

Public Sector Lending Transparency

Section 1 Summary

Use Case Summary			
Use Case ID:	GOV-001	Use Case Type:	Vertical
Submission Date:	May 28, 2018	Is Use Case supporting SDGs	Yes
Use Case Title:	Public sector lending transparency	Domain:	Government and public sector
Status of Case	Pilot	Sub-Domain	Government and non-profit transparency
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Proposing Organization	BNDES, Brazil		
Short Description	This use case is a proposal for changing the process of lending projects in The Brazilian Development Bank using a stable coin with DLT technology. The main goal is achieve more transparency of the public money allocation. However, the new proposal achieve other benefits like operational costs reduction and the generation of data to support aggregate analysis of the benefits arising from the bank's loans.		
Long description	This use case is a proposal for changing the process of lending projects in The Brazilian Development Bank using a stable coin with DLT technology. The stable coin is used when disbursing money from BNDES to the client and from the client to contractors. Then, the contractor can redeem to get its fiat money. It is a closed ecosystem between BNDES, clients and contractors in order to avoid regulatory risks. In order to achieve the desired transparency, it is necessary to identify everyone who do transactions using the stablecoin. In future view, there is also important to identify services and products offered from contractors to clients. The main goal is achieve more transparency of the public money allocation. However, the new proposal achieve other benefits like operational costs reduction and the generation of data to support aggregate analysis of the benefits arising from the bank's loans.		
SDG in Focus (when applicable)	16 – Peace, Justice and Strong Institutions		

Value Transfer:	Tokens representing fiat money	Number of Users:	20+
Types of Users:	Development bank, Lender, Contractor, Society		
Stakeholders	Government, Development bank (or Public agency), Commercial banks, Lender, Contractor, Society, Auditor		
Data:	<p>=> Use case shared data (ideally stored in DLT):</p> <ul style="list-style-type: none"> - Entity identification (link between DLT account and real world entity identification) - Product or service type identification (Future Vision only) <p>=> Use case specific DLT data:</p> <ul style="list-style-type: none"> - Account - Token balance to each account - Project identification - Instances of use case shared data identification <p>=> External data - not stored in DLT:</p> <ul style="list-style-type: none"> - Entity additional information (number of employees, revenue, geographic region, industry, sector etc.) <p>=> All public information (see Security and privacy section).</p>		
Identification:	Full identification of Lenders and Contractors required by the development bank		
Predicted Outcomes:	<p>The predicted outcomes of the adopting the new process are to:</p> <ul style="list-style-type: none"> - increase transparency of public money allocation - make clients' proofing of their spending simpler - reduce audit and compliance costs - improve public money allocation by postponing fiat money lending - minimize time to publish lending information - produce data to do aggregate analysis of the benefits arising from the development bank's loan 		

Overview of the Business Problem or Opportunity
<ul style="list-style-type: none"> - In general, society demands more transparency in the use of public money. - The development bank uses public money to finance projects that adhere to government

development policies priorities.

- The society does not trust the development bank.
- The development bank needs to verify that the public money is being used as planned.
 - Periodically, lenders need to prove each money spending, including transfer to contractors.
 - The development bank needs to verify that lenders' proof correctly demonstrates that the public money was used as planned.
 - Auditors verify that the development bank indeed has assessed lenders' money spending.
 - Maximizing process automation would increase processes efficiency, while reducing the development bank's verification and audit costs.
- The process information of lending is fragmented.
 - The development bank owns the projects and disbursements data. Each lender or contractor has its transfer data.
 - Transfer data is protected by commercial banks - financial privacy.
 - The development bank has to collect transfer data in order to publish lending information to society.
 - The development bank does not have contractor's registry.
 - The development bank has to collect and group data to demonstrate benefits arising from the development bank's loans.
 - Integrating data would improve the process efficiency, while minimizing cost.
- In order to minimize paperwork, the development bank disburses to lenders large amounts of money.
 - Lenders take some time to spend all the money so they have to invest the funds. If the value of investment interest rate is bigger than the value of the lending interest rate, lenders may have an incentive to postpone the project schedule.
 - To make disbursement date and money spending date closer would improve the process efficiency and improve fiat money allocation.

Why Distributed Ledger Technology?

DLT would improve the current solution because it is possible to achieve public money loans transparency without trusting the development bank. Transfer data become easily accessible and can be used to make the underlying processes of lender's proof of money spending and the process of collecting and publishing loans benefits simpler and more efficient.

In addition, the use of DLT token enables the development bank to disburse fiat money just-in-time. Many times the money can flow to contractors directly.

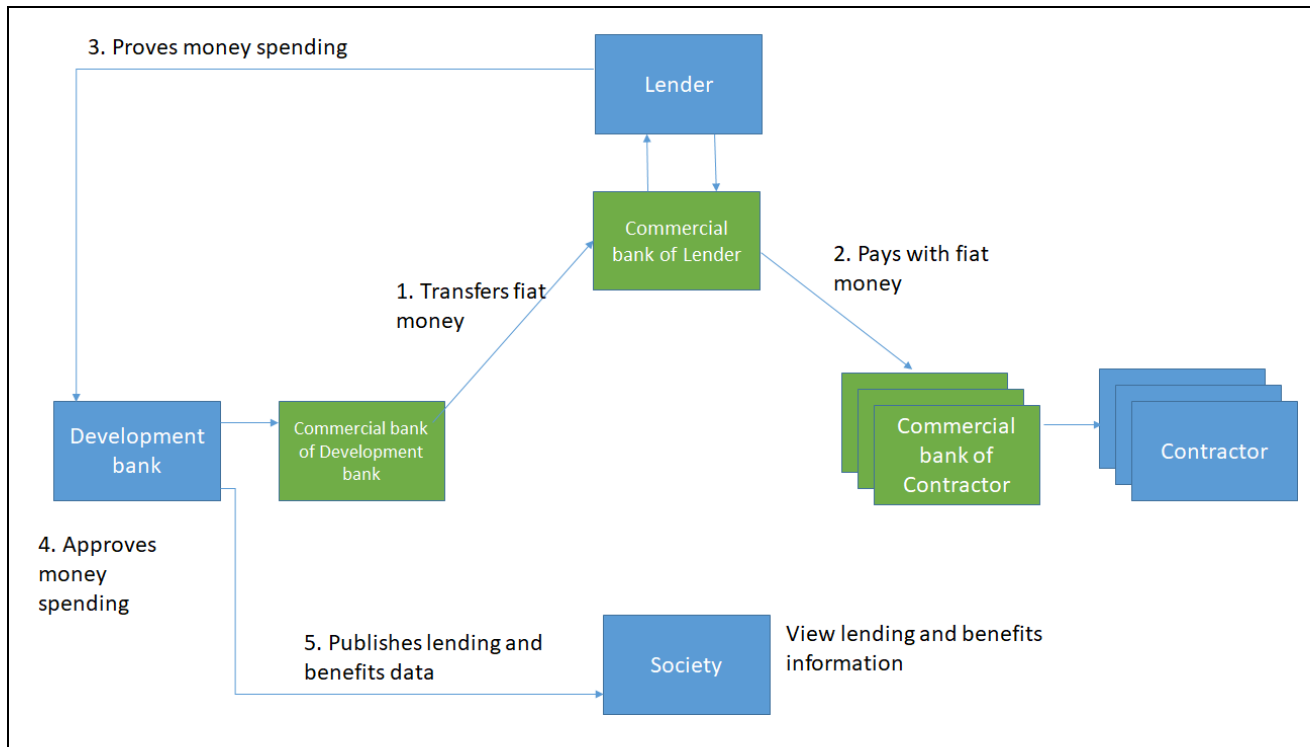
Section 2 Current process

Current Solutions
Value is transferred by corresponding banks; There is a lot of manual work to prove and validate money spending; There is a lot of manual work to publish lending and benefits data; Lending and benefits data can be manipulated by the development bank; There is no data publication in real time.

Existing Flow (as-is)		
Step	User Actions	System Actions
1.	The development bank makes a transfer of fiat money to lender using the service of commercial banks.	The development bank's internal system registers the transfer Each commercial bank updates its ledger The lender's internal system registers the transfer
2.	The lender pays some contractors using a service of commercial banks. It can take a while to spend all money.	For each payment: The lender's internal system registers the payment Each commercial bank updates its ledger The contractor's internal system registers the payment
3.	The lender proves his money spending to the development bank.	The development bank system register the lender's spending proof
4.	The development bank approve lender's money spending. It can involve a lot of manual work.	The development bank system changes disbursement status
5.	The development bank publishes lending and benefits data	N/A

Process scheme (as-is)

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Data and information (as-is)		
Data	Type	Description
1	Fiat money transactions	The way value is transferred between: (a) the development bank and the lender and (b) the lender and contractors
2	Money spending proof	Documents, images etc used to proof the money was used as planned. It must include commercial bank statements to proof that the lender paid contractors and what products or services type were commercialized.
3	Lending data	Detailed information about each transaction, including who the lender and the contractors were, what time each transaction happened and what the value of each transaction was, what product or service type was commercialized in each transaction.
4	Benefits data	Aggregate information about transactions joined with entities additional information. Examples: How many transactions involved companies with small revenues? How much money was transferred in a geographic region or an industry?

Participants and their roles (as-is)		
Actor	Type/Role	Description
1	Development bank	Financial institution designed to provide medium- and long-term capital for productive investment

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2	Commercial bank	Financial institution to provide transfer/payment between parts
3	Lender	Entity who takes the loan with the development bank
4	Contractor	Entity who sells a product or service to the lender
5	Society	Everyone who is interested to know how the public money was allocated and what were the benefits of that

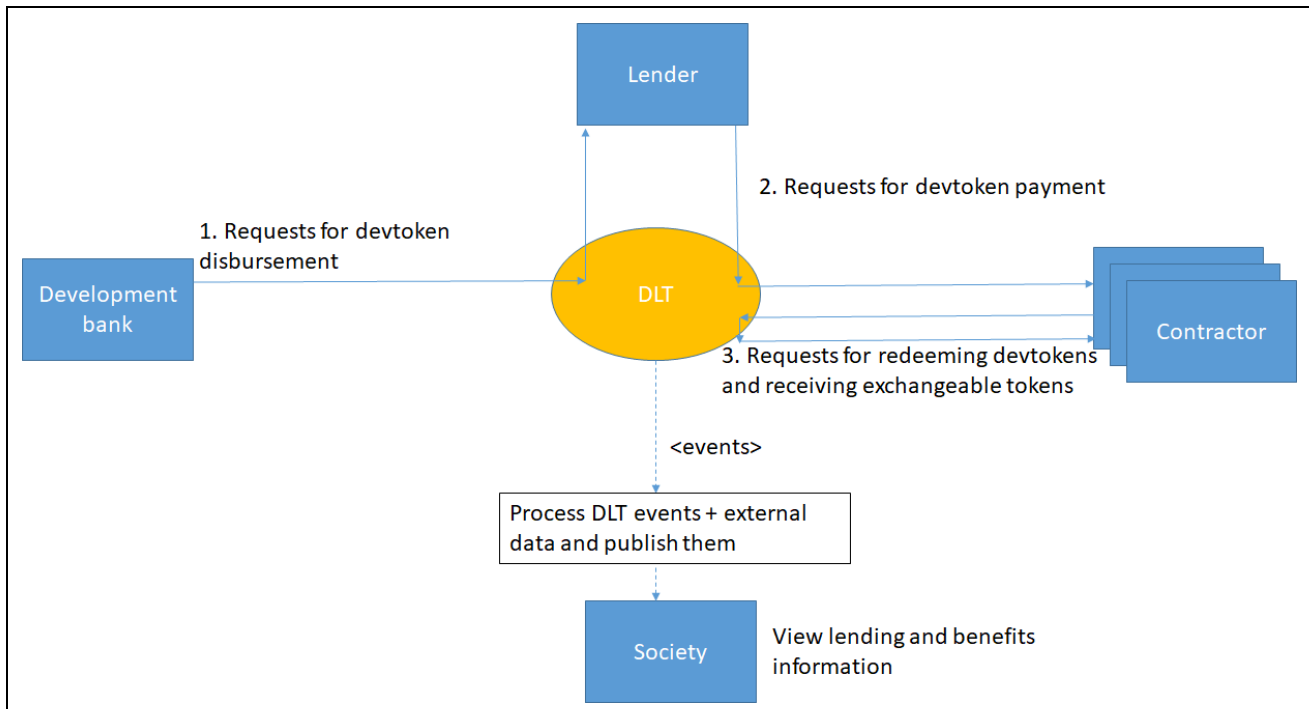
Other Notes
<p>Some steps must occur before the described use case but are not relevant to the description:</p> <ul style="list-style-type: none">- The development bank must approve a development project within a contract. The contract must state the conditions of each public money disbursement;- The lender must ask for a disbursement to the development bank;- The development bank approves disbursement to the lender.

Section 3 Expected process

Future Vision

Expected Flow (to-be)		
Step	User Actions	System Actions
1.	The development bank requests for devtoken disbursement.	DLT checks the development bank is authorized and the lender is enabled to receive devtokens. If true, DLT mints new devtokens and transfers them to the lender's address. DLT emits <disbursement event>.
2.	The lender request for devtoken payment	DLT checks the lender is authorized and has enough balance and the contractor is enabled to receive devtokens. If true, DLT transfers devtokens to the contractor. This transfer demonstrate what the product or service commercialized are. In addition, it has legal value to be used as lender's proof of money spending. DLT emits <payment event>.
3.	A contractor requests for redeeming devtokens and receiving exchangeable tokens * At some point before, the development bank must input enough exchangeable token in DLT.	DLT checks the contractor is authorized and has enough balance and the smart contract has enough exchangeable tokens. If true, DLT burns the received devtokens, makes the conversion between the devtoken value and the exchangeable token value and transfers the corresponding exchangeable token value. DLT emits <redemption event>.
Trigger event	N/A	When a trigger event of DLT is observed, a system updates the lending and benefits information.

Process scheme (to-be)

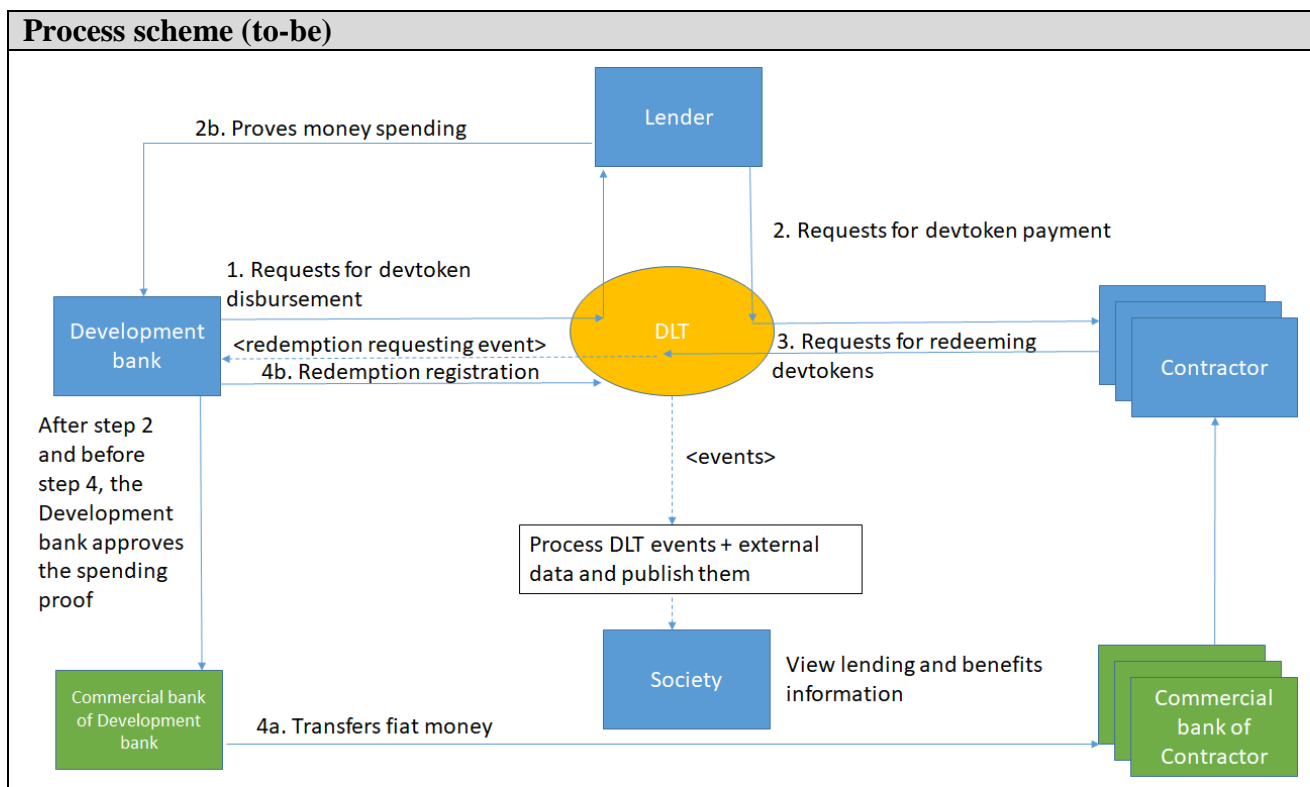


Transition Vision

Expected Flow (to-be)		
Step	User Actions	System Actions
1.	The development bank requests for devtoken disbursement.	DLT checks the development bank is authorized and the lender is enabled to receive devtokens. If true, DLT mints new devtokens and transfers them to the lender's address. DLT emits <disbursement event>.
2.	The lender request for devtoken payment. (2a) At the same time, proves his money spending to the development bank. (2b)	DLT checks the lender is authorized and has enough balance and the contractor is enabled to receive devtokens. If true, DLT transfers devtokens to the contractor. (2a) This transfer does not demonstrate what the product or service commercialized. Then, although the transfer contains devtoken values*, it cannot be used as <u>complete</u> spending proof. * Since devtoken values are available to DLT, it is possible to update published lending and benefits data when trigger event is fired. DLT emits <payment event>. The development bank system register the lender's money spending proof. (2b)
3.	A contractor requests for	DLT checks the contractor is authorized and has

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	redeeming devtokens	enough balance. If true, DLT burns the received devtokens and emits <redemption request event>.
After step 2 and before step 4	The development bank approves the money spending proof.	The development bank system changes disbursement status.
4.	The development bank observe that a redemption request event has occurred. The development bank pays the contractor using a service of commercial banks. (4a)	The development bank's internal system registers the payment (4a) Each commercial bank updates its ledger (4a) The contractor's internal system registers the payment (4a) DLT emits <redemption event>. (4b)
Trigger event	N/A	When a trigger event of DLT is observed, a system updates the lending and benefits information.



Future and Transition Vision

Participants and their roles		
Actor	Type/Role	Description

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1	Development bank	Financial institution designed to provide medium- and long-term capital for productive investment
2	Commercial bank	Financial institution to provide transfer/payment between parts
3	Lender	Entity who takes the loan with the development bank
4	Contractor	Entity who sells a product or service to the lender
5	Society	Everyone who is interested to know how the public money was allocated and what were the benefits of that

Data and information		
Data	Type	Description
1	Devtoken	Token representing fiat money value. It is used to transfer value between: (a) the development bank and the lender and (b) the lender and contractors. It cannot be transferred to a entity who is not registered and enabled to receive devtoken. The token should only be used to execute the associated development project.
2	Fiat money transactions	The way fiat money is transferred between: (a) the development bank and contractors in the transitional vision
3	Money spending proof	Documents, images etc used to proof the money was used as planned in the transitional vision. It must include what products or services type were commercialized. It does not need to include commercial bank statements since this information is available at DLT.
4	Exchangeable token	A token that can be exchanged by fiat money or other cryptocurrency without use the devtoken smart contract.

Security and privacy
<ol style="list-style-type: none"> 1. Since transparency is the main requirement, the ideal information visibility is public; 2. If business privacy prevent public visibility, this critical subset of data can be encrypted or protected; 3. DLT system should be able to provide mechanisms of DLT data integrity control; 4. DLT data and related services (System Actions) should be available in 24/7/365 mode; 5. The entity identity solution should prevent identity fraud. 6. The products and services type identification solution should prevent fraud. (Future Vision only)

Main Success Scenario
<ol style="list-style-type: none"> 1. All information exchange and payments occur in Distributed Ledger in automatic mode; 2. Payments are transferred using digital currency (either devtoken or an exchangeable token);

3. Money spending proof occurs without human verification;
4. Lending and benefits data published without human intervention.

Conditions (pre- or post-)

1. The development bank must have established a financial contract with lenders;
2. Lenders and contractors who receive devtokens must be registered in the identity solution and enabled to receive devtoken;
3. Products and services types used in devtoken transactions must be registered in Product or service type identification (Future Vision only);
4. Devtoken smart contract must be deployed;
5. All parties are connected to DLT-network.

Performance needs

1. Transactions processing near real time;
2. 24/7/365 availability;
3. Volume of disbursements > 1000 Tx/day, volume of transactions > 10.000 Tx/day;
4. Lending and benefits data published in the moment they are available (near real time).

Legal considerations

Changing how a lender proves his money spending has legal impacts.

Risks

1. Legal risks, including regulation of cryptocurrencies, money spending proofing and taxation;
2. Security risks;
3. Contractors do not accept devtokens;
4. Lenders do not want devtokens;
5. Risks related to DLT immaturity.

Special Requirements

N/A

External References and Miscellaneous

1. Project using this use case =>

Brazilian State Bank to Tokenize Brazilian Real on Ethereum's Public Blockchain - <https://www.trustnodes.com/2018/03/06/brazilian-state-bank-tokenize-brazilian-real-ethereums-public-blockchain>

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Other Notes
<p>1. For simplicity, this use case does not describe a scenario where:</p> <ul style="list-style-type: none">- Lender can request for redemption- Contractor can transfer devtoken again
