

Unblocked Cash Pilot

Full Report V2

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1. Consistent phone compatibility and internet connectivity is a major variable in assessing efficiency
2. The capacity of implementing teams has a strong influence on outcomes
3. Vendors require transparent access to transaction data and financial processes
4. NFC Cards would benefit from a unique identifier
5. Better analytics and monitoring of offline functionality would enable accurate insight into its performance
6. Local cash out options such as the Supervendor enabled faster re-stocking, strengthening the overall systems effectiveness, but needs structured processes
7. Localised and simplified processes supported vendor engagement

Summary

Acronyms

CVA: Cash and Voucher Assistance
DLT: Distributed Ledger Technology
KYC: Know Your Customer
OAU: Oxfam Australia
OiV: Oxfam in Vanuatu
RFP: Request for Proposal

Acknowledgements

This pilot was funded by the Australian Government. Information contained within this report was collected by Sempo and Oxfam in Vanuatu. All personal information, aside from direct quotes, has been de-identified. Images are courtesy of Keith Parsons/OxfamAUS and ConsenSys.

Executive Summary

In April and May 2019, the Sempo team travelled to Vanuatu to work with Oxfam Australia (OAU) and Oxfam in Vanuatu (OiV) to deliver the Unblocked Cash Transfer pilot. Sempo's involvement in this pilot is the result of a successful Request For Proposal (RFP) process, in which Sempo put forward a co-bid with ConsenSys to use our cash transfer platform to deliver digital credits to 200 recipients in urban and peri-urban regions on Efate island, Vanuatu. This project, including the use of a stablecoin as a representation of value, was supported by the Australian Government.

Sempo's cash transfer platform was selected by OAU and OiV to test the time, quality and cost of distributed ledger technologies (DLT) and e-voucher based cash transfer programs in response settings, in comparison to other modes of cash assistance.

This report outlines the process undertaken to implement the small scale pilot and documents key reported outcomes, challenges and learnings.

Overall, the pilot reached a total of 1,080 individuals. Together, Sempo and Oxfam reduced enrollment speeds for recipients to 3.6 minutes compared to over an hour for previous cash-aid pilots, and vendors to 8 minutes. In comparison to other cash aid mechanisms involving long wait times, ID verifications and trips to post offices or banks to deposit cheques, this demonstrates significant time and cost savings to NGOs and end- users. Further, user feedback from both communities indicated high degrees of preference for this type of aid over other conventional aid, attributing the systems useability, safety and greater choice. Unexpected challenges with repayments in country allowed for trialling a Supervendor system, and poor connectivity enabled the testing of the platforms offline functionality.

Finally, the successful planning and implementation of the pilot can be largely credited to the Oxfam team in Vanuatu. Community engagement and information sharing enabled the broad acceptance from the community- both from those directly involved, and those who were not selected to participate in the pilot.

The findings from this report will be distributed amongst our customers, investors and the broader public to enable shared learning.

Introduction

With 1.7BN people unbanked globally (World Bank), creating avenues for financial inclusion is essential to support people affected by disaster to create sustainable, long term livelihoods. With global aid spend exceeding \$200BN, cash transfers offer a more efficient, transparent and empowering way to deliver aid, and has become an increasingly popular alternative to conventional aid over the last decade (Hobbs and Jackson, 2016).

Without identity documentation, financial literacy or trust in financial institutions, many lack the opportunity to access financial services and products, and this ongoing exclusion from the market prevents these people being lifted from poverty.

Sempo has decided to address this global issue, developing a cash transfer platform which leverages the benefits of the blockchain, such as accountability, transparency and auditability and building a user friendly interface where community members can purchase goods from their local stores, create resilience in their local economy and reduce the impact of external shocks. In partnering with Oxfam and ConsenSys, Sempo has been able to test the strength of this system, and in doing so, assess its appropriateness for the Pacific market, and other markets with similar characteristics.

This report outlines the scope of the pilot, key results and impact, challenges and learnings.

Background

Prior to this pilot, Oxfam Australia has been actively working in the cash transfer space in the Pacific Islands. OiV has longstanding and pre-existing relationships with the communities targeted in this program, and prior to Sempo's arrival, had facilitated a number of cash transfer projects in response to natural disasters in the region. In February 2019, Oxfam published the results of their Vanuatu Cash Transfer Feasibility Assessment, determining that it is possible to implement cash transfer responses in Vanuatu, although the feasibility varies between islands.

In 2019 an RFP for a 'Disintermediated Conditional Cash Transfer Pilot' was advertised seeking a system in which there could be an exchange of tokenised value to communities in Vanuatu via local partners, allowing Oxfam to determine whether a DLT based cash transfer can outperform conventional solution by assessing the time, cost and quality.

The pilot sought to answer the question:

Can Distributed Ledger Technologies (DLTs) reduce the cost and transaction time of Intra-Institutional Transfers (IITs) and Cash Transfer Programming (CTP) while improving

transparency, security and overall user experience (UX)?

Within the RFP was also a request for the respondent to provide substantial marketing and technical sector exposure of the pilot. Acknowledging the requirements of the RFP, and the limitations of Sempo, Sempo reached out to ConsenSys, with whom we had an existing relationship, and it was agreed that a joint bid would be put forward where ConsenSys would leverage their media platform and Sempo would provide the technical solution, comprising a digital wallet, an NFC card, the Sempo App and a dashboard, with transactions stored on the Ethereum blockchain.

Platform

Sempo's cash transfer platform was the agreed solution that would be deployed in two communities in Vanuatu.

The solution was comprised of:

- NFC enabled smart cards for recipients. Each card stored the balance of the users digital wallet, and was referred to as an 'e-vouchers'
- Android devices provided to Vendors with the Sempo App installed
- Dashboard for approving participants, disbursements and monitoring of the program
- Ethereum blockchain backend for verifying the flow of digital cash
- Ethereum backed Smart Contract for wrapping Dai

The RFP indicated a desire to use blockchain tokens to track the movement of funds only, making it necessary for either Oxfam or Sempo to act as guarantors for the value of the tokens. On Sempo's advice, it was decided that a publically available cryptocurrency would be used for funds transfers, increasing transparency and opening up potential for lower international funds-transfer costs.

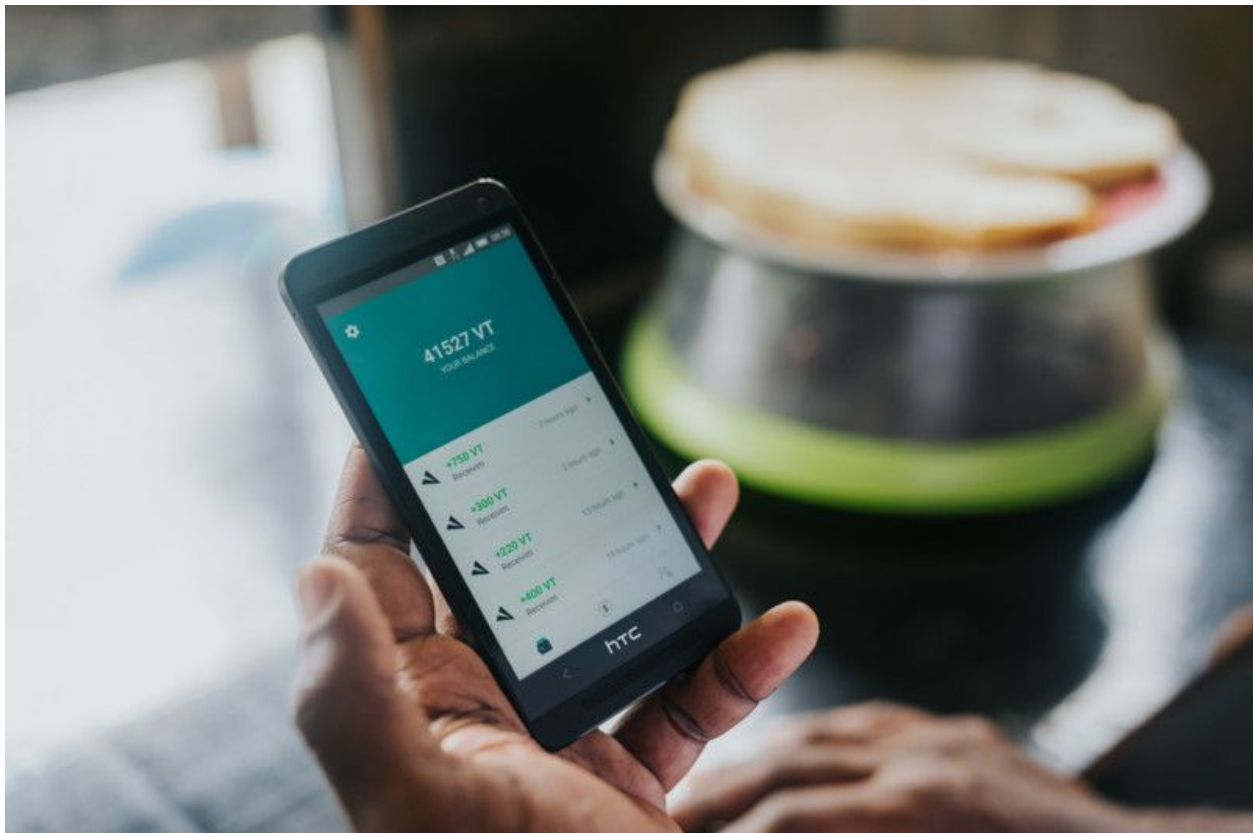
The pilot required Oxfam funds, provided by the Australian Government, to be converted into digital currency (Dai) that would be used in the platform. The decision to work with Dai was attributed to its non-speculative qualities; where other cryptocurrencies are vulnerable to fluctuation, MakerDAO's stablecoin provides reassurance that each coin purchased and sold retains the value of 1USD.

Given many recipients lacked the identity documentation necessary to pass Know-Your-Customer (KYC) checks, and the Vanuatu Government's strict regulatory requirements, direct distribution of cryptocurrency to recipients was not possible. To address this, the Dai was locked into a Smart Contract and used as collateral for e-vouchers.

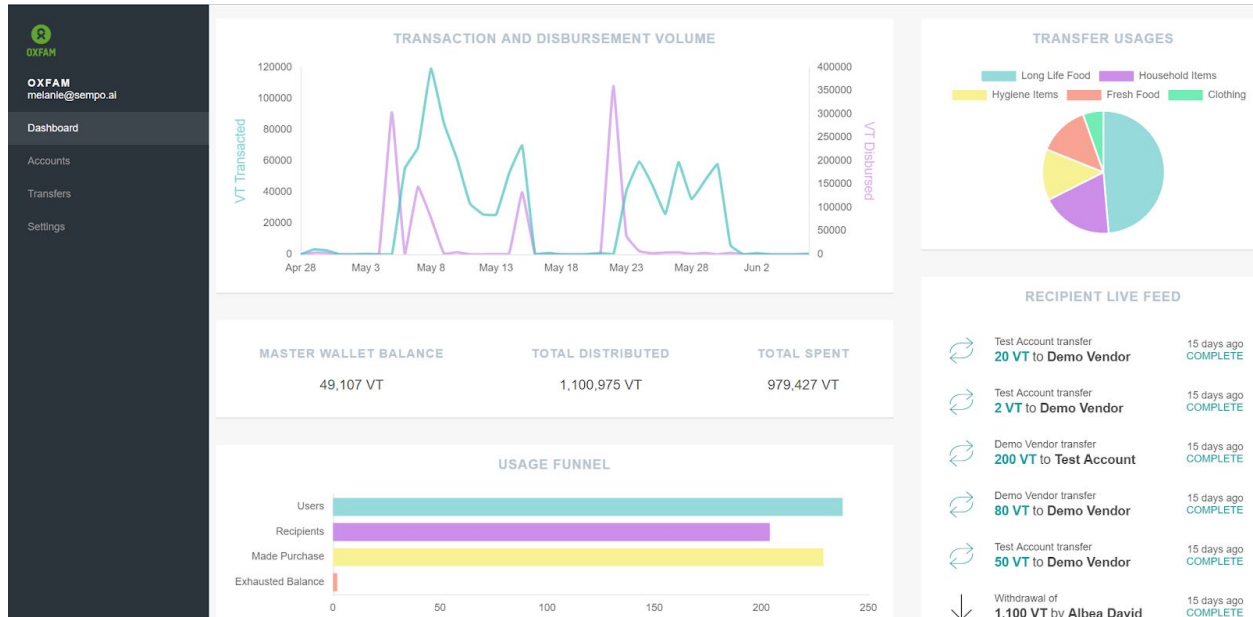
These e-vouchers were freely tradable between community members, and could be used to purchase goods at local vendors, while the underlying Dai was only accessible by parties that met the regulatory expectations of the Vanuatu government. Approved parties were recorded on a whitelist stored on the smart contract.

Wrapping the Dai to create “Crypto-Collateralised Vouchers” allows Governments and NGOs to confidently transfer value, regardless of internal policy and country regulations, and means that virtually anyone who meets local requirements can act as guarantor of value for programs.

The value of the funds was then stored in recipients’ digital wallets on the Sempo platform, and recipients were provided with the e-voucher card which held the balance. To make a purchase, the recipient simply taps the card against the Vendors Android phone, where the Sempo App is installed.



The Sempo App, installed on an NFC enabled Android device. Credit: Keith Parsons/OxfamAUS



The Sempo dashboard managed by OIV

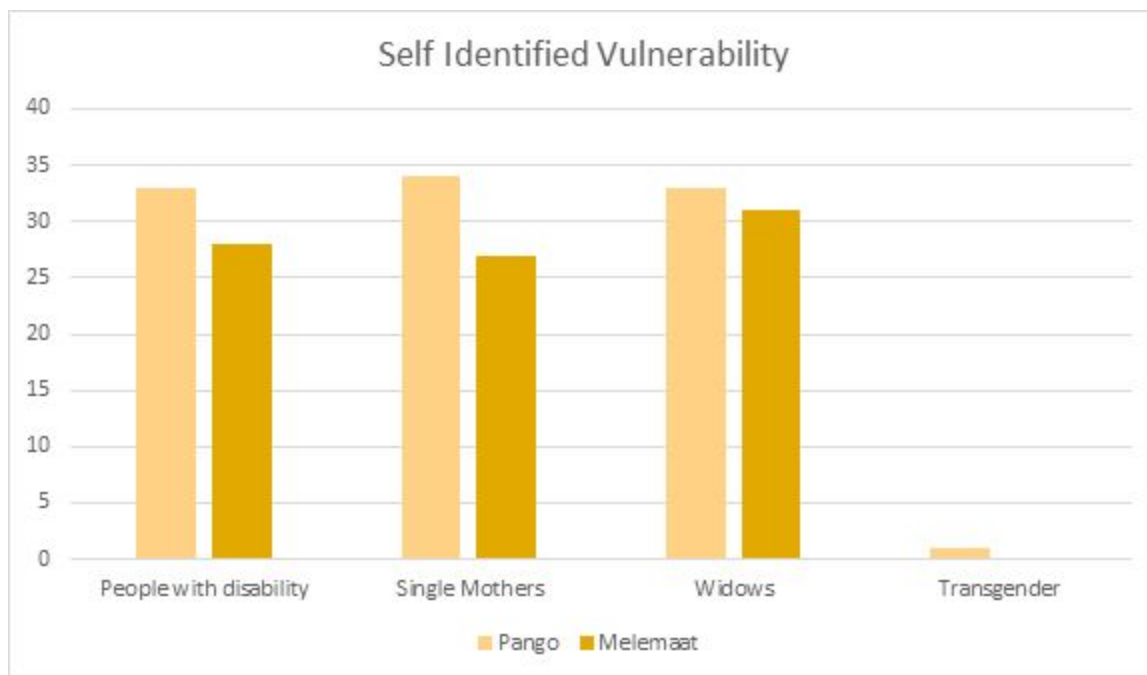
The Sempo dashboard is used by OIV approved administrators for enrollment, disbursements and monitoring transactions.

The backend to the system functions as a local sending mechanism, verifying transactions between the digital wallets locally and updating the database, displayed on the dashboard, prior to the transaction being logged on the blockchain.

The blockchain used in this solution is the Ethereum public blockchain. There is a one-to-one mapping of the NFC card IDs to Ethereum addresses. The transactions are put onto the blockchain by a single Ethereum account, which is effectively the Sempo admin account. It is authorised to do so by the individual user accounts because they have triggered a token “approve” function for their balance amount. The “approve” function is equivalent to giving Sempo permission to process debit and credit transactions when those engagements occur in real life between the NFC card owner and a participating vendor. The “approve” permission is triggered when the NFC card holders have their balances disbursed to them (ConsenSys).

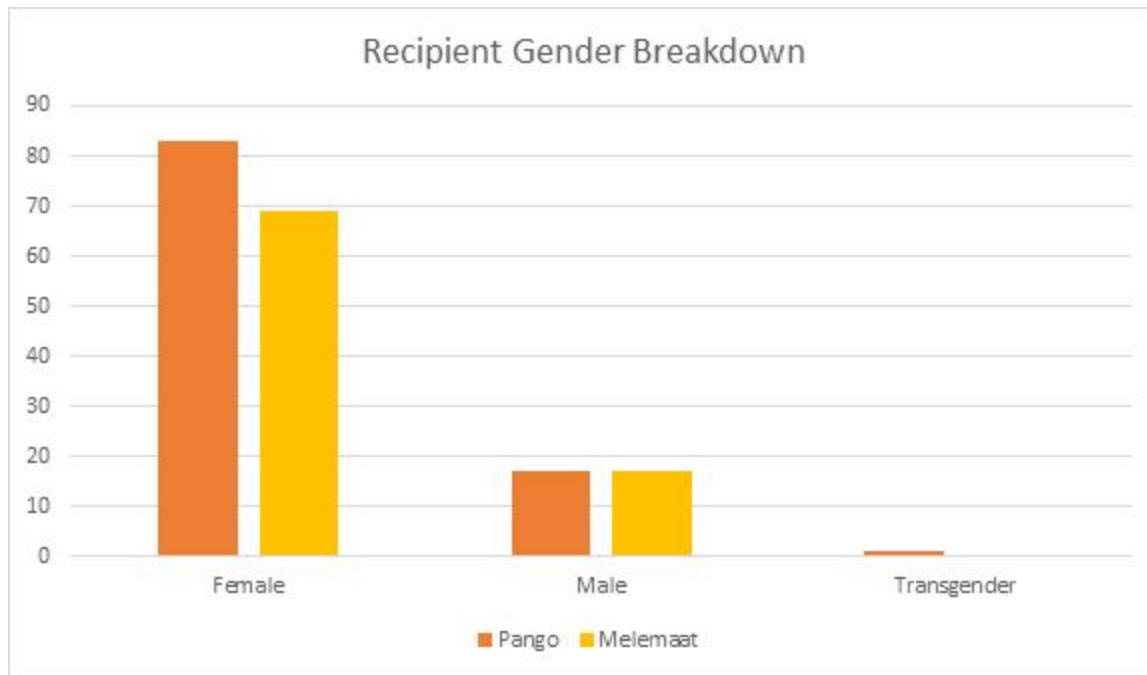
Targeting

Oxfam Vanuatu selected two Communities on the island of Efate in Port Vila; Pango, in the South and Melemaat in the north west. Within these communities two hundred vulnerable people were targeted as e-voucher recipients; comprising single mothers, widows, people with disability and people who identify as transgender. Post- distribution monitoring revealed unanimous agreement from both communities that the program included the most vulnerable groups.



Participants of the pilot were selected by OiV

Vendors were selected on the basis of operating in the area, willingness to participate and basic eligibility requirements, such as having a bank account, meeting KYC requirements and having access to the internet. Baseline questionnaires were developed for vendors and recipients by the Oxfam team which formed part of the enrollment process.



Significantly more females than males recipients were involved in the pilot

Community Acceptance

Oxfam was responsible for facilitating the engagement, participation and ongoing support of communities during the pilot. As part of their participation in the pilot, recipients would receive 40000 Vatu to spend at merchants. To gain trust and acceptance from Vendors, it was decided that a 4000 Vatu incentive would be provided, which could be used at the vendors discretion.

Prior to Sempo's arrival, Oxfam developed a range of communication material, to raise awareness of the pilot, encourage participation from vendors and beneficiaries and provide instructions for transactions in store. In addition, OiV facilitated community consultation 'inception workshops' to gain community buy in.

Communication aids included:

- Posters in Bislama describing the pilot
- Posters in store which tell the participants and vendors how to make a transaction in Bislama

- Instructional flyer for vendors and recipients in Bislama

Upon Sempo's arrival, additional community consultation was conducted in both Pango and Melemaat, using structured survey questions to gain insight into community perceptions and expectations. Survey feedback revealed that both communities were willing and curious to be part of the pilot. Many of the questions from the community focused on eligibility criteria and security.



A community leader in Pango reviews information about the pilot. Credit: Keith Parsons/OxfamAUS

The consultation was also used to inform OiV of the potential categories recipients intended to spend in, and use this as baseline data to cross check at the conclusion of the pilot.

Categories selected were: Fresh Food, Long Life Food, Household Items, Hygiene Items, Medicine, Bills, Taboo and Clothing. During the community testing, cash out was added as a category, and in the second pilot, this was expanded to include School Fees.

Following this, an information session was held with Community Leaders (representing local council's and women's committees), facilitated jointly by Sempo and OiV. This resulted in 3 people in Pango electing to be Community Focal Point's who would check the balance of recipients.

It is important to note that Pango's Area Secretary, Alan, was very open to the pilot, and spoke of how he was planning Business Education training for local vendors. He asserted that vendors had high levels of financial literacy, however, they exercised varying levels of bookkeeping, resulting in some businesses having more financial success than others. His vision was to increase the entrepreneurship of local vendors, encouraging them to take advantage of local icons to create tourist experiences. His influence as a person of authority, and his continued presence throughout the pilot should be considered a contributing factor to the willingness of Pango vendors to participate.

Pilot Process

The pilot process involved community awareness and consultation (inception workshops, consultations, session with community leaders), OiV staff training, community testing (Mini-pilot), Enrollment and disbursements and finally, Monitoring and Feedback.

Community Awareness and Consultation

Prior to Sempo's arrival, the OiV cash team undertook inception workshops and consultation to familiarise the communities with the pilot, gain acceptance from community members not partaking and identify potential recipients.

OiV Staff Training

The first week of Sempo's in country presence involved delivering training to the OiV staff across two days. Training included powerpoint slides on using the dashboard and platform, as well as hands on demonstration time using the Android Phone and the NFC card. Staff completed post-training surveys to provide feedback, as well as post-distribution surveys at the conclusion of the pilot.

"It's a new technology and there are many technical issues that may occur. Working closely with Sempo onsite is important, it will take at least 2 days to fully learn how to use the software"

Oxfam staff member



OiV staff practising transactions during Training week

Community Testing

During the second week of Sempo's in country presence, and prior to on-boarding all intended recipients to the platform, a mini-pilot was run. The purpose of this was to test the functionality of the platform, user experience in the field, as well as familiarising staff to enrolment and monitoring processes.

In Pango, the Mini-pilot involved 1 vendor and 3 recipients. In Melemaat, 2 vendors and 3 recipients participated. One vendor was requested to work in offline mode to test functionality.



A vendor signs the vendor agreement for the mini-pilot in Pango. Credit: Keith Parsons/OxfamAUS

Enrollment

The process for enrollment was different for recipients and vendors.

Recipients were enrolled by OiV staff in person, using Kobotoolbox. For Sempo and Oxfam's purposes, the following data was collected:

- Recipients Name
- Self identified vulnerability
- Age
- Gender
- Community

Additional baseline information was collected pertaining to OiV's project objectives. The staff then demonstrated how to use the NFC card to make purchases, and how to check their balance.



Oxfam staff register recipients in Pango. Credit: Keith Parsons/OxfamAUS

For vendors, a more detailed enrollment process was required, which involved collecting :

- Vendor name
- Vendor store name
- Vendor bank details
- Know Your Customer (KYC) documentation
- OiV baseline data

One on one demonstration was also provided on how to use the Android phone, and providing information on cash out options. Vendors were also required to sign a vendor agreement with Sempo, as a provider of goods and services. As some language in the agreement was quite technical, OiV staff were provided a simplified explanatory document which was translated into Bislama to assist the Oxfam team in explaining the agreement.

The enrollment process was complete once the kobo form was synced to the dashboard.

Disbursement and Cash Out

The Sempo platform offers three types of transactions, Disbursements, Payments and Withdrawals. These are described below:

Disbursement refers to the NGO or Sempo transferring funds to a recipient or vendor digital wallet

Payment refers to a recipient making a payment at a vendor, or a vendor making a payment at a vendor

Withdrawal refers to a vendor requesting a reimbursement of digital tokens for fiat.

During the community testing, disbursements to recipients occurred on site as they were being enrolled, enabling immediate purchasing in Pango, however during the pilot, disbursements occurred in bulk at a later time back at the office. This resulted in some confusion with vendors and recipients, who subsequently went to make purchases, but found that they had not yet been approved in the system.

Vendors were able to receive bank transfers twice per week to reimburse their sales, or cash out via a Supervendor, by exchanging their digital currency for fiat. The SuperVendor was provided a cash advance, in anticipation of their cash out services and the transfer fees they would incur.

Recipients in both communities were asked to exhaust their funds within 1 week of disbursement, though some flexibility was provided to ensure that all recipients had sufficient spending opportunity.

Monitoring, Feedback and Support

The OiV team had different levels of Administrative access to the dashboard for monitoring and tracking purposes.

Process times were observed by nominated OiV staff, who timed processes using their mobile devices, recording these figures on Oxfam's internal observation sheet

Sempo's approach to gathering feedback from OiV staff and pilot participants was split into structured information gathering mechanisms, including a Baseline Survey and Post-

Distribution Monitoring (PDM) facilitated by OiV, informal feedback recorded in the Issues Log, and feedback through the Sempo platform. The PDM questions varied slightly from Pango to Melemaat, as review of Pango data lead the team to increase their enquiry.

Feedback gathered from 7 staff who participated in Sempo's first week of training validated the effectiveness of the training approach, but also suggested additional demo devices would have enabled more individual hands on training time.

Support and communication to participants and vendors throughout the pilot was achieved through a combination of physical presence in the community (largely, members of the OiV team, with Sempo as required), and direct support over the phone via the Oxfam Hotline.

Public Exposure

The project received local and international exposure, featuring on numerous platforms, including the [ABC Pacific Beat](#) and [Radio National](#) program, crypto-currency publication, [Micky](#), [Yahoo Finance](#), [Cryptopolitan](#), Bitcoin and Ethereum content producer, [CoinTelegraph](#), and finance newsletter, [CryptoAM](#), in addition to the project being presented at the at the [Blockchain for Social Impact Conference 2019](#).

Reported Results and Impact

Results reported in the following sections were collected through the following mechanisms

- OiV observation Sheets
- Baseline Surveys
- Post Distribution Monitoring Surveys
- Monitoring and tracking data recorded in the Operational Plan
- Sempo Dashboard data
- Focus Group Feedback sessions

All data below should take into consideration the varying degrees of understanding of the technology by Oxfam staff, which may have impacted their ability to use the platform to its most efficient performance.

Key Data

“E-voucher is very easy. During the (Ambae) response we had to come back every day to update the daily cheque distribution and to plan how many cheques had to be distributed and to whom. It took a long time to set up the response and people where waiting, it took a lot less time to set up during the pilot

Oxfam staff member

TOTAL

“Donation” amount distributed	966,443 VT
Amount spent	816, 497 VT
Number of participating shop keepers	33
Number of participating recipients	198
Total number of transactions	1,572
Disbursements / Payments / Withdrawals	320/1,212/ 40

Breakdown by Community

PANGO

“Donation” amount distributed	541,602 VT (~4730 USD) (~6860 AUD)
Amount spent	498,089 VT (~4350 USD) (~6310 AUD)
Peak daily transaction volume	119,000 VT (~1500AUD)
Number of participating shop keepers	15
Number of participating recipients	112
Total number of transactions	827

Disbursements / Payments / Withdrawals	196 / 619 / 12
Average number of daily transactions	75.5
Average value of transactions	2286 VT (~20 USD) (~29 AUD)
Average enrollment speed recipients*	5.4 minutes
Average enrollment speed vendors*	8.5 minutes
Average vendor KYC	5.6 minutes

*Average times do not include time to explain the system, which was part of community awareness sessions

MELEMAAT

"Donation" amount distributed	424,841VT (~3660 USD) (~5280 AUD) See Note
Amount spent	318,408VT (~2743 USD) (~3957 AUD)
Peak daily transaction volume	59, 647VT (~513 USD) (~741 AUD)
Number of participating shop keepers	18
Number of participating recipients	86
Total number of transactions	745
Disbursements / Payments / Withdrawals	124/593/28
Average number of daily transactions	106.4
Average value of transactions	1320 VT (~11 USD) (~16 AUD)
Average enrollment speed recipients*	3.6 minutes
Average enrollment speed vendors*	8 minutes
Average vendor KYC	5 minutes

*Average times do not include time to explain the system, which was part of community awareness sessions

Note: Discrepancy between amount distributed and spent includes payments to vendors who immediately cashed out.

Key Notes

It is positive to note that all enrollment speeds reduced between Pango and Melemaat. In the case of recipient enrollment speeds between Pango and Melemaat, the data demonstrates a significant reduction in time taken, which could be attributed to staff having greater confidence in the enrollment process.

The difference in daily transactions highlights the different spending patterns between communities, with Melemaat making greater numbers of lower value purchases, indicating a level of comfort to use the system to buy as they needed.

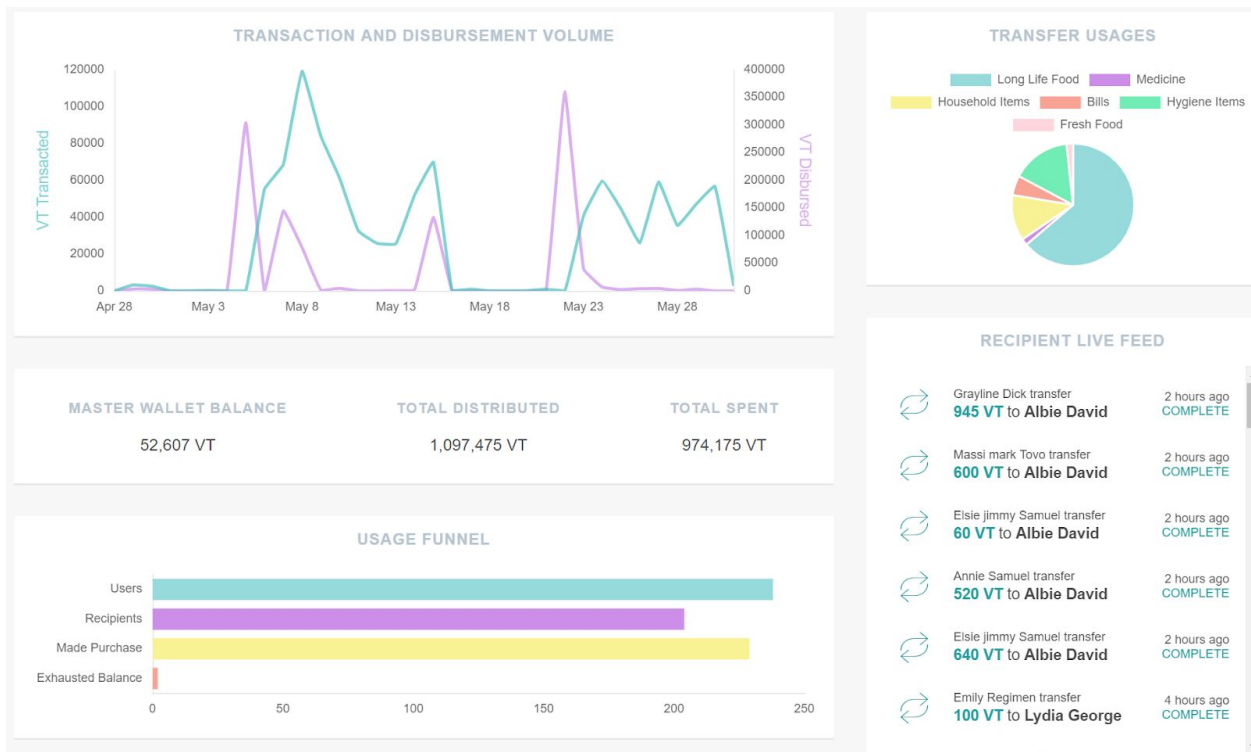
Recipient Experience

Despite both communities having exposure to the same product, staff members and community information, it must be acknowledged that the experience and learnings gained from the first pilot in Pango influenced and improved the processes for the second pilot in Melemaat. This is reflective in the user feedback below.

Usage behaviour data captured by OiV revealed that surveyed recipients (157) preferred making multiple purchases with the e-voucher, rather than one off.

Recipient usage of e-voucher						
Target Group	Multiple Times		Once		TOTAL	
	Count	%	Count	%	Count	%
People with disability	50	90.91%	5	9.09%	55	100%
Single mother	43	97.73%	1	2.27%	44	100%
Transgender	1	100%	0	0%	1	100%
Widow	51	89.47%	6	10.53%	57	100%

TOTAL	145	92.36%	12	7.64%	157	100%
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Screengrab from 31 May shows different spending patterns and greater diversity in spending

Pango



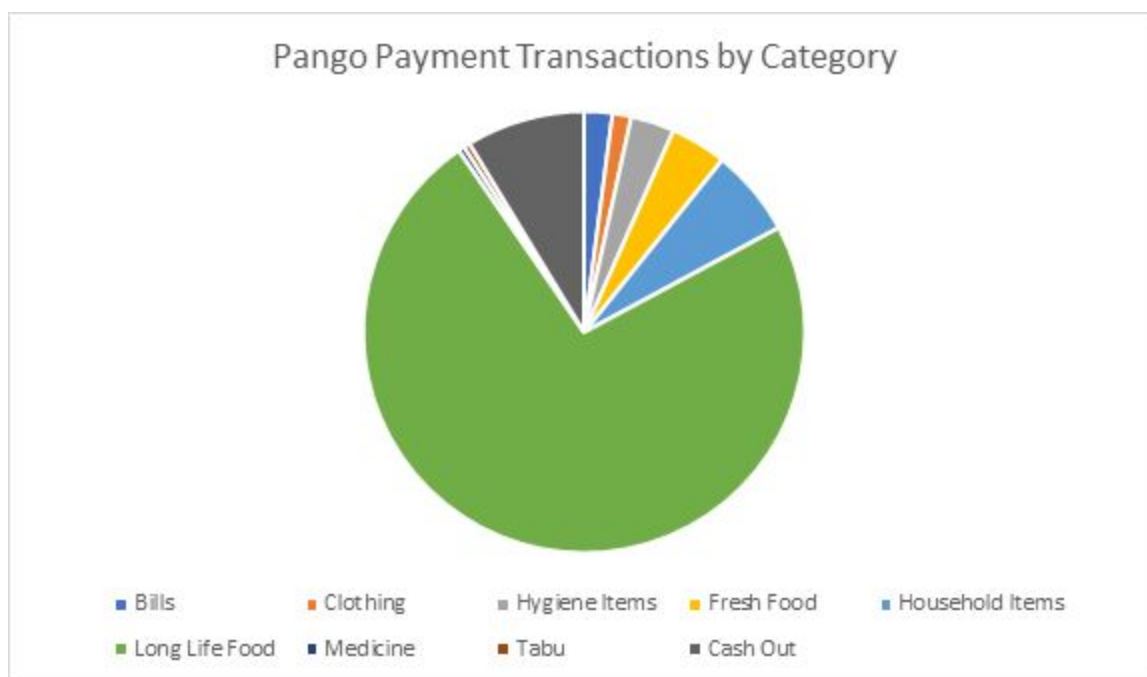
Users identified one of the key benefits of the Sempo system as greater choice. Credit: Keith Parsons/OxfamAUS

Preference

Of the 80 recipients surveyed, when asked of their experiences around choice in past disaster context, (on a scale of 1-5, with 1 being no choice and 5 being a lot of choice), 85% reported scale 1, that they had no choice, whilst using the same scale to measure perceptions of choice using the e-voucher, 96% reported scale 5, a lot of choice, with cash assistance being perceived by 86% as offering a high degree of choice. Finally, over 98% of those surveyed reported they would prefer to use an e-voucher in future disasters, with the vast majority believing the e-voucher is easier to use.

Usage Behaviours

38% of surveyed recipients reported having family members (the largest percentage being daughters) use their card to make purchases on their behalf, verifying the useability of the card, as recipients were able to explain to others how and where it could be used. However, this may present challenges if unique IDs (such as names or photos) are attached to the cards, likewise, a singular biometric lock could create barriers to accessing aid. The large majority (85%) of recipients reported making multiple purchases using their e-voucher, which is supported by data on the dashboard. This could indicate that recipients made use of multiple vendors, and/or that they were only making purchases as required. 95% reported that items purchased were for family members.



A screengrab during the pilot indicated e-voucher use was primarily used for long life food

Acceptance, Safety and Trust

Just under 4% of recipients reported experiencing issues with the card, with 91% reporting they felt that they received enough support with the use of the e-voucher.

Despite the majority of recipients (82.5%) reporting they did not know what information was stored on the e-voucher, 95% reported they felt safe to store information about themselves on the e-voucher, suggesting high levels of trust between the parties.

Most people surveyed (67%) did not believe that being in receipt of an e-voucher would impact family relationships, with most impact perceived as positive, in that it is meeting the needs of the family, reducing stress and increasing shared decision making. Less than 2% believed that negative impacts would arise. Less than 4% reported feeling unsafe to use the e-voucher,

believing it may be stolen, although debrief focus group discussions with a vendor revealed that they had held the cards of 5 recipients who reported feeling they could not safely store it in their homes. Despite these concerns, during the pilot, there were no actual instances of theft. Overall, 100% of surveyed recipients reported a positive experience using the e-voucher.

Melemaat

Preference

Of the 77 recipients surveyed, when asked of their experiences around choice in past disaster context, (on a scale of 1-5, with 1 being no choice and 5 being a lot of choice), 91% reported scale 1, that they had no choice, (with the remaining 9% selecting scale 2). Using the same scale to measure perceptions of choice using the e-voucher, 96% reported scale 5, a lot of choice, with cash assistance being perceived by 80% as offering a high degree of choice.

100% of surveyed recipients reported that they would prefer an e-voucher over other forms of assistance in a future disaster, with all surveyed recipients believing it is easier to use.

“In the future we want to receive the e-voucher because it is fast and simple and you can make your own choice and decision with your e-voucher without any power over from someone else

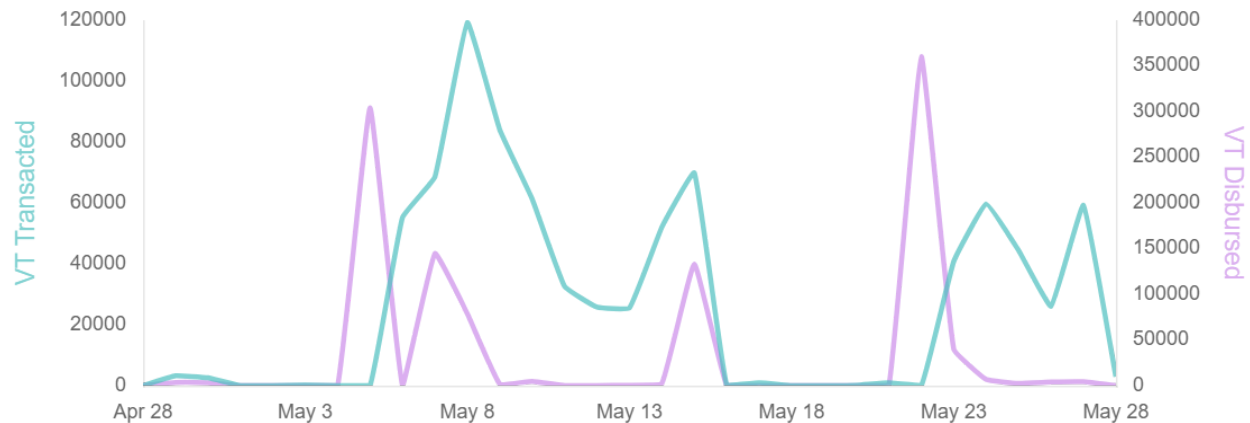
Focus Group Feedback (Widows), Melemaat

Usage Behaviours

The selection process was clear for over 90%, with those who were unclear reporting issues including not being present at meetings and having relatives explain.

In Melemaat, 58% of recipients made purchases for themselves, with the remaining 42% of surveyed recipients reported having family members (the largest percentage being daughters) use their card to make purchases on their behalf. A small percentage of these people reported that this was due to the difficulty of getting to the store, which may have been the case for people with disability or older people with decreased mobility. 100% of surveyed recipients reported that purchases were for the family.

When asked whether recipients made one bulk purchase, spending all funds, or multiple visits to the store, 100% reported multiple visits, which corresponds to the transaction data which displays consistent, lower spending patterns than what was experienced in Pango.



The above graph (obtained 28 May 2019) demonstrates the differences in user behaviour. After the first disbursements to the residents of Pango, transactions peaked, reaching the highest recorded daily payment volume in the pilot. However, after disbursements in Melemaat, daily transaction volumes were lower, and spending habits appear more consistent.

Acceptance, Safety and Trust

Just under 10% of recipients reported experiencing issues with the card, with 93% reporting they felt that they received enough support with the use of the e-voucher.

Storage of the e-voucher varied greatly, between at home (42%), baskets (31%) and wallets (27%).

Unlike Pango, the majority of recipients in Melemaat (60%) reported understanding what information was stored on the e-voucher, and subsequently, 99% felt safe to store information about themselves on the e-voucher. This may be attributed to an increase in staffs confidence in describing the system after having rolled out the pilot in Pango two weeks prior.

The perception of whether receiving the e-voucher would affect family relationships was divided, with 55% believing it would. Despite 45% suggesting it would, all but one qualifying comment as to how it would affect relationships was positive, including strengthening the family and better meeting their needs. The only negative perceived was jealousy. Overall, 100% of surveyed recipients reported a positive experience using the e-voucher.

Vendor Experience

A key learning from vendor enrollment was through the KYC process, where it was identified that some of the identification documents had expired and there were discrepancies between the spelling and names of vendors that were provided and that of their account details, resulting in delays as the account information bounced back. This highlights the importance of communication with vendors about appropriate documentation, and cross checking identity documents prior to processing to reduce potential delays. After experiencing this issue in

Pango, OiV staff communicated the need for up to date documentation to vendors in Melemaat, thus resolving the issue.



Oxfam staff collecting KYC information from Vendors in Pango. Credit: Keith Parsons/OxfamAUS

Pango

Of the 14 vendors, only 1 did not have access to their own mobile device, however these were not smart phones, and this meant that Oxfam staff were required to provide ongoing support to familiarise vendors to use the device.

73% of vendors reported receiving clear information on the details of registration and phone distribution, with the majority of information communicated by the Area Secretary

During the pilot, the large majority of vendors encountered between 0-5 pilot related customers per day, with 100% of vendors reporting the typical purchase as Food, followed by Hygiene and Medical items.

80% of vendors claimed they ran out goods during the pilot, with 60% of those able to re-stock before the conclusion of the pilot. It can be reasonably assumed that had the pilot duration been longer, this figure would be higher.

100% of vendors reported that they had an overall positive experience, would participate as a vendor if a disaster were to occur in the future, and the majority (93%) believed the e-voucher to be an easier system than other forms of assistance

Usage Behaviours

During the pilot, vendors were provided with an e-voucher as their login, and were also able to make purchases using the credit they acquired from purchases at their stores, however, the survey reveals that 93% of vendors opted to cash out, rather than to use their credits at another vendor, with all 15 vendors reporting a positive experience using the SuperVendor cash out system. The reasons to cash out rather than use the credit within the community were reportedly a desire to restock, a desire to diversify their goods and using cash for personal needs.

Vendors further verified this when asked how they would prefer to be paid in future situations using this platform, with 46% preferring to be paid in cash.

40% of surveyed vendors reported experiencing issues with the phone, primarily related to a lack of internet and an inability to process the payment of the recipient. Of those who reported issues, 33% reported them to Oxfam, who were supported by Sempo to reach a resolution. This was mostly done over the phone, however on occasions this involved the team travelling to the vendor's store to provide in person assistance. All 15 vendors reported feeling they received enough support throughout the pilot with how to use the Android device and Sempo App.

Acceptance, Safety and Trust

When examining community dynamics, the majority did not believe the pilot would result in negative relations, however 26% did believe their participation in the pilot contributed to tensions in the community. Of the concerns include jealousy (13.33%), domestic violence (6.67%) and community violence (6.67%).

The majority of vendors (86%) reported feeling safe to use the phone, storing it inside their homes, however 13% had concerns that the device would be stolen.

Melemaat

Of the 14 vendors, all reported having access to a mobile device, however, only four of these were smart phones, highlighting that to participate in the pilot, many vendors needed to become familiar with not only the Sempo app, but smart phones more broadly.

13 of 14 of vendors reported receiving clear information on the details of registration and phone distribution, with the majority of information communicated by the OiV staff and the Area Secretary.

During the pilot, 57% of vendors reported encountered between 0-5 pilot related customers per day, followed by 21% encountering between 11-15. This is validated by the different spending behaviours between Pango and Melemaat, which may be attributed to improved communication between OiV and communities, as staff became more familiar with the project.

Vendors reported the primary purchase as Food, followed by hygiene and household items.

50% of vendors claimed they ran out goods during the pilot, with 42% of those able to re-stock before the conclusion of the pilot. It can be reasonably assumed that had the pilot duration been longer, this figure would be higher.

13 of 14 vendors reported that they had an overall positive experience, would participate as a vendor if a disaster were to occur in the future, and 100% believed the e-voucher to be an easier system than other forms of assistance

Usage Behaviours

During the pilot, vendors were provided with an e-voucher as their login, and were also able to make purchases using the credit they acquired from purchases at their stores. 50% of vendors selected this option, providing an indication of the potential of this platform to function as a small ecosystem. 42% of vendors opted to cash out.

When asked how they would prefer to be paid in future situations using this platform, 64% would prefer to be paid into their bank accounts.

50% of vendors reported experiencing issues with the phone, primarily related to a lack of internet and an inability to process the payment of the recipient, which was the same issues reported in Pango. Of those who reported issues, all issues were reported and vendors reported that they receive enough support.

Acceptance, Safety and Trust

When examining community dynamics, all vendors believed the pilot would not result in negative relations. 100% of vendors surveyed reported feeling safe to use the phone, with 13 of 14 storing it inside their homes.

Other Comments:

Notably, in both Vendor and Recipient focus group feedback, both groups expressed how the e-voucher promoted greater financial management and potential for savings, as they were unable to physically see cash.

“E-voucher is better, because it helps us buy only food with the e-voucher and we don’t see any money, we just keep the e-voucher card but if we were given cash, we will spend it on unnecessary things that might not benefit my family but will only benefit myself- Focus Group Feedback (Widows), Melemaat

“Card is better, because if I had some cash in my hand, I will spend it all at once but with the card, I can get whatever I want in the shop without seeing any money and it will help me to manage or save the amount of money in my card- Focus Group Feedback (Widows), Melemaat

Platform and System Performance

Issues related to Sempo’s platform and broader system performance was captured in an Issue Log which was co-managed by Sempo and OiV. 22 issues were recorded during the pilot, some of which included challenges with cards, connectivity, login difficulties and vendor payment processing. All critical issues were resolved, though it was decided to leave some lower priority issues unresolved. Most issues were managed over the phone, within 10-30 minutes, with a maximum resolution time of 90 minutes, in person.

There were no registered comments/ feedback by Vendors through the Sempo App. This is likely due to the combination of on the ground presence of OiV and Sempo and instructional posters in the local community and may indicate a lack of awareness of the feedback function.

Total fund transfer overheads for reimbursing vendors was approximately 11%. It is worth noting that we did not attempt to lower the figure by shopping around, or performing bulk transfers. Rather, Sempo was focused on proving the reimbursement cycle process, and therefore, it is reasonable to assume this figure could be lowered.

Dashboard

Functionally, the dashboard did not experience any downtime or lag throughout the duration of the pilot and was accessed by 16 administrative users.

“Evouchers are easier because we can see exactly what they pay and all information of the recipient are online it is very user friendly. The preparation of recipient information and updates during the Ambae response always took a long time, we often had to work long hours in the evening to update information and to prepare cheques.

Oxfam staff member

However, the dashboard could display greater transparency with regard to transaction history, given that when viewing listed recipients, if the account balance reads 0, without individually

entering each account, it is unclear whether they had been distributed funds and spent those funds, or have not yet received funds, creating potential for double payments.

Oiv made a total of 18 modification requests related to dashboard display, filtering and administrative control, for example, adding filters (such as community name, transactions and balance) to improve analysis, displaying total users in the system, viewing online versus offline transfers, creating automatic disbursements upon account creation and having the ability to deactivate accounts.

Given the timeframe of the pilot, 8 of the modification requests deemed to be the most critical, were addressed during pilot rollout.

Sempo App

The Sempo App was used exclusively by Vendors in this pilot for the purpose of performing transactions, having access to a record of their transactions and requesting fiat reimbursement, referred to as withdrawals.



Vendors enter the amount owing via the Sempo App. Credit: Keith Parsons/OxfamAUS

Given the limited experience of vendors with smart phones, teething issues to use the App was inevitable, and most issues were resolved quickly over the phone using the Oxfam hotline.

Some vendors expressed challenges logging into the App once they had logged out of the system. It was identified that this was due to either the mobile data not being turned on, or that the vendor had created, and subsequently forgotten their PIN.

In Melemaat a 'pending' notification displayed during transactions when local connectivity was low, causing vendors and recipients to duplicate purchases as the system tried to switch between online and offline functionalities. The duplications subsequently appeared on the dashboard and were able to be rectified, however it highlighted the systems challenge in determining which payment mode (online or offline) would be the accepted mode.

Android Device

During the community-testing phase, it was identified that the Android devices (HTC M7) onto which the Sempo App was installed did not perform to specification, as individual microchips used to communicate with mobile phone networks differed slightly, some of which were not compatible in Vanuatu. The phones were expected to connect to the internet at 3G speed (sufficient for low-intensity web-browsing, such as visiting websites without video content), however, it was later discovered that approximately 70% of the phones had a connection so slow that loading the plain Google home-page took several minutes. While the Sempo app is designed to operate in poor-internet conditions, this had the effect of slowing-down the speed at which phones could sync transactions to the main system, and made it impossible to update the Sempo app remotely.

Prior to arrival, it was tested with two devices. This anomaly between microchips was not documented anywhere on the device, or product specification, and was impossible to determine without in country testing.

For future programs, thorough in country testing prior to launch is advised.

NFC Card

NFC cards were provided to recipients, to make purchases using their stored digital balance, and to vendors, who were able to spend at other vendors, although primarily, cards were provided to both groups as many vendors did not have their own smartphone devices with which to log into the Sempo App. To provide clear and consistent messaging, Oiv informed vendors to use the number on the card used as their log in, and the final four digits were the PIN.

During the community testing, two issues were identified

- 1) Holding the card against phone for too brief a period caused a failure to transfer message and;
- 2) The card had to be tapped at the top of the phone, tapping anywhere lower failed to initiate a transaction

After these findings, the community was instructed to hold the phone against the card for up to 5 seconds, and staff demonstrated the correct location for the NFC card to tap the device. For the remaining duration of the pilot, the NFC cards performed as intended, with minimal functional errors.

During the pilot in Melemaat, because the Sempo App automatically returns to the PIN screen when the phone is locked, vendors were taking out their NFC cards with their PINS to re-sign in when a new customer arrived at their store. This led to recipients and vendors mixing up their NFC cards, as the vendor would be holding their own card to login and then assisting the recipient to tap their own card. This resulted in the vendor charging themselves, and having to reverse transactions. In debrief focus group discussions, vendors and recipients suggested this could be better resolved by having a name and photo on the card.

Challenges

Third- Party Suppliers

Sempo requires third party suppliers to provide the Android Devices and NFC enabled e-voucher cards.

In the days leading up to Sempos arrival in country, OiV informed us that a larger pool of vendors had been identified to participate in the pilot, meaning there was going to be a shortfall in the number of Android phones. As Sempo imports our goods from Hong Kong, the last minute additions to the vendor list required the goods to be sent directly to Vanuatu via DHL Courier services.

Once it was identified that the package was in the country, the process of fee's payment, customs clearance and package delivery took two days, at which point it was discovered that only half of the package had arrived, with the second half of the package arriving almost a week later.

It was fortunate that the schedule for Melemaat implementation had been shifted, therefore, not impacting pilot delivery, however, it highlights the necessity of both pre-planning and communication with the project parties.

Financial Matters

During contract development between Sempo and OAU, it was agreed that Sempo would be performing the financial reconciliation of vendors. However, ultimately, this was not an efficient way of getting money to vendors quickly, given that Sempo did not have a local account and transfers had to be made internationally, causing significant delays to vendors in receiving their funds and impacting their ability to re-stock during the pilot.

The delay was further exacerbated for some vendors where incorrect personal banking details and inconsistencies with spelling had been provided, resulting in bounce backs from the banking institutions.

Furthermore, during community testing, Sempo discovered that international bank transfers minimum transfer was 10,000 Vatu and transfers included a fee on the recipient end, meaning the vendor was out of pocket to an even greater extent until they were due to be reimbursed. This presented an issue for reimbursing vendors who participated in the mini pilot week, where only small amounts (1,000 Vatu) were disbursed to participating recipients, as well as for vendors in the Pango pilot, who reported engaging between 0-5 customers per day, meaning the 10,000 Vatu income could not be guaranteed. Subsequently, vendors from the community testing were repaid in cash.

In addition, processing times varied depending on which banking institution the vendor was with, meaning a guaranteed date of reconciliation could not be provided.

To address these issues, the concept of a Supervendor (who had sufficient liquidity and supplies of their own) was introduced during the community testing phase, and was provided a 30,000Vatu advance and 5% profit in exchange for cash out services to allow smaller vendors to restock faster. When it came to the financial transparency for the Supervendor however, the App lacked features to provide the Supervendor with confidence that she was repaid what she was owed. Luckily, the transparency of the dashboard and strong relationship with OiV staff resolved these concerns.

Advances paid by Sempo to the Supervendor's bank account were not recorded in the Sempo platform, as the platform is unable to go into a negative balance. From an NGO auditing perspective, this lack of consistency could prove problematic when attempting to discern when the Supervendor was paid and when it was an advance or credit. Furthermore, there was no formalised system for determining the advance amount to be paid to the Supervendor, resulting in a loose calculation that did not reflect the actual volume of transactions, resulting in the Supervendor being temporarily out of pocket. Although, given the nature of the system, it is inevitable that the vendor will always be 'out of pocket' until they claim a withdrawal. This highlights the importance of setting clear expectations and providing vendor transparency over payment processing times, which is often outside the control of the NGO or Sempo.

As a result of the financial challenges detailed above, it was decided that OiV would manage the repayment of vendors during the Melemaat. This also enabled the OiV team and their finance department to test the feasibility of managing the financial reimbursements locally. Future operations should ensure the necessary local cash out infrastructure is in place, and tested before launch.

Security

Theft of devices

Oiv staff raised concerns over the possible theft of phones by vendors, particularly given that community focal point persons had not been required to sign a contract. However, PDM feedback revealed that a small number of vendors also had a concern of the theft of the devices. To resolve this, it was agreed that an amendment would be made to the vendor agreement to include that devices not returned would incur a fee (equivalent to the cost of the device), and this was also signed off by the Area Secretary, whose influence at the Government level was perceived to promote accountability among vendors.

PINS

Despite instructions to vendors create their own unique PINS to access the Sempo App, it became quickly evident that this was not effective, as people forgot their codes. To address this, vendors were provided an NFC card, the card code which would be used as their phone number, with the last four digits of that code acting as the PIN. Whilst this increased the risk for vendors that their account could be hacked, the likelihood of theft of both the card and device was deemed low.

E-voucher security

Concerns were raised during initial community consultation by a woman who was blind about her card being taken by family members or her carer and used for their own purchases. Solutions provided at the time were to either **a)** write her name on the card **b)** tape her image to the card (acknowledging it could easily be removed) or **c)** have an Oxfam representative accompany her. This concern was also felt by residents of Melemaat during the community testing, with some expressing uncertainty around signing up a recipient with a disability and then having their caregiver be the person conducting the shopping on their behalf.

During the Pango pilot, there were two reported instances relating to the loss of the NFC card. PDM surveys revealed that 55% of surveyed recipients stored their card in their wallet. One recipient with a disability reported to OiV staff that she gave her card to someone else to make purchases, but could not recall who that person was. No transactions were recorded on the dashboard.

Another incident was reported by a recipient that their card had gone missing, and tracking of the card on the dashboard revealed that transactions were taking place. OiV staff asked the recipient to check whether a family member had been using the card, and it was later discovered that a younger sibling had taken the card.

Hack attempts

Throughout the pilot, the system encountered regular low intensity attempts to gain access to the system, which were prevented by even the most basic of our security measures. Because these penetration attempts were so rudimentary, they are not indicative of Sempo's security resistance, but do highlight the constant scrutiny from malicious actors that such platforms are exposed to and need to protect against.

Learnings

1. Consistent phone compatibility and internet connectivity is a major variable in assessing efficiency

During the community testing, it became evident that the Android phones were not always compatible with Vanuatu's mobile infrastructure. Of the 18 devices ordered for the pilot, some did not accept Mobile Provider, TVL's SIM card. As a result, all the phones were required to use Digicel SIMs. Further, inconsistent levels of connectivity challenged vendors attempts to process payments, creating duplicate transactions as the system tried to switch between offline and online modalities. One recipient in Melemaat described taking items from the stores, and returning later in the day when connectivity was stronger to process the payment.

In the future, more rigorous testing of equipment prior to launch, in a wide range of conditions, will reduce uncertainties and delays in country. In addition, it is recommended to set up a community hotspot as a backup connection for vendors.

“Network is the major challenges with many Vendors to connect for payments. It will be great if in the future after a disaster we trained young and smart people to be as vendors due to technology used-

Joseph Frank, Area Secretary, Melemaat

Enrollment of vendors and recipients was completed using Kobotoolbox, selected because of its ability to function in offline modes, given the inconsistency of strong internet connection in these communities. However, this created confusion for vendors and recipients, who anticipated using the system immediately after enrollment, only to find that their details had not yet been updated in the platform, and that the recipient accounts had yet to be credited, because the kobo form had yet to be synced to the Sempo platform. Whilst this was a connectivity issue, and having someone with portable, fast internet and battery is recommended for future projects, this also could have been better managed with clear communication.

2. The capacity of implementing teams has a strong influence on outcomes

The human resourcing to implement this pilot was critical, as evidenced by the OiV led community consultation, registration events and non-technical support provided across both communities. Both the capacity to resource, and the leadership required to effectively coordinate such projects, should be considered an important variable in determining the potential of any community based project.

As evidenced by the increased speed of enrollment in the second community, the capacity of implementing staff to understand the platform, and upskill others will impact the effectiveness of any community based program. In the case of this pilot however, the successful implementation in both communities within the anticipated time frame reflects the teams level of experience and willingness to work with new technologies.

However, the challenge with introducing new technology into communities is that the level of technical expertise required to understand the backend of the platform is typically reserved to Sempo staff. Whilst the OiV team were able to workshop and resolve non-technical issues, others had to be managed by Sempo, posing potential limitations for a scaled solution if technical expertise was not accessible. If Sempo were to provide enduring resources such as an introductory pack with key system information, as well as a “Trouble-shooting” guide for typical issues, this, along with remote support, should enable teams to reach solutions locally, for the long term.

3. Vendors require transparent access to transaction data and financial processes

It was evident, particularly in the case of the Supervisor that greater transparency of transfer information is required to maintain trust and ensure the ongoing participation within the project. Vendors engagement and ongoing participation in cash transfer programming is a business decision, and as such, they are entitled to high levels of financial oversight.

To meet this need, Sempo would need to build a feature which enabled vendors to review the status of their withdrawal request, creating assurance that their reimbursement is being processed, and clarity around when they will be able to restock.

Furthermore, advances paid to SuperVendor for their service as a liquidity agent need to have clear methodology behind them, and vendors should be able to have access to this data, and be able to differentiate between money reimbursed versus money owed.

4. NFC Cards would benefit from a unique identifier

At several points throughout the pilot process, questions arose on how to ensure that the card can be connected back to the owner. Issues of borrowing cards within families, and card mix ups between vendors and recipients further validated these concerns.

Resolutions suggested by pilot participants included having names on cards, images or colour coding cards to reduce the likelihood of mix up, however, the privacy implications and cultural and social context needs to be considered before exploring these avenues to ensure the identity of vulnerable people are protected.

Critically, any system needs to support the capacity for recipients to delegate purchasing authority to trusted family or friends. This is evidenced by the fact that in one community, 38% of recipients sent others to make purchases on their behalf.

5. Strengthened analytics and monitoring of offline functionality would enable accurate insight into its performance

While this pilot utilised both online and offline functionalities of the platform, a limitation to be noted was the inability to effectively capture and monitor data from the offline performance and for the system to select an online or offline mode, when there is a low or inconsistent connectivity environment, without risk of duplicating the transfers.

To effectively assess the degree to which offline functionality plays a role in cash transfer programs, and the features required to successfully support offline functionality for long durations, the platform would benefit from receiving information about any activity from the device (online and offline).

6. Local cash out options such as the Supervendor enabled faster re-stocking, strengthening the overall systems effectiveness, but needs structured processes

The establishment of the Supervendor was the result of challenges with Sempo's financial reimbursement processes (as detailed in the Financial Matters section), however, ultimately, it provided an opportunity to explore the feasibility of localised solutions to efficiently repay smaller vendors, and offer options for continued use of digital funds within their market.

To reproduce this system at scale however, several considerations need to be taken into account, such as determining appropriate advances with evidence based calculations, formal contract processes and eligibility criteria to ascertain appropriateness, capacity and sustainability.

The Supervendor system has the potential to increase the pool of vendors, enabling those without bank accounts to participate. Therefore, it is recommended that this system is assessed for suitability in future programs.

7. Localised and simplified processes supported vendor engagement

There is no doubt that localised material will always support greater communication, and therefore, engagement in community based programs. This was particularly evident during the Vendor enrollment process, which required vendors to read and sign contracts with Sempo related to their role as Vendors, and the financial reimbursement process.

It was realised early on that the language in the contract was quite technical and did not use everyday language, making some terminology difficult for OiV staff to interpret and convey, despite translating the documents into Bislama. To address this, Sempo developed a 'Simple English' reference guide, which provided clear explanations for each item in the contract.

Furthermore, by limiting the amount of information required during enrollment, and providing clear demonstrations of transactions during community awareness and consultation sessions, vendors and recipients were consistently engaged throughout the pilot, and when uncertainties or issues arose, participants reported these to Oxfam staff.

Summary

In summary, the Unblocked Cash Transfer pilot has provided a platform in which Sempo can demonstrate the strength of its systems; processing large volumes of transactions in remote, low connectivity environments to people with low levels of mobile and technical exposure within a matter of weeks. The success of the pilot to deliver on its initial objectives within the agreed time frame indicates the platform could perform effectively in other Pacific regions, and environments presenting similar characteristics. Furthermore, this pilot has demonstrated the utility of using Smart Contracts to wrap the Dai, which has enabled the value of Dai, but not the Dai itself, to reach communities in societies where strict crypto-currency regulations exist.

“Cost of Multi purpose cash grant (Ambae response) where really high such as printing cost to do with logistics and procurement. The e-voucher was much easier and faster and cheaper

Oxfam staff member

Challenges experienced during the pilot highlighted a need for better coordination with third party suppliers, localised financial systems and processes, thorough testing of devices and a secure NFC card identification solution. Further, managing the challenges with low connectivity environments by

User feedback has confirmed that the Sempo platform would be the preferred modality in the case of future disasters, attributing ease of use, safety and choice, and vendors have expressed their readiness to accept this type of system in disaster contexts. In addition, feedback from both vendors and recipients suggested that e-vouchers have the potential to increase longer term financial management, in the absence of seeing physical cash. Oxfam staff have also verified the systems useability, reduced costs and improved speed of delivery.

Markers such as enrollment speeds, which reduced substantially between the first and second location provides optimism that further reductions in time could be achieved, dependent on factors such as recipient literacy and staff familiarity, and daily transaction data offers insight into the ease and efficiency of introducing this technology into communities. However, the success of the pilot would not have been possible without the established relationship and trust between OiV and the communities where the pilots took place.

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