Money®
BitMint

BitMint
Quantum Randomness Money

*Easy * Fast * Secure*

Q-Pay

RF

BitMint*cash*

BNR CBDC Ideathon Pitch Deck

Fostering Innovation to deliver value to end users of the potential e-Franc Rwandais

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Confidential

e-Franc Rwandais - - in order for being widely accepted and obtaining trust - should introduce the next generation of digital money, immunized against mathematical collapse, well-grounded into the economy, and offer a yet unimaginable range of tools and means for society to run itself much better than it does today.

BitMint®
bitwise Money

Secure
Versatile
Digitized
Currency

The solutions which we propose to add to the e-Franc Rwandais will make it:

- more efficient and robust
- easier for use with more use cases and functionalities
- empower communities, businesses and industry
- enhance financial inclusion
- reduce compliance costs
- mitigate financial crime
- prevent risk of distribution of counterfeit e-Francs
- will not compromise user's privacy more than necessary
- and will make it already NOW immune against AI-Cryptanalysis, and against quantum computers attacks.

BitMint's unique and tested solutions will enhance the
e-Franc Rwandais
in ALL four sweet spots,
and more,

With the First ever quantum secure two-tier token-based CBDC that was tested by a central bank and successfully passed banking stress tests,

while introducing innovation BEYOND DLTs and distributed ledgers,

with cash-like capabilities – from paying in any denomination with no intermediaries, up to payment in fully offline mode without the need to rely on encryption;

and the first ever intuitive remittance payments, cross border, with no intermediaries.

BitMint AI-Powered Cyber-Innovation Hub
DCI - Digital Currency Innovation

Problem statements

1. INCREASED RESILIENCY

a. National currency - Franc Rwandais -should not be a target for being counterfeit by bad actors - hence – token creation, as well as every phase from issuing, validating, transaction and redeeming should be resilient against any possible attack, including by AI-Cryptanalysis, or quantum computers, in the future..

b. Although most of Rwanda's electricity comes from hydropower, there is still lack of electricity, and a NEW payment system MUST be using much LESS computing power for conducting all processes with e-Franc.

2. IMPROVING INN0VATION AND COMPETITION

Both DLTs and the Distributed data bases, as they are designed NOW, will be obsolete in a few years, also because both suffer from shortcomings and require many trade-offs and compromises between security, ease of use, efficiency, energy consumption, prevention of terror financing and money laundering, etc.

These shortcoming could NOT be fixed in the future by adding a patch or layers.

Therefore, since the e-Frank will be designed for many years to come, for being sustainable, it must be built on the new technology (a "high-way'), that is already in advanced feasibility trials, that avoids all shortcomings of the other two concepts, without giving up any of the prominent advantages of both.

3. CASHLESS ECONOMY

- means first of all that the e-Franc can mimic ALL attributes of cash, and adding the advantages of cyber cash. Practically, it means P2P, P2B and P2G payments with no intermediaries, while paying exactly in any denomination, even if the taxy driver does have change, etc., and if desired - to enable adding terms of use – so grant money, for example, will be used only for the designated purpose;

second, enable paying cash-like – anonymously - up to a threshold;

third, to enable payment when there is totally no Internet and no electricity, with instant finality of payment, while NOT dependent on any encryption protocol.

4. CROSS BORDER REMITTANCES

Remittances to and from Rwanda should be much more secure (too many weak links in the process), much faster & more scalable and much less costly, and instant;

On top of that, current customer experience must be advanced - it should be more intuitive to send and receive money - also for non-technology savvy people,

while revenue model should not be based on transaction volume, rather on enhancing liquidity management capabilities, and service-based approaches with data monetization, while more local SMEs should be involved .

Problem Solution – Fit (1)

1. INCREASED RESILIENCY

Current solution seem not to be resistant to attack by AI-Cryptanalytic, and not ready now to the quantum threat (that no one can guess when it will appear, but it should be a design choice for the e-Franc from day one, since it can not be fixed later).

Current Offline solution is based on encryption, which can enable distribution of counterfeit e-Franc by bad actors.

If the e-Franc will be breached at its mathematical level (distinguished from implementation level) – then, not only that future transactions stop –
the present status is untrustworthy because money was likely shadily shifted around before the breach was discovered.
Money accounts will be all stained, payments will stop.

That is why BitMint can support you and G+D in mitigating these and other risks and vulnerabilities that are not mentioned here, and we'll do it gladly, since we acknowledge that G+D is a serious and responsible company.

BitMint AI-Powered Cyber-Innovation Hub
DCI - Digital Currency Innovation

Problem Solution – Fit (2)

2. IMPROVING INN0VATION AND COMPETITION

BitMint can add innovation and enhance competitiveness in all levels of the e-Franc, from the creation, through issuing, validation/transaction/redeeming through use cases and functionalities.
For example:

1. e-Franc tokens could be more secure than other CBDCs, if it will be stored in an analogue format rather than digital (like you are protected against sharks, if you walk on the beach).

2. e-Franc and many other CBDCs, rely on the secrecy of a key,
So, any weakness of the key can be exploited in any transaction.
-> Token keys that are created and deleted regularly, cannot mitigate the threat.
Keys + OWF mutations will make a competitive edge.

3. e-Franc procedures are being conducted by intermediaries' servers, which is very costly, requires high processing power and therefore much cooling energy.
A competitive edge is introduced by enabling most procedures to be executed by traders' mobile phones and not in servers that require much cooling energy, making the e-Franc less costly to operate and more eco-friendly.

4. e-Franc is managing articles of cash. A competitive edge enables to manage also articles of debt, not just articles of cash. This is carried out via the negative valuation function.

5. e-Franc token cannot be split by traders' App, which means that any small payment requires burning tokens and creating two new tokens - all done in an intermediary server.
A competitive edge is enabling users (human, or devices) to execute most procedures autonomously by their phone APP with no intermediaries.

Problem Solution – Fit [3]

3. CASHLESS ECONOMY

Achieving widespread consumer merchant acceptance requires disruptive features and use cases that are not available today. We'll add (or enhance) the following parameters, which are essential for cashless economy, with a Modular architecture, flexible, easy to expand and that support future replacement of specific modules and easy integration of new innovative technologies:

- Instant, frictionless payment transactions, easy for use also for non-technology savvy users
- Enabling users (human, or devices) to execute most procedures autonomously by their phone with no intermediaries
- Making payments at any desired resolution micro, nano payments, and continuous payments per service, with payment finality
- Pay-as-you-Go, replacing the unfair subscription regimen where light users over pay and heavy users underpay
- Bilateral Payment Trust, also between strangers
- Privacy of transactions to law abiding citizens
- One unified framework for retail as well as wholesale payments, removing existing barriers, settlement risks and superfluous costs/fees
- Universal availability and interoperability without restrictions
- Payment continuity anytime, anywhere for everyone
- Sustained Offline Payment capability not linked to any external system/network, providing finality of settlements even as long as the Internet is compromised
- Micro-Services Economy: IoT (Internet of Things) devices pay each other autonomously.

BitMint AI-Powered Cyber-Innovation Hub
DCI - Digital Currency Innovation

Problem Solution – Fit [4]

BNR

4. CROSS BORDER REMITTANCES

International borders represent two boundaries for two distinct, and often contradictory financial ecosystems. This friction makes it very costly and cumbersome to transfer money to and from Rwanda. The AML efforts on a global scale built up more friction, posing a big hurdle on the goal for efficient global finance.

We are addressing the cross-border potential in the design of domestic e-Franc used in conjunction with a qmoney (superposition money) framework which enables the interlinkage options to facilitate efficient cross-border and cross-currency payments between different jurisdictions.

On top of that, statistics show that cross-border cash withdrawals increased sharply the Covid-19 pandemic, which means that traders prioritize privacy over convenience.
BitMint can offer both, and still not being an enabler for illicit activities.
Transactions monitoring while preserving users' privacy and anonymity – is feasible.
A shared (public) ledger for authenticating and transaction of the digital should NOT necessary be a DLT, that is cumbersome to operate and is dependent on a consensus mechanism, nodes/validators/peers...
but -
a public ledger, that enables a payee to autonomously authenticate the coin, make sure it was not double spent and get ownership on the coin - all without intermediaries.

Demonstrating Solution Clarity and Viability

Due to the length limitation of the presentation, we present here only a few illustrations of our solutions and case studies, the advantage of which is that they are based on proven technologies, and that they can be implemented in Rwanda - starting in a small ecosystem and gradually scaled up to all residents of the country, as we did in China, in a region with a number of residents that is almost double that of Rwanda.

At BitMint, we are working on building and continuously enhancing infrastructures (“Highways”) that make tokenization of every regulated value, CBDC, stablecoins, assets or deposits, as well as programmable money movement not just possible, but most secure and very simple to use.

BitMint’s technologies, centred on regulated and programmable digital money with quantum-safe security and granular monetary control, with the potential to make substantial contributions across several dimensions of the Rwandan’s financial system, among others:

1. **Financial Resilience**

- BitMint's core capability enables programmable, traceable, and highly secure digital cash, which can withstand cybersecurity threats, including those from looming AI-Cryptanalysis and future quantum computing. This strengthens financial system resilience by mitigating risks of fraud and facilitating swift recovery from disruptions or attacks.

- Digital cash, managed at the user and device level, offers redundancy and continuity during operational or communications outages, enhancing the financial sector's ability to withstand and recover from shocks.

2. **Governance and Strategic Autonomy**

- By allowing nations and regions to issue, manage, and regulate their own sovereign digital currencies without dependency on external, centralized platforms, BitMint supports strategic autonomy and sovereignty over monetary policy.
- The programmable logic in BitMint's system underpins auditable, transparent monetary flows, making regulatory compliance, oversight, and enforcement more effective and accountable—a key element in robust financial governance.
- Secure, sovereign digital money helps preserve national interests, reducing risks of over-reliance on global tech providers or private digital payment networks.

3. **Digital Assets**

• BitMint enables the minting, distribution, and redemption of digital
tokens representing diverse asset classes, both native digital and tokenized traditional assets. This helps expand the universe of tradable digital assets.

• Programmability and traceability features simplify compliance, risk management, and audit, while enhancing transparency and liquidity—vital for mainstream adoption of digital assets.

4. **Payment Infrastructures**

• By providing instant, digital cash-like settlement, BitMint's technology can significantly reduce payment frictions, lower costs, and remove intermediaries for both retail and wholesale transactions.

• Its design supports cross-border and peer-to-peer payments with programmable conditions, improving efficiency and enabling new business models (e.g., programmable micropayments, conditional transfers).

5. **Capital Markets**

• BitMint's support for secure tokenization, coupled with programmable compliance and settlement, enables digitization of equities, bonds, and other securities. This streamlines issuance and trading, shortens settlement cycles, and increases transparency in capital markets.

• The system's quantum-safe and programmable features position it well for the next phase of market infrastructure, which requires scalability, reliability, and direct ownership models.

• Automation and real-time settlement can reduce systemic risk and operational costs, fostering a more inclusive and competitive investment environment.

Offline and Online change (split) possible autonomously by the phone without the network

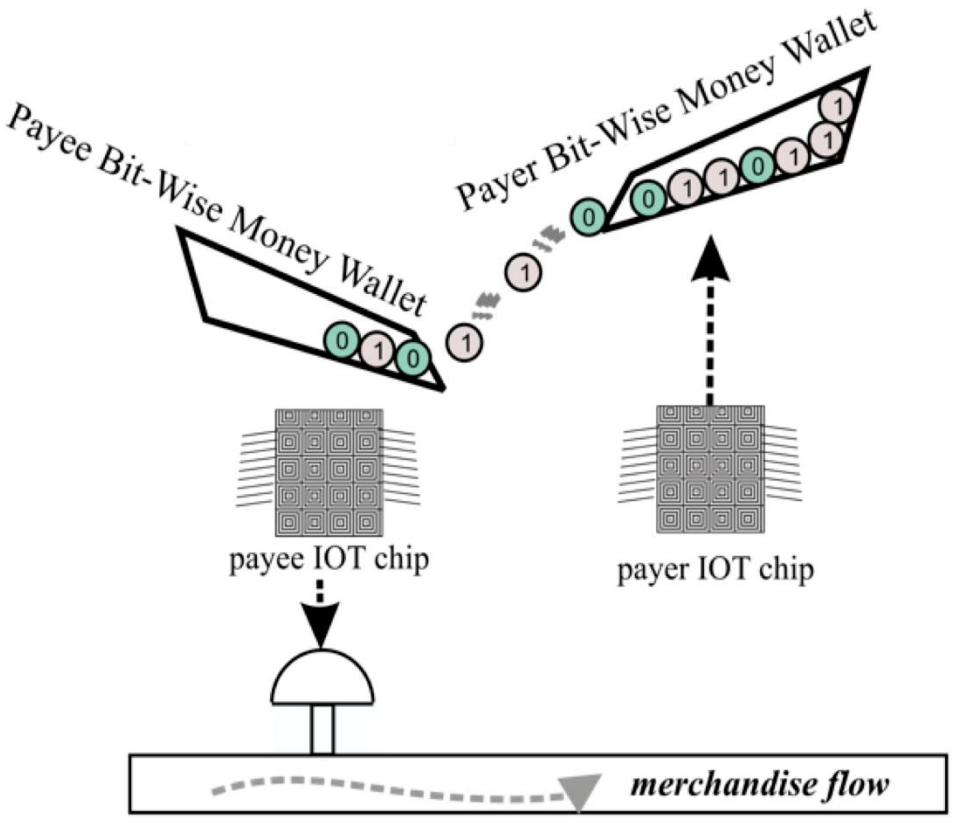
Offline Peer-2-Peer
in any resolution

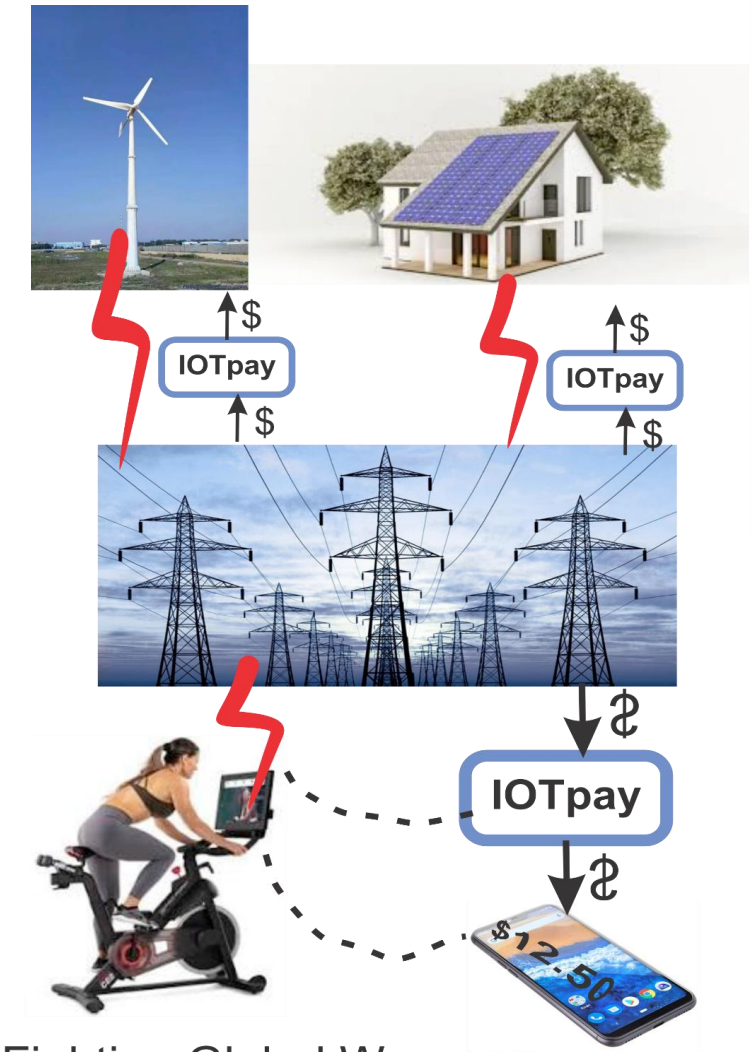
Infinite offline-hops possible

BitMint's solutions added values/use cases

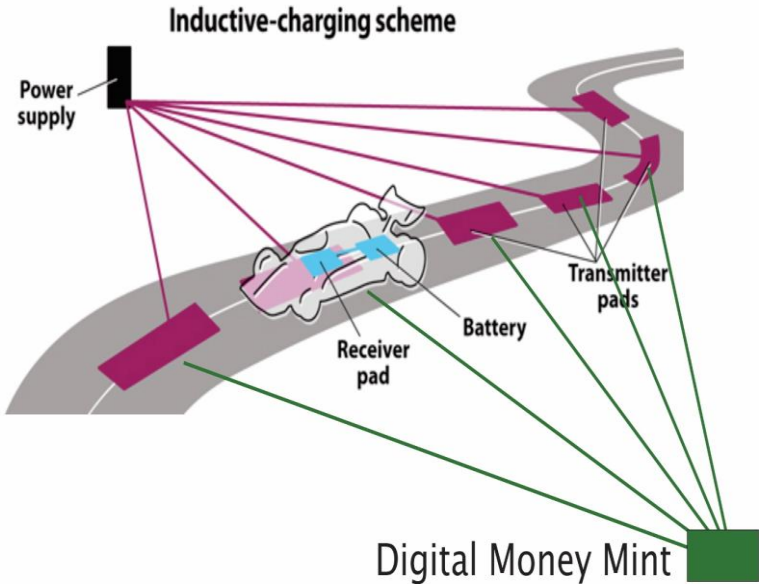
Frictionless Payment

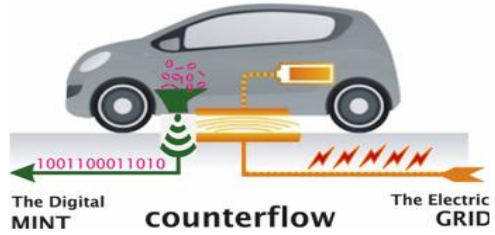
Continuous Pay-as-You-Go!





Payment is executed automatically





In-Vehicle payments

auto continuous pay

LEVEL –

Autonomous Validation and Settlement protocol for e-Franc Rwandais that keeps payment behavior unexposed, guarded against AI-Cryptanalysis and mis-profiling

Adjustable Privacy of transactions to law abiding citizens

Making payments
at any desired resolution
micro, nano payments,
and
continuous payments
per time or service,
Or per reading content –

NO Subscription required
replacing the unfair
subscription regimen
where light users over pay
and heavy users underpay

you can chop any portion of
your token
up to a few cents,
- autonomously -
with no network
or intermediary,
and transfer it directly to a payee

BitMint Credit Trade: The Magic of Negative Coins

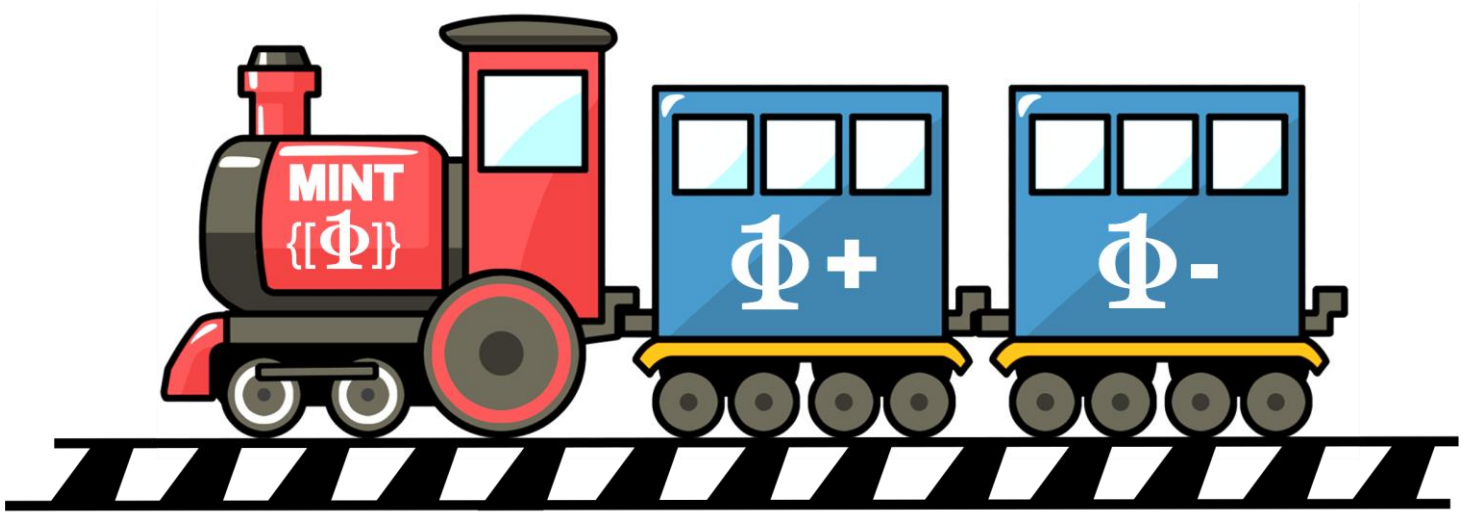
BitMint mints 'negative coins' which are passed around as credit,
using the same platform as cash. New versatility, and new efficiency.

BitMint offers the world of finance the benefit of a unified framework for cash and credit: a positive BitMint coin (cash), and a negative BitMint coin (credit, obligation). Like an electron and a positron, two matching BitMint coins of opposite value mutually annihilate:

[+|X|] + [-|X|] = 0

Traders are attracted to positive BitMint coins (cash), and are "repelled" by negative BitMint coins (obligations). Yet traders covet things, and to receive something of value, traders part with their attractive positive coins, as well as accept unattractive negative coins (obligations).

Historically societies prospered in proportion to the extent of trade with credit and obligation. The BitMint money framework offers a frictionless trade with both cash and obligations.



BitMint Financial Railways Transport Positive and Negative Cash

Super-Position Currency for Cross border payments

The term 'superposition' is used in physics to indicate subatomic entities that are in an intermediate state for a short period before they 'collapse' to one of two allowable states.

We borrow this concept to devise a currency that is a superposition between the currency paid by the payer and the currency received by the payee.

This super-positioned currency will be short lived and will soon be reduced to one or the other currencies it is a superposition of.

By deploying the LeVeL for remittance cross border payments, you not only mitigate high costs and inefficiencies of the currency cross border payments, but you eliminate market Fragmentation, shifting the focus of service provider to local Rwandan SMEs, that will gain access to international payments previously reserved for large corporates.
Commercial banks will continue being players in this market, and will be able to generate revenue by also using the "LeVeL", which will reduce their operational costs and they will not need anymore to maintain liquidity, like they do now, on expense of the payers/receivers.

Economic/revenue models will be transforming, shifting from transaction fees, which is absolutely discriminating the low remittance transactions, which represent most of the players in the market (in number of transactions, not in value) to service-based approaches and data monetization.

the LeVeL will do what blockchain cannot do, apart from being safer and faster and more scalable, it will enhance liquidity management capabilities, Customer experience integration as a very intuitive platform, while it offer technology infrastructure superiority.

Financial services beyond borders

Currently, banks and PSPs in Rwanda are inherently local, and hence can only offer financial services tied to local customers, and to local interest rates.

BitMint's "LeVeL" platform and the "LoanChain" protocol open access to Rwandan fintech landscape to yield and penetrate into the lending and credit markets that aren't tied to any single Geography, based on a digital e-Franc.

This includes earning a more competitive yield, accessing additional lending markets, or using their balances for gaining from higher interest rates in other jurisdictions, WITHOUT outflow of liquidity from Rwanda, due to the capability to lend - for example for night time when you don't need the money, which will reside back into your balance in the morning.

LoanChain exploits AI and BitMint protocols to make money more productive in ways not available before

Technical Feasibility

BitMint Technology is based on the novel and forward-looking notion that quantum randomness can improve every technology in almost every field. Here we focus on digital money solutions, where we claim that every digital coin on the market today can be improved with proper injection of quantum randomness. And we further claim that it is advantageous to use the mathematically most basic, simplest expression of money -- and then inject quantum randomness into it, in order to upgrade it to achieve everything that digital money is expected to achieve. The result is BitMint -- it's robustness and security is insured by its utmost simplicity.

BitMint is a technology hub pioneering novel thematic innovation through the methodology of Artificial Intelligence Assisted Innovation (AIAI).

Combining material sciences and computer sciences, with financial insight, and recognizing quantum randomness as the cyber oil that powers cyberspace, BitMint is marching on with 42 awarded patents and about three dozen more in the pipeline. We focus our new technology on the dramatic promise of cyber finance, and secure exchange of value.

BitMint's solutions are proven to be workable and scalable with well-defined methodology, for retail online & offline, wholesale and cross-border - - - Digital Currency Ready to Deploy with no tradeoffs.

LeVeL is Making the e-Franc Rwandais systems more Secure, Instant & Resilient

- **Key Points:**
  - It can handle the entire lifecycle of e-Franc Rwandais from issuance and distribution to real-time transaction validation and fraud detection.
  - It can significantly reduce settlement risk and costs, enabling instant payments around the clock.
  - It could also be programmed to analyze transaction data in real time to automatically flag and freeze suspicious coins, enhancing anti-money laundering (AML) efforts.
  - Adoption of the LeVeL will significantly reduce cybersecurity vulnerabilities.

e-Franc Rwandais needs more than just mobile phones and digital bits.

It needs infrastructure

that can bridge ecosystems, align standards
and coordinate execution with the precision global finance demands.

This is the *LeVeL*.

We are laying out a bold case for the LeVeL as the next Trust layer for Rwanda financial system.

What the Internet did for information, LeVeL does for value.

The LeVeL provides higher security (AI & quantum resistant) and trustworthy data sharing among payer and payee and financial institutions within a community-sanctioned protocol, while not compromising parties' privacy, according to local legislation, obtaining higher efficiencies, enhancing financial inclusion, reducing time and effort (computational power) required to configure and execute transactions.

It is universal and programable, enables flexibility and scalability and enhancing resiliency.

It manages different identity-bearing configurations incorporating central bank money [CBDC], stablecoins, tokenized commercial bank deposits and tokenized government bonds and asset tokenization, integrating messaging, reconciliation and settlement, laying the foundations of a new era for tokenized monetary and financial system.

It will democratize the payment landscape, making it more user friendly, much more secured and accessible and simplifies the value transfer process for all.

It opens up huge possibilities for free-flowing trade, reliable and inclusive economy, while not being an enabler for illicit activities

Implementation Plan – [1]
Suggested cost proposal for a demo (excl. testing & integration)

We suggest to start with a demo-play of the “LeVeL” that demonstrates the foundational concept , to enable minting, paying, getting paid, and redeeming digital coins.

While playing the roles of the different traders featured in this "demo play", you will familiarize yourself with the simplicity, and with few of the advantages of the LeVeL payment solution.

The application can be viewed as a "play" involving a community of coin traders: Alice, Bob, Carla, David, Eve, and Frank. The user of this application can "play the role" of any coin trader:

(i) requesting the mint to mint a new coin, which then appears in their wallet;
(ii) passing this coin as payment to any other trader;
(iii) redeeming the coin with the authority that minted it.

The life- story of each coin is recorded on the ledger maintained by the mint (The BNR).

Cost suggestion for such a demo play (on Amazon cloud, for example) starts from 74kUSD.
Estimated time to develop: 5 months.

Implementation Plan – [2]

Suggested cost proposal for a payload capsule demo

(excl. testing & integration)

We suggest here for this early stage to demonstrate this unique capability of a coins that could be split buy the user to any required resolution, via a 'skeleton' mode, where all non-essential aspects are left unaddressed, and focus is totally reserved to the payload capsule of he coin, for demonstrating how the coin can be split without network.
In the working solution the coin builder is requesting a random bit string from a random number generator (RNG), while this demo will be limited to pseudo-randomness, potentially augmented with the BitMint randomness filter that throws out particularly non-randomized sequences.

Cost suggestion of payload capsule demo w/o the Filter: 195kUSD (7 months)
Cost suggestion of payload capsule demo with the Filter: 265kUSD (9 months)
Cost suggestion for the entire Capsule Builder demo in a skeleton mode: 995kUSD (15 months)

The modular structure of our solution and the gradual integration process from a small ecosystem to its gradual expansion, while continuously operating our risk assessment tools, will respond and overcome promptly any possible hurdle and the system will continue working continuously.

- ✓ BitMint is a technology hub pioneering novel thematic innovation through the methodology of Artificial Intelligence Assisted Innovation (AIAI).

- ✓ BitMint was acknowledged by G+D and won first prize in an international financial innovation competition organized by G+D.

- ✓ Leveraging quantum-randomness, with focus on cyber finance and secure exchange of value, to meet evolving payment needs, providing seamless user-friendly payment experience to consumers and merchants, enabling market participants to execute frictionless, precise and real-time transfer of value.

- ✓ BitMint developed cyber security solutions consisting of physical security products and software programs for protecting and recovering networks, communication and data-centers. BitMint contributes to autonomous computing and autonomous and embedded payments.

- ✓ BitMint offers Uninterrupted Payment solutions online and offline, not dependent on network availability. Technologies fits centralized and decentralized regimen, exploiting benefits of both, escaping pitfalls of each.

- ✓ BitMint Tethered Money tailors money to its intended purpose.

Our proposal to The National Bank of Rwanda [BNR] is based on our vast experience of 18 years in the non-speculative digital currencies challenge, on our close acquaintance with CBDC pilots executed by several central banks, and our experience and lessons that we have learned from **a two-tier retail CBDC project, that we were invited to design, build and co-operate**, and that successfully passed banking stress tests, demonstrating the following main attributes:

Supports adjustable privacy for law abiding users, not being an enabler for illicit activities

Offers all the versatility and power of digital currencies without the unacceptable risk of currency collapse

Multi currency public ledger that enables instant finality of payments, high values as well as atomic settlements

Very user friendly and environmentally friendly, available 24x7x365, with optional purpose driven money (Tethered Money)

Being quantum-safe, preventing counterfeit risk, enhancing resiliency and security, including against the new threat of AI Cryptanalytics

Easy * Fast * Secure
Q-Pay
BitMintcash

Meet the dedicated team leaders

for the e-Franc Rwandais project

Our experts are here to assist you

Scientific leader

inventor of the

identity-bearing digital currency

Prof. Dr. Eng. Gideon Samid

Business manager

A digital currency expert, helping central banks and vendors to leverage innovative technologies

Ms. Mary Hall

Legal and regulatory leader

e-Currency expert

author of the Payment Order

Professor Benjamin Geva

Implementation leader

Extraordinary expert in applied security who founded and managed leading companies in the field

Mr. Ron Efron

Project manager

The leader of the **1st ever CBDC project** that passed banking stress tests and is immune against AI cryptanalysis and looming quantum attacks

Mr. Amnon Samid

Coin Creation

Mϕney®
BitMint

We are primarily anxious in strengthening the pioneering process, that Rwanda began about three years ago, with the intention that Rwanda will be a leader and not be dragged behind others - ensuring that a comprehensive portfolio of responsible and impactful solutions are developed and implemented to high standards, supporting Rwanda's strategic goals & being a role model in Africa in achieving digital financial inclusion

We'll be happy to discuss with you all aspects for making the e-Franc Rwandaisa a success and beneficial for Rwanda's citizens and society and stabilize the monetary and financial system

Technology Architype

Coin Creation

Coin Structure

Validation/ Settlement protocol

Offline Protocol/ Hardware

BitMint Money®
Your Payment Solution of Choice
Dutegereje gukorana na Banki Nkuru yu Rwanda

Looking forward to working with the Central Bank of Rwanda and with G+D

Together, we can make a Positive Impact!

Thank You!

Murakoze!

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