# CGAP

Case Study

## The Future of G2P Payments:
## Towards an integrated infrastructure in Bangladesh

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# DISCLAIMER

# Summary

By 2015, Bangladesh already had begun to experiment with digitizing government-to-person payments. Several social safety net programs, among the more than 100 in place, were experimenting with various digital payment approaches—often through a customized arrangement with a single vendor or provider.

Access to Information (A2i) is a cross-government agency that seeks to improve government services to citizens. Along with the digitization efforts that were already taking shape, A2i saw that more benefits could be gained if government programs shared and used a unified government payments platform that would consolidate and simplify delivery for both government programs and their citizens. In early 2016, A2i partnered with CGAP, the Bill & Melinda Gates Foundation, the Better Than Cash Alliance, and Price Waterhouse Coopers to conduct a deep as-is context assessment. Based on this assessment, the partners set out to create a detailed systems design process that leveraged the existing payments infrastructure, identified trade-offs and reaffirmed the core goals of A2i's vision of building a more inclusive digital payments system. As implementation progressed, A2i revisited the design, made adjustments, and brought in other government departments, while remaining focused on its ambitious long-term vision. By February 2019, A2i had connected key elements of the system and was well into piloting different aspects of the overall architecture.

## Introduction to the case

Bangladesh has around 110 government social safety net payment programs. In recent years, the government has shown an increased interest in modernizing payments because, at nearly 13 percent of the annual budget, these payments account for a significant part of the budget. This growing interest aligned with the efforts of "Digital Bangladesh," a government-wide initiative championed by the Prime Minister's son. By 2016, many government programs had begun to move their payments through digital channels by seeking customized solutions, which presented both a problem and an opportunity.

Access to Information (A2i) is a cross-government agency that seeks to improve government service. A2i is housed at the Prime Minister's Office and focuses on advancing technology-led solutions for government services. Since its creation in 2007, A2i has promoted digitizing and overhauling government services. It developed a methodology for measuring, understanding, and communicating government service improvement, called TCV (time, costs, and visits). Despite considerable success in digitizing public services, the associated payments to and from government were still processed manually and often incurred significant costs on citizens.

A2i saw an opportunity to establish a system-wide approach to channeling multiple, if not all, government payment flows. A2i believed that a unified approach could offer a range of benefits beyond what an individual financial institution could offer. A2i began to articulate this vision by emphasizing that citizens could make choices on how and where to receive and make payments to government. The vision promoted the idea that choice should not be dictated to citizens by either government or providers and simultaneously linked to a wider aspiration for digital finance; that government payments ought to reinforce wider goals of interoperability, competition among providers, and more inclusive open systems. Their goal was to reinvent both government-to-person (G2P) and person-to-government (P2G) payments though in the learning process they realized the need to tackle these distinct payment types under separate initiatives. Their focus early on in 2017 was to begin with G2P payments.

## Enabling environment

**There was considerable room for improving the existing G2P payments system in Bangladesh.** A 2016 review of the volumes, management systems, and disbursement practices of Bangladesh's highest volume government schemes, including social welfare schemes and government salary payments, revealed that payments were predominantly made in cash. The manual systems were vulnerable to leakage and inefficiency. Where some digitization had occurred, government programs were procuring single vendor closed-loop solutions that offered little to no choice to citizens.

For citizens, the experiences with receiving G2P payments ranged from bad to terrible. The typical customer journey was riddled with pain points, including unpredictable payments, high levels of fraud and financial loss, and overall inconvenience and cost. Those few (less than 1 percent) who were already receiving payments into an account, frequently complained about account opening fees and cumbersome cash-out processes. The 2016 study also showed that citizens were not well equipped to take advantage of digitization. With most G2P recipients representing the poorest and most vulnerable, they typically have low literacy levels and limited access to, and familiarity with, digital devices and services. Despite the rapid uptake of mobile phones, including smartphones, in Bangladesh over 80 percent of the G2P population did not own a mobile phone in 2016. Citizens had diverse realities and needs: An old person receiving an old age allowance would conceivably want disbursements delivered directly to her home or as close as possible, whereas a citizen sending school fees to government, might prefer to travel to the school and pay there for various reasons.

**Key payments infrastructure was already in place**. Bangladesh Bank's National Payments Switch (NPSB) connected with the four big public banks and most of the roughly 50 commercial banks. However, NPSB did not connect with a majority of the mobile financial services (MFS) accounts, including those of bKash—by far the largest provider of mobile accounts and agent points of service. NPSB was also in need of a technology upgrade that would, among other things, enable it to handle biometric authentication.

**Existing distribution networks were reasonably well spread across the densely populated country.** The banks that were delivering G2P payments at that time, and those connected to the existing switch, did not reach far beyond urban and suburban areas. MFS providers had a much greater reach than these banks, with over 200,000 access points, but they were not interoperable. Over 5,000 publicly run Union Digital Centers (UDC) and over 8,500 e-centers of Bangladesh Post offered an additional network. While a few UDCs had begun to also offer basic banking and payments services, large portions of these nonbank delivery networks remained outside the payments system.

**Bangladesh's National ID (NID) system was in transition.** The national biometric ID covered over 95 percent of the adult population, including over 85 percent of G2P recipients. This meant that the NID database could be leveraged for biometric customer verification during enrollment and account opening, and for authenticating customers performing transactions. NID offered customer verification services to a few banks on a single contract basis. Only recently, mobile network operators had been given access to the NID database to biometrically verify customers for SIM card registration.

While the ID infrastructure was in place, its full use for government or private sector services had not been well developed yet. Since the NID had been designed for election purposes, it was within the domain of the Bangladesh electoral commission. The commission was not oriented towards offering the NID for regular use by multiple institutions. The use agreements they did establish were based on ad hoc technical and pricing arrangements rather than well-established Application Programming Interfaces (API) or terms.

There was a parallel effort to issue a large number of IDs via smartcards that would allow offline customer verification. While this held some potential, the card's deployment was running into significant delays and its long-term availability was in doubt.

**The regulatory framework for digital financial services was conducive to digital government payments and a wider outreach of access points with some minor gaps.** Bangladesh Bank had allowed both agents for MFS and agents for banking under two different regulations. However, the agent regulations were not specific about whether interoperable off-us transactions[1] would be possible. These types of transactions were not barred in the regulation, but neither were they specifically permitted. Also, the regulatory regime provided little clarity as to whether Bangladesh Bank would allow electronic Know-Your-Customer (eKYC) processes for account opening.

**A2i was uniquely positioned to take on the challenge of driving this kind of payments reform**. It was housed in the influential Prime Ministers' Office and had access into the senior echelons of the civil bureaucracy. A2i also recognized its limitations: It was not a government ministry that had direct control over government programs. A2i would need to "sell" its ideas within government. On the other hand, because it did not run any programs, A2i could take the role of a neutral party and work to establish cross-cutting government payments systems, with fewer inter-ministerial "turf" constraints. Political considerations were a final and compelling reason to push ahead. The government had set a priority of going digital by 2021, in time for the country's 50th anniversary.

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[1] In an off-us transaction, the bank or agent processing a cash-out is not the customer's financial service provider.

# Design: Key choices

Confident and backed by several partners, A2i took further steps in early 2016. With support from the Bill & Melinda Gates Foundation, CGAP, and the Better than Cash Alliance (BTCA), A2i engaged a team from Price Waterhouse Coopers (PWC)[2] to assist in an intensive design effort.

This began with an As-Is context assessment to identify existing resources and gaps, followed by a design phase that sought to optimize key choices to best meet A2i's goals, and lastly involved the development of a detailed implementation roadmap.

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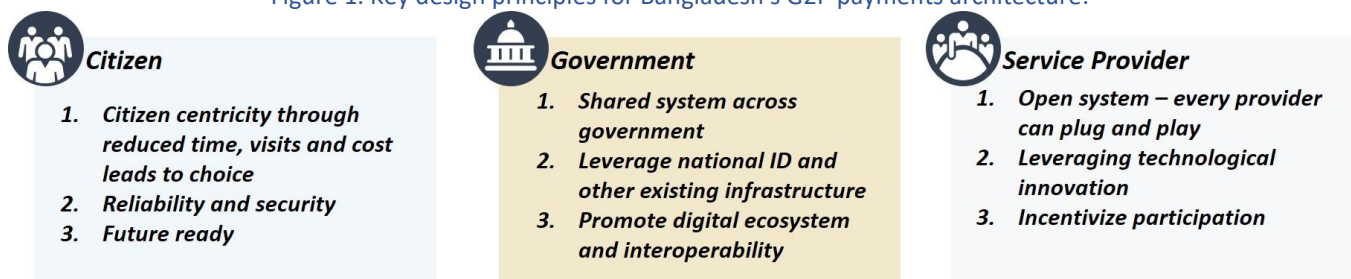*Box 1. A crucial intervention by Nandan Nilekani.*

A key event in the design stage was a security crackdown that followed a terrorist attack in July 2016 in Dhaka. Enhanced security measures made it difficult for A2i and its partners to meet at a critical stage in the design planning phase. This important two-day design meeting was moved to Bangalore from its original venue in Dhaka.

The meeting's new location presented an opportunity for A2i to invite Nandan Nilekani, the former Minister of the Unique Identification Authority of India (UIDAI) and a founder of the software giant Infosys. Nilekani was a key person behind the development of India's identification and G2P architecture. He spent nearly a full day with A2i and its partners learning about Bangladesh's current landscape and its growing digitization efforts.

He observed that several key elements in payments, national ID, and other systems were already present in Bangladesh, and he advocated for a design that would best leverage the existing assets. In the weeks that followed, A2i and PWC pressure-tested the design, vetted assumptions, and reviewed the design. Nilekani's input persuaded A2i to push for a design that best leveraged existing systems and to adopt a longer term and more aspirational vision. Critically, Nilekani's credibility and backing gave A2i even greater reassurance that their vision could be delivered.

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A2i and its partners used the knowledge gleaned from the multi-pronged As-Is assessment to consolidate the design choices. The design process took several weeks and required verification of key factors and system capabilities. The design was guided by a clearly articulated set of overarching principles, as shown in Figure 1.

Figure 1. Key design principles for Bangladesh's G2P payments architecture.

**Citizen**
1. Citizen centricity through reduced time, visits and cost leads to choice
2. Reliability and security
3. Future ready

**Government**
1. Shared system across government
2. Leverage national ID and other existing infrastructure
3. Promote digital ecosystem and interoperability

**Service Provider**
1. Open system – every provider can plug and play
2. Leveraging technological innovation
3. Incentivize participation

*KEY CHOICE #1: A2I WOULD FOCUS ONLY ON SERVICING PAYMENTS, NOT G2P PROGRAM MANAGEMENT*

A2i decided to focus solely on making payments easier and leave program management to government departments. This decision helped A2i to avoid conflict with government programs. A2i's focus would be on

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[2] PWC is a global consulting firm that proposed a team of various expertise from government process re-engineering, national IDs, payment systems, and strategy. The team, from PWC Asia, had worked on IDs and G2P in India.

making payments easier for the government programs. The design meant government programs would collect citizens' verified NIDs and offer these basic details at the time of payment.

This approach was not without risks. Without its own programs, A2i would need to persuade programs to deploy the new payments approach. Some government programs had already created their own customized solutions and A2i would need to offer them a compelling reason to join.

*KEY CHOICE #2: LONG-TERM VIEW TO PROMOTE INTEROPERABILITY*
A2i chose to leverage the existing payments switch, the NPSB, since it had many of the necessary capabilities and was the most widely available. This meant, however, that payments could only be made to accounts at providers who were linked to NPSB. This decision left out bKash, which had the largest reach of accounts and access points. By sacrificing its reach in the short run, A2i hoped that its patience would prove to be a strong incentive for bKash and other providers outside the national payments system to come in later. This decision exhibits how A2i opted for a larger, long-term pay-off over short-term smaller gains.

One key piece of infrastructure that did not exist and needed to be built was a "mapper" that connected individuals' IDs to their bank account of choice. This function would allow government programs to capture only IDs (not account information) and provide this information to the mapper in order to initiate a payment.

*KEY CHOICE #3: SOUGHT TO LEVERAGE EXISTING NID DATABASE AND EASE AUTHENTICATION*
Another key design choice was to focus on biometric account opening and payment authentication. This decision was based on findings from the As-Is assessment: Many citizens did not have phones or the skills to navigate complex registration processes. A card-based system was considered but de-emphasized due to higher costs and complications inherent in card system management. An important related objective is that A2i also saw this as an opportunity to promote government use of NIDs and provide further reasons for the Election Commission to expand the utility of the ID system.

*KEY CHOICE #4: PAY HEFTY FEES FOR PAYMENTS DELIVERY TO INCENTIVIZE PROVIDERS*
One of the concerns with this new G2P payments approach was how to create incentives that would draw providers into the system. The expectation, based on experience elsewhere, was that the target population would immediately cash out the entirety of their payments. Payments directly to customer accounts meant less float for the banks and so other incentives would need to be developed.

The new approach also challenged perceptions citizens had developed over time. For example, it was perceived to be difficult to shift from cash delivery, which is perceived as "free" to citizens, to making citizens pay a fee to cash out. Therefore, A2i determined that a fee would be needed to be paid to providers—one that is substantial enough to give an incentive to pursue these customers. The acquiring networks (points of service where people could cash out) would be compensated by an interchange fee based on the interoperable payments system in place.

A2i's design encompassed a range of long-term goals. One was to bring providers into the interoperable system, where the cash-out fees would give them the incentive to pursue these accounts and increase the number of access points. Rather than paying one firm in a single-vendor contract, A2i opted to stimulate a wider digital financial ecosystem. The keys to success, therefore, were whether the volumes, fees, interoperability, and other considerations would be sufficient to stimulate a positive and dynamic provider response.

*KEY CHOICE #5: ASKING AS LITTLE AS POSSIBLE FROM OTHER ARMS OF GOVERNMENT*

To limit interdependence and to avoid creating unnecessary complications, the design sought to rely as little as possible on help from other parts of government. However, A2i needed to work with a few other arms of government, including Bangladesh Bank, the Election Commission and the government schemes, as well as the banks and the MFS providers to make the design feasible. (See Table 2 in Annex.)


These five key choices significantly shaped the design of the payments model and defined the processes required for making direct payments to citizens. (See Figure 2.)

# Figure 2. Process flows for key steps in the new G2P payments system.

*Account opening and "seeding" the mapper*

*Payment to the citizen's account*
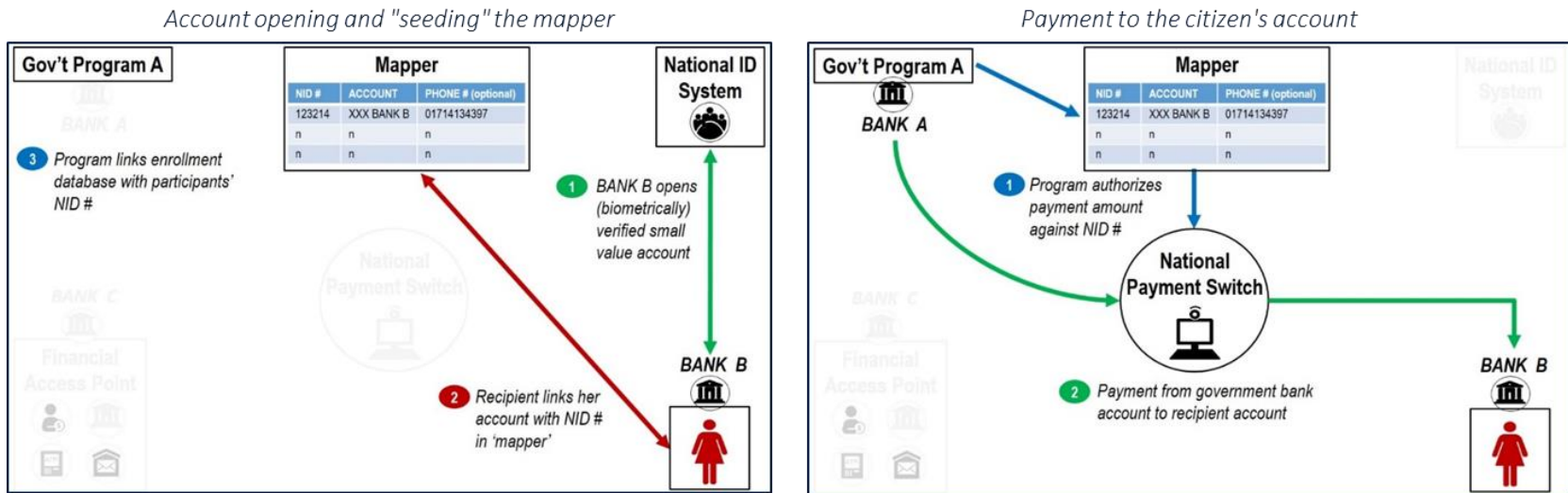
*Citizen cash-out with biometric authentication from any access point*
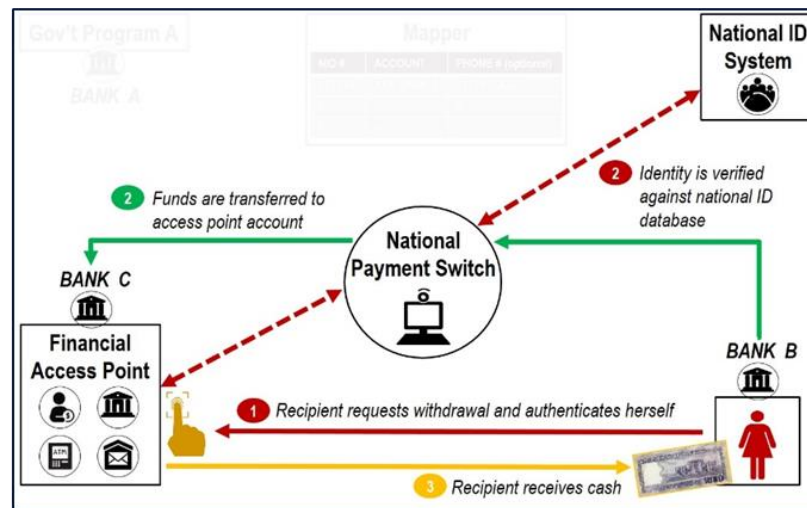
# Implementation thus far

Following the design effort A2i created a Project Management Unit dedicated to pursuing the goal of implementing the new system.[3] It was clear that implementation would not happen quickly and take some significant effort, including management expertise, resources, partnerships, and political navigation. It would need to follow a phased strategy in which earlier steps create momentum for subsequent steps. This staged approach comprised three broad phases, as illustrated in Figure 3.

Figure 3. Phased roadmap for Bangladesh's new payments architecture.
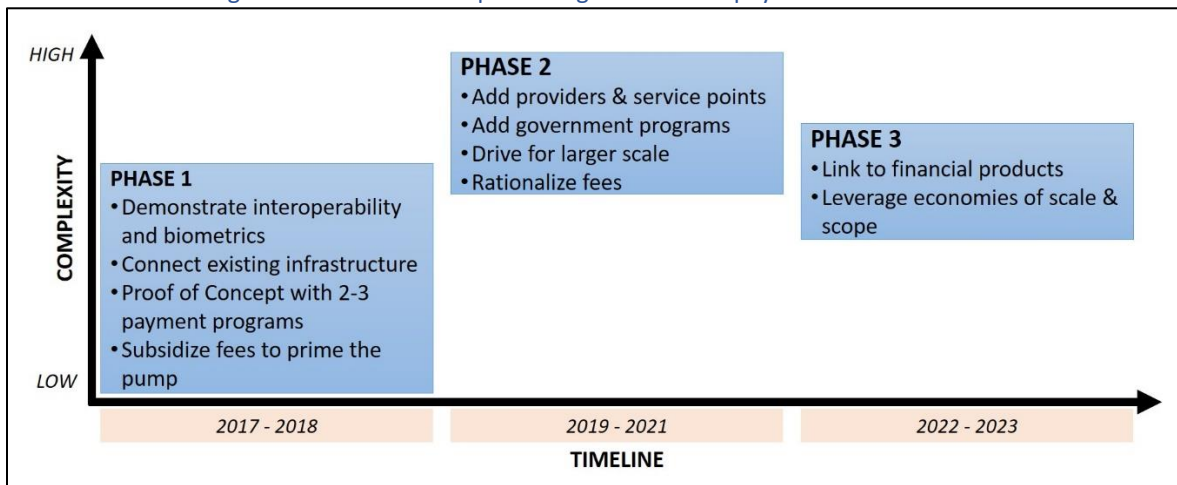


The first step was to identify a few government programs and banks to kick off a pilot. By early 2018, two G2P programs from the Ministry of Social Services and one program from the Ministry of Women's Affairs agreed to participate in the pilot. As the pilot efforts were launched in 2018, some significant shifts were needed in the original design in order to get things moving (see Figure 4). By early 2019, the pilots had made payments to over 100,000 individuals across three programs. Of these at least a quarter had been done testing the mapper function.

**The Ministry of Finance takes center stage.** As implementation of the roadmap proceeded, A2i brought on board the Finance Division of the Ministry of Finance, which is the Government's key payments and treasury arm. The Finance Division determined that it would disburse funds directly from Treasury instead of through public banks as was assumed in the original design. In addition, the Finance Division—as opposed to A2i—procured and oversaw the development of a shared scheme and payments management portal. Since the Finance Division will own the portal, it will be able to regularly monitor payments and schemes; such as identifying duplicate G2P recipients. This reflects both greater buy-in by government but also added effort to integrate with the Ministry's systems.

**Interoperability through the electronic fund transfer network instead of the switch.** NPSB, managed by Bangladesh Bank, was going to take many months to upgrade the switch to support biometric transactions. Instead, A2i began to work with an alternative payment scheme called the Electronic Fund Transfer Network (BEFTN), which connects 40 of the 58 banks in Bangladesh. Crucially, as with the NPSB, citizens would be able to choose from among several providers on where to keep an account. However, going with the BEFTN entailed some significant tradeoffs. For cash-outs, BEFTN is unable to allow off-us transactions and customers are limited

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in their options of cash-out points. Large providers that are not banks, such as bKash, do not participate directly in BEFTN. Instead, bKash payments are routed to a bank and then subsequently sent down to a specific account at bKash. BEFTN is also not able to process biometric authentication so this original element of design is not available in the early piloting. So far, the BEFTN has held up well, breaking its record for the number of daily transactions during the pilot. A2i can still transition to the NPSB after undergoing the necessary upgrade.

**Mapper built and undergoing testing.** A2i procured a firm to develop the ID-account mapper software and to seed the information of citizens involved in the early pilots.[4] So far, the mapper has been able to facilitate payments to some 25,000 citizens. During implementation, however, the programs have learned about challenges with the NID itself that has curtailed wider use.

Figure 4: The original versus adjusted design of the G2P payments process.
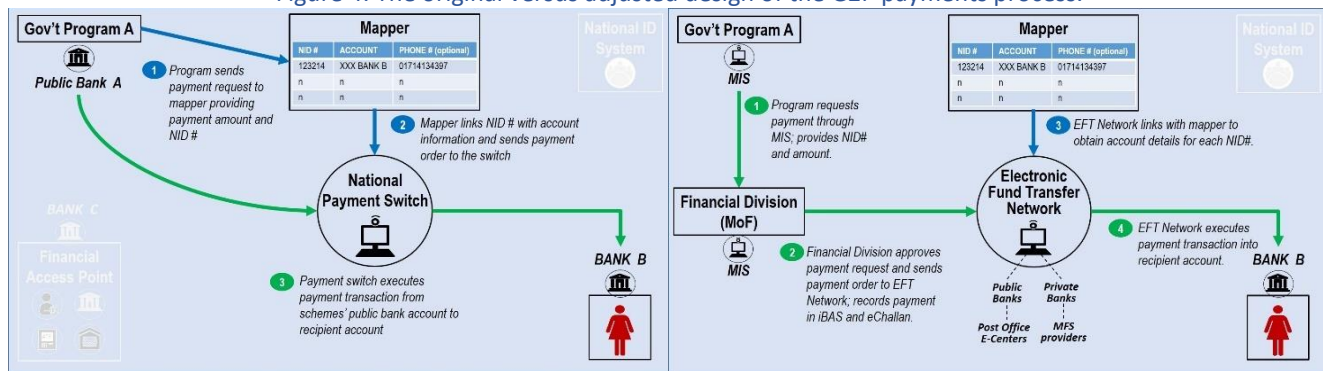


By mid-2018, A2i and the partnering Ministries had onboarded 128,000 G2P recipients in 11 subdistricts, trained government field staff and rolled out their first pilot with funds being routed into individuals' accounts across four banks and three MFS providers.[5] Key aspects of the design were tested such as customer choice, involvement of multiple programs, the newly developed mapper and routing payments directly from Treasury. The pilot offered A2i important learnings and uncovered a few challenges that will need further fine-tuning as A2i plans scaling up:

**Positive prospects for building a unified payment system across government.** Having different programs from different Ministries successfully participate represents an important validation of the design. It also points to a future process for onboarding more programs from across Government.

**Customer choice was implemented and tested—but not in all cases, everywhere.** A2i carried out training and introductory workshops with local government officials and UDC agents to build their capacity for account opening, account seeding (i.e., linking a customer's account to her ID in the payments mapper), and cash-out services. Whilst all participating recipients' information had been seeded into the new payments mapper, the degree of choice offered differed across pilot locations. Depending on the G2P program and citizens' location, citizens were able to choose from either a fixed menu of bank options or, in some cases, a single bank was selected for them. In some areas they were even able to choose from a menu of MFS providers. Despite not testing full choice for all citizens in all locations, it was an important validation of the design that at least a subset of citizens had been enabled to choose their preferred provider.

**The business model for providers still needs to be figured out.** The commissions and fees to be paid to participating payment providers are yet to be settled. A2i commissioned PiStrategy, a Bangladesh based

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[4] The same firm had developed Bangladesh's banking switch for ATM and POS interoperability.
[5] The participating providers include Bank Asia, Mohtomuti Bank, NRB Commercial Bank, Sonali Bank, bKash, Rocket DBBL and Surecash.

consultancy, to study different compensation models. Their study will recommend a rate for endorsement by Government, after which it can be applied.

**The National ID has some drawbacks.** The pilot uncovered that 5-8 percent of G2P recipients do not possess an NID. In addition, the NID database against which citizens are authenticating exhibited some data quality issues leading to failed transactions. These issues will need to be addressed before scaling up from the pilot.

**Fees for authentication services need to be negotiated.** A2i has held regular negotiations with the Election Commission on the pricing of biometric authentication services and the issuance of IDs for citizens under 18 years of age. To reduce the costs of biometric authentication services through the NID database, A2i is considering a model that applies a fee for authentication during enrollment and no fee for subsequent authentication for cash-in and cash-out transactions. The fee structure has not been settled yet and negotiations continue.

A second, more ambitious pilot that includes more banks and programs, is planned for 2019. The parameters are still unclear but A2i envisions to pilot the biometric authentication process with the ID-account mapper. How they will overcome the inability of the BEFTN to link with the biometric component of the NID is still unclear. However, some outstanding issues will need to be sorted out first, such as the quality issues in the NID database, citizens without an NID and the fees to be paid to participating payment providers. Beyond the second pilot, A2i has the ambition to switch from the BEFTN to the NPSB and integrate bKash and Rocket DBBL. Bangladesh Bank is also contemplating regulatory adjustments for allowing eKYC beyond a pilot test.

# ANNEX

Table 1. Summary of Key Context Findings and Implications for Design Choices

| As-Is Context Assessment | Design Implications |
| --- | --- |
| Citizens have wide-ranging and diverse needs. | Enabling payments through multiple channels held out the promise that customers could choose the delivery methods that suited them. |
| G2P recipients largely do not have their own mobile phones. | A fashionably mobile-only design would exclude precisely the population being targeted. |
| There is limited literacy and numeracy capabilities. | Enabling biometric authentication would alleviate the common issues customers faced with remembering the PINs for cash out. |
| Government schemes pursue a myriad of individual solutions. Each procure single-payment providers for a limited term. Providers treat the government, rather than G2P recipients, as the customer. | By opening payments delivery to a variety—if not all—players would reduce vendor-lock and help create a more level playing field that would spur innovation in services and infrastructure. It would switch the providers' focus from winning government contracts to improving service for citizens. |
| Key pieces of payments infrastructure were in place. However, the largest distribution networks, including bKash, were not interoperable. | A focus on enhancing and linking the existing payment switching would make it possible to focus on interoperable systems and, therefore, more choice. This choice also meant it might provide additional incentives for large players like bKash to interoperate. Or at least, to avoid establishing single provider systems that create more reasons not to interoperate. |
| Distribution was heavily dominated by providers outside the payments system. | This would mean starting from a narrower set of access points focusing on a few agent banking locations and the Union Digital Centers. The goal would be to add more access points as more providers join the payments system. |
| NID had good coverage but was mostly used as a voter ID. The existing capabilities were not extended to government or private sector applications such as e-KYC or authentication. This was assessed to be technically feasible. | Offering eKYC and authentication to financial services providers would allow for simplified account opening and customer authentication. Demonstrate a use case for government to extend NID beyond its use exclusively as an election tool. |

Table 2. Areas of collaboration with other arms of government

| | |
|---|---|
| **Bangladesh Bank (Central Bank)** | • Allow small-value accounts to be opened through biometric identification.<br>• Allow eKYC verification through the NID database.<br>• Enable biometric authentication for each transaction on NPSB.<br>• Build and host an ID-account mapper. |
| **Election Commission (National Identification)** | • Provide an open API to financial services providers for e-KYC verification for account opening and an open API to NPSB for biometric authentication of cash-out, cash-in, and payments transactions. |
| **Government Schemes** | • Use a management information system that can generate a standard payments file or link with the ID account mapper to make payments.<br>• Collect and seed citizens' ID numbers.<br>• Generously cover fees (>3%) of cash payments to issuing banks. |
| **Banks and MFS Providers** | • Provide small-value accounts<br>• Ensure data connectivity to link NID for biometric authentication.<br>• Establish biometric message format capability for biometric transactions. |
| **A2i Implementation Team** | • Expand DFS coverage to all 5,000 UDCs—enabled as banking agents.<br>• Prepare guidelines for standardizing technical infrastructure at the UDC level.<br>• Negotiate with providers to make agent operation service-level agreements. |