

# **BLOCKCHAIN TECHNOLOGY IN HUMANITARIAN PROGRAMMING**

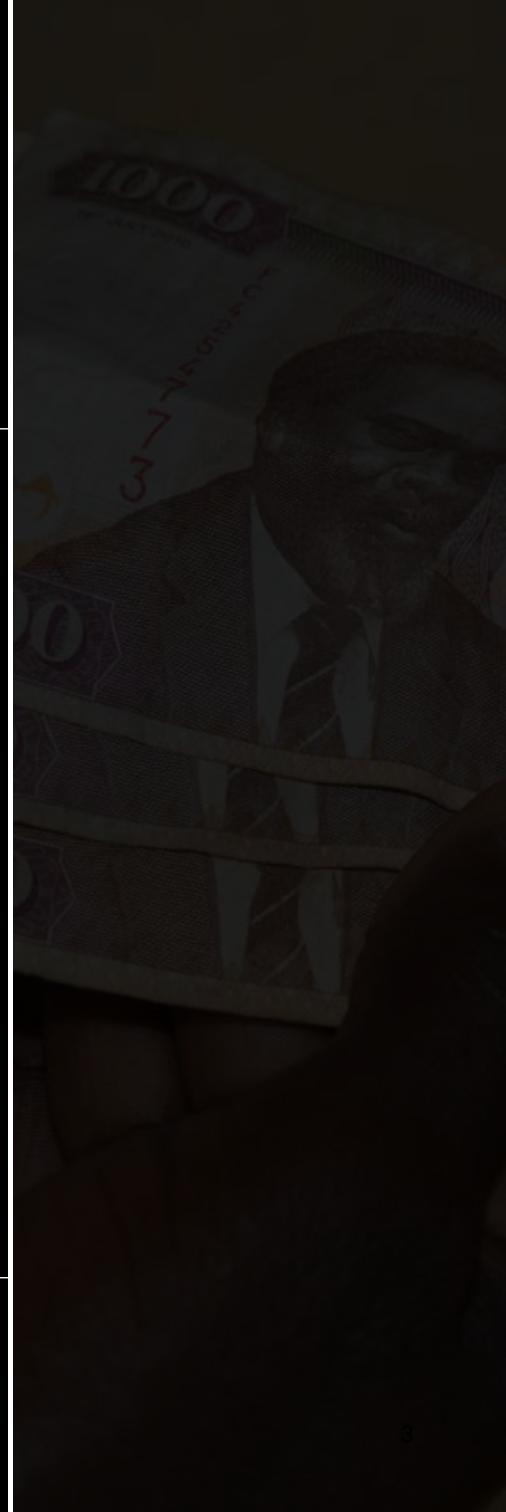
**A PILOT PROJECT IN CASH TRANSFER PROGRAMMING IN KENYA**



# KEY

# MESS AGES

- **Blockchain Technology can transform the humanitarian sector by saving costs, tracing the flow of information, and reducing transaction times.**
- **In theory, Blockchain Technology can provide a better record of where humanitarian aid is directed and fight corruption through transparency.**
- **Blockchain Technology can also be utilised in information management, identification, supply chain tracking, cash programming, and humanitarian financing.**
- **Further research on the impact of Blockchain Technology should be conducted and experimentation with future implementation.**





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# 1.0 Introduction



In the ever-changing environment of humanitarian aid, there are a few constants. One is the need for humanitarian organisations to find innovative ways to be efficient and effective in aid delivery and still remain financially feasible. Another is accountability and transparency to communities and donors because of reduced donations to aid organisations due to geopolitics and mistrust. As a humanitarian organisation, Kenya Red Cross Society (KRCS) has also felt the brunt of these changes and to overcome the barriers, they have adopted innovation as part of the organisations' core values. Innovation in the context of KRCS means identifying opportunities for risk mitigation, sustainability and growth through exploring uncharted opportunities (KRCS Strategy 2020). This is done through the use of Information Communication and Technology (ICT) and the International Centre for Humanitarian Affairs (ICHA) innovation and research units.



## 1.2 Blockchain Technology in Humanitarian Programming

Blockchain Technology has the potential to provide substantial benefits in the humanitarian sector, such as protected data sharing, supply chain, donor financing, cash programmes and crowdfunding. By providing a decentralised, verifiable source of data, Blockchain Technology can enable a more transparent, efficient form of information and data management.

In the humanitarian sector, unreliable information and information silos between different humanitarian actors is often cited as a key barrier in information management<sup>6</sup>. Blockchain can overcome the barriers to data sharing by providing an information marketplace that is publicly accessible to all users while ensuring information security. A combination of time-stamped and digitally verified information hosted on an accessible ledger could play an important role in reducing costs and increasing transparency with humanitarian data<sup>7</sup>.

Lack of identification documents is a key challenge in humanitarian response and early recovery systems<sup>8</sup>. Having basic documentation to verify one's identity is fundamental to survival and security, as they are essential to obtain basic humanitarian assistance and reach areas of safety. Blockchain can provide accessible and verifiable identification where a person can prove their existence and identity through a distributed public ledger, akin to an international public notary<sup>9</sup>. This enables a decentralised personal data-management system that individuals own and control<sup>10</sup>. Since information is protected using encryption, the technology can protect the personal data of those who are most vulnerable.

Humanitarian supply chain can be extremely dynamic. As a result, supply chain visibility and data tracing is often poor<sup>11</sup>. Strengthening supply chain transparency can greatly improve humanitarian operation by providing data to inform more effective and accurate decisions. This will ensure evidence-

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<sup>6</sup>Humanitarian Information Management Failures; Survey Report (2016).

<sup>7</sup>McConaughey, T. et al, *BigChainDB: A Scalable Blockchain Database (Tech.)*, Berlin: Ascribe GmbH (2016)

<sup>8</sup>ICRC Advisory Service on International Humanitarian Law. *Means of Personal Identification*; Retrieved from: [www.icrc.org/eng/assets/files/other/means\\_of\\_personal\\_id\\_eng.pdf](http://www.icrc.org/eng/assets/files/other/means_of_personal_id_eng.pdf)

<sup>9</sup>Rhodes III, Y. (31 May 2016), *What does identity mean in today's physical and digital world?*; Retrieved from: [azure.microsoft.com/en-us/blog/what-does-identity-mean-in-today-s-physical-and-digital-world/](http://azure.microsoft.com/en-us/blog/what-does-identity-mean-in-today-s-physical-and-digital-world/)

<sup>10</sup>Zyskind, G., Nathan, O., & Pentland, A. (2015), *Decentralizing Privacy: Using Blockchain to Protect Personal Data*. 2015 IEEE Security and Privacy Workshops. doi:10.1109/spw.2015.27.

<sup>11</sup>Privett, N. (24 February 2014), *Improving visibility in humanitarian supply chains - ODI HPN*; Retrieved from: [odihpn.org/blog/improving-visibility-in-humanitarian-supply-chains/](http://odihpn.org/blog/improving-visibility-in-humanitarian-supply-chains/)

based interventions and management, exposing issues for an effective remedy and increasing accountability. By providing a publicly visible ledger, Blockchain Technology offers a way to introduce transparency in humanitarian supply chains. In this case, Blockchain can be used as a data platform that traces the origins, use and destination of humanitarian supplies. As a share, secure record of exchange, Blockchain can “track what went into a product and who handled it along the way, breaking supply chain data out of silos, and revealing the provenance of a product to everyone involved from the originator to end user”<sup>12</sup>.

The need for more flexible, efficient, transparent and effective donor financing must be underscored. This is coupled with a call for greater visibility and transparency in financing, not only to address corruption and misuse of funds, but also to enable humanitarian actors better identify funding gaps based on impact rather than institutional requirements<sup>13</sup>. Through Blockchain, humanitarian actors can have better control on the distribution of aid and ensure that funds reach the intended recipients by lowering transaction cost, getting rid of intermediaries and publicly tracking commitments, distribution and use (transparency).

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<sup>12</sup>Williams, R. (31 May 2015), *How Bitcoin Tech Could Make Supply Chains More Transparent*; Retrieved from: [www.coindesk.com/how-bitcoins-technology-could-make-supply-chains-more-transparent/](http://www.coindesk.com/how-bitcoins-technology-could-make-supply-chains-more-transparent/)

<sup>13</sup>IASC Task Team on Humanitarian Financing, *Background document for the Future of Humanitarian Financing dialogues, October 2014*; [interagencystandingcommittee.org/system/files/hf\\_looking\\_beyond\\_the\\_crisis\\_report.pdf](http://interagencystandingcommittee.org/system/files/hf_looking_beyond_the_crisis_report.pdf)



Cash-based programming often relies on digital technology, thus considerations on data exchange standards, data security, privacy, and encryption are critical to the process<sup>14</sup>. The biggest challenge in cash-based programming is the use of centralised databases limiting data security and sharing information across multiple actors. A shared platform based on Blockchain can allow humanitarian actors to easily and responsibly share population and usage trends and anonymised transaction data, reducing

the beneficiary survey fatigue. Digital cash payments can be made traceable, interoperable across multiple actors, more secure and at a lower cost through Blockchain Technology, with the possibility of tracking funds from original donor to final recipient while still ensuring privacy and security<sup>15</sup>.

Blockchain Technology can also be used in crowdfunding during emergencies by using existing digital currencies and by providing a decentralised

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<sup>14</sup>United Nations World Food Programme, *Information technology for cash-based transfers*; Retrieved from: [www.wfp.org/node/649700](http://www.wfp.org/node/649700)

<sup>15</sup>Currión, P. (2015), *AidCoin: a revolution in humanitarian financing*; Retrieved from: [medium.com/@paulcurrión/introduction-513f86ed92df#2dz4l3166](https://medium.com/@paulcurrión/introduction-513f86ed92df#2dz4l3166)

funding platform. United Nations Office for the Coordination of Humanitarian Affairs (OCHA) Crowdfunding for Emergencies Think Brief reports that “increasing transparency, accountability and reporting among donors, project initiators and funding recipient’s increases trust in the project and ensures continued donor engagement<sup>16</sup>”.

Blockchain can increase transparency, accountability and trust by providing a verifiable platform. Examples of crowdfunding programs using Bitcoin and other cryptocurrencies to fund humanitarian emergencies include Colu, BTC Funding, CoinFunder and BitPesa, which have lower transaction costs and ensure transparent and rapid disbursement of funds during crises.

Furthermore, crowdfunding initiatives go beyond digital currencies, whereby Blockchain removes the need for an intermediary third party to monitor and disburse funds. Such platforms use Blockchain Technology to reduce transaction costs and enable rapid disbursement of micropayments.

As funds are processed on a peer-to-peer basis, the amounts can be approved and transferred directly to

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the recipients. Through the introduction of its own dedicated cryptocurrency, the humanitarian sector could reduce transaction times and exchange-rate losses while maintaining transparency and traceability of funds<sup>17</sup>.

Since the inception of Blockchain Technology, the endorsement in the humanitarian world has been minimal at best. With the scepticism surrounding the technology due to its decentralised and unchecked nature, humanitarian organisations are shying away from using it. For those organisations that have used Blockchain Technology as part of their aid delivery, most have shown that it does have a significant positive impact.

<sup>16</sup>United Nations OCHA, “Crowdfunding for Emergencies,” *OCHA Policy and Studies Series, Issue brief (2015)*

<sup>17</sup>Curriion, P. (2015), *AidCoin: a revolution in humanitarian financing*, Retrieved from: [medium.com/@paulcurriion/introduction-513f86ed92df#2dz4l3166](https://medium.com/@paulcurriion/introduction-513f86ed92df#2dz4l3166)

In Jordan, the World Food Program (WFP), launched a Blockchain based system called Building Blocks that helps support 10,000 Syrian refugees in the Azraq Camp. Refugees are given digital identities that they use to purchase items using biometrics since all their information is stored on the platform. Refugees who arrive during the night can purchase items by morning because the system can manage and process large volumes of transactions and information in seconds<sup>18</sup>.

The International Federation of Red Cross and Red Crescent (IFRC) in collaboration with AID: Tech together with the Irish Red Cross (IRC) and Lebanese Red Cross piloted a Blockchain project in Tripoli, Aker Refugee Camp and Beirut. The project provided digital identities to 100 Syrian refugee families to allow them to use an electronic voucher to purchase commodities. The pilot was considered a success because families were able to purchase goods and services with ease and the IRC tracked the whole process in real time<sup>19</sup>.

In India, the Akshaya Patra Foundation which is the largest non-governmental organisation (NGO) in the world that offers mid-day meals to school children, teamed up with Accenture Labs in 2017 to use

Blockchain based technology, the Internet of Things (IoT), and artificial intelligence (AI), to improve their products, efficiency, and expansion. The Foundation feeds 1.7 million children from 14,173 schools traversing 12 Indian states<sup>20</sup>. Blockchain has helped the Foundation to increase the number of meals they provide and also increase their efficiency by reducing the time it takes to solve problems and avoid wastage.

In February 2018, UN Women, the UN Office of Information and Communication Technology (UN OICT) in collaboration with Innovation Norway, held a four-day workshop that brought together seven Blockchain Technology companies and other UN agencies, to find a way of using Blockchain based technologies to help address challenges faced by women and girls around the world. From the workshop, it was evident that, humanitarian aid organisations need to embrace new technologies to ensure that no one is left behind during crises<sup>21</sup>.

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<sup>18</sup><http://innovation.wfp.org/project/building-blocks>, retrieved in June 2018

<sup>19</sup><http://media.ifrc.org/innovation/2017/01/04/using-blockchain-technology-to-assist-refugees-in-lebanon>, retrieved in June 2018

<sup>20</sup><https://www.akshayapatra.org>

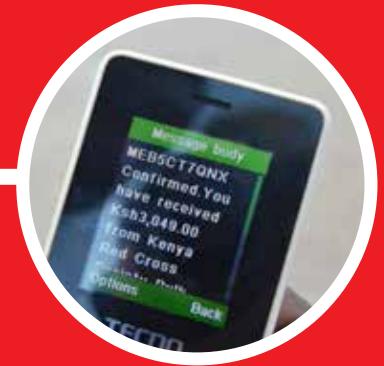
<sup>21</sup><http://www.unwomen.org/en/news/stories/2018/2/> retrieved in June 2018

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## 1.3 Purpose of the Study

The purpose of this study is to document the learnings from this pilot, inform the way forward for KRCS, and to explore the benefits and risks of Blockchain Technology in its operations. The findings from the pilot project will be shared with other humanitarian organisations, decision makers and Blockchain experts in different platforms with the aim of promoting knowledge, sharing experiences, and exploring further, the possibilities of Blockchain in humanitarian programming

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## 2.0 The Pilot Project

Over the last decade, cash transfer programming (CTP) has increased due to its accountability and the dignity it gives to beneficiaries. CTP is a tool that uses money as a mode of intervention in a humanitarian crisis. Like all other methods of aid delivery and program implementation, there is constant change in methodology and implementation. This is inevitable because with time, the dynamics of disasters, donors and the international humanitarian world changes and programs need to be more efficient and effective without compromising the quality of work, delivery and impact.

KRCS has been using CTP for close to seven years as part of its emergency response. The strategic focus when it comes to CTP is in line with the global cash discussions that is centered on the need to upscale CTP using partnerships and innovations. Since the onset of CTP in 2011, KRCS has used different delivery mechanisms such as banks, mobile money and vendors. Banks and mobile money were preferred because they greatly reduced the risk of theft, diversion of funds and fraud through an audit

trail that could be seen. Also, with the use of mobile money, people who were deemed unbankable can now transact money without having bank accounts.

In May 2018, KRCS in collaboration with IFRC conducted a Blockchain Open-Loop Cash Transfer pilot project in Isiolo County, Kenya. The primary focus of this project was to understand Blockchain Technology potential for transparency and accountability, which is important to the humanitarian sector. This was the first of its kind in the humanitarian sector, given that previously, the use of Blockchain Technology for cash transfers by humanitarian organisations has mostly used the closed-loop payment mechanisms such as e-vouchers, where payments are linked to merchants' specific outlets. In this case, Blockchain was explored to make CTP more effective, by promoting timely delivery of aid while strengthening transparency and accountability to beneficiaries and donors.

Other partners in the project included, RedRose who provided the cash data management platform, Craft



Silicon Limited who were the Mpesa API integrator and Safaricom, the financial service provider. RedRose implemented a data management system integrated with Safaricom Mpesa mobile money and constructed a private Blockchain to record transactions.

**...with the use of mobile money, people who were deemed unbankable can now transact money without having bank accounts.**



## 3.0 Results and Discussion

### 3.1 The Approach

The usual KRCS CTP approach involves a minimum of nine steps as indicated in Figure 1. These steps include; stakeholder engagements at county and sub-county levels, community mobilisation, training of KRCS team, verification and validation of the beneficiary data, cash transfers, encashment monitoring, conducting post-distribution monitoring and carrying out after action review.

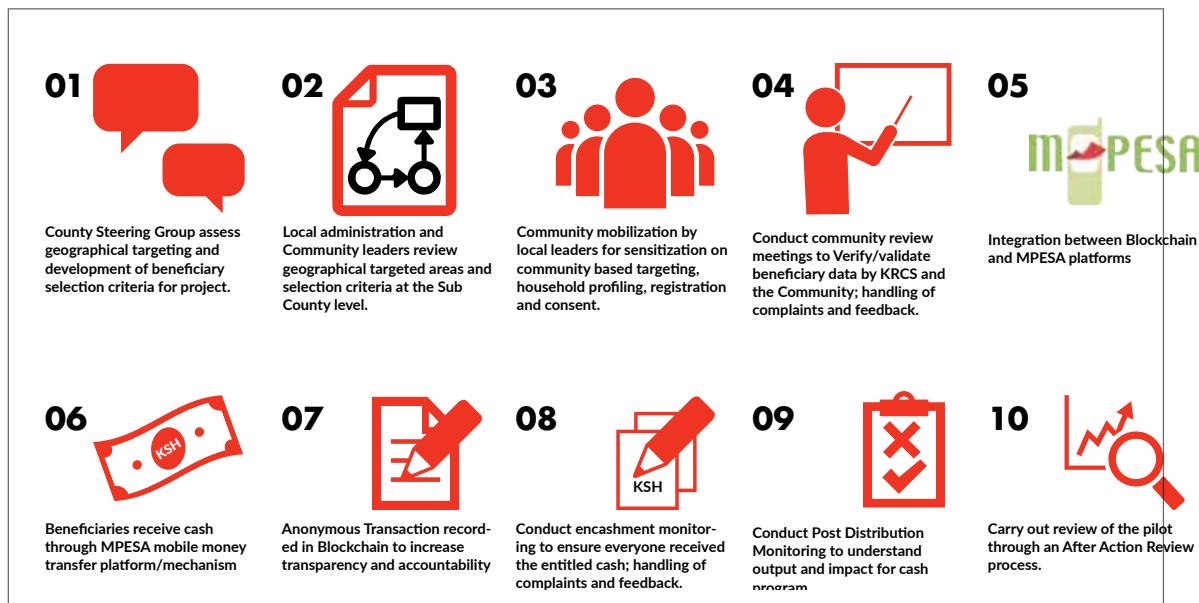


Figure 1: Steps involved in KRCS' Cash transfer programming

The approach utilised in the pilot project included a combination of technologies that yielded a more responsive system for the KRCS cash program. Since the beneficiaries for the pilot project were already registered, their information was extracted from the KRCS KOBO data collection platform and uploaded to RedRose data management system.

The integrated system (Figure 2) included a mobile money network (Safaricom), an internal electronic funds transfer system (Craft Silicon), a humanitarian

data management platform (RedRose) and an open-source blockchain. Here, there was a segregation of duties between the fund requester and the finance manager who approves the disbursement. After approval by the finance manager, cash was disbursed to beneficiaries through Safaricom Mpesa. Once Safaricom received the payment requested and executed cash disbursement to the mobile wallets of beneficiaries, the transaction was recorded on the RedRose platform and the blockchain.

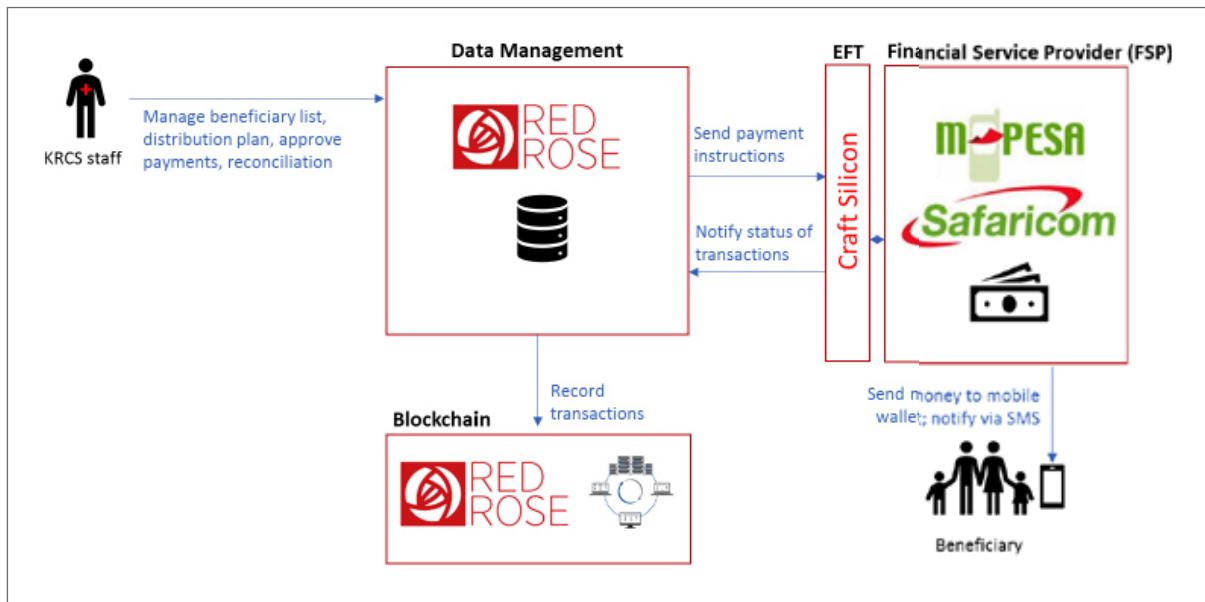


Figure 2: A more responsive system developed for KRCS cash programme

## 3.2 Successes

### **Transparency and accountability:**

The pilot project implemented a blockchain using multi-chains off-the-shelf solution by making use of its native algorithm to secure transaction data with cryptography, providing an immutable digital ledger. Here, four nodes were connected to blockchain allowing KRCS, IFRC, and RedRose to view the transactions, thus promoting transparency and accountability. In the current KRCS scenario, information for most projects is stored in different platforms so with blockchain this information becomes decentralized and every node (computer) in the chain is considered a gatekeeper making the information available and unchangeable.

In terms of data protection and privacy, very limited information and no personal information was recorded on the blockchain during the pilot project implementation. This was done to ensure data protected as the benefits and risks of Blockchain Technology were explored (Figure 3 and 4).



**MULTI CHAIN ADDRESS DETAILS**

ADDRESS: 125FUDaBz4BmCzKtLz6hGyWfCokk8wF

ACTIVITY ADDRESS: DLDQNT8R CPERLGGP

**GET ADDRESS OF TAILS**

**TRANSACTIONS**

FROM	TO	ACTUAL TRANSACTION DATE	TRANSACTION ID	TRANSACTION AMOUNT	CURRENT BALANCE	MEMBER TYPE
125FUDaBz4BmCzKtLz6hGyWfCokk8wF	125FUDaBz4BmCzKtLz6hGyWfCokk8wF	May 8, 2019, 12:37:39 PM	8794622047F16	14000 KES	12000 KES	Beneficiary
125FUDaBz4BmCzKtLz6hGyWfCokk8wF	125FUDaBz4BmCzKtLz6hGyWfCokk8wF	May 8, 2019, 12:33:01 PM	8794622047F16	12000 KES	0	Beneficiary
125FUDaBz4BmCzKtLz6hGyWfCokk8wF	125FUDaBz4BmCzKtLz6hGyWfCokk8wF	May 8, 2019, 12:33:01 PM	8794622047F16	12000 KES	0	Beneficiary
125FUDaBz4BmCzKtLz6hGyWfCokk8wF	125FUDaBz4BmCzKtLz6hGyWfCokk8wF	May 8, 2019, 12:33:01 PM	8794622047F16	12000 KES	0	Beneficiary
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125FUDaBz4BmCzKtLz6hGyWfCokk8wF	125FUDaBz4BmCzKtLz6hGyWfCokk8wF	May 8, 2019, 12:33:01 PM	8794622047F16	12000 KES	0	Beneficiary
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125FUDaBz4BmCzKtLz6hGyWfCokk8wF	125FUDaBz4BmCzKtLz6hGyWfCokk8wF	May 8, 2019, 12:33:01 PM	8794622047F16	12000 KES	0	Beneficiary
125FUDaBz4BmCzKtLz6hGyWfCokk8wF	125FUDaBz4BmCzKtLz6hGyWfCokk8wF	May 8, 2019, 12:33:01 PM	8794622047F16	12000 KES	0	Beneficiary
125FUDaBz4BmCzKtLz6hGyWfCokk8wF	125FUDaBz4BmCzKtLz6hGyWfCokk8wF	May 8, 2019, 12:33:01 PM	8794622047F16	12000 KES	0	Beneficiary
125FUDaBz4BmCzKtLz6hGyWfCokk8wF	125FUDaBz4BmCzKtLz6hGyWfCokk8wF	May 8, 2019, 12:33:01 PM	8794622047F16	12000 KES	0	Beneficiary

Figure 3: Snapshot of transactions recorded in the blockchain

**DETAILS**

TRANSACTION ID: 8979c3a6c3c9b647f484e6b69500149a0e3e29f03a601779a43e7

MEMBER TYPE: Beneficiary

FROM %: 125FUDaBz4BmCzKtLz6hGyWfCokk8wF

TO %: 13aUdMAG8H0PNCQfhwNpYqprvGqjgkR9AY

TRANSACTION AMOUNT: 5049 KES

CURRENT BALANCE: KES

ASSET NAME: KES

ACTUAL TRANSACTION DATE: May 8, 2019, 12:33:01 PM

TIME: May 8, 2019, 02:41 PM

TIME OF RECEIVAL: May 8, 2019, 3:24:41 PM

BLACK HASH: 0077460344633210435470571366K2183000577A0C10462C3318B06C2

BLOCK TIME: May 8, 2019, 3:24:57 PM

BLOCK INDEX: 0

NUMBER OF CONFIRMATIONS: 425

IS VALID: Yes

Figure 4: Snapshot of a cash disbursement transactions to a beneficiary recorded in the blockchain

**Efficiency:** The KRCS CTP verification and validation process is ordinarily lengthy, sometimes taking up to three weeks depending on the geographical location where the project is being implemented. The verification and validation processes, the back and forth between volunteers in the field, staff in headquarters and partners such as Safaricom, are not only extended but in some cases get delayed due to unexpected circumstances such as flooded roads, beneficiaries' migration and poor network coverage. This was not experienced during the pilot project, 2,090 beneficiaries received their money in three days after consent, proving that disbursement can be done efficiently and without affecting the quality of delivery. RedRose data management platform managed all aspects of the project cycle in just ten days while consent, disbursement and post-distribution monitoring was also accomplished proving that CTP delivery can be timely and up scaled.

**Effectiveness:** Automation of the Mpesa payment instructions and confirmation of the status of the transactions for reconciliation purposes made it easy for KRCS Finance Manager to disburse funds on the click of a button from the data management platform

and view results of the transactions once a response from Mpesa was received. Previously, the beneficiary list was uploaded manually in to the Mpesa portal. This is also made possible by the widespread of mobile money networks in Kenya. In cases where money disbursed to the beneficiary's account appeared inactive because Mpesa had frozen their accounts, KRCS was able to confirm beneficiary payments and accounts status immediately. This improved the quality of service allowing KRCS staff to explain to the beneficiaries why their funds appeared unusable.

**Better auditability:** The Blockchain Technology offered auditors an independent way of verifying a compiled list of transactions against the records produced by the individual systems such as RedRose or Mpesa, keeping each of the systems honest and increasing confidence in the programme. Any discrepancies with the data could help flag an investigation quickly. In reality, blockchain makes it harder to simply request the service provider to change the data. For example, when a disbursement is requested by mistake, it's easy to call Mpesa and ask them to reverse the transaction. However, because of the integration with the data management platform and blockchain, the process of reversing a transaction

must be orchestrated, so a record to update the data is reflected on the blockchain and to all the interacting systems. An auditor should be able to see the record for the original disbursement request and a separate record to correct that request.

**Scalability:** As one of the emerging technologies for CTP, Blockchain Technology has demonstrated its capacity to up scale in the last few years through proof of concept and use cases. Blockchain pilot in Lebanon (2015), was a closed-loop solution using barcoded vouchers for 100 households and all transactions were written on the blockchain. In 2017, the Akshaya Patra Foundation in India teamed up with Accenture Labs, the Internet of Things (IoT), and artificial intelligence (AI) to use blockchain, to improve their products, efficiency and expansion. They used data on the blockchain to increase the number of meals and change the operating systems. The KRCS pilot project is the only one in the world that used an open-loop solution with a large number (2100) of beneficiaries and proved that it was scalable.

**The Blockchain Technology offered auditors an independent way of verifying a compiled list of transactions against the records produced by the individual systems such as RedRose or Mpesa...**



# Three features of the RedRose data solution that were essential to the success of the Pilot Project

- It was based on open data kit (ODK) and worked offline. Power in Isiolo County was limited with frequent outages. Internet connection was afforded by Safaricom hotspots, which were cumbersome and slow. Being able to collect data offline and uploading it later when there was connectivity allowed the program to continue without disruptions. Beneficiary and transaction reports could also be download and used offline. Although not used in the Pilot, Red Rose's mobile application for manual distribution also works offline and could add value to future KRCS programming where mobile money is not feasible.
- It integrates with financial service providers and other third parties through an application programming interface (API) allowing seamless communications between different platforms. This feature allowed KRCS to automate the distribution and reconciliation with M-PESA.
- It helped ensure high program quality by providing audit logs so that decisions and approvals were documented, segregating duties between the funds requester and the approver for financial controls, and providing an easy way to see who received what so donor funds could be tracked all the way down to beneficiary level. During the Pilot, the requester was an authorised programme staff member and the approver was a KRCS finance manager. Audit logs captured the steps, timestamp, and actors involved in the process for transparency.

**It helped ensure high program quality by providing audit logs so that decisions and approvals were documented...**





## 3.3 Lessons Learnt

- It is better to have several fit-for-purpose and easy to integrate technologies that fulfil required capabilities than a comprehensive system that is difficult and costly to change. The combination of a humanitarian data management platform, an internal electronic funds transfer system (EFT) and open source blockchain yielded a more responsive system for KRCS' cash programme.
- Good collaboration and flexibility between the technology partners, KRCS and IFRC was also helpful in ensuring a successful project.
- Community trust is paramount especially in the consent getting process since it is still unclear how informed consent can be obtained from beneficiaries for projects involving complex data structures like Blockchain. For beneficiaries, the consent process was uncontroversial. Beneficiaries explained that they trusted KRCS and that this trust extended to its partners.
- Having a robust data management system significantly improved the KRCS processes, increasing efficiency in the delivery of assistance as well as improving the quality of programming. It promoted the segregation of duties and financial controls, auditability, and security of data. RedRose's capabilities to work offline, ability to view up-to-date information on beneficiaries and assistance, and the ability to monitor data remotely increased KRCS' responsiveness and quality of service.
- The Pilot Project demonstrated that Blockchain Technology can add value to CTP. By combining several fit for purpose technologies, the blockchain open-loop cash transfer Pilot Project offered greater transparency, accountability and responsiveness to beneficiaries.
- The process of obtaining consent for this project was not only meant to record explicit beneficiary consent for personal data processing, but it was also used to ensure that beneficiaries received communication on programme goals and objectives, how they will receive their cash

assistance, and feedback and complaint mechanisms. The consent process was also used to verify the targeted beneficiaries by presenting their identification cards. These are fundamentals of good programming. Sharing information on how personal data will be used is also a requirement regardless of which legal basis is used.

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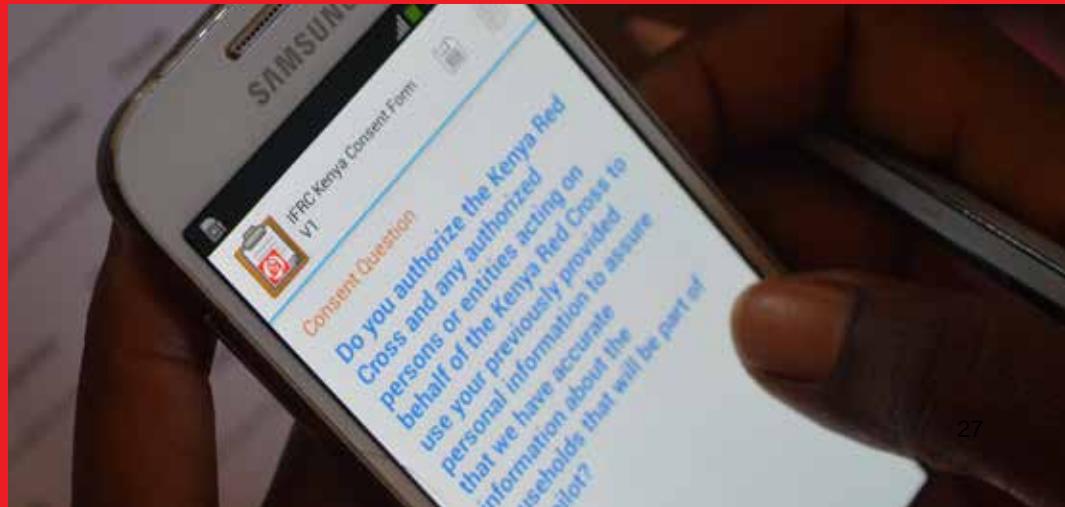


## 3.4 Challenges of Blockchain in Humanitarian Programming

- Blockchain Technology is Internet based and requires connectivity. In typical humanitarian environments where operations take place in difficult to access areas with limited to no Internet access or electricity, incorporating blockchain use should be designed to address these environmental constraints. For the Pilot Project, Blockchain complemented data collection and data management technology that worked offline. Additionally, data stored in the Blockchain was timestamped but not expected to be updated in real time.
- The Pilot Project raised fundamental questions on consent and data privacy. Blockchain Technology is a complex data structure involving multiple stakeholders, which is still difficult for most to understand and it remains unclear how informed consent can be obtained from beneficiaries for projects involving complex data structures.
- Due to time constraints, very basic elements of how to generate, maintain and tracking

transaction using digital identity was tested. The beneficiary profile was established in the RedRose data management platform and a RedRose beneficiary ID was assigned; on the blockchain, private and public keys were generated based on the RedRose beneficiary ID; transactions were written on the blockchain based on the public keys generated corresponding to beneficiaries. Thus, there is need to explore the use of digital identity generated by humanitarian organisations such as KRCS as alternatives to government identification cards.

**Blockchain Technology is Internet based and requires connectivity...For the Pilot Project, Blockchain complemented data collection and data management technology that worked offline. Additionally, data stored in the Blockchain was timestamped but not expected to be updated in real time.**



## 4.0 Conclusion and Recommendations

### 4.1 Conclusion

As KRCS fulfils its commitment to scale up cash transfer programming (CTP), better ways of implementing and supporting its cash programmes are necessary. Innovative technologies such as blockchain offer new opportunities to address specific needs for CTP. The use of Blockchain Technology as an asset database is imperative, the paradigms of aid intervention are shifting and donors as well as beneficiaries are demanding for accountability and transparency. Through its unalterable distributed ledger, Blockchain Technology offers a way to improve transparency and accountability. When this is coupled with data management and integration with open-loop payments such as mobile money transfer, this technology not only enables efficient, timely disbursement of cash at scale but also assures controls and improves quality of service to beneficiaries.

The focus of this Pilot Project was to understand the potential of Blockchain Technology in transparency and accountability within the humanitarian

sector. There are numerous opportunities that KRCS can explore using Blockchain Technology including the identification of funding gaps based on impact rather than institutional requirements, crowdfunding, and supply chain management. Other opportunities include cash-assistance, the use of smart contracts to secure forecast-based financing arrangements, volunteer and membership data management, the deployment of durable, self-sovereign digital identifications, tracking of peer-to-peer donations and payments and the potential use of cryptocurrencies.

Is Blockchain Technology the game changer in humanitarian programming including CTP? Only more case studies from the implementation of humanitarian projects using blockchain technology will tell. One thing that is clear from this pilot study is that, it is all about the overall design of the ecosystem supporting a programme such as CTP and not a single technology that will have a lasting, transformative impact.



**Is Blockchain Technology the game changer in humanitarian programming including CTP? Only more case studies from the implementation of humanitarian projects using blockchain technology will tell.**

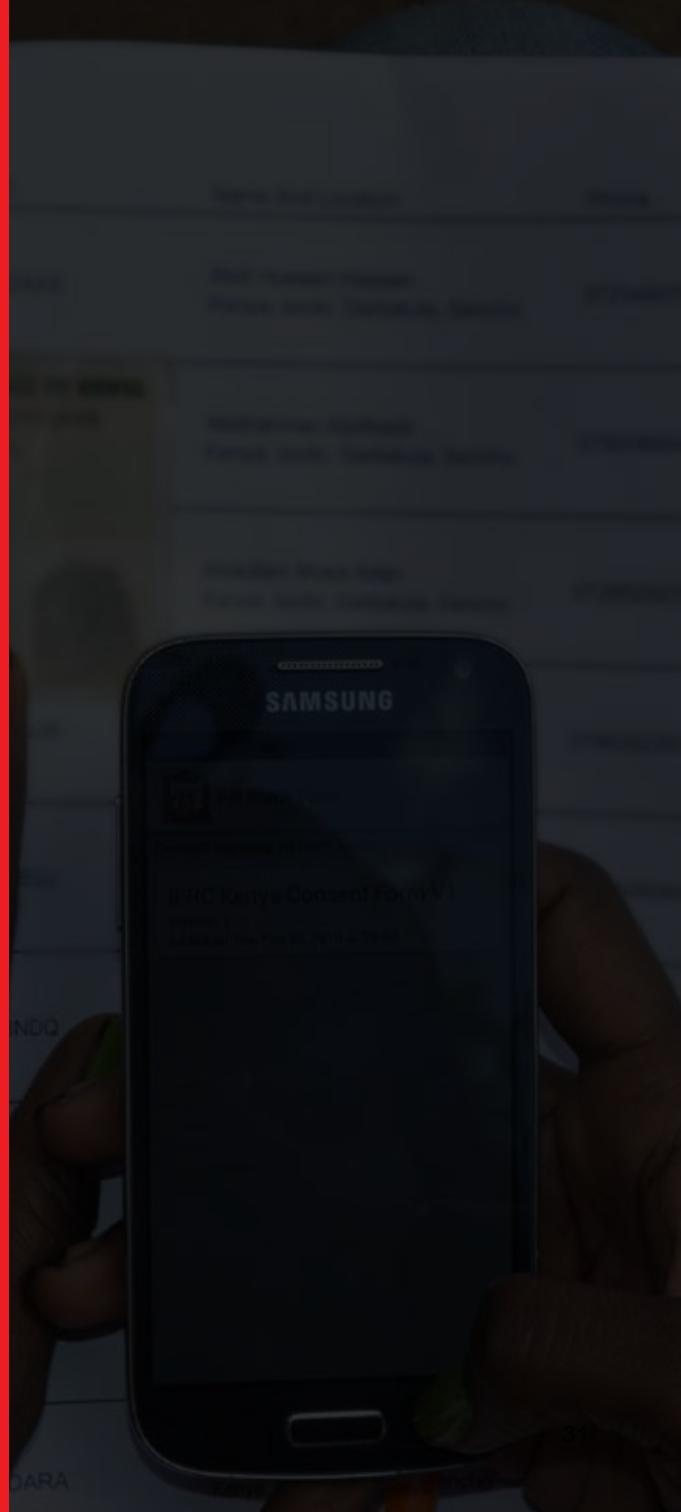


## 4.1 Recommendations

- For KRCS to fully implement Blockchain Technology in its programming, guidelines for safety and data sharing must be established. Best practices and guidance for using data responsibly must be adopted, which can then be used to develop a framework on how to use the blockchain responsibly. Questions about data privacy still need to be explored.
- Since Blockchain Technology is well suited to provide an additional layer of security and integrity to data from CTP, KRCS needs to explore more on the process, tools and skillset to audit data on blockchain by internal and external auditors for assurance.
- More research into the benefits, challenges and consequences of using Blockchain Technology should be pursued. Additional research and evidence is also required to translate these potential use cases to actual implementation.
- On issues surrounding consent and data privacy, KRCS in partnership with IFRC may need to build a robust protocol on the legal bases which includes, informed consent for using beneficiary data involving complex data architectures and contexts.
- To successfully implement Blockchain Technology within KRCS operations, a team drawn from different departments must be trained in the technology.
- Through different forums, reach out to policymakers, practitioners and other humanitarian partners to create awareness on the applicability of Blockchain Technology in the humanitarian sector.
- Conduct more collaborative work with other national partners, IFRC, the Government and private partners to ensure the scalability of Blockchain Technology. For example, a collaboration between Bitpesa (a Kenyan digital payment platform that helps people in the diaspora to send money to Kenya) and KRCS might help reach more Kenyans in the diaspora during fundraising

## Frequently Asked Questions

- If the data transacted on the Blockchain is immutable, do people have the right or the ability to remove themselves from a Blockchain system?
- How can private and sensitive information such as gender, religion, and ethnicity be concealed from people who may intend to do harm?
- Who is accountable to ensure data privacy?
- In case of breach or abuse, what jurisdiction applies?





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