IMPROVING CASH-BASED INTERVENTIONS
MULTIPURPOSE CASH GRANTS AND PROTECTION
Enhanced Response Capacity Project 2014–2015

Challenges and the State of Play of Interoperability in Cash Transfer Programming

Executive Summary

UNHCR
The UN Refugee Agency

World Vision

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Background

The following paper is an executive summary of the "Interoperability in Cash Transfer Programming: Design Challenges and State of Play" report released on the 20th of April 2015 and authored by Dan McClure and Brad Menchi of Thoughtworks. The paper is the result of a collaborative effort under ECHO's Enhanced Response Capacity Grant. It is an era of a proliferation of agency-specific information management platforms, not least newer versions of ProGres – UNHCR's refugee registration system, ScOPE – WFP's all-inclusive beneficiary, entitlement and reporting information management system, and Last Mile Mobile Solutions (LMMS), a World Vision developed system used frequently by an increasing number of NGOs (footnote http://www.lastmilemobilesolutions.com/). This falls against a backdrop of an increased demand for accurate beneficiary information which is in turn shared with financial service providers who facilitate cash transfers. To increase the efficiency, effectiveness and safe data management and transfer for cash-based interventions (CBIs), ERC partners felt the issue of interoperability was worth exploring. Specifically – is it a desired outcome? – and if so, how close are we to being able to achieve this? The paper attempts to answer some of these questions and contributes to the sector's understanding of a way forward to achieve its primary goal – effective aid and safeguarding beneficiary protection.

This study explores the factors driving the design of interoperability for Cash Transfer Programming (CTP). It outlines the rapidly changing environment in which digital services are emerging, the types of digital collaborations that could be enabled, and the key design challenges that confront effective interoperability.

Definition of the Challenge

The multi-dimensional characteristics of interoperability coupled with constraints in cash-based intervention processes and systems make the challenge of achieving interoperability in cash-based humanitarian assistance difficult to define let alone solve. The problem space (the field onto which any proposed solution must be mapped) in CTP is young and in flux, where the underlying cash strategies and the supporting stakeholder ecosystem are still evolving. Against this shifting field, the current State of Play (in which inventories the current set of solutions and practices in use) is a relatively fragmented group of solutions developed for specific needs.

The report seeks to reflect the multi-dimensional aspect of the design challenge. Several distinct challenges lie within complete interoperability solutions in the context of CTP: These challenges are expounded on later in the document.

- Designing for semantic interoperability. 3 types of semantic meaning need to be aligned when exchanging data:

  - Meaning of terms – What is the meaning of this variable?

  - Meaning of values – If there is a term Education Level, what are the values that the term can hold? If the allowable values are illiterate, primary, secondary, what defines the scope of each value?

  - Hierarchy of relationships e.g. being able to identify the children of single mothers requires a relationship to be built between the mother and the child. The types of relationships and their meaning give a higher order meaning to the data.

- Aligning syntax and communication. By comparison to designing for semantic interoperability,, the alignment of syntax is easier. Here the concern is that the specific format and structure of information is consistent.

● Designing for Data Privacy and Protection. CTP and the broader digitization of aid has the potential to drive an increased level of personal data collection and sharing. This raises a number of personal privacy issues and increases the importance of data security.

The goal of any interoperability effort should be to achieve more efficient, effective and safe cash-based interventions and e-transfers, not just to achieve sameness for the sake of sameness. Please note that using the same tool is helpful in Interoperability, but not a requirement.

Information flows are inward, requiring the data collection to ultimately align with the types and formats of internal systems. Since many of the legacy operating systems are very large and have their own deeply entrenched technical ecosystems of data repositories, reports and integration points, there is limited ability to change.

As a result, there is pressure on any tool in wide use to support varied demands from different business systems integrations. A tool's ability to enforce a new data standard across cash transfer programming may be limited, even if there is broad adoption.

Because existing beneficiary case management systems are situated within a context of internal, organization-specific, proprietary databases and systems, the interoperability challenge extends not only to the systems directly involved in supporting cash-based interventions, but also those systems that depend upon them to function (e.g. organization-specific systems – including back office systems – that are not directly involved with providing cash assistance). This situation increases the complexity of possible solutions.

Operationally, sharing digital beneficiary data enables increased accountability to donors and enhances data integrity. However, data confidentiality concerns as well as data structure incompatibility are impediments to sharing personally identifiable information.

State of Play

CTP is part of a growing inventory of digital services that are in the early stages of transforming the Humanitarian and Developmental aid sectors. We are seeing the leading edge of a shift from physical in-kind goods and services to digitally delivered aid.

The report notes that the CTP landscape is a relatively immature space with change occurring across multiple dimensions. The interview responses were quite diverse, with no two organizations sharing more than one or two of the same technical characteristics (e.g. similar geographic data standards, taxonomies, data usages, data systems, data structure and maturity in the handling of data privacy, etc.).

While this is an early stage marketplace with multiple platforms in play and no single market leader, Appendix 1 details products and solutions that show the leading tools and applications. Among these leading tools are applications developed by World Vision (LMMS), UNHCR (ProGres), and WFP (SCOpe).

One of the frequently questions asked (in the investigation into the state of the problem), was "What do you mean by interoperability?" As respondents describe challenges and experiences in the problem space, a wide range of possible answers to this question emerged. Ultimately, the question of which problem is being solved dramatically changes the types of issues that must be resolved and which organizations are the principal stakeholders in the effort. These functions divide into three major use cases, each with substantially different data interoperability needs as depicted in the table below:

Three Interoperability Use Cases		
Use Case	**Data Needs**	**Level of Data**
Use Case 1 – Transaction Processing "As an Aid Provider I want to deliver cash based aid to a beneficiary via a financial intermediary."	Transaction Values – stable well defined data structures that can be explicitly defined and exchanged.	Individual + Transaction.
Use Case 2 – Consolidated Reporting "As a Reporting Agency I want to consolidate data about beneficiary needs and aid deliveries to provide a holistic picture of a crisis response."	Attributes – Descriptive data about additional elements that help group, sort, and assign values to elements in a data set.	Anonymized Individual Data and / or Consolidated Aggregate Data.
Use Case 3 – Collaborative Programming "As an Aid Provider I want to personalize my aid services to the current needs of specific individuals."	Transaction + Attributes + Context – Additional enrichment with time and context sensitive information.	Individual. Not just transactional information.

Additional existing tools and standards include Point to Point Integrations (integrations established between, a pair of partners or a small set of similarly engaged players), the Open data movement and the HXL lightweight data. The report notes the risks and power of biometrics as well as the limited usefulness of the open data movement1 in relation to interoperability due to the limitation of sharing personally identifiable beneficiary information.

Possible solutions

The report notes that the following five contributors to the current transformation of the aid ecosystem must ultimately be accounted for in the design of a strategic approach to interoperability. Each contributor is listed along with its set of key observations:

Stage 1: Digital Beneficiary Capture for Traditional Aid

Data Capture Tools Available: There are tools available to support the digital capture of beneficiary information. While there has yet to be comprehensive adoption, tools such as LMMS, ProGres, and SCOpe, have been proven in real life deployments

Tool Led Standard Unlikely: There is no dominant tool for capturing beneficiary data, so it is unlikely that a standard led by a single tool will naturally develop.

Integration Drives Variation: Highly varied internal system needs will exert pressure for customization of functionality and data as they are integrated with the data capture tools

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¹   https://okfn.org/opendata/

Stage 2 – CTP – Switching from Goods to Cash

Cash Programs In Early Days: There are still diverse experiments in the design of cash aid programs. There is no single model that has become a dominant standard for delivering cash aid. The experimentation is likely to continue for some time.

Diversity In Approach Likely to Continue: Multiple drivers including infrastructure, urgency, local context, varying legal constraints, and aid goals make it unlikely that a single model of cash programming will emerge.

Multiple Stakeholders Impact Adoption: While financial providers have a lead role in defining transaction data standards, the ability of other participating organizations to accept and manage data will also impact adoptions.

Stage 3 – Inviting New Participants

Diversifying Sector Participation: Digitization of aid opens the door for non-traditional aid providers to enter the field. It also may undermine the position of dominant incumbents.

Questioning Big Player Strategies: The priority of issues addressed by interoperability strategies will likely shift with the entry of new players. Strategies suited to a small number of large participants may be less viable.

Mixed News for the Reporting Use Case: Digitization will improve the ability to create consolidated reporting from traditional industry participants, while at the same time, it may reduce the potential for central players to control and define standards. (e.g. emergence small independent cash transfer programs that work outside the framework for established standards – for example GiveDirectly)

Stage 4 – Expanding Possibilities for Digital Aid

More Digital Services: Cash is not the only digital aid. A growing number of digital humanitarian services (e.g. education, medical services, etc.) are leveraging advances in real-time. This ability to get real-time data makes the services work well together in the context of data gathering and aid delivery. Interoperability can cut across the new digital services. Real-time personal data increases the possibilities of the synergies. (i.e. the shift from Use case 1, to Use Case 2 to Use Case 3)

Interoperability Beyond Cash: New digital services may stretch the definition of interoperability and add to challenges defining privacy and data interchange standards.

Manual Data Collection Declines: The development of real time in context alternatives to labor intensive manual data collection may diminish the importance of current aid worker tools and processes.

Stage 5 – Expanding the Role from Aid to Human Welfare

The line between Humanitarian Aid and Developmental assistance is already blurry. Transitioning Services Over Time: Digital services can be more easily transitioned over time. A key interoperability need is therefore between successive aid providers.

Government Stakeholders: Digital services for aid could be used by government agencies for ongoing health and welfare services.

Design Challenges

Design Effort – Aspiring to create an all-powerful interoperability solution is a dangerous goal. As discussed earlier, the report lists the following challenges related to the design process:

Challenge 1 – Designing for Semantic Interoperability

The first interoperability design challenge is linked to the meaning of the data elements themselves and their logical relationship with one another. Strategies for semantic interoperability include, consistent use of dates and terms, getting the correct stakeholders and arbiters, as well as mapping and rules enforced by technology,

Limited Standardization Today

Selected parts of standard beneficiary information have generally consistent use, such as unambiguous date of birth and mobile number have similar form and meaning across all systems.

However, in some cases terms were used across several organizations, but still had significantly different meanings and were semantically inconsistent.

Some standard global definitions are in use for a number of common concepts.

Goods and services: The UN Standard Products and Services Codes (UNSPSC) have been used to identify goods and services for in-kind relief and CTP.

Locations: UN/LOCODE, ISO and GPS have been used to identify locations of distribution points and domiciles as well as the Inter-Agency Standing Committee (IASC) Common Operating Datasets (CODs and FODs).[2]

Challenge 2 – Aligning Syntax and Communications

Syntax alignment is less complicated. Approaches for data sharing include fixed format files, XML, HXL and JSON format files. Strategies for data access include file transfer models, subscription, central repository, and centralized services.

Challenge 3 – Designing for Data Privacy and Security

Privacy requirements are defined by different parties in different ways and are subject to a specific time, place, and circumstance. This makes the determination of constraints on a privacy policy highly contextual. Legal, Ethical and Authorization considerations need to be taken into account.

For the creation of end to end security, a number of factors including the collection and transmission, centralized storage and access and use should be taken into account.

Mitigation strategies for reducing the security risks associated with data privacy include encryption, designing of secure systems, anonymization subset data and only sharing what is needed (minimization) while still fulfilling Know Your Customer (KYC) requirements.

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[2]   www.humanitarianresponse.info/en/applications/data

Recommended next steps

Based on the review of this rapidly evolving space, there are a wide range of opportunities to foster interoperability capabilities for CTP and other digital aid services. Potential activities range from near term actions (1–3) to long term strategic enablement (4–5)

(1) Answer Questions of Scope

Determine the scope of the interoperability effort (who participates, what services, what use case) that is to be undertaken. These choices will significantly impact the problems that need to be tackled and the actions that should follow.

(2) Foster Ongoing Collaborations / Intentionally Gather Learning

This is a domain where both the problem space and the practices are actively evolving. There are new initiatives underway that expand the use of tools and collaborations in the service of new aid strategies. These are an excellent lab for identifying needs and opportunities.

A program of active engagement and learning would help build a rich, ongoing view of the development of the sector, such as the recently convened Electronic Cash Transfer Learning Action Network (ELAN).[3]

(3) Opportunistically Create Resources

Traditional resources such as data sharing agreements and core data sets can be developed with the recognition that they will not be the whole of a long term resilient solution.

(4) Support the Architecture of a Resilient Ecosystem

Provide a focus for thinking and design of the overall ecosystem in support of personalized digital aid. This is not something that can be engineered from the top down, but it will benefit from a choreographer's big picture view of the problem space. The challenge is to aid in the architecture of the overall ecosystem as it evolves. In order to evolve, large organizations and the UN need to adapt to the innovations of numerous smaller NGOs, while meanwhile, innovations made by the large organizations need to be scalable so they can be adopted by the smaller players.

(5) Strategically Address the Wicked Problems

Some problems, like assuring verifiable data security across a loosely configured ecosystem of collaborators need deep study and solution architecture. These should be prioritized for cross industry efforts, since it is unlikely that single players will have the perspective, resources, or influence to address them.

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[3]   www.cashlearning.org/elan/elan

Appendix 1 – Leading products and applications in CTP

Product: LMMS

Sponsor:

WVI – Developed by World Vision Canada in 2008

Stats:

Canadian International Development Agency Department of Foreign Affairs, Trade and Development (CIDA DFATD) gave a contribution of $900,000 to spread LMMS to other NGOs

By March 2015, LMMS had been deployed to 26 countries spanning Asia, Africa and the Caribbean, and has assisted approximately 2.5 million people

LMMS is a hand-held electronic device and software to support real-time reporting and tracking, remote data collection, beneficiary management, commodity distribution. Beneficiary photos are stored and IDs generated from the software, barcode scanning. Can works with or without internet, locally. Flexible, can expand. User login to ensure accountability

Product: ProGres

Sponsor:

Developed by Microsoft and UNHCR, work originally started in 1999, introduced in 2004

Stats:

At end of 2010, operating in more than 250 locations in 82 countries and has provided assistance to nearly 5 million refugees

UNHCR's global registration system for personal data of refugees. Well established with over 6 million active registrations. It is used to manage a long lifecycle of engagement with refugees and support a number of aid activities. It supports management of a broad range of assistance programs including the granting of micro-credit and loans, managing payback schedules and registering for skills training. It can support the issue of identification cards, and has new capabilities to support IDP populations outside of camps. It is coupled with biometric technology (fingerprints and iris scans) for identity verification and the reduction of fraud. Version 3 (currently deployed) is a bespoke solution but Version 4 (in development) uses Microsoft Dynamic CRM and is web-enabled.

Product: SCOpe – System for Cash Operation

Sponsor:

WFP

Stats:

2013, expected entire system to be live by end of 2014. By 2013, had been piloted in four countries.

IT solution for cash and voucher project implementation. Has two main parts: Beneficiary and transfer management and an electronic voucher solution. Can register beneficiaries offline with photos and fingerprints. Based on open source technology. Works 'offline'. Can import beneficiary info from other databases.

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Humanitarian Aid
and Civil Protection