the surest way to enable both banks and non-banks to cooperate and compete in serving even the very poor with a variety of financial services.”⁶⁵

Perhaps the most powerful evidence that digital payments can lead to improved welfare outcomes comes from economists Suri and Jack. Their research showed that the mobile money service M-PESA in Kenya increased per capita consumption significantly and lifted 194,000

63 Muralidharan et al., 2014, as cited in Bill & Melinda Gates Foundation et al., *The Opportunities of Digitizing Payments*, (Washington DC: The World Bank, August 2014). http://siteresources.worldbank.org/EXTGLOBALFIN/Resources/8519638-1332259343991/G20_Report_Final_Digital_payments.pdf

64 Ibid.

65 McGowan, Kathleen, and Jaisinghani, Priya. “The End of Financial Marginalization Is in Sight: Here’s the Roadmap”. *Innovations* (2015) volume 10, 1-2. https://www.mitpressjournals.org/doi/pdf/10.1162/inov_a_00226

households (2 percent of Kenyan households) out of poverty.⁶⁶ Importantly, the impact was even greater for female-headed households: women using M-PESA were even more likely to move out of agriculture and into business.⁶⁷ Additionally, there is evidence that M-PESA users were better able to withstand economic shocks, because they were able to receive domestic remittances from friends and family members more easily.⁶⁸

There is also evidence that farmers who receive payments digitally rather than through cash invest more. One study in Malawi showed that farmers who received digital payments for their crops rather than cash payments invested 13 percent more in farm inputs, saw a 21 percent increase in the value of crop outputs, and an 11 percent increase in household consumption.⁶⁹

5.3 Savings

Likely welfare impact: **High** (dependent on product design)

Quality of evidence: **Good**

The beneficial impact of asset-building and saving on overcoming economic shocks and improving education, nutrition and health outcomes has been established by quite a number of studies.⁷⁰ The impact appears to be more significant when no-fee accounts and deposit collection services are provided. For example, in Nepal, when these services were provided to female-headed households, their ability to cope with shocks improved, as did their overall household financial position. They were also more likely to spend on education and protein-rich foods.⁷¹ Other studies found similar

66 Suri, Tavneet and William, Jack., "The Long-Run Poverty and Gender Impacts of Mobile Money", *Science* 354, no. 6317 (December 9, 2016): 1288–92. <https://doi.org/10.1126/science.aah5309>.

67 Ibid.

68 Karlan, Dean et al., "Making Microfinance More Effective", *Harvard Business Review*, October 5, 2016, <https://hbr.org/2016/10/making-microfinance-more-effective>.

69 Bill & Melinda Gates Foundation et al., *The Opportunities of Digitizing Payments*

70 UNICEF Innovation, "Financial technology to benefit children & families" (unpublished working paper, August 2017)

71 Prina, Silvia, "Banking the Poor via Savings Accounts: Evidence from a Field Experiment"

effects, especially where savings accounts were paired with support from women's savings groups.⁷²

However, there is also evidence that using insights from behavioral science can amplify welfare impacts. For example, a study in Kenya used a “safe box” intervention to improve investment in health. In this experiment, respondents were given a locked box with a deposit slit at the top, and a passbook so they could record their savings without having to open the box (they were given a key so were able to open the box at will). They were also asked to record their savings goal and the amount on the front page. Investment in preventative health increased by 66 to 75 percent compared with the control mean, in the year following the box's introduction (Dupas & Robinson, 2013).⁷³ Therefore so-called “commitment savings”—which may help to improve willpower, and remove temptation to spend—can improve outcomes.⁷⁴ Other studies in Malawi and the Philippines have similarly found that “commitment devices” such linking an account to a specific savings goal, or high withdrawal costs, can increase savings balances and allow women to invest in durable goods such as sewing machines.⁷⁵ This effect is stronger for women with low bargaining power (as is typically the case in low-income households in rural India).

However, there is less research about the value of digitizing savings⁷⁶—although, as noted above, there is evidence that receiving government payments digitally can increase savings.

72 Kast and Pomeranz, 2014; as cited in UNICEF Innovation, “Financial technology to benefit children & families”

73 Dupas, Pascaline and Robinson, Jonathan. “Why Don't the Poor Save More? Evidence from Health Savings Experiments”. *American Economic Review* 2013, 103(4): 1138–1171 <http://dx.doi.org/10.1257/aer.103.4.1138>

74 Karlan, Dean et al., “Making Microfinance More Effective”

75 Brune et al, 2015 and Ashraf et al, 2015 and 2010; as cited in UNICEF Innovation, “Financial technology to benefit children & families”

76 UNICEF Innovation, “Financial technology to benefit children & families”

5.4 Microfinance and credit

Likely welfare impact: **Low to moderate** (depending on user group and product design).

Quality of evidence: **Moderate**. More studies needed on the impact of different product designs.

A recent literature review of rigorous academic studies on the impact of financial services for the very poor found that “traditional microcredit hasn’t lived up to expectations”⁷⁷. This is very relevant for India, given it is one of the largest microfinance markets in the world.⁷⁸ The study cited seven randomized evaluations from different countries that showed the “Grameen model” of microfinance (which makes small loans without collateral, often to women)⁷⁹ failed to increase average incomes or household consumption. One reason for this may be the high interest rates often associated with microfinance institutions (MFIs)⁸⁰, which “has been a perennial source of debate and discussion in the sector of microfinance”⁸¹.

The impact of credit for entrepreneurs is more mixed. One study in Hyderabad, India showed that improved access to microfinance improved business size and performance for more motivated and experienced entrepreneurs, but had almost no effect for first-time business owners.⁸²

However, there is also evidence that better design of microfinance products is associated with higher impact. One survey article cites evidence from India that features such as “flexible repayment periods, grace periods, individual-liability contracts”⁸³ have the potential to improve the impact of microcredit on poverty. Alternative credit-scoring techniques may also help

77 Karlan, Deanet al., “Making Microfinance More Effective”

78 Chakrabarti, R., and Sanyal, K. “Microfinance and Financial Inclusion in India” in Gopalan, Sasidaran and Kikuchi, Tomoo, eds. *Financial inclusion in Asia: Issues and Policy Concerns*. London: Palgrave, 2016.

79 Ibid.

80 Ibid

81 Ibid.

82 Banerjee et al., “Do Credit Constraints Limit Entrepreneurship? Heterogeneity in the Returns to Microfinance”, Working paper (July 2015) http://faculty.wcas.northwestern.edu/~cgk281/credit_entrepreneurship.pdf

83 Karlan, Deanet al., “Making Microfinance More Effective”

to better identify creditworthy individuals,⁸⁴ which can help reduce lending to individuals that cannot afford it, and enable lower interest rates in the long term. To ensure a positive welfare impact, it is therefore especially important in the case of microfinance to be aware of product design.⁸⁵

5.5 Microinsurance

Likely welfare impact: **Uncertain**; weather insurance most promising.

Quality of evidence: **Poor**. More research needed, especially on other types of microinsurance.

There is evidence that microinsurance can help to reduce income shocks—particularly weather insurance for farmers. One study found that individuals who invested in microinsurance in Burkina Faso and Senegal had higher average yields, and were better-placed to manage food insecurity and income shocks (Delavallade, 2015).⁸⁶ However, a number of studies also suggest that demand for these products is very low, even in the context of awareness-raising programs.⁸⁷

Microinsurance is increasingly being delivered digitally. Companies such as BIMA provide the service to feature phone users, in partnership with mobile money providers to enable regular micropayments. However, the impact of these products is not yet well-established.

5.6 Key takeaways

Overall, the strongest and clearest welfare impacts are associated with **digital payments** (and within that, government-to-person payments), and to a lesser extent **savings**. In the case of payments, digitization also appears

84 Ibid.

85 Ibid.

86 Delavallade, 2015 as cited in UNICEF Innovation, “Financial technology to benefit children & families”

87 UNICEF Innovation, “Financial technology to benefit children & families”

to encourage **active use** of financial products. Credit and microinsurance products appear to have positive impacts for some groups, in certain conditions, but the evidence is more mixed.

These findings are also referenced later in the report, when prioritizing opportunity areas and outlining implementation considerations (Section 8).

6. Key findings



Rakhi, a farmer and entrepreneur from rural Bihar. Rakhi keeps her family's savings in a small box, which she locks in a trunk, in an old pillow or above the door. She moves the box every night, so her sons cannot find it.

This section addresses the following questions:

- 6.1—What are the major barriers to low-income people using digital financial services?
- 6.2—To help us identify opportunity areas, what insights can we gain about how the poor use technology and manage their money offline?

6.1 What are the barriers to using digital financial services?

There are eight major barriers to accessing and using digital financial services in India for the poor. Four are demand-side barriers, which most affect users, and four are supply-side barriers, which most affect financial service providers. This list is of course not exhaustive, but represent what the author believes are the most important, based on synthesizing field research, expert interviews, financial inclusion data and the literature review.

The barriers are listed below in approximate order of importance. Among experts there was a clear consensus that most ecosystem activity has focused on supply-side barriers, and that demand-side barriers are in greater need of attention.

Demand-side barriers:

1. Restrictive gender norms
2. Not having enough money to make an account or a transaction worthwhile
3. Low tech literacy, confidence and access to tech**
4. Low financial literacy and low awareness of options

Supply-side barriers:

5. Inadequate service point infrastructure
6. Unintuitive user experience (UX)**
7. Inconsistent technical infrastructure**
8. Unsuitable product design

**Specific to *digital* financial services.⁸⁸

88 Although other barriers – such as restrictive gender norms – are exacerbated in digital contexts

6.1.1 Restrictive gender norms

The majority of those who are unbanked or underbanked are women: this points to the possibility of restrictive gender norms. Only 34 percent of women in India actively use a bank account, compared with 47 percent of men.⁸⁹

Restrictive gender norms appear to have negative impacts at each stage of the user journey (see Section 4). The most substantial gap comes at the “active use” stage. Women are often not perceived as financial decision-makers in India, with just 14 percent of women responding that they decide how their income is spent, versus 61 percent of men.⁹⁰

6.1.2 Not having enough money to make an account worthwhile

InterMedia’s 2016 survey showed that 19 percent of adults who had *not* registered for a bank account reported that they did not perceive they had enough money to justify it.⁹¹ Researchers argue that “even households with incomes of less than a dollar a day per person” do not typically spend all their money immediately, and still have a need for financial services.⁹²

However, the sentiment of not having enough money for banking was reflected in field research. For instance, some people had registered for a bank account in the past, but not used it for some time—suggesting that this sentiment may partially explain the gap between accounts opened and actively used accounts. Sita, a farmer, reported that she had a bank account and had previously used it to save. However, she had not used it in over a year, because her household-related outgoings had increased as her family had grown. Although she mentioned she keeps some money for emergencies in a box at home—suggesting she does save to an extent—she believed she did not have enough to make formal financial services worthwhile.

89 InterMedia, *India Wave 4 Report FII Tracker Survey*

90 20% of men and 27% women reported it was a joint decision. Source: InterMedia, *India Wave 4 Report FII Tracker Survey*

91 Ibid.

92 Chakrabarti, R., and Sanyal, K. “Microfinance and Financial Inclusion in India”

6.1.3 Low tech literacy, confidence and access to technology

Lack of access to a mobile phone, ownership of a SIM card, and knowledge of how to use it restricts access to digital financial services. For example, knowing how to text and having one's own SIM card are prerequisites for using mobile payments.

InterMedia's 2016 survey data shows that on average, 60 percent of Indian adults do not own a SIM card, 32 percent do not have access to a mobile phone, and 74 percent do not know how to text. These numbers are all significantly worse for women (see above). Gandhali, a farmer from Bihar, said she used her family's feature phone to speak to her brother, who lives in another village. But she relied on her son to operate the phone and did not know how to send or receive text messages.

6.1.4 Low financial literacy and low awareness of options

Although most (97 percent) of Indian adults are numerate, financial literacy is relatively low, at 24 percent. This figure compares with 68 percent in Canada and the United Kingdom, 42 percent in South Africa, and 28 percent in emerging economies on average. Financial literacy is also lower among women, and among the poor.⁹³ These figures use Standard and Poor's Rating Service's Global Financial Literacy Survey methodology, which involves five questions designed to test basic understanding of the concepts of risk diversification, inflation, and compound interest.⁹⁴

Field research also suggested that many adults are unaware of the options open to them. A prototype financial coaching class in rural Bihar found that none of the participants were aware of USSD payments, even though all owned or had access to a feature phone. Few interviewees reported

93 Klapper, L., Lusardi, A. and van Oudheusden, P., *Financial Literacy Around the World*, IBRD/World Bank, 2017, http://gflec.org/wp-content/uploads/2015/11/3313-Finlit_Report_FINAL-5.11.16.pdf?x87657

94 "S&P GLOBAL FINLIT SURVEY – METHODOLOGY". *Global Financial Literacy Excellence Center, George Washington University* (webpage). <http://gflec.org/sp-global-finlit-survey-methodology/>

having researched different accounts or loan options before making a decision; most had relied on a recommendation from a family member or neighbor.

6.1.5 Inadequate service point infrastructure

There are only 10.5 bank branches for every 100,000 adults,⁹⁵ and penetration of agents is significantly lower than in other comparable countries.⁹⁶

Field research uncovered obvious difficulties for people—especially those in poverty and rural areas—in being able to access bank branches or service points (including agents, informal saving/lending groups and ATMs). Gandhali highlighted many of the issues when she said: “We have to spend five to ten rupees to get there, it’s far, we get tired... There are long queues [at the bank branch], and sometimes the bank says, ‘We don’t have cash, come back tomorrow’”. Another lady farmer, Rakhi, said that it costs 80 rupees for her and her husband to go to the bank, and typically takes four to six hours by auto-rickshaw. Considering Rakhi earns 100 rupees a day, this is a very expensive trip, in terms of both money and time.

Quantitative surveys reflect these sentiments: 2016 data shows that 27 percent of Indian adults reported not having at least one of these point of service within 5 kilometers of their household.⁹⁷ Given the financial cost and time (which often equates to foregone wages) of traveling to access points further than 5km away, this represents a significant barrier.

6.1.6 Unintuitive user experience (UX)

Poor quality user experience can make digital financial services unappealing and difficult to use, compounding the difficulties faced by low

95 Nair, Suraj and Sharma, Misha, “Digital Social Payments in India: Can the Challenges Be Overcome?” CGAP, September 26, 2016. <http://www.cgap.org/blog/digital-social-payments-in-india-can-challenges-be-overcome>.

96 Krishnaswamy et al., “Building Viable Agent Networks in India,” CGAP, April 2010. <https://www.ifc.org/wps/wcm/connect/73590c8049585f409f8abf19583b6d16/Tool+10.8.+CGAP+Analysis+-+FINO+and++EKO+Channel+Management.pdf?MOD=AJPERES>

97 InterMedia, *India Wave 4 Report FII Tracker Survey*

technological and financial literacy. Several experts mentioned that while India has a wealth of software engineering talent, projects tend to be engineer-led rather than design-led. They commented that there was not enough focus on making sure that products were well-designed, easy-to-use, attractive and accessible to users. Indeed, eight steps are required to use USSD payments on a feature phone (see Appendix F).

Field research confirmed this. User testing revealed that popular mobile payments apps like Paytm could be confusing to navigate, especially for users who are less confident with technology, or who do not speak English—the Hindi-language version often reverts to English when it shows error messages, for instance.⁹⁸ No one in our focus group used BHIM (the government’s payments app), although all knew about it: they claimed there were too many steps to register, and that it was too difficult to use. And apps often do not offer a broad range of languages: a problem for the 41 percent of Indians for whom Hindi is not their first language,⁹⁹ and for the approximately 837 million adults in India who do not speak English.¹⁰⁰

This set of barriers is not unique to India. Indeed, the Consultative Group to Assist the Poor (CGAP) at the World Bank recently launched an effort to improve the UX of digital financial services for low-income groups¹⁰¹ across multiple emerging markets.

6.1.7 Unsuitable products for the poor

Experts voiced concerns that most providers do not focus on product innovation for the poor. This is a significant issue given research has indicated that product features such as flexible repayment periods can significantly increase welfare impacts (Section 5).

98 Field research, India, January 2018

99 Jainl, Bharit, “Nearly 60% of Indians speak a language other than Hindi”, *The Times of India*, June 21, 2014. <https://timesofindia.indiatimes.com/india/Nearly-60-of-Indians-speak-a-language-other-than-Hindi/articleshow/36922157.cms?>

100 World Bank population data (2011); The Times of India, “Indiaspeak: English is our 2nd language”, March 14, 2010. <https://timesofindia.indiatimes.com/india/Indiaspeak-English-is-our-2nd-language/articleshow/5680962.cms?>

101 Expert interview

Research by the consultancy Dalberg found that FinTech companies in India have received over \$4.6 billion in investment from venture capital and private equity firms over the past decade. However, the vast majority of activity has targeted the top 14 percent of the population by income. This group has a household income of at least \$430/month, and are considered middle class or above.¹⁰² Indeed as Jasuja and Khan assert: “service providers continue to offer cheaper variants of standard financial products to the poor instead of creating customized financial products that are deeply integrated with their attitudes, beliefs, and habits”.¹⁰³

Of course, the market’s lack of focus on the “bottom” 86 percent of the population is in many ways unsurprising: lower-income consumers are typically less profitable.

6.1.8 Inconsistent technical infrastructure

Field research uncovered a reluctance to use digital financial services regularly (even among those who had downloaded payment apps), due to unreliable cellular or data connectivity. Many users reported instances when their payment had not been properly processed, with money leaving their account but not arriving in the recipient’s account because the transaction was interrupted. Although in most cases the user was refunded, this can take a week or more to be processed, impacting the user’s cash flow.

Other kinds of technical infrastructure are also inconsistent: users frequently reported ATMs being offline or broken. Indeed, well over half the ATMs the research team tried to use in Bihar, India over multiple locations in the course of a week did not work: the software application often crashed, showing a blue screen.

¹⁰² Desai et al., “Your Guide to UPI — the World’s Most Advanced Payments System”; based on exchange rate as of 18 March 2018

¹⁰³ Ibid.

6.2 Behavioral insights about how people use technology and money

To be able to start designing products, services and experiences to improve access to and use of digital financial services for the poor, the research team wanted to better understand existing behaviors in depth. Design research in Mumbai and Bihar unearthed a set of behavioral insights about *how* people manage their money, and their *attitudes* to technology. **All but one of the insights¹⁰⁴ were developed by IDEO.org and MicroSave, and can also be seen on the project’s microsite (available at www.pathtodigitalindia.com).** Each can be mapped to one of the demand-side barriers listed above in Section 6.1, and provide a starting point for understanding how each barrier may be tackled, and for developing opportunity areas:

1. Restrictive gender norms

- 1A—A blurred “big picture”: Individual savings behavior is common among women, but it is not often tied to a clear snapshot of the household’s overall financial situation.
- 1B—Digital proxies: Women often manage household finances, but access digital through other people.
- 1C—Not for women: Many perceive financial apps to be for men.¹⁰⁵

2. Not having enough money to make an account or a transaction worthwhile

- 2A—Out of sight, out of mind: People appreciate being protected from their own temptations by having savings “out of sight,” whether physically in a lockbox at home or in the bank.*

3. Low tech literacy, confidence & access to tech

104 “Not for women: Many perceive financial apps to be for men”

105 Additional to the IDEO.org / MicroSave insights, as described at <http://www.pathtodigitalindia.com/>

- 3A—First impressions: One negative experience with a new technology can deter a whole community, but a human guide helps ensure a good first impression.
- 3B—Young catalysts: As early adopters, young people often act as mini-agents or IT ambassadors for their families.
- 3C—Beyond acquisition: Direct Benefit and other incentives work for acquiring users of digital solutions, but don't encourage ongoing use or healthy habits.
- 3D—Phone calls only: Feature phones are widely present in rural areas, but people largely use them for calls.

4. Low financial literacy and low awareness of options

- 4A—No place to turn: With few reliable sources for sound financial advice, trust is easily misplaced.
- 4B—Learning on the job: Almost everyone is an entrepreneur, but no one receives any formal training to be one.
- 4C—Safety concerns: The need to travel great distances in rural areas increases the risk of carrying cash.

1—Restrictive gender norms

Behavioral insight 1A—A blurred “big picture”: Individual savings behavior is common among women, but it is not often tied to a clear snapshot of the household’s overall financial situation

Most—but not all—women we spoke with do save in some form, but do not always consider their activity “saving” when they store cash at home, and not in a bank account.

Women would sometimes say they were saving for a particular event—such as an upcoming festival—or for their daughter’s dowry; yet at the same time would profess to often failing to pay school fees on time due to lack of cash, and to struggling to pay for medical care and medicines in the event of a health emergency.

1B—Digital Proxies: Women often manage household finances, but access digital through other people

Many women we spoke to play some role in managing the household finances. Paying children’s school fees—or saving for a daughter’s dowry or wedding—were typically top-of-mind, as was saving for healthcare. However, most women generally manage money through a variety of analog tools. For instance, Shakti uses a wall calendar to circle reminders about when different bills and other payments are due. She runs her local women’s loan group and records transactions in a large notebook. However, she rarely interfaces with her account directly. Instead, she sends a male family member to deposit cash at a bank branch on her behalf.

We gave Shanti a smartphone for a few days loaded with Paytm credit and asked her to try it. But when we returned, we found that neither she nor her daughter-in-law had tried it at all. “How can we use Paytm when we can’t use an ATM?” her daughter-in-law asked, despite owning a smartphone herself.

1C—Not for women: Many perceive financial apps to be for men.

Even for young women who owned phones, none had a mobile wallet or payments app installed, unlike most of their male peer group—they perceived Paytm, Google Tez and other apps as being “only for men”.¹⁰⁶ Other researchers have found that in many communities, it is frowned upon for women to use social media apps if they use phones at all.¹⁰⁷ We might hypothesize that financial apps also fall into this category.

2—Not having enough money to make an account or a transaction worthwhile

2A—Out of Sight, Out of Mind: People appreciate being protected from their own temptations by having savings “out of sight,” whether physically in a lockbox at home or in the bank.

Interestingly, some women we met said that the difficulties in getting to a bank branch were sometimes a benefit because it meant the money was harder to spend.

Sometimes, women took on the role of keeping money “out of sight” to prevent other family members from being tempted to spend it. For instance, Rakhi, who lives in a small village in a rural area, lives with her three sons, two daughters and her husband. She manages all the household finances, and her husband gives her his earnings. Rakhi keeps household cash in a small box, which she keeps locked in a trunk, under the bed, in an old pillow, or on top of a doorframe. She changes the location regularly, and is careful not to tell her sons—and often also her husband—so they won’t be tempted to spend the cash.¹⁰⁸

106 Author’s interviews with experts

107 Omidyar Network. *Currency of Trust: Consumer Behaviors and Attitudes Toward Digital Financial Services in India* (2017) https://www.omidyar.com/sites/default/files/file_archive/Cof-Trust/17-05-15_Currency_of_Trust_Report_DIGITAL_FINAL.pdf

108 Field research, Bihar, January 2018

3—Low tech literacy, confidence and access to tech

3A—First impressions: One negative experience with a new technology can deter a whole community, but a human guide helps ensure a good first impression.

We frequently heard stories of difficulty in using ATMs, or ATMs not working properly or at all. This had clearly discouraged other community members from using them.

On the other hand, when we prototyped an impartial financial advice class in a small rural community, the feedback was very positive. We showed participants how to send money using just their feature phones, via UPI-optimized USSD. Participants said they had not heard of this payments option but were very receptive and quick to try it out themselves when an impartial human was showing them how to.

3B—Young Catalysts: As early adopters, young people often act as mini-agents or IT ambassadors for their families.

Ravi, a young man who had moved to Mumbai for work, revealed that he had taught his mother (living in Uttar Pradesh) how to use an ATM card to make withdrawals. He then began depositing money into her account from Mumbai to save on domestic remittance fees, and so that she could access the funds easily.

In many households, we saw that parents—especially mothers—relied on their children to be able to use phones. For instance, Geetika, a mother of four living in a small village in Bihar, said that she makes calls to relatives through her son, “he has the household phone, and helps me use it when I need to make a call”.

3C—Beyond acquisition: Direct Benefit and other incentives work for acquiring users of digital solutions, but don't encourage ongoing use or healthy habits.

Of six young men we spoke to, aged 16—26 and all from a small village in Bihar, all had at least two payments apps or digital wallets downloaded on their smartphones, such as Paytm, Phone Pay, and even Google Tez, which had only launched five months earlier.

However, all of them said the main reason they had downloaded the apps in the first place was to access the cash reward for signing up. They continued to refer friends to access referral bonuses. However, they were not really using the digital payments apps or wallets as their main way to pay or to manage their money. Most kept only small balances and used the wallets primarily to obtain these incentives and to recharge their phone credit.

Interestingly, all had heard of BHIM, the payments app launched by the Indian government agency NPCI, but none had used it. Although they cited usability issues, the fact that this app does not offer incentives may also be a factor.

3D—Phone Calls Only: Feature phones are widely present in rural areas, but people largely use them for calls.

Although most people we met in rural areas used a phone, this was generally only for calls. Most adults we encountered (aside from young people) did not know how to receive or send text messages (and did not appear to see the need, either).

4—Low financial literacy and low awareness of options

4A—No place to turn: With few reliable sources for sound financial advice, trust is easily misplaced.

We frequently heard in field interviews in Bihar and Mumbai that people rely on recommendations from friends, family members and neighbors before trying a financial service or provider. However, this is rarely accompanied by any other kind of research, partly because unbiased advice is not readily available.

This means that trust can easily be misplaced. For instance, we spoke to one man who acknowledged that most fixed-term savings schemes were “scams”, but had decided to save with one anyway because his brother-in-law worked there as an employee. “You’ve got to know someone on the inside to trust it”, he said. However, there was no evidence that he had conducted any other research to ensure the new company was sound—and was still at risk of losing all his money.

Some farmers we spoke with had taken money from local moneylenders at extortionately high rates because they were known to their friend or family member, rather than through a microfinance institution where interest rates are typically lower and payback periods more flexible.

4B—Learning on the job: Almost everyone is an entrepreneur, but no one receives any formal training to be one.

The financial advice class also included information about how to grow your own business. Most low-income people we met in rural areas were entrepreneurs in the sense that they farmed a small piece of land or a cow and sold some of the produce. However, after the financial advice class, participants reflected that they had never before received impartial advice

on when and how to take credit to grow their business, or received other entrepreneurship advice.

4C—Safety concerns: The need to travel great distances in rural areas increases the risk of carrying cash.

When visiting traditional agricultural markets (“mandis”) in Patna, Bihar, we saw that all transactions happen in cash. This can be an issue for farmers, who have sometimes traveled long distances to reach the mandi, and are then worried about making the long journey home with cash. One female farmer we spoke to, Lakshmi, noted that her husband sometimes sleeps at the mandi to avoid making the trip home at night and risk his cash being stolen.

7. Opportunity Areas & Criteria



A prototype financial coaching class in rural Bihar. The class covered topics like avoiding financial fraud and using mobile payments on a feature phone.

This section includes:

- 7.1—Brief overview of the options (opportunity areas) and example concepts.
- 7.2—Criteria used to assess concepts.

7.1 Brief overview of the opportunity areas and example concepts¹⁰⁹

These four opportunity areas were a key output of the design sprint and build directly on the key findings presented in the previous section. Each of the boxes below includes a short explanation of the opportunity area, which barriers it addresses, and which behavioral insights it leverages. An early, illustrative concept is also included for each.¹¹⁰

¹⁰⁹ Source for all opportunity areas and concepts: IDEO.org – wording for opportunity area title and short description taken from <http://www.pathtodigitalindia.com/>

¹¹⁰ These concepts are very early ideas of potential interventions associated with the opportunity areas.

These opportunity areas represent the four “options” for IDEO.org:

- A. **Unblock Women**—Introduce women to digital financial tools by building on their existing savings behaviors.
- B. **Equip Entrepreneurs**—provide business owners with the knowledge they need to be financially successful.
- C. **Activate Youth**—Ready the next generation of savers by teaching them healthy financial habits.
- D. **Connect farmers**—Leverage the untapped potential of feature phones to reach rural markets.

This report does not consider further alternatives here. Given this report focuses on what IDEO.org can do using HCD, it makes sense to only compare the opportunity areas that IDEO.org has been generated by using this methodology.

A) Unblock Women: Introduce women to digital financial tools by building on their existing savings behaviors.

Barriers addressed: 1. Restrictive gender norms *and* 2. Not having enough money to make an account or a transaction worthwhile.

Behavioral insights leveraged:

- 1A—A blurred “big picture”: Individual savings behavior is common among women, but it is not often tied to a clear snapshot of the household’s overall financial situation.
- 1B—Digital Proxies: Women often manage household finances, but access digital through other people.
- 2A—Out of Sight, Out of Mind: People appreciate being protected from their own temptations by having savings “out of sight,” whether physically in a lockbox at home or in the bank.

Opportunity area description: There is an opportunity to build on existing household tools to help women take advantage of goal-based savings and digital accounts. Given the long-term societal changes required to change restrictive norms, this needs to be done slowly and in phases. This journey could start by providing analog tools (such as savings pouches and money boxes) to women. By linking them to the practice of goal-based saving, they could help expand the influence of women over household saving and spending. Over time, mobile apps and banking could be developed to mirror these structured saving practices online. With gender norms around financial management starting to change, women will be better positioned to take advantage of these digital tools to manage household finances and access value-added services.

Illustrative concept: “Bite-sized savings”. A combination bank account and physical savings box that share a visual language. Both let you “bucket” money for emergencies and long-term goals. The box makes it easy to take the money to an agent for cash-in, or for the agent to collect your savings from your doorstep. Progress toward personal goals is shown on deposit receipts provided by the agent.



Source: IDEO.org (2018)

B) Equip Entrepreneurs—provide business owners with the knowledge they need to be financially successful.

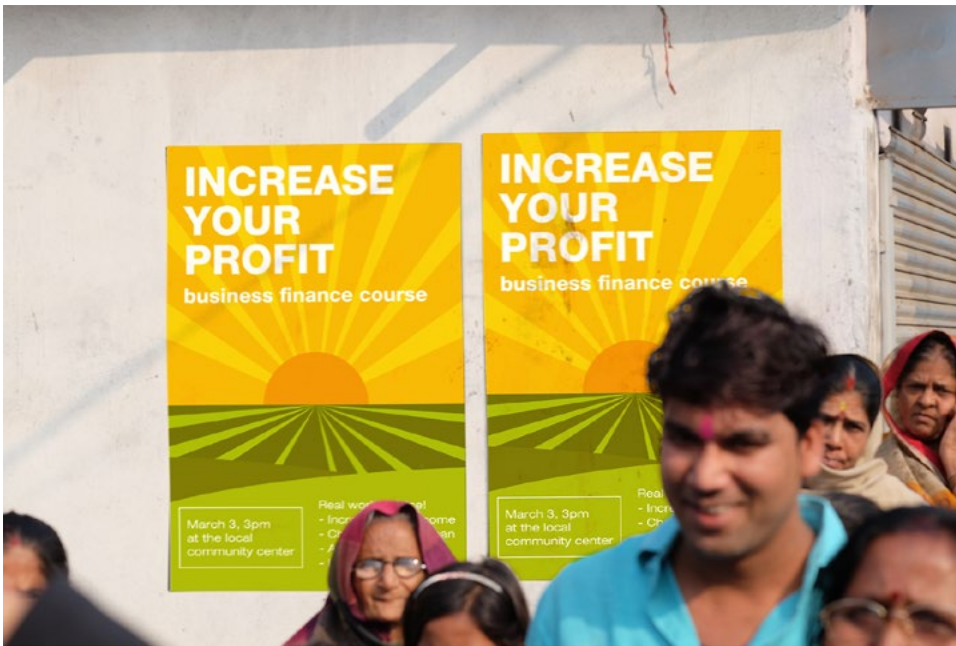
Barriers addressed: 3. Low tech literacy, confidence and access to tech *and* 4. Low financial literacy and low awareness of options.

Behavioral insights leveraged:

- 3A—First impressions: One negative experience with a new technology can deter a whole community, but a human guide helps ensure a good first impression.
- 4A—No place to turn: With few reliable sources for sound financial advice, trust is easily misplaced.
- 4B—Learning on the job: Almost everyone is an entrepreneur, but no one receives any formal training to be one.

Opportunity area description: There is an opportunity to provide impartial, high quality financial and digital coaching and advice. People are more likely to trust this advice if it comes from people they know, or who are trusted members of their communities. Classes and coaching could focus first on business advice and how to avoid fraud, and progress to learning how to use digital tools, first by trialing them in-class. A prototype financial coaching class conducted in rural Bihar received positive feedback from participants. Entrepreneurs could eventually take advantage of range of digital products online to grow their businesses.

Illustrative concept: “Trusted Voices”. Banks could provide a training program and materials to agents so they can lead community classes, and address the knowledge and confidence gap. Agents benefit because they can attract new customers, increase transaction frequency among their existing customers, and cement their standing in their local communities.



Source: IDEO.org (2018)

C: Activate Youth—Ready the next generation of savers by teaching them healthy financial habits.

Barriers addressed: 1. Restrictive gender norms and 3. Low tech literacy, confidence and access

Behavioral insights leveraged:

- 1C—Not for women: Many perceive financial apps to be for men
- 3B—Young Catalysts: As early adopters, young people often act as mini-agents or IT ambassadors for their families.
- 3C—Beyond acquisition: Direct Benefit and other incentives work for acquiring users of digital solutions, but don't encourage ongoing use or healthy habits.

Opportunity area description:

Policy changes in the state of Bihar mean that student scholarships are now paid directly into children's bank accounts. However, many student accounts go unused after the government scholarship has been withdrawn

at the start of the year. There is an opportunity to provide education, training and tools for children. Students can learn healthy financial behaviors and how to use digital financial services effectively, and help their parents to do the same.

Illustrative concept: India's Next Gen

A set of age-appropriate activities associated with take-home analog and digital tools, delivered throughout the child's schooling. Activities can help children better understand how to use their bank account through ongoing nudges or incentives for different activities.



Source: IDEO.org (2018)

D: Connect farmers—Leverage the untapped potential of feature phones to reach rural markets.

Barriers addressed: 3.Low tech literacy, confidence and access to tech *and*
4.Low financial literacy and low awareness of options

Behavioral insights leveraged:

- 3A—First impressions: One negative experience with a new technology can deter a whole community, but a human guide helps ensure a good first impression.
- 3D—Phone Calls Only: Feature phones are widely present in rural areas, but people largely use them for calls.
- 4C—Safety concerns: The need to travel great distances in rural areas increases the risk of carrying cash.

Opportunity area description: There is a strong use case for farmers—who transact regularly, and travel great distances with their produce or with cash—to use mobile payments. USSD-based payments may be most suitable, given they can be used on feature phones and via UPI. This means they can be received by anyone with a UPI address. Where USSD-based payment platforms can be linked to live local agricultural prices online by the government (see Section 3), this could help drive adoption. Regular use of mobile payments could also unlock better access to small business loans through alternative credit scoring methods in future.

Illustrative concept: Mandi money

A “farmer-friendly payment bank at mandis”. Representatives of payment banks would be regularly present at the mandis, allowing them to withdraw and deposit cash easily. They would then onboard both farmers and brokers to mobile money at “key moments in the crop cycle”.



Source: IDEO.org (2018)

7.2 Criteria

Although IDEO.org will share all of these opportunity areas publicly, the organization now faces a choice about which opportunity area(s) to prioritize in the next phase of the human-centered design process: implementation. In this next phase, IDEO.org will continue to refine the most attractive opportunity areas, and develop, test and iterate associated concepts, like the ones above. This would ideally be done in partnership with service providers in India, to enable further co-creation with end users, and for scaling up any successful

To assess the attractiveness of each opportunity area, I have used six criteria, aligned to the overarching considerations of desirability, feasibility and viability commonly used in human-centered design¹¹¹: “importance to users” and “probable impact on user well being” (desirability); “existing enabling environment” and “time to impact” (feasibility); “partner potential” and “market size” (viability).

111 IDEO.org, *The Field Guide to Human-Centered Design*

The chosen criteria are all qualitative, except the final criterion, which estimates the potential market size (# potential users under the poverty line)¹¹². The table below explains the rationale and measurement approach for each criterion.

Six criteria developed to assess attractiveness of each opportunity area, weighted equally

	DESIRABILITY		FEASIBILITY		VIABILITY	
	Importance to users	Impact on user wellbeing	Existing enabling environment	Time to impact	Partner potential	Market size
	1	2	3	4	5	6
Rationale	Desirability should be rooted in addressing important user needs	An opportunity area (OA) that can improve users' financial health and wellbeing more is more desirable	Enabling factors (incl. policy & regulatory environment, tech & human infrastructure and level of user awareness & skills) will impact feasibility	The longer it takes to have an impact, the harder it will be to implement	More viable if there are potential partners interested in OA	It will be more viable/attractive to target a reasonably large market
How measured	Qualitative assessment of importance to users based on field research interviews	Qual. assessment based on findings in peer-reviewed financial inclusion literature, and expert interviews	1. Identify most relevant enabling factors (using case studies) 2. Qual. assessment of the extent to which conditions already in place in India	Qual. assessment based on the theory of change, and on time to impact of similar cases in peer-reviewed research	Qual. assessment of 1. existence of potential partners and 2. interest/energy of partners in OA	1. Identify parameters for user group 2. Estimate # users using demographic data
Units	Very high / high / moderate / low importance	Very high / high / moderate / low impact on user wellbeing	Very good / good / moderate / poor enabling environment	Very short / short / moderate / long time to impact	Very high / high / moderate / low partner potential	# potential users living below \$1.90 poverty line

112 A relatively low poverty line has been used here, of \$1.90 income per person per day. If this line is increased to \$3.20 income per person per day, the market size figures increase by 3-4x

8. Recommendations



Shakti, who leads a women's loan group in Fahua, Bihar. The research team was introducing Shakti to the mobile payments app Paytm, but she and her friend laughed. Her daughter-in-law later commented, "If we don't know how to use an ATM, how can we use Paytm?"

The recommendations for IDEO.org are structured as follows:

- 8.1—Evaluation and prioritization of the four opportunity areas
- 8.2—Additional advantages, disadvantages and uncertainties of the prioritized opportunity areas to keep in mind
- 8.3—Implementation considerations for developing opportunity areas
- 8.4—Long-term recommendations to amplify IDEO.org's impact in India

8.1 Opportunity area evaluation and prioritization

Recommendation: Based on the criteria outlined above, IDEO.org should prioritize the development of opportunity areas A (unlock women) and C (activate youth).

Based on these criteria, opportunity areas A and C are most attractive

Opportunity Area	DESIRABILITY		FEASIBILITY		VIABILITY		Overall
	Importance to users	Impact on user wellbeing	Existing enabling environment	Time to impact	Partner potential	Market size # potential users <\$1.99 poverty line	
A Unblock Women	Very high	High	Moderate	Moderate	High	60 million	Attractive
B Equip Entrepreneurs	Very high	Moderate	Good	Long	Moderate	52 million	Moderate+
C Activate Youth	High/uncertain	Moderate/uncertain	Very good	Short	High	84 million	Attractive
D Connect Farmers	Very high	High	Poor	Moderate	Low	30 million	Moderate

Prioritizing two opportunity areas—not just one—has advantages. Partly it mitigates the uncertainties associated with each (see section 8.2). In addition, as Liedtka et al. observe in *Design Thinking for the Greater Good*, there has been a shift from expecting design thinking to produce “one ‘best’ big idea that can be proved”¹¹³ to a “portfolio of small bets to be tested in the real world”¹¹⁴. It is in this vein that two opportunity areas are recommended, not just one. Within these two areas, there is an expectation that IDEO.org will develop, test and iterate multiple concepts, not just one for each.

A full discussion of the rationale for each of the “ratings” above, and the advantages and disadvantages of each opportunity area under the criteria, is included as Appendix A.

113 Liedtka et al., *Design Thinking for the Greater Good: Innovation in the Social Sector* (New York: Columbia University Press, 2017)

114 Ibid

8.2 Additional advantages, disadvantages and uncertainties of the prioritized opportunity areas

8.2.1 Unblock Women

Advantages: One advantage of developing this opportunity area is that it envisages an important role for agents in the pathway to digital—IDEO.org has significant relevant experience thanks to its *Agents of Change* partnership with the Gates Foundation in East Africa.¹¹⁵ This experience might be very appealing to some potential partners, who will likely be keenly aware of the success of mobile money in East Africa, but may not have direct experience in those markets.

Disadvantages: To be a success, this opportunity area would require a change in India's restrictive gender norms, which are particularly evident around the use of technology and financial services. Although the pay-off is potentially large—as it could bolster women's empowerment more broadly, not just women's financial health¹¹⁶—norm-change is also notoriously difficult to achieve. IDEO.org should look to partner with other organizations with a similar agenda, or build on existing programs that aim to increase women's empowerment.

Uncertainties and mitigation: How to most effectively build on analog behaviors to create a *pathway* to digital financial services is largely unknown. Some startups are trying to digitize women's savings and loan groups—these include Arisan Mapan in Indonesia and Chamasoft and m-PESA Chama in Kenya¹¹⁷. However, these ventures have had limited success, and many have failed¹¹⁸: Accion reports issues with digitizing the

115 Bill and Melinda Gates Foundation and IDEO.org. "Agents of Change". (Webpage) <http://www.mobileagentsofchange.com/>

116 Sunstein, Cass R, "Social Norms and Social Roles" *Columbia Law Review* 96, no. 4 (1996): 903–68. <https://doi.org/10.2307/1123430>.

117 Patel, A. et al., "Digital Savings Circles: Challenges and the Road Ahead". *Accion* (blog), March 10, 2016. <http://blogs.accion.org/fin-tech/digital-savings-circles/>

118 Author's interviews with experts

“trust” and experience of in-person groups.¹¹⁹ Although not exactly the same, IDEO.org could try to learn from these efforts.

8.2.2 Activate Youth

Advantages: IDEO.org should leverage its financial health work with school students in the United States in this opportunity area. Although the context and resources are different, IDEO.org has a strong track record of building popular financial tools for young people such as Moneythink Mobile. IDEO.org can bring learnings from this experience, and use it to attract partners in India. This area might also link with “Unblock Women”, if it succeeds in changing restrictive gender norms around money and digital banking for the next generation.

Disadvantages: This opportunity area focuses on students in education who are receiving government payments. However, although primary education completion rates in India are now high, the net attendance ratio for secondary school is just 54 percent.¹²⁰ Furthermore, user research did uncover a number of students who did not claim their educational allowances, as they said the process is too cumbersome, and most of the benefits would be skimmed off by corrupt officials. This opportunity area likely will therefore likely exclude some young people.

Uncertainties and mitigation: The speed at which other states will require students to have their own bank accounts and pay into them is uncertain. Though many states have professed a desire to do this, the readiness of state governments varies significantly.¹²¹ It would be wise to partner with the state of Bihar first. Additionally, the research team spoke with relatively few school-age students in Bihar—further field research would definitely be helpful for developing and iterating concepts.

119 Patel, A. et al., “Digital Savings Circles: Challenges and the Road Ahead”

120 UNICEF Data. “India: Key Demographic Indicators”. *UNICEF* (webpage), accessed March 25, 2018. <https://data.unicef.org/country/ind/>

121 Author’s interviews with experts

8.3 Implementation considerations

This subsection briefly outlines a set of recommendations for IDEO.org as they move into the implementation phase, and develop the opportunity areas “Unblock Women” and “Activate Youth”. These considerations are around:

- 8.3.1—Concept design
- 8.3.2—Structural supply-side barriers
- 8.3.3—Partners
- 8.3.4—Data privacy
- 8.3.5—Security

8.3.1 Concept design

IDEO.org should consider research into the efficacy of different product design choices (see Section 5), as these could help inform and inspire new concepts. For instance, research suggests that the *design* of savings commitment devices has a significant impact on their efficacy.¹²² It may be more effective to use lockable boxes than envelopes in the concept *bite-sized savings*, associated with the opportunity area “Unblock Women”. This is because having to unlock a box provides additional friction for accessing cash that envelopes do not.

There is an increasing body of learnings about financial inclusion programs for youth—such as New America’s YouthSave Project, which operated in Colombia, Ghana, Kenya and Nepal.¹²³ In developing concepts for the “Activate Youth” opportunity area, IDEO.org could learn from these efforts, and reach out to programs to anticipate and mitigate challenges related to financial inclusion for youth.

¹²² See Section 5

¹²³ New America. “Key Findings from the YouthSave Project”. New America (webpage), accessed March 25, 2018. https://www.newamerica.org/asset-building/youthsave/key-findings-youthsave-project-brief/http://www.savethechildren.org/site/c.8rKLIXMGIpI4E/b.9316585/k.C2CC/Financial_Services.htm

8.3.2 Structural supply-side barriers

In the short term, IDEO.org may be constrained by some of the structural supply-side barriers outlined in Section 6—in particular inadequate service point infrastructure and inconsistent technical infrastructure. IDEO.org should design for inconsistent technical infrastructure, by developing digital tools with low data requirements and download speeds. Better UX can help to alleviate users’ concerns about interrupted or slow online transactions, for instance through a progress or status bar. In finding a partner and a locality to develop and iterate concepts, it is advisable to find somewhere with reasonable service point coverage. This is because both opportunity areas make use of women (in A) and young people (in C) using formal financial services offline at first.

Two other issues—unintuitive UX and unsuitable products for the poor—are well within IDEO.org’s capabilities to address in the near-term, at least on the specific concepts it develops, tests and implements. In the long run, there is significant potential for IDEO.org to help address three supply-side barriers at an industry level (all except inconsistent technical infrastructure)—see Section 8.4, “longer-term recommendations” for more details.

8.3.3 Partners

Identifying the right partner(s) will be critical for developing and iterating concepts for both opportunity areas—and certainly for implementation. Indeed, long-term partnerships are critical to IDEO.org’s approach: “we build deep partnerships because we can’t do this work alone”.¹²⁴

Based on IDEO.org’s standard four criteria for a successful partnership,¹²⁵ and the opportunity areas prioritized, five types of partner are particularly high potential and should be targeted: payments banks, children’s charities, state governments, big tech and agent network managers.

¹²⁴ “Partners | IDEO.org.” IDEO.org. <https://www.ideo.org/partners>.

¹²⁵ 1. Are you tackling a critical problem to improve the lives of the poor?, 2. Do you believe the key to solving the problem lies with the people you’re trying to serve?, 3. Is solving this problem core to your organization’s mission?, 4. Are you positioned to have real impact? Source: <https://www.ideo.org/partners>

- **Payments banks**—These “new” banks created by new RBI regulation (see Section 3) have mostly just become operational in the last year. They tend to be technology-driven and may be more open to partnerships and new concepts given they are just launching. There is more likely to be mission alignment than with a traditional bank, given this regulatory structure was created with the explicit aim of improving financial inclusion.
 - Promising potential partners: FINO, India Post, Paytm
- **Children’s or educational charities**—For “Activate Youth”, partnering with a children’s or educational charity could be an effective way to ensure financial coaching is complementary to the broader curriculum and gains the trust of schools, teachers and the Indian government. Indeed, OECD guidelines recommend incorporating financial literacy training into the broader curriculum, rather than being a stand-alone initiative.¹²⁶ For instance, UNICEF Innovation’s UpShift program positions financial literacy as part of a broader program on “twenty-first century skills”.¹²⁷
 - Promising potential partners: UNICEF India / UNICEF Innovation, Teach for India, Save the Children India
- **State governments**—“Activate Youth” builds on government scholarships that are sent electronically to children’s bank accounts. It therefore makes sense to partner with those few state governments that already use this approach, or are developing it.
 - Promising potential partners: State government of Bihar
- **Tech companies**—Large technology companies such as Google and Facebook may increasingly be good partners, for three reasons. First, because they have recently launched FinTech products in India (Google Tez and WhatsApp Pay respectively), second, because they face increasing scrutiny over their social impact, and third, because it is in their interest to encourage both women and young people to use financial services online. IDEO.org has an

126 OECD. OECD INFE Guidelines on Financial Education in Schools. OECD, June 2012. <https://www.oecd.org/daf/fin/financial-education/2012%20Schools%20Guidelines.pdf>

127 UNICEF Innovation. “UPSHIFT” UNICEF Innovation (blogs), accessed March 25, 2018. <http://unicef-stories.org/tag/upshift/page/2/>

advantage that it can interface directly with US-based companies’ global public policy and social impact teams in San Francisco, given its presence there.

- Promising potential partners: Google, Facebook/WhatsApp, Paytm
- **Banking correspondent (agent) network managers**—Although they tend to work in concert with financial service providers rather than alone, agent network managers may be a valuable partner as part of a broader coalition. Their experience with agents across a wide range of service providers—and their scale—would be helpful in exploring how to ensure that women and young people feel comfortable and confident using their services.
 - Promising potential partners: Oxigen, EKO, FINO Paytech

8.3.4 Data privacy

In 2017, the Indian Supreme Court stated that Indians have a right to privacy.¹²⁸ At the same time, there have been concerns that the personal data of public benefit recipients have been exposed due to the mismanaged roll-out of Aadhaar in some areas. Some interviewees also professed concern that there is not enough focus on users’ privacy in digital financial inclusion projects.¹²⁹

In this context, the importance of ensuring privacy—and being able to communicate data usage clearly to users with potentially low digital and financial literacy levels—is of paramount importance. Some experts believe that regulation and legislation around data privacy is inevitable in the next few years.¹³⁰ In this context, IDEO.org take a “privacy by design” approach,¹³¹ which “promotes privacy and data protection compliance

128 Arun, Chinmayi. “The Implications of India’s Right to Privacy Decision”. *Council on Foreign Relations* (blog), September 13, 2017. <https://www.cfr.org/blog/implications-indias-right-privacy-decision>

129 Author’s interviews with experts

130 Author’s interviews with experts

131 Information Commissioner’s Office, “Privacy by Design” *Information Commissioner’s Office* (web-page). <https://ico.org.uk/for-organisations/guide-to-data-protection/privacy-by-design/>

from the start”.¹³² Indeed, there is an opportunity to contribute to higher standards and best practices around data privacy for digital tools in India, especially given the spotlight on these issues following the Supreme Court ruling.

8.3.5 Security

IDEO.org should consider both physical and data security. Concepts associated with either opportunity area would almost certainly involve storing and analyzing users’ personal and financial data, most likely in partnership with a financial service provider. IDEO.org should ensure it has robust data security measures in place, and take steps to review partners’ information security policies and practices as well.

For *Unblock Women*, concepts such as the *bite-sized savings* envelopes would require cash savings to be kept at home by users, and for agents to deposit them on users’ behalf. Although both practices are common, IDEO.org should review partners’ security protocols: there may be process improvements or interventions (for example, providing users with a lockable box) that could reduce the risk of theft.

8.4 Long-term recommendations to amplify IDEO.org’s impact in India

The recommendations in this section necessarily focus on which opportunity areas to prioritize from IDEO.org’s recent design sprint, and how to develop them further. However, there are longer-term opportunities for IDEO.org to amplify its impact. These are also partly designed to address some of the supply-side barriers outlined in Section 6. There are four main opportunities. The first and second are intended to be complementary to the recommendations outlined above and could be implemented alongside them. The third and fourth represent potential focus populations for future design sprints.

¹³² Ibid.

- 8.4.1—Advocate for improved consumer protection at a policy level
- 8.4.2—Leverage IDEO.org’s *Tools for Design* to build HCD capacity in India
- 8.4.3—Design for the most excluded
- 8.4.4—Design for agents

8.4.1 Advocate for improved consumer protection at a policy level

- How might we help policy-makers understand the dangers poor people face from financial fraud?
- How might we equip change-makers with stories and concepts to advocate for stronger consumer protection in India?

Design research revealed that many individuals struggle to know how to trust a financial institution or a specific product. This is closely linked to the issue of low financial literacy outlined in Section 6. People typically rely on people they know to vouch for an organization, but this does not always help to avoid scams. For those that are using digital financial services, concerns over their reliability and safety, and the failure or length of time taken to rectify errors (such as a failed money transfer), were critical issues. Expert interviews positioned the lack of a robust consumer protection framework and enforcement agency in India as a “major policy gap”.¹³³ There is an opportunity for IDEO.org to tell the stories of individuals that have suffered compellingly, and to showcase potential concepts for addressing the issue. Such initiatives could help the proposal of an empowered consumer protection enforcement agency seem more tangible and urgent. By explicitly linking the consumer protection problem to a reluctance to use digital financial services—a key priority of the Indian government—IDEO.org can help motivate action.

133 Author’s interviews with experts

8.4.2 Leverage Tools for Design to build human-centered design capacity in India

- How might we help improve the capacity of different players in the digital financial ecosystem in India to use human-centered design independently?
- How might we tackle the widespread problems of poor UX and lack of innovation in financial product design for the poor in India?

As outlined in Section 6, there are important supply-side barriers around the quality of UX, and unsuitability of financial products for the poor. This problem could be mitigated by broader training in and use of human-centered design. As IDEO.org’s own *Impact* report states, “To truly scale the kind of design-led innovation we think the social sector needs, we have to get human-centered design into the hands of everyone working on the problems of poverty”.¹³⁴

Interviews suggest that comparatively little training in HCD is available in India.¹³⁵ There is an opportunity for IDEO.org to leverage their existing, highly popular *Tools for Design*, including *The Field Guide to Human-Centered Design*, and the online *Design Kit*, and adapt them for the Indian market. This could include translation into Hindi and other local languages. To address the barriers mentioned above, IDEO.org could specifically target MFIs, agent networks, and socially-minded FinTech startups. One way of doing this could be to partner with Cashless Catalyst’s *Fintech for the Last Mile* incubator. The material could also be adapted to focus on financial health examples from IDEO.org’s work in other countries. It should also incorporate—or link to—training on UX, especially UX for users with low tech and financial literacy, and poor connectivity.

134 IDEO.org. *Impact: A Design Perspective*

135 Author’s interviews with experts

8.4.3 Design for agents

- How might we enable agents to assume a greater role in their communities, and go beyond providing basic financial services?
- How might we improve the value proposition for agents, enabling providers to better recruit and retain high-quality agents?

Design research showed a clear opportunity to better harness agent networks, given the trust local communities often place in agents, especially in more rural areas. It also found that people lack personal financial advice and information. The opportunity area *Elevate Entrepreneurs* envisages trusted agents providing personal financial advice and coaching to their local communities. However, experts were skeptical about how feasible this would be, given the poor quality of agent networks in India compared with other countries.¹³⁶

Instead, a more concerted effort may be needed to tackle these deficiencies—and to address the “inadequate service point infrastructure” supply-side barrier outlined in Section 6. Some of the issues around banking correspondents require policy solutions and business model innovations. For instance, the fact that profitability for agents in India is lower than in Pakistan, Bangladesh, Kenya, Tanzania and Uganda, and that 28 percent of agents in India report making losses,¹³⁷ surely needs to be addressed if agent coverage and quality is to improve. In future, IDEO.org could consider an Indian “version” of its “Agents of Change” work in East Africa.

8.4.4 Design for the hardest-to-reach

- How might we improve access to financial services for those most excluded from India’s digital revolution?

136 Sharma, Misha et al., *Agents of Change*, Center for Financial Inclusion, Accion, December 2017. https://www.centerforfinancialinclusion.org/storage/Agents_of_Change_India_FINAL.pdf

137 Mehrotra, A. et al., “Agent Network Accelerator Survey: India Country Report 2015”, *Helix Institute of Digital Finance*, August 2015, http://www.helix-institute.com/sites/default/files/Publications/Agent%20Network%20Accelerator%20Survey%20-%20India%20Country%20Report%202015_0.pdf

- How might we design a bridge to the digital world for populations who may never use mobile technology directly?

In a future design sprint, IDEO.org could consider focusing narrowly on a specific “hard-to-reach” group, that is especially excluded from the government’s digital transformation. Examples include those who do not have Aadhaar numbers; manual laborers whose fingerprint authentication often fails; the poor elderly, who are least likely to be able to read, or to be financially or digitally literate; and the physically disabled, who often face social marginalization and often find it especially difficult to reach financial service points.

The flipside of addressing these groups is, of course, that it could take more resources to design and implement effective solutions. It may therefore also be more difficult to find private sector financial service providers to partner with, as these users are likely to be more costly to serve, and less profitable. Funding from the government or from a philanthropic foundation may be needed to subsidize the design process and service delivery. However, there is surely a case to be made that in the excitement of the digital revolution, these users’ needs have not been adequately addressed.

9. Conclusion



Participants in a youth focus group in Bihar showing off their Google Tez apps. All the men had multiple payment apps installed on their phones, but the one woman—Dhwani—had none, despite owning a smartphone.

The Indian government is pursuing a national digital revolution, and the digitization of financial services is a key part of that. This revolution offers enormous potential benefits for India’s society and economy, but also risks further disadvantaging the most vulnerable.

IDEO.org has an enormous opportunity to help make India’s digital transformation more inclusive, through improving digital financial services for the poor. This report has outlined both short and long-term recommendations for doing so. In the short term, to progress the recent design sprint, IDEO.org should prioritize opportunity areas A and C: “Unblock Women” and “Activate Youth”. As this work moves into the implementation phase, IDEO.org should carefully consider concept design, structural supply-side barriers, partners, data privacy and cybersecurity. In the longer term, IDEO.org could amplify its impact by (1) advocating for better consumer protection at a policy level, (2) building capacity in HCD within India’s digital financial inclusion ecosystem, (3) designing for India’s agents, and (4) designing for the most excluded, hard-to-reach populations.

Appendix

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- A. Detailed assessment of opportunity areas
- B. Organizations interviewed
- C. Sample Discussion Guide—Women’s Loan Group
- D. List of activities used in group interviews
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- F. Steps required to use USSD payments in India with a feature phone

Appendix A: Detailed assessment of opportunity areas

Opportunity Area (A): Unblock Women

Importance to users: **Very high**

User research and observations demonstrated a clear desire for better financial tools and advice for saving and managing money amongst women.

Impact on user well being: **High**

This opportunity area has a large focus on goal-based savings—which typically have a high impact on the welfare of the user and their family, in being able to manage financial shocks, and improve nutrition, health and educational outcomes (see Section 5). It therefore can be considered high impact.

Existing enabling environment: **Moderate**

As part of the bridge from analog to digital financial services, this opportunity area relies on agents. However, given the relatively low number of agents per capita in India relative to other countries, reliance on this infrastructure could prove challenging in the short term. However, as payments banks expand, this issue is likely to be addressed, at least in some areas, in the medium term.

Time to impact: **Moderate**

Since this opportunity area is reliant on behavior change, and accumulating savings over time, it will likely take some time to have an impact.

Partner potential: **High**

Improving financial health for women in India is a clear priority for many influential foundations and NGOs—including the Gates Foundation and Women’s World Banking. It is also increasingly an area of interest for children’s organizations, who recognize that better financial health and savings behaviors amongst women can positive impact educational, health and nutrition outcomes for children in low-income families.

Given the emphasis on bridging the gap between analog and digital financial behaviors, and the use of agents, this opportunity area is also likely to be attractive to payments banks and MFIs.

Market size potential: ~60 million (**high**)

This market size estimate includes all women in India aged 15–64 below the poverty line of \$1.90/day. Using the lower middle income line of \$3.20/day, the market size rises to around 230 million.¹³⁸

Overall: **Attractive**

¹³⁸ Calculated, based on data from the following sources: World Bank (2012, 2016); UNICEF (2016)

Opportunity Area (B): Equip Entrepreneurs

Importance to users: **Very high**

User research demonstrated a very clear need for impartial, high quality financial advice and coaching for the poor. The enthusiasm of attendees of the financial advice prototype class—an early concept idea associated with this opportunity area—underlined this.

Impact on user wellbeing: **Moderate**

Academic research suggests that the impact of entrepreneurship and financial literacy training is mixed (see Section 5), and in the case of women in India may partially depend on the extent of the social restrictions they face.¹³⁹

Existing enabling environment: **Moderate**

The lack of consumer protection infrastructure and regulation makes it difficult to comprehensively protect users from fraud and scams. Although agents could be leveraged to provide financial coaching, the number of agents per capita is low, and most providers do not have good data to identify which agents are most reliable and trusted, and which are not.¹⁴⁰ However, some payments banks are aiming to expand their reach by using field officers with tablets (rather than agents); this professionalization and flexibility could serve as helpful infrastructure.

Time to impact: **Long**

This opportunity area emphasizes the ability of low-income individuals self-employed in agriculture to grow their incomes over time, by more effectively investing in seeds, fertilizer and equipment, and using mobile technology to use mobile payments and access daily, accurate market prices.

¹³⁹ <https://pubs.aeaweb.org/doi/pdf/10.1257/aer.100.2.125>

¹⁴⁰ Expert interview

However, the advice on avoiding fraud could theoretically have an immediate impact.

Partner potential: **Moderate**

There are some agricultural NGOs and MFIs which may be interested in this opportunity area. However, a number of expert interviews emphasized the reluctance of financial service providers to hold or even to fund financial coaching programs.¹⁴¹

Market size potential: ~52 million (**moderate**)

This market size estimate includes all adults aged 15–64 below the poverty line of \$1.90/day, who live in rural areas and are self-employed. Using the lower middle income line of \$3.20/day, the market size rises to around 200 million.¹⁴² However, if any interventions were to include urban areas, the market size would be significantly higher.

Overall: **Moderate**

Opportunity Area (C): Activate Youth

Importance to users: **High** (but uncertain)

This opportunity area is relatively nascent, in that it is partly predicated on digitized G2P payments that are paid directly into students' bank accounts, which is a very recent policy and only operational in Bihar and a few other states. However, we did clearly see reliance among parents on their children for using technology and often also accessing financial services (for instance, depositing money at a bank branch, or learning how to use an ATM card). In this respect, this opportunity area does address a clear user need.

¹⁴¹ Expert interview

¹⁴² Calculated, based on data from the following sources: World Bank (2012, 2016); UNICEF (2016)

Impact on user wellbeing: **Moderate** (but particularly uncertain)

Experts hypothesize that delivering financial literacy education *alongside* providing formal financial services and a reason to use them could be quite effective¹⁴³. The provision of student bank accounts and scholarships and educational subsidies paid direct to school students presents this opportunity; but as this is relatively new, it has not yet been studied¹⁴⁴. So whilst we may expect at least a moderate impact, this is particularly uncertain.

However, the probable impact of activating youth to help their parents with digital financial services is more clear—but is also largely unstudied.

Existing enabling environment: **Very high**

The existing enabling environment is very high in states like Bihar, given the provision of student accounts and educational payments direct to students. Schools also represent a type of infrastructure that could serve as a channel for financial coaching.

Time to impact: **Short**

In states where students already have bank accounts and are receiving government payments, the impact of compelling financial education and digital services could be felt quite quickly. For instance, if students are able to start using their accounts in more advanced ways (not just withdrawing); can start trialling digital financial tools (such as mobile payments), and start teaching their parents, the impact could be seen quite quickly. This is especially true given adoption of technology and new products is typically faster and easier amongst young people.¹⁴⁵

Partner potential: **High**

The Indian government is a clear potential partner in this opportunity area, as they have a clear incentive to help students better manage their money,

¹⁴³ Interviews with financial inclusion researchers and academic experts

¹⁴⁴ Expert interviews

¹⁴⁵ Expert interview

and to use mobile technology effectively, given their commitment to financial inclusion and the JAM trinity.

In addition, children's charities such as UNICEF may be interested in partnering, given the potential for better financial health of young people to improve their welfare outcomes and girls' empowerment.

Finally, financial service providers could also be potential partners. The investment of many banks in high-income countries to add incentives for account opening for students and children is driven by the recognition that, once an account has been opened at this age, they are unlikely to switch. There could be a similar business rationale in this case, despite the fact that initial balances are likely to be low.

Market size potential: 83 million (**very high**)

This market size estimate includes all children aged 5–19 below the poverty line of \$1.90/day. Using the lower middle income line of \$3.20/day, the market size rises to around 205 million.¹⁴⁶

Overall: **Attractive**

Opportunity Area (D): Connect Farmers

Importance to users: **Very high**

We observed a clear need among farmers in being able to better manage their finances and commercial activity, and to reduce risk and uncertainty. Farmers currently typically guess when to sell their produce based on what they think the daily price will be, travel significant distances to reach their local mandi (market), and worry about carrying cash back home when they get it. They struggle to access credit to grow their businesses, and are often unaware of mobile payment options, even though most have access to a feature phone.

¹⁴⁶ Calculated, based on data from the following sources: World Bank (2012, 2016); UNICEF (2016)

Impact on user well being: **High**

The welfare impacts of mobile payments are well-established, at least in East Africa (see Section 5).

More specifically for farmers, one study in Niger found that the introduction of mobile phones in Niger improved the performance of grain markets. Mobile phones reduced grain price differences across markets by 20 percent, with even larger increases for markets that were further apart and connected by poorer-quality roads. They led to reduced search costs, more market information and increased efficiency moving goods across the country (Aker, 2008).¹⁴⁷

Existing enabling environment: **Low**

The greatest difficulty with this opportunity area is that infrastructure is inconsistent, and mobile tech literacy is low. For instance, 74 percent adults do not know how to text—which makes using mobile money very difficult (see appendix for steps required to use USSD payments on a feature phone). Mobile connectivity is also poor and unreliable, especially in rural areas, which can result in failed transactions.

Time to impact: **Moderate**

Theoretically, this opportunity area could see impact relatively quickly. The use of mobile payments requires behavior change—which takes time—and sufficient adoption within a user's ecosystem to be useful. But elements such as providing live agricultural prices and advice could have an impact much sooner. Building sufficient data to be able to access alternative credit (through making digital payments), will also take time.

147 Aker, Jenny C., Does Digital Divide or Provide? The Impact of Cell Phones on Grain Markets in Niger (October 1, 2008). Center for Global Development Working Paper No. 154. Available at SSRN: <https://ssrn.com/abstract=1093374> or <http://dx.doi.org/10.2139/ssrn.1093374>

Partner potential: **Low**

There is a clear reluctance among banks—especially FinTechs, who are innovating the most with technology in financial services—to invest in USSD and any feature phone-based services.¹⁴⁸

On the other hand, the Reserve Bank of India has clearly indicated that it believes improved USSD payments are important for financial inclusion—its Committee on Medium-term Path on Financial Inclusion asserted that the technology: “has huge potential for reducing the dependence on cash as well as brick-and-mortar branches and should be promoted by getting issues of session drop and call/session rates resolved. A multilingual application needs to be developed for better acceptance and ease of access to people across the country.” It is therefore possible the RBI could lend support to find a partner.

Market size potential: 30 million (**low**)

This market size estimate includes all adults aged 15-64 below the poverty line of \$1.90/day, who live in rural areas and are self-employed in agriculture. It assumes that all of these adults have access to a feature phone.¹⁴⁹ Using the lower middle income line of \$3.20/day, the market size rises to around 205 million.¹⁵⁰ However, if any interventions (such as improved feature phone payments), were publicized more broadly than farmers, the market size would be significantly larger.

Overall: Moderate

¹⁴⁸ Expert interviews

¹⁴⁹ Note this is a widely-held assumption; source: expert interview.

¹⁵⁰ Calculated, based on data from the following sources: World Bank (2012, 2016); UNICEF (2016)

Appendix B: Organizations interviewed

Foundations and Nonprofits:

- Accion (x2)¹⁵¹
- Bill and Melinda Gates Foundation, Financial Services for the Poor team (x2)
- Cashless Catalyst (x2)

Think-tanks and research-focused organizations:

- Better Than Cash Alliance, UN Capital Development Fund
- Caribou Digital
- Consultative Group to Assist the Poor (CGAP), World Bank
- Evidence for Policy Design (EPoD), Harvard University
- IFMR (x2)
- iSPIRIT

FinTech companies and startups

- Bloom Finance
- Google Tez
- Shubh Loans
- Future State

Industry associations:

- GSMA

¹⁵¹ "x2" indicates two people from the same organization were interviewed

Appendix C: **Sample Discussion Guide—Women’s Loan Group**¹⁵²

BRIEF

- *Describe project. Stress that we want to learn from you.*
- We are from IDEO.org, a nonprofit, and we want to learn what you think about money in India and in your household. We’re hoping to learn from you and your specific needs and maybe build a tool or an experience that might help people.
- *There are no wrong answers. You are the expert. If you need to end it we can.*
- *Record permission to take photographs.*

DISCUSSION

Introduction [10-15 min]

- Let’s introduce ourselves by stating our name.
- Where are you from? How many children do you have?
- Do you all know each other well?
- Do you have a bank account?
- Do you own / have access to a phone? What type of phone is it? Do you share it? What do you use it for?
- Can you explain to me how this savings group works?
 - How often do you meet? Who organizes the meetings?
 - How do you decide the terms of your loan? Who is included in deciding?

¹⁵² Source: IDEO.org/MicoSave field research team. Note this is a working document that the author contributed to, and was intended to guide the discussion only. Not all questions were used.

- How do you gather the money for the loan payment? Does anyone help you?
- What amount is your payment?
- How do you track loan repayments?
- How do you repay loan installments?
- What amount is your your loan?
- How do you receive the loan amount?
- What will you use your loan money to purchase?
- After completing this loan, would you consider getting a loan from the bank? Why or why not?
- What do you spend money on?
 - What's your most recent big purchase?
 - Do you keep a written record of your income and expenses?
 - How do you pay for things? (debit card, paytm etc.)
 - What is your responsibility with money in your household compared to your husband?
 - How does your family generate income?

User Journeys [30-40 min]

- Tell me about the experience of joining and opening an account.
 - How did you decide which account to open and where?
 - What did you have to do to open the account? How convenient was it? How much time did it take?
 - How did you feel opening the account?
 - Have you opened something other than a savings account and how? (Debit card, loan, insurance)
- Tell me about your everyday banking experiences

- How frequently do you use your bank account and why?
- Do you visit your bank to receive government payments? If not, how do you receive them? How satisfied are you with the experience?
- Tell me about the first time you visited a branch
- Tell me about the last time you visited a branch
- What are the two best things about your bank?
- What are the two worst things?
- Tell me about a time you felt frustrated with your bank?
- What went wrong?
- How did that make you feel?
- Has that happened again?
- Have you ever experienced a financial shock? Can you tell me about that time?
 - Who did you ask for help or advice?
 - How did you cope with the situation?
 - Are you worried about it happening again?
 - [If yes] what would you do next time?
- Have you heard of CICO agents?
 - Why did you visit / for which services?
 - What was your experience?
 - Do you always go to the same CICO agent?
 - What are the two best things about your CICO agent?
 - What are the two worst things?

CONCEPT CO-DESIGN [1 hour]

- Financial Progress Tracker
 - This concept is for a tool to help you track financial progress— you could mark income and expenses, and mark when your payments are due for loans or savings. You could also color in boxes to monitor your progress towards your goal. What do you think about this idea?
 - How do you currently track progress?
 - How is this different from your existing monitoring practice?
 - Would it help to visualize it?
 - Which form do you like, a book, calendar, or poster?
 - What value do you think it will add?
- My Child's Saving Account
 - This concept is for a locked savings account for your child. The money you put in it could only be used for school fees, and could be transferred to the school using only your mobile phone. Any extra money would build and become available when your child turns 18 years old. What do you think about this idea?
 - How do you currently save for your child's future?
 - How do you currently pay for school fees?
 - Would you enroll in this account? If not, why?
 - What else would you like to add to this service?
- Women's Bank Day
 - This concept is for an event at your local bank branch announcing the introduction of a new women's only bank counter line. On this day, women who sign up for a new

account will get 250 rupees deposit from the bank that they can access after 1 year. What do you think about this idea?

- Would you go to this event? Would you sign up?
- How often do you currently go to the bank?
- How do you feel when you go to the bank?
- Would a women's only line affect your experience?
- Do you think more women would go to the bank? Why?
- Mobile Agent
 - This concept is for an agent who will come to your house to give financial advice and do cash in/cash out services. What do you think about this idea?
 - Who would you trust to give you financial advice? What are the qualities of this person?
 - What would you like to learn about?
 - Would you feel comfortable with this agent coming to your house? Would that be better than going to their stand?
 - How far do you currently go for cash in/ cash out services?
- Savings Reward
 - This concept is for earning incentives on depositing money into your savings account. If you deposit money for 5 consecutive months, the bank will make the deposit for you on the 6th month. What do you think about this idea?
 - Would this make you save more frequently?
 - If this incentive existed, would you tell your community?
 - Do you think this would affect their savings?
 - Would you rather deposit money at a bank or with an agent?
- SMS app

- This concept is for a sms app on a feature phone that allows you to send and receive money, and sends you payment reminders. What do you think about this idea?
- Do you currently use sms? Have you heard of any apps like this?
- Would this be useful?
- How do you currently remember when your payment is due?
- How else could you be reminded?
- Would you want to try this product?
- Which of these concepts do you like best? Which would be most helpful to you? Can you rank them from your favorite to least favorite?

Appendix D: **List of activities used in group interviews**

- *Concept feedback.* Interviewees were presented with between 3 and 5 ideas (one at a time) for improving financial services, illustrated using sketches, with a voice-over explanation. Concepts were presented one at a time, and participants were asked for their feedback and reactions. Interviewees were then asked to rank the concepts according to their favorite. The activity was intended to stimulate discussion about interviewees' current financial behaviors, and get an indication of which type(s) of products, services and experiences might bring most value.
- *Money flows.* In the youth group in rural Bihar, and in some individual interviews, we gave participants a worksheet, and asked them to list income flows, stored money, and expense flows. We also asked them to indicate which of these payments and accounts was digital, and which were analog. This activity was designed to get participants thinking about their financial activity, and serve as a prompt for discussion.

- *Take A Stand.* In the youth group in rural Bihar, we quickly discovered that all but one participant had multiple payment apps on their smartphone. We therefore decided to divide the payment app users into three groups, and asked each group to advocate for one particular app, outlining the pros and cons related to other apps. This activity was designed to tease out which aspects participants most value about digital banking apps, and how they are typically used.
- *Prototype testing.* At the end of a group interview with a woman's Joint Loan Group, we gave the leader of the group a smartphone with a popular digital payments app pre-installed (Paytm), and gave her and her daughter-in-law a tutorial on how to use it. The woman did not currently use a smartphone. We pre-loaded the account with about 300 rupees, and gave her a small journal. We asked her to try using it however she wanted, and to record any transaction she made, and whether it was a positive or negative experience. Another prototype example was a financial advice class we conducted in a village, which covered topics including goal-based savings, how to prevent financial fraud, when to apply for a loan to grow your business, and how to send money with a feature phone.

Appendix E: **Technology used by a payments bank (FINO branch, in Patna, Bihar)**



Appendix F: Steps required to use USSD payments in India with a feature phone¹⁵³



153 Source for these images: National Payments Corporation of India, "Discover BHIM" *National Payments Corporation of India* (webpage), accessed March 25, 2018. <https://bhimupi.org.in/>

References

- "Beyond Cash," Global Innovation Exchange, last modified January 11, 2016. <https://www.globalinnovationexchange.org/beyond-cash>.
- "Bihar through Figures". *Directorate of Statistics, Planning & Development Dept., Govt. of Bihar*, accessed March 2, 2018. <http://planning.bih.nic.in/Figures.htm>
- "District Wise Statistics," NITI Aayog (National Institution for Transforming India), Government of India. Accessed January 3, 2018. <http://niti.gov.in/best-practices/district-wise-statistics>.
- "Financial Health | Programs | IDEO.Org." IDEO.org, accessed October 22, 2017. https://www.ideo.org/programs/financial_health.
- "India—Key Findings." MIX. Accessed January 4, 2018. <http://finclusionlab.org/country/India/analytics>.
- "India's Poverty Profile." World Bank. Accessed February 10, 2018. <http://www.worldbank.org/en/news/infographic/2016/05/27/india-s-poverty-profile>.
- "NPCI Says UPI Now Offered by 50 Banks in India." *The Times of India*, May 2016, 2017. <http://timesofindia.indiatimes.com/business/india-business/npci-says-upi-now-offered-by-50-banks-in-india/articleshow/58847093.cms>.
- "Partners | IDEO.org." IDEO.org. Accessed March 24, 2018. <https://www.ideo.org/partners>.
- "Pradhan Mantri Jan-Dhan Yojana—Progress Report." *Department of Financial Services | Indian Ministry of Finance*. Last updated March 14, 2018. <https://www.pmjdy.gov.in/account>.
- "Prime Minister Modi Goes to Washington." *Center for Financial Inclusion Blog* (blog), June 7, 2016. <https://cfi-blog.org/2016/06/07/prime-minister-modi-goes-to-washington/>.
- "Raisina 2018 | Digital Money: Innovating with India for the World". *Better Than Cash Alliance* (video), January 2018. <https://www.betterthancash.org/tools-research/videos>.
- "S&P GLOBAL FINLIT SURVEY—METHODOLOGY". *Global Financial Literacy Excellence Center, George Washington University* (webpage). Accessed March 25, 2018. <http://gflec.org/sp-global-finlit-survey-methodology/>.
- "The Story of M-PESA." USAID. Accessed November 16, 2017. <https://www.usaid.gov/news-information/videos/how-mobile-banking-can-transform-development-0>.
- Abrams, Corinne. "Are You a Credit Risk? Indian Banks Dig Deep in Your Phone to Find Out." *Wall Street Journal*. November 23, 2017. <https://www.wsj.com/articles/are-you-a-credit-risk-indian-banks-dig-deep-in-your-phone-to-find-out-1511433007>.
- Aggarwal, Smita. "India Shows the Way to Innovate for Financial Inclusion." *Omidyar Network* (blog), March 7, 2017. <https://www.omidyar.com/india-financial-inclusion>.
- Auerswald, Philip and Gupta, Arvind. "How India Is Moving Toward a Digital-First Economy." *Harvard Business Review*, November 8, 2017. <https://hbr.org/2017/11/how-india-is-moving-toward-a-digital-first-economy>.
- Arun, Chinmayi. "The Implications of India's Right to Privacy Decision". *Council on Foreign Relations* (blog), September 13, 2017. <https://www.cfr.org/blog/implications-indias-right-privacy-decision>
- Balasubramanian, Shyam. "'Less-Cash' First, 'Cashless Society' next: PM Narendra Modi Appeals in 'Mann Ki Baat' Radio Address." *The Times of India*, November 27, 2016. <http://timesofindia.india-times.com/india/Less-cash-first-cashless-society-next-PM-Narendra-Modi-appeals-in-Mann-ki-Baat-radio-address/articleshow/55646835.cms>.
- Balooni, Amit. "Payments Banks in India: Challenges and Opportunities." *Lets Talk Payments* (blog), February 28, 2017. <https://letstalkpayments.com/payments-banks-in-india-challenges-and-opportunities/>.

- Banerjee et al., "Do Credit Constraints Limit Entrepreneurship? Heterogeneity in the Returns to Microfinance". Working paper (July 2015) http://faculty.wcas.northwestern.edu/~cgk281/credit_entrepreneurship.pdf
- Better Than Cash Alliance. "Why Digital Payments". *Better Than Cash Alliance* (webpage), accessed March 25, 2018, <https://www.betterthancash.org/why-digital-payments>
- Bill & Melinda Gates Foundation, and the Better Than Cash Alliance, *The Opportunities of Digitizing Payments*. (Washington DC: The World Bank, August 2014). http://siteresources.worldbank.org/EXTGLOBALFIN/Resources/8519638-1332259343991/G20_Report_Final_Digital_payments.pdf
- Bill & Melinda Gates Foundation and IDEO.org. "Agents of Change". IDEO.org (webpage) accessed 25 March 2018 <http://www.mobileagentsofchange.com/>
- Bull, Greta. "Four Drivers of Change for Financial Inclusion in 2017." *CGAP*, January 3, 2017. <http://www.cgap.org/blog/four-drivers-change-financial-inclusion-2017>.
- Bull, Greta. "India Has Built the Rails — Will Passengers Climb Aboard?" *CGAP*, January 26, 2017. <http://www.cgap.org/blog/india-has-built-rails-%E2%80%94-will-passengers-climb-aboard>.
- Centre for Digital Financial Inclusion. *Going Cashless? Perceptions, usage and behaviour towards digital payments in India: pre and post demonetisation*. New Delhi: Institute for Financial Management and Research, 2017.
- CGAP and Glenbrook. "Digital Finance and Interoperability: 20 Country Scan." September 2016. <https://www.slideshare.net/CGAP/digital-finance-and-interoperability-20-country-scan>.
- Chada, Sakshi. "PMJDY: Commendable Growth, Yet Low-Hanging Barriers Persist." *CGAP*, August 25, 2016. <http://www.cgap.org/blog/pmjdy-commendable-growth-yet-low-hanging-barriers-persist>.
- Chakrabarti, R., and Sanyal, K. "Microfinance and Financial Inclusion in India" in Gopalan, Sasidaran and Kikuchi, Tomoo, eds. *Financial inclusion in Asia: Issues and Policy Concerns*. London: Palgrave, 2016.
- Chancel, Lucas, and Piketty, Thomas. "Indian income inequality, 1922-2014: From British Raj to Billionaire Raj?". WID World Working Paper Series, 2017/11 July 2017, <http://wid.world/wp-content/uploads/2017/12/ChancelPiketty2017WIDworld.pdf>.
- Chandrashekar, Anoushaka and Sharma, Misha. "The Longest Last Mile: Are India's Poor Ready for Digital Financial Services?" *NextBillion*, November 2, 2017. <https://nextbillion.net/the-longest-last-mile-are-indias-poor-ready-for-digital-financial-services/>.
- Chen, Greg, and Raman, Anand. "Should Other Countries Build Their Own India Stack?". *CGAP* (blog), April 6, 2017, <http://www.cgap.org/blog/should-other-countries-build-their-own-india-stack>
- Deloitte. *RBI Guidelines for Licensing of Payments Bank: Opportunities and Challenges*. Deloitte, December 2014, <https://www2.deloitte.com/content/dam/Deloitte/in/Documents/financial-services/in-fs-deloitte-pov-on-payments-banking-license-guidelines-noexp.pdf>
- Desai, Sasi, Jasuja, Nipun and Khandekar, Piyush. "Your Guide to UPI — the World's Most Advanced Payments System." *Wharton Fintech* (blog), May 11, 2017. <https://medium.com/wharton-fintech/your-guide-to-upi-the-worlds-most-advanced-payments-system-b4e0b372bf0b>.
- Digital India. "About Digital India." *Ministry of Electronics & Information Technology, Government of India* (webpage), updated March 23, 2018. <http://digitalindia.gov.in/content/about-programme>
- Digital India. "What is Digital India?" *Digital India* (webpage), accessed March 25, 2018. <http://www.cmai.asia/digitalindia/>
- Dixit, Pranav. "Amazon Is Asking Indians To Hand Over Their Aadhaar, India's Controversial Biometric ID, To Track Lost Packages." *BuzzFeed*. November 27, 2017. <https://www.buzzfeed.com/pranavdixit/amazon-is-asking-indians-to-hand-over-their-aadhaar-indias>.
- Dupas, Pascaline and Robinson, Jonathan. "Why Don't the Poor Save More? Evidence from Health Savings Experiments". *American Economic Review* 2013, 103(4): 1138–1171 <http://dx.doi.org/10.1257/aer.103.4.1138>
- Field, Erica and Pande, Rohini. "Give Women Credit." *Ideas for India*, November 23, 2017. <http://ideasforindia.in/article.aspx?article=Give-women-credit>.

Field, Erica, Pande, Rohini and Rigol, Natalia, Schaner, Simone, and Moore, Charity Troyer. "An Account of One's Own: Can Targeting Benefits Payments Address Social Constraints to Female Labor Force Participation?". October 17, 2016. https://www.bc.edu/content/dam/files/schools/cas_sites/economics/pdf/Seminars/SemF2016/Schaner_FBA.pdf

Gopalan, Sasidaran and Kikuchi, Tomoo, eds. *Financial inclusion in Asia: Issues and Policy Concerns*. London: Palgrave, 2016.

GSMA. *The business case for payments banks in India*. GSMA, December 2016, available at https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2016/12/GSMA_The-business-case-for-payments-banks-in-India_2016.pdf

Hagerman, Andy. "Spotting the Patterns: 2017 Trends in Design Thinking." *Stanford Social Innovation Review*. October 9, 2017. https://ssir.org/articles/entry/spotting_the_patterns_2017_trends_in_design_thinking.

Hart, Maura. "Keeping Our Pulse on Women's Needs: How Our Research Approach Points the Way to Eliminating the Financial Inclusion Gender Gap." *Women's World Banking* (blog), June 5, 2017. <https://www.womensworldbanking.org/news/blog/keeping-pulse-womens-needs-research-approach-points-way-eliminating-financial-inclusion-gender-gap/>.

Household Finance Committee. *Indian Household Finance*. Government of India, July 2017. Available at <https://rbidocs.rbi.org.in/rdocs/PublicationReport/Pdfs/HFCRA28D0415E2144A009112D-D314ECF5C07.PDF>

IDEO.org. "Approach". IDEO.org (webpage), accessed 25 March 2018, <https://www.ideo.org/approach>

IDEO.org. *Impact: A Design Perspective*. IDEO.org, accessed 25 March 2018, https://s3.amazonaws.com/ideo-org-images-production/downloads/113/original/IDEOorg_Impact_A_Design_Perspective.pdf

IDEO.org. *The Field Guide to Human-Centered Design*. IDEO.org, 2015.

Information Commissioner's Office. "Privacy by Design" *Information Commissioner's Office* (webpage). Accessed March 25, 2018, <https://ico.org.uk/for-organisations/guide-to-data-protection/privacy-by-design/>

InterMedia. *India Wave 4 Report FII Tracker Survey*. InterMedia, June 2017. http://finclusion.org/uploads/file/reports/India%20Wave%204%20Report_8-Jun-2017.pdf

Iyengar, Rishi. "India Poised for Smartphone Revolution." *CNN Money*, September 26, 2017. <http://money.cnn.com/2017/09/26/technology/india-mobile-congress-market-numbers/index.html>.

Jainl, Bharit. "Nearly 60% of Indians speak a language other than Hindi". *The Times of India*, June 21, 2014. <https://timesofindia.indiatimes.com/india/Nearly-60-of-Indians-speak-a-language-other-than-Hindi/articleshow/36922157.cms?>

Jasuja, Nipun and Khan, Nadeem. "India's Fintech Boom: Ensuring No Man Is Left Behind as the Sector Races Along." *Wharton Fintech* (blog), December 27, 2017. <https://medium.com/wharton-fintech/indias-fintech-boom-ensuring-no-man-is-left-behind-as-the-sector-races-along-64ce5d631a65>.

Jenkins, Beth. *Developing Mobile Money Ecosystems*. International Finance Corporation/Harvard Kennedy School of Government, 2008.

Juma, Calestous. *Innovation and its Enemies: Why People Resist New Technologies*. New York: Oxford University Press, 2016.

Karlan, Dean, Rebecca Mann, Jake Kendall, Rohini Pande, Tavneet Suri, and Jonathan Zinman. "Making Microfinance More Effective." *Harvard Business Review*, October 5, 2016. <https://hbr.org/2016/10/making-microfinance-more-effective>.

Khaira, Rachna. "Rs 500, 10 minutes, and you have access to billion Aadhaar details". *The Tribune*, January 4, 2018. <http://www.tribuneindia.com/news/nation/rs-500-10-minutes-and-you-have-access-to-billion-aadhaar-details/523361.html>

Khera, Reetika, "Why India's Big Fix Is a Big Flub". *The New York Times*, January 21, 2018. <https://www.nytimes.com/2018/01/21/opinion/india-aadhaar-biometric-id.html>

- Klapper, L., Lusardi, A. and van Oudheusden, P., *Financial Literacy Around the World*, IBRD/World Bank, 2017, http://gflec.org/wp-content/uploads/2015/11/3313-Finlit_Report_FINAL-5.11.16.pdf?x87657
- Kumar, Manoj. "Modi: Banking for All to End 'Financial Untouchability.'" *Reuters*, August 28, 2014. <https://in.reuters.com/article/india-modi-banks/modi-banking-for-all-to-end-financial-untouchability-idINKBNOGS1P320140828>.
- Krishnaswamy, Karuna, Claudia McKay, Mark Pickens, and Sarah Rotman. "Building Viable Agent Networks in India," CGAP, April 2010. <https://www.ifc.org/wps/wcm/connect/73590c8049585f409f8abf19583b6d16/Tool+10.8.+CGAP+Analysis+-+FINO+and++EKO+Channel+Management.pdf?MOD=AJPERES>
- Leith, Kendra and Smith, Rebecca. "User Research Framework." D-Lab Scale-Ups. Accessed November 26, 2017. Available at https://drive.google.com/file/d/0B36nNXj12OvSUzFSYWZQd2tvVU0/view?usp=embed_facebook.
- Liedtka, Jeanne, Salzman, Randy, and Azer, Daisy. *Design Thinking for the Greater Good: Innovation in the Social Sector*. New York: Columbia University Press, 2017.
- Malick, Badal. "The View from 10 Months In." *Catalyst* (blog), August 11, 2017. <http://cashlesscatalyst.org/catalyst-blog/view-10-months-in/>.
- McGowan, Kathleen, and Jaisinghani, Priya. "The End of Financial Marginalization Is in Sight: Here's the Roadmap." *Innovations* (2015) volume 10, 1-2. https://www.mitpressjournals.org/doi/pdf/10.1162/inov_a_00226
- Mehrotra, A. and George, D., "Agent Network Accelerator Survey: India Country Report 2015", *Helix Institute of Digital Finance*, August, 2015, http://www.helix-institute.com/sites/default/files/Publications/Agent%20Network%20Accelerator%20Survey%20-%20India%20Country%20Report%202015_0.pdf
- Mendonca, Jochelle, and Variyar, Mugdha. "Modi government transforms India's digital engagement". *The Economic Times*, May 16, 2017. economictimes.indiatimes.com/articleshow/58688960.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst
- Monks, Kieron. "M-Pesa: Kenya's Mobile Success Story Turns 10." *CNN*. February 24, 2017. <http://www.cnn.com/2017/02/21/africa/mpesa-10th-anniversary/index.html>.
- Nagi, Taruna. "Demonetisation: USSD Technology Shows You How to Pay Digitally without Internet." *The Economic Times*, November 23, 2016. <https://economictimes.indiatimes.com/wealth/spend/demonetisation-ussd-technology-to-pay-digitally-without-internet/articleshow/55574701.cms>.
- Nair, Suraj and Sharma, Misha. "Digital Social Payments in India: Can the Challenges Be Overcome?" *CGAP*. September 26, 2016. <http://www.cgap.org/blog/digital-social-payments-india-can-challenges-be-overcome>.
- National Payments Corporation of India. "Discover BHIM". *National Payments Corporation of India* (webpage), accessed March 25, 2018. <https://bhimupi.org.in/>
- National Payments Corporation of India. "RuPay". *National Payments Corporation of India* (webpage), accessed March 25, 2018. <https://www.rupay.co.in/>
- New America. "Key Findings from the YouthSave Project". *New America* (webpage), accessed March 25, 2018. <https://www.newamerica.org/asset-building/youthsave/key-findings-youthsave-project-brief/>
- NITI Aayog. "Interim Report of the Committee of Chief Ministers on #DigitalPayments". NITI Aayog, Government of India, January 2017. http://niti.gov.in/writereaddata/files/new_initiatives/Digi%20Report%20-%20Final.pdf
- OECD. *OECD INFE Guidelines on Financial Education in Schools*. OECD, June 2012. <https://www.oecd.org/daf/fin/financial-education/2012%20Schools%20Guidelines.pdf>
- Omidyar Network. *Currency of Trust: Consumer Behaviors and Attitudes Toward Digital Financial Services in India*. 2017. Available at https://www.omidyar.com/sites/default/files/file_archive/Cof-Trust/17-05-15_Currency_of_Trust_Report_DIGITAL_FINAL.pdf

- Parmjeetsingh, Kahlon Amritpal, Kajal Chaudhary, Surjan Singh, and Amit Kumar. "A Study on Airtel Payment Bank a Step Towards Digital India" *International Journal of Innovative Studies in Sociology and Humanities*, no. 5 (2017): 7. <http://ijissh.org/wp-content/uploads/2017/07/IJISSH-020411.pdf>
- Patel, A., Plaisted, J. and Widjaja, N. "Digital Savings Circles: Challenges and the Road Ahead". *Accion* (blog), March 10, 2016. <http://blogs.accion.org/fin-tech/digital-savings-circles/>
- Prina, Silvia. "Banking the Poor via Savings Accounts: Evidence from a Field Experiment." *Journal of Development Economics* 115 (July 1, 2015): 16–31. <https://doi.org/10.1016/j.jdeveco.2015.01.004>.
- Qazi, Moin. "India's Digital Revolution." *The Diplomat*. Accessed April 14, 2017. <https://thediplomat.com/2017/04/indias-digital-revolution/>.
- Reserve Bank of India. "Master Direction on Issuance and Operation of Prepaid Payment Instruments." Accessed January 5, 2018. https://rbi.org.in/scripts/BS_ViewMasDirections.aspx?id=11142#MD.
- Reserve Bank of India. "Data Releases". Reserve Bank of India, Accessed January 5, 2018. <https://www.rbi.org.in/Scripts/Statistics.aspx>
- Reuters. "Mastercard Working with India for Low-Cost Payment Tech." *The Hindu Business Line*, August 2, 2017. <http://www.thehindubusinessline.com/money-and-banking/mastercard-working-with-india-for-lowcost-payment-tech/article9798434.ece>.
- Roumani, Nadia. "Social Impact by Design." *Stanford Social Innovation Review*. Accessed November 25, 2017. https://ssir.org/book_reviews/entry/social_impact_by_design.
- Sapovadia, Vrajlal. "Chapter 14—Financial Inclusion, Digital Currency, and Mobile Technology." In *Handbook of Blockchain, Digital Finance, and Inclusion, Volume 2*, 361–85. Academic Press, 2018. <https://doi.org/10.1016/B978-0-12-812282-2.00014-0>.
- Schueth, Dr Samuel, and Alex Moler. "The Effects of Demonetization on Financial Inclusion in India," InterMedia, November 8, 2017.
- Shah, Alpesh, Roongta, Prateek, Jain, Chilman, Kaushik, Vibha, and Awadhiya, Abishek. "Digital Payments 2020: The Making of a \$500 Billion Ecosystem in India," Boston Consulting Group/Google, July 2016. http://image-src.bcg.com/BCG_COM/BCG-Google%20Digital%20Payments%202020-July%202016_tcm21-39245.pdf
- Sharma, Misha and Chatterjee, Shreya. *Agents of Change*. Center for Financial Inclusion, Accion, December 2017. https://www.centerforfinancialinclusion.org/storage/Agents_of_Change_India_FINAL.pdf
- Sharma, Vaibhav. "India's Demonetisation: 'Modi Didn't Think of the Poor'". *Al Jazeera*, December 6, 2016. <http://www.aljazeera.com/indepth/features/2016/11/india-demonetisation-mo-di-didn-poor-161123073645259.html>.
- Singh, Santosh. "Scholarships Head Straight to Bank Accounts of Bihar Schoolkids | The Indian Express." January 7, 2016. <http://indianexpress.com/article/india/india-news-india/scholarships-head-straight-to-bank-accounts-of-bihar-schoolkids/>.
- Singh, Shelley. "India's Digital Transaction Space Set for next Leap Thanks to Tech Giants." *The Economic Times*, February 20, 2018. <https://economictimes.indiatimes.com/industry/banking/finance/banking/indias-digital-transaction-space-set-for-next-leap-thanks-to-tech-giants/article-show/62989141.cms>.
- Sinha, Shuchi. "Banking Regulation 2017 | India." *Global Legal Insights*. Accessed December 29, 2017. <https://www.globallegalinsights.com/practice-areas/banking-and-finance/global-legal-insights---banking-regulation-4th-ed./india>.
- Startupbootcamp FinTech. "FinTech Trends Report India 2017." 2017. <https://indd.adobe.com/view/5fe597fa-3d25-4348-84a4-d392254500a4>.
- Sunstein, Cass R. "Empirically Informed Regulation Essay." *University of Chicago Law Review* 78 (2011): 1349–1430.
- Sunstein, Cass R. "Social Norms and Social Roles." *Columbia Law Review* 96, no. 4 (1996): 903–68. <https://doi.org/10.2307/1123430>.

- Suri, Tavneet and William, Jack. "The Long-Run Poverty and Gender Impacts of Mobile Money." *Science* 354, no. 6317 (December 9, 2016): 1288–92. <https://doi.org/10.1126/science.aah5309>.
- The Economic Times. "Definition of Payments Banks." *The Economic Times*. Accessed November 26, 2017. <https://economictimes.indiatimes.com/definition/payments-banks>.
- The Times of India. "Indiaspeak: English is our 2nd language" *The Times of India*, March 14, 2010. <https://timesofindia.indiatimes.com/india/Indiaspeak-English-is-our-2nd-language/article-show/5680962.cms>
- The World Bank Group. "Financial Inclusion Data / Global Findex". The World Bank Data (2014), accessed March 12, 2018. <http://datatopics.worldbank.org/financialinclusion/country/india>
- The World Bank Group. *Identification for Development 2017 Annual Report*. World Bank, 2017. <http://pubdocs.worldbank.org/en/561391513609113984/2017-ID4D-Annual-Report.pdf>
- The World Bank Group. "India". The World Bank Data, accessed March 12, 2018. <https://data.worldbank.org/country/india>
- UNICEF Data. "India: Key Demographic Indicators". *UNICEF* (webpage), accessed March 25, 2018. <https://data.unicef.org/country/ind/>
- UNICEF Innovation. "Financial technology to benefit children & families." Unpublished working paper, last modified August, 2017.
- UNICEF Innovation. "UPSHIFT" *UNICEF Innovation* (blogs), accessed March 25, 2018. <http://unicefstories.org/tag/upshift/page/2/>
- West, Darrell M. "Modi's Financial Inclusion Push." *Brookings* (blog), May 22, 2015. <https://www.brookings.edu/opinions/modis-financial-inclusion-push/>.
- Wonglimpiyarat, Jarunee. "Electronic Payment System of Thailand: Mobile Banking Market Competition." In *The Book of Payments*, 269–81. Palgrave Macmillan, London, 2016. https://doi.org/10.1057/978-1-137-60231-2_23.
- Worstell, Tim. "Effects Of Demonetisation On India's GDP—Difficult To Calculate, We Don't Even Know The Sign." *Forbes*. Accessed November 19, 2016. <https://www.forbes.com/sites/tim-worstell/2016/11/19/effects-of-demonetisation-on-indias-gdp-difficult-to-calculate-we-dont-even-know-the-sign/>.
- Yadnya Investment Academy. "What Is UPI (Unified Payments Interface)? | Details on UPI | Why UPI Is a Game Changer?" *YouTube* (video). <https://www.youtube.com/watch?v=501kafdgof8>.



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