Digital Currency Global Initiative

A collaboration between

International Telecommunication Union (ITU)

and

Stanford University

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1 Background

In 2017, the ITU-T Focus Group Digital Currency including Digital Fiat Currency (FG DFC) was set up and established an open and neutral platform for dialogue on Central Bank Digital Currency and other digital currency implementations. The FG-DFC brought together digital currency ecosystem stakeholders to discuss technical requirements, standards and anticipate effects of digital currencies in global national economies.

The FG DFC completed its work in June 2019. At the last meeting of the ITU-T FG DFC, ecosystem stakeholders expressed a need to maintain an open platform for dialogue, knowledge sharing and research on the applications of digital currency. Building on the momentum of the FG DFC's past efforts, the setting up of the Digital Currency Global Initiative will continue the dialogue and collaboration initiated by FG DFC.

2 Digital Currency Global Initiative

The Digital Currency Global Initiative is a joint collaboration of the International Telecommunication Union (ITU), a United Nations specialized agency for Information Communication Technologies (ICT) and telecommunications, based in Geneva Switzerland and Stanford University's Future of Digital Currency Program, based in Silicon Valley USA. The Initiative will continue the dialogue and research initiated by the FG-DFC on pilot implementations, use cases, applications and developing specifications for technical standards that will foster adoption, universal access and ultimately financial inclusion. In this document, Digital Currency (DC) is considered as all digital currencies in any form including but not limited to Cryptocurrencies (CC) based on Distributed Ledger Technology (DLT) , Central Bank Digital Currencies (CBDC), Digital Fiat Currency (DFC) and any hybrid variants including stablecoins (SC).

The collaboration will work towards maintaining the neutral, open access, and conducive environment of the FG DFC where central banks, fintech innovators, technology providers, United Nations specialized organizations, payment service organizations, ICT security and other related industries and professionals. This platform will allow for sharing of industry best practices and lessons learned on implementations of DCs. Stanford University's School of Engineering will be the main technology partner for the Digital Currency Global Initiative**.**

Mission: The mission and purpose of the Digital Currency Global Initiative is to pursue the following objectives:

- Undertake research on technical architecture for digital currency use cases, security best practices and assurance level; operational implications of Central Bank Digital Currency; interoperability requirements; technology trends in digital currency and use cases;
- Develop a set of metrics by which to evaluate, validate and benchmark the various characteristics of digital currency technologies against the requirements set by various ecosystem stakeholders;
- Identify areas for standardization to enable implementation of digital currency in the shortest time possible; and
- Organise a global annual conference to enhance relationships and share information on best practices, technical standards and lessons learned on implementation.

The main outcomes of the Initiative's vision will contribute towards the United Nations Sustainable Development Goals (SDG):

- ***SDG 1: No poverty—***"By 2030, ensure that all men and women, in particular the poor and the vulnerable, have…access to financial services including microfinance".
- ***SDG 9: Industry, innovation, and infrastructure—***by providing small enterprises with access to financial services (digitizing payments thereby reducing the need for cash-in and cash-out).
- ***SDG 10: Reduced inequalities—***reducing the costs for remittances.

Goals: The Digital Currency Global Initiative goals are to drive the synergistic engagement, innovative use, and standardization of Digital Currencies, which are the three pillars of the Initiative. The goals of each pillar are described below.

Engagement: The Initiative will drive synergistic engagement between Digital Currency ecosystem stakeholders by:

- Organizing workshops and an annual event to convene industry leaders for discussion, consensus building and dissemination the findings of the working groups.
- Sharing knowledge and lessons learned on best practices, technical requirements and implementations.
- Fostering dialogue with Central Banks and regulators on the effective deployment of digital currency systems

Innovative Use: *Drive industry efficiency through the establishment of evaluation methods and metrics to ensure high confidence and repeatable validation and benchmarking of performance, security, and resilience across ecosystem*

The Initiative will drive the innovative use and application of Digital Currencies through:

- Research on innovative emerging technologies and uses cases
- Developing a common set of methods and metrics to evaluate the performance, security and resilience of existing and future implementations against a set of common requirements
- Testing and evaluation of system and components of implementations using a common measurement reference.
- Monitoring and documenting technology trends and future implementations and their lessons learned as emerging best practices

Standardization: *Development of policy objectives, governance norms, technical requirements for architecture and interoperability of digital currency systems and work towards identification of areas for standardization in coordination with ITU and other Standards setting bodies*

The Initiative will drive standardization of Digital Currency pilot implementations through the three working groups that will be established:

- Research and analysis of DC implementation use cases, DC platform architectures, identification and authentication technologies, fraud prevention, consumer protection, cryptographic mechanisms and other key technical matters relevant for deployment of DCs.
- Develop technical guidelines and best practices for interoperability to enable the effective interconnection of DC technologies with existing payment systems
- Develop reliable methods and metrics to enable the consistent and high confidence evaluation and benchmarking of performance, scalability, and operational efficiency.
- Develop security and assurance models and metrics of threats and vulnerabilities and the application of security controls in ways that improve clarity and reduce complexity.

3 Working Groups Terms of Reference

The work will be conducted by subject matter and domain experts across academia, government, industry and standard's setting organizations in all related fields including Standards, Regulatory, Audit and Certification organizations, Service Providers, Central Banks and Banks; Technology Providers, System Integrators, Implementors, Supply Chain, and experts in Security, Privacy & Trust Emerging Law and policy.

Three working groups would be set up under the Standardization Pillar:

- Architecture, Interoperability Requirements and Use Cases (AIRU)
- Policy and Governance (PG)
- Security and Assurance (SA)

3.1 Architecture & Use Cases Working Group

Focus on the operational challenges of Digital Currency implementations including operational efficiency (cost of operations), scalability (performance at scale), reliability (highly repeatable), maintainability (change management), interoperability (Supply chain integration), and resilience (highly recoverable)

The working group will carry out research and validate the architecture, characteristics and technical requirements for interoperability for different digital currency use cases. The main tasks that will be undertaken include inter-alia:

a) Collect and document information on current initiatives and activities from the stakeholders, including Open Source Initiatives involved in digital currency implementations;
b) Map the functional network reference architecture and process components required to implement digital currency and integration with existing payment systems for interoperability;
c) Analyze and evaluate the current status of digital currency technologies, emerging trends and their maturity;
d) Identify use cases, technical requirements and applications of digital currency;
e) Identify characteristics and functional requirements for services based on digital currency; and
f) Make recommendations on requirements for technical standards on the architecture and for interoperability with existing systems.

The main deliverables of the working group are:

a) Develop online repository on digital currency implementations with detailed information on functional characteristics, use cases, architecture, governance and policies implemented, technology used.
b) Develop technical report on the functional requirements for Central Bank Digital Currency for wholesale and retail CBDCs and technology trends that could lead to innovative applications.
c) Develop a set of metrics by which to benchmark/evaluate the robustness, performance and characteristics of various digital currency technologies against the requirements set by various stakeholders.
d) Develop technical report describing and addressing the standardization gaps and identifying future standardization work for digital currency.

3.2 Policy & Governance Working Group

The working group will focus its research on policy, legal and governance implications of Digital Currency in society for financial inclusion. The group will also monitor technology trends and use cases based on lessons learned from all implementations.

The working group will bring together Central Banks, policymakers, and technology providers to work on the following tasks:

a) Study and analyze the technology implications on governance for digital currency platforms considering those based on integrating DCs with legacy systems
b) Study and analyze the need for technical standards for DCs in general including wholesale and retail CBDC, privately issued stablecoins cross border remittances and for use by international organizations for humanitarian aid.
c) Study and analyse technology competitiveness issues that may hinder the deployment of digital currency for financial inclusion.
d) Develop policy guidance on how digital currency could help in reducing the financial inclusion gap.

The main deliverables of the working group are:

a) Develop a policy toolkit which can be used by policymakers and regulatory authorities implementing digital currency at national level.
b) Organise regional thematic workshops in order to collect inputs from various stakeholders. The workshops will bring together the Telecommunication Regulators, Financial Regulators, Policy makers and other relevant parties to identify issues and priorities, exchange information and best practices through peer learning and knowledge dissemination processes and identifying possible policy interventions for implementing digital currency to meet the objectives of financial inclusion.
c) Develop high level policy principles for meeting interoperability, security, Anti Money Laundering, identification and authentication and data privacy requirements for digital currency

3.3 Security and Assurance Working Group

Focus on the development of flexible multi-assurance security best practice profiles and templates that come with guidelines for the reasonable protection of Digital Currencies and their implementations

The working group will bring together security practitioners from the digital currency ecosystem to work on the following:

a) Build DC issuance & DC transaction processes templates including underpinning asset and process classes.
b) Map the relationships between threats to and vulnerabilities of DC System and security countermeasures. Recommend best practices
c) Develop security methods and metrics for the DC implementation evaluation and validation
d) Develop flexible and customizable multi-assurance DC security assurance profile templates that can facilitate the consistent management of DC security and compliance and enable a common basis of benchmarking
e) Showcase DC security technologies and their use cases for evaluation

The main deliverables of the working group are:

a) A technical report on cyber risk management, security assurance profiles, security control frameworks and security assurance best practices designed to protect Digital Currencies and their implementations
b) A technical report on the security metrics and criteria for validation of the security of digital currency implementations
c) A security toolkit and evaluation platform aimed at Security practitioners and managers to manage security risks for digital currency implementations

4 Annual Digital Currency Conference

The main objectives of the annual event under the Engagement pillar are to:

- Provide a unique platform to share lessons learned about digital currency technologies, pilot implementations, interoperability and governance;
- Showcase digital currency pilot implementations and innovations taking place at the global level; and
- Provide thought leadership on digital currency strategies, standards, and innovations as an enabler to bridging the financial inclusion gap and achieving the United Nations Sustainable Development Goals.

The event will be organized by the ITU jointly with Stanford University and will be open to everyone. The intended audience are Central Banks, Digital Currency technology companies, Payment system providers, Fintech companies, Standard Setting Bodies, IT security companies, industry fora, academia, and policymakers.

5 Innovative Use Pillar

The main objectives of the Innovative Use pillar will be to study pilot implementations of CBDCs and other digital currencies and to develop the appropriate benchmarking and evaluation frameworks through the Digital Currency Lab to be operated by Stanford University. A secondary future objective may be to develop an incubator for digital currency startups that are participating in the work of the Digital Currency Global Initiative.

6 Digital Currency Lab: Evaluation and Benchmarking

In order to achieve the stated DIGITAL CURRENCY GLOBAL INITIATIVE objective to drive the development of DC standards, the Working Groups will establish a process to develop and validate the requirements, specifications and technical evaluation criteria to enable benchmarking of digital currency platforms through ecosystem collaboration and consensus.

The creation of proposed specifications will be generated by Ecosystem stakeholders and domain experts participating in the three Working Groups. Taking a problem-solving approach, the Working Group experts will analyze challenges and propose “untested” solutions.

These solutions and proposed specifications are then evaluated using real world DC implementations to determine the appropriateness and value in their intended purpose, for example protection through the application of security controls. This iterative process between the creation and validation of specifications continues until all stakeholders have reached consensus on applicability and completeness.

Essential to achieving the outcome of sound and acceptable published standards is the development of reliable models, evaluation methods and metrics to ensure a repeatable and high confidence basis for assessment and benchmarking. The process of validation starts with

identifying the aspects of operational performance and security needs that require technical evaluation criteria and metrics which can be defined and standardized. The various validation test specifications and benchmarking process would also be standardized. The above work would be done in the Working Groups and then implemented and tested in the Digital Currency Lab.

This is the "what needs to be validated." This includes:

- Performance characteristics of Scalability (performance at scale), Efficiency (cost of operations), Interoperability (with existing and legacy systems), Reliability (highly repeatable), Maintainability (change management), Resilience (highly recoverable).
- Protection characteristics of DC components vulnerabilities as attack targets; threat vectors that can exploit the target vulnerability; security countermeasures that can mitigate the threat and reasonable assurance levels which yield acceptable residual risk.

The follow-on question to "what needs to be validated" is "validated for what?" This includes whether the DC System asserted:

- Is what it purports to be?
- Meets a set of requirements
- Meets a specific assurance level