

Whitepaper

Metadium

Next Generation Identity Standard for the New Era

Created : Feb 1st, 2018

Revised : Aug 23th, 2018

- *This document is currently under the legal review.
Please keep it strictly confidential.*

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- (a) Certain information set forth in this Whitepaper includes forward-looking information regarding the future of the project, future events and projections. These statements are not statements of historical fact and may be identified by but not limited to words and phrases such as “will”, “estimate”, “believe”, “expect”, “project”, “anticipate”, or words of similar meaning. Such forward-looking statements are also included in other publicly available materials such as presentations, interviews, videos etc. information contained in this Whitepaper constitutes forward-looking statements including but not limited to future results, performance, or achievements of Metadium or its Affiliates.

- (b) The forward-looking statements involve a variety of risks and uncertainties. These statements are not guarantees of future performance and no undue reliance should be placed on them. Should any of these risks or uncertainties materialise, the actual performance and progress of Metadium or its Affiliates might differ from expectations set by the forward-looking statements. Metadium or its Affiliates undertake no obligation to update forward-looking statements should there be any change in circumstances. By acting upon forward-looking information received from this Whitepaper, Metadium or its Affiliates' website and other materials produced by Metadium or its Affiliates, you personally bear full responsibility in the event where the forward-looking statements do not materialize.

- (c) As of the date of this White Paper, the Metadium platform has not been completed and is not fully operational. Any description pertaining to and regarding the Metadium platform is made on the basis that the Metadium platform will be completed and be fully operational. However, this paragraph shall in no way be construed as providing any form of guarantee or assurance that the Metadium platform will eventually be completed or be fully operational.

1.5 Potential Risks

By purchasing, holding and using the META Tokens, you expressly acknowledge and assume the risks set out in this section. If any of these risks and uncertainties develops into actual events, the business, financial condition, results of operations and prospects of Metadium or its Affiliates may be materially and adversely affected. In such cases, you may lose all or part of the value of the META Token. Such risks include but are not limited to the following:

Risks Relating to the META Tokens

1.5.1 There may not be a public or secondary market for the META Tokens

- (a) The META Tokens are intended to be native tokens to be used on the Metadium platform, and Metadium and its Affiliates have not and may not actively facilitate any secondary trading or external trading of META Tokens. In addition, there is and has been

no public market for the META Tokens and the META Tokens are not traded, whether on any cryptocurrency exchange or otherwise. In the event that the META Tokens are traded on a cryptocurrency exchange, there is no assurance that an active or liquid trading market for the META Tokens will develop or if developed, be sustained. There is also no assurance that the market price of the META Tokens will not decline below the amount paid for the META Tokens, which is not indicative of such market price.

- (b) A META Token is not a currency issued by any central bank or national, supranational or quasi-national organisation, nor is it backed by any hard assets or other credit. Metadium and its Affiliates are not responsible for nor do they pursue the circulation and trading of the META Tokens on the market. Trading of the META Tokens merely depends on the consensus on its value between the relevant market participants, and no one is obliged to acquire any META Token from any holder of the META Token, including the purchasers of the META Tokens, nor does anyone guarantee the liquidity or market price of the META Tokens to any extent at any time. Accordingly, Metadium and its Affiliates cannot ensure that there will be any demand or market for the META Tokens, or that the price upon which the META Tokens were purchased is indicative of the market price of the META Tokens if they are made available for trading on a cryptocurrency exchange.

Risks Relating to Metadium, its Affiliates and the Metadium Platform

1.5.2 Limited availability of sufficient information

The Metadium platform is still at an early development phase as of the date of this White Paper. Its governance structure, purpose, consensus mechanism, algorithm, code, infrastructure design and other technical specifications and parameters may be updated and changed frequently without notice. While the White Paper contains the key ©2018 Metadium, Next Generation Identity Standard for the New Era information currently available in relation to the Metadium platform, it is subject to adjustments and updates from time to time, as announced on Metadium's website (the "**Website**"). Purchasers will not have full access to all the information relevant to the META Tokens and/or the Metadium platform. Nevertheless, it is anticipated that significant milestones and progress reports will be announced on the Website.

1.5.3 The digital assets raised in the sale of META Tokens are exposed to risks of theft

Whilst Metadium and its Affiliates will make every effort to ensure that the ETH and other digital assets received from the sale of META Tokens are securely held through the implementation of security measures, there is no assurance that there will be no theft of the cryptocurrencies as a result of hacks, mining attacks, sophisticated cyber-attacks, distributed denials of service or errors, vulnerabilities or defects on such blockchain addresses, the Ethereum Blockchain, or any other blockchains, or otherwise. Such events may include, for example, flaws in programming or source code leading to exploitation or abuse thereof. In such event, even if the sale of META Tokens is completed, Metadium and its Affiliates may not be able to receive the cryptocurrencies raised and Metadium and its Affiliates may not be able to utilise such funds for the development of the Metadium platform, and the launch of the Metadium platform might be temporarily or permanently curtailed. As such, the issued META Tokens may hold little worth or value. The META Tokens are uninsured, unless you specifically obtain private insurance to insure them. In the event of any loss or loss of value of the META Tokens, you may have no recourse.

1.5.4 The blockchain address(es) may be compromised and the digital assets may not be able to be retrieved

The blockchain address(es) are designed to be secured. However, in the event that the blockchain address(es) for the receipt of payments for the META Tokens or otherwise are, for any reason, compromised (including but not limited to scenarios of the loss of keys to such blockchain address(es)), the funds held at such blockchain address(es) may not be able to be retrieved and disbursed, and may be permanently unrecoverable. In such event, even if the sale of the META Tokens is successful, Metadium and its Affiliates will not be able to receive the funds raised and Metadium and its Affiliates will not be able to utilise such funds for the development of the Metadium platform, and the implementation of the Metadium platform might be temporarily or permanently curtailed. As such, distributed META Tokens may hold little worth or value.

1.5.5 There is no assurance of any success of the Metadium platform and Metadium and its Affiliates may cease the development, launch and operation of the Metadium platform

- (a) The value of, and demand for, the META Tokens hinges heavily on the performance of the Metadium Platform. There is no assurance that the Metadium Platform will gain traction after its launch and achieve any commercial success. The Metadium ©2018 Metadium, Next Generation Identity Standard for the New Era Platform has not been fully developed, finalised and integrated and is subject to further changes, updates and adjustments prior to its launch. Such changes may result in unexpected and unforeseen effects on its projected appeal to users, and hence impact its success. There are no guarantees that the process for creating the META Tokens will be uninterrupted or error-free.
- (b) While Metadium has made every effort to provide a realistic estimate, there is also no assurance that the cryptocurrencies raised in the sale of META Tokens will be sufficient for the development and integration of the Metadium platform. For the foregoing or any other reason, the development and integration of the Metadium platform may not be completed and there is no assurance that its systems, protocols or products will be launched at all. As such, distributed META Tokens may hold little or no worth or value.
- (c) Additional reasons which may result in the termination of the development, launch or operation of the Metadium platform includes, but is not limited to, (aa) an unfavourable fluctuation in the value of cryptographic and fiat currencies, (bb) the inability of Metadium and its Affiliates to establish the Metadium platform or the META Tokens' utility or to resolve technical problems and issues faced in relation to the development or operation of the Metadium platform or the META Token, the failure of commercial relationships, (cc) intellectual property disputes during development or operation, and (dd) changes in the future capital needs of Metadium or its Affiliates and the availability of financing and capital to fund such needs. For the aforesaid and other reasons, the Metadium platform may no longer be a viable project and may be dissolved or simply not launched, negatively impacting the Metadium platform and the potential utility and value of the META Tokens.

1.5.6 There may be lack of demand for Metadium platform and the Services provided, which would impact the value of the META Tokens

- (a) There is a risk that upon launching of the Metadium platform, there is a lack of interest from consumers, merchants, advertisers, and other key participants for the Metadium platform and the Services, and that there may be limited interest and therefore use of the Metadium platform and the META Tokens. Such a lack of interest could impact the operation of the Metadium platform and the uses or potential value of the META Tokens.
- (b) There is a risk of competition from alternative platforms that may have been established, or even from existing businesses which would target any segment of the potential users of the Metadium platform fulfilling similar demands, e.g. Facebook or other corporations targeting advertisers seeking purchase consumer data and market analysis. Therefore, in the event that the competition results in a lack of interest and demand for the Metadium platform, the Services and the Tokens, the operation of the Metadium platform and the value of the Tokens may be negatively impacted.

1.5.7 Metadium and its Affiliates may experience system failures, unplanned interruptions in its network or services, hardware or software defects, security breaches or other causes that could adversely affect Metadium or its Affiliates' infrastructure network, or the Metadium platform

- (a) Metadium and its Affiliates are unable to anticipate or detect when there would be occurrences of hacks, cyber-attacks, mining attacks (including but not limited to doublespend attacks, majority mining power attacks and “selfish-mining” attacks), distributed denials of service or errors, vulnerabilities or defects in the Metadium platform, the Tokens, the Purchaser Wallet or any technology (including but not limited to smart contract technology) on which Metadium, its Affiliates, the Metadium platform, the META Tokens, the Purchaser Wallet rely or on the Ethereum Blockchain or any other blockchain. Such events may include, for example, flaws in programming or source code leading to exploitation or abuse thereof. Metadium and its Affiliates may not be able to detect such issues in a timely manner, and may not have sufficient resources to efficiently cope with multiple service incidents happening simultaneously

or in rapid succession.

- (b) Although Metadium and its Affiliates will be taking steps against malicious attacks on its appliances or its infrastructure, which are critical for the maintenance of the Metadium platform and its other services, there can be no assurance that cyber-attacks, such as distributed denials of service, will not be attempted in the future, and that any of such security measures will be effective. Any significant breach of security measures or other disruptions resulting in a compromise of the usability, stability and security of Metadium and its Affiliates' network or services, including the Metadium platform.

Risks Relating to the Participation in the Sale of META Tokens

1.5.8 You may not be able to recover 1.5.8 the Payment Amount

Except as provided under these Terms or prescribed by applicable laws and regulations, Metadium is not obliged to provide you with a refund of the Payment Amount. No promises of future performance or price are or will be made in respect to the META Tokens, including promises of inherent value or continuing payments, and there is no guarantee that the META Tokens will hold any particular value. Therefore, the recovery of the Payment Amount may be impossible or may be subject to applicable laws and regulations.

1.5.9 You may be subject to adverse legal and/or tax implications as a result of the purchase, distribution and use of the META Tokens

- (a) The legal character of cryptocurrency and cryptographic assets remain uncertain. There is a risk that the META Tokens may be considered securities in certain jurisdictions, or may be considered to be securities in certain jurisdictions in the future. Metadium and its Affiliate does not provide any warranty or guarantee as to how the META Tokens will be classified, and each purchaser will bear all consequences of the META Tokens being considered securities in their respective jurisdictions, and bear the responsibility of the legality, use and transfer of the Tokens in the relevant jurisdictions.
- (b) Further, the tax treatment of the acquisition or disposal of such cryptocurrency or

cryptographic assets might depend on whether they are classified as securities, assets, currency or otherwise. As the tax characterisation of the META Tokens remains indeterminate, you must seek your own tax advice in connection with the purchase of the META Tokens, which may result in adverse tax consequences or tax reporting requirements for you.

1.5.10 The loss or compromise of information relating to the Purchaser Wallet and your Metadium platform ID may affect your access to and possession of the META Tokens

There is a risk that you may lose access to and possession of the META Tokens permanently due to loss of unique personal ID created in the Metadium platform, the Metadium platform ID, and other identification information, loss of requisite private key(s) associated with the Purchaser Wallet or vault storing the META Tokens or any other kind of custodial or purchaser errors.

1.5.11 Blockchains may face congestion and transactions may be delayed or lost

Most blockchains used for cryptocurrency transactions (e.g. Ethereum) are prone to periodic congestion during which transactions can be delayed or lost. Individuals may also intentionally spam the network in an attempt to gain an advantage in purchasing cryptographic tokens. This may result in a situation where block producers may not include your purchase of the META Tokens when you intends to transact, or your transaction may not be included at all.

Privacy and data retention issues

1.5.12 As part of the Restricted Public Sale, the verification processes and the subsequent operation of the Metadium platform, Metadium may collect personal information from you. The collection of such information is subject to applicable laws and regulations. All information collected will be used for purposes of the Restricted Public Sale and operations of the Metadium platform, thus it may be transferred to contractors, service providers and consultants worldwide as appointed by Metadium. Apart from ©2018 Metadium, Next Generation Identity Standard for the New Era external compromises, Metadium and its appointed entities may also suffer from

internal security breaches whereby their employees may misappropriate, misplace or lose personal information of purchasers. Metadium may be required to expend significant financial resources to alleviate problems caused by any breaches or losses, settle fines and resolve inquiries from regulatory or government authorities. Any information breaches or losses will also damage Metadium's reputations, thereby harming its long-term prospects.

Macro Risks

1.5.13 General global market and economic conditions may have an adverse impact on Metadium and its Affiliates' operations and the use of the Metadium Platform

- (a) Metadium and its Affiliates could be affected by general global economic and market conditions. Challenging economic conditions worldwide have from time to time, contributed, and may continue to contribute, to slowdowns in the information technology industry at large. Weakness in the economy may have a negative effect on Metadium and its Affiliates' business strategies, results of operations and prospects.
- (b) Suppliers on which Metadium platform relies for servers, bandwidth, location and other services could also be negatively impacted by economic conditions that, in turn, could have a negative impact on Metadium and its Affiliates' operations or expenses. Additionally, in a down-cycle economic environment, Metadium and its Affiliates may experience the negative effects of a slowdown in commerce and usage of the Metadium platform, whereby there is less activity or usage by merchants and consumers purchasing or selling goods and services, and advertisers in terms of processing data and targeting consumers.
- (c) There can be no assurance, therefore, that current economic conditions or worsening economic conditions or a prolonged or recurring recession will not have a significant adverse impact on Metadium and its Affiliates' business strategies, results of operations and prospects and hence the Metadium platform, which may in turn impact the value of the META Tokens.

1.5.14 The regulatory regime governing blockchain technologies, cryptocurrencies, Meta Tokens, offering of META Tokens, and the Metadium Platform remain uncertain, and any changes, regulations or policies may materially adversely affect the development of the Metadium Platform and the utility of the META Tokens

- (a) Regulation of the META Tokens, the offer and sale of META Tokens, cryptocurrencies, blockchain technologies, and cryptocurrency exchanges is currently undeveloped or underdeveloped and likely to rapidly evolve. Such regulation also varies significantly among different jurisdictions, and is hence subject to significant uncertainty. The various legislative and executive bodies in different jurisdictions may in the future adopt laws, regulations, guidance, or other actions, which may severely impact the development and growth of the Metadium Platform, the adoption and utility of the META Tokens or the issue, offer, and sale of the META Tokens by Metadium. Failure by Metadium and its Affiliates or users of the Metadium Platform and the Services to comply with any laws, rules and regulations, some of which may not exist yet or are subject to interpretation and may be subject to change, could result in a variety of adverse consequences against Metadium and its Affiliates, including civil penalties and fines.
- (b) Blockchain networks also face an uncertain regulatory landscape in many foreign jurisdictions. Various jurisdictions may, in the near future, adopt laws, regulations or directives that affect the Metadium platform, and therefore, the value of the META Tokens. Such laws, regulations or directives may directly and negatively impact the operations of Metadium and its Affiliates. The effect of any future regulatory change is impossible to predict, but such change could be substantial and could materially adverse to the development and growth of the Metadium Platform and the adoption and utility of the META Tokens.
- (c) To the extent that Metadium and its Affiliates may be required to obtain licences, permits and/or approvals (collectively, the “Regulatory Approvals”) to carry out its business, including that of the creation of the META Tokens and the development and operation of the Metadium platform, but are unable to obtain such Regulatory Approvals or if such Regulatory Approvals are not renewed or revoked for whatever

reason by the relevant authorities, the business of Metadium and its Affiliates may be adversely affected.

- (d) There is no assurance that more stringent requirements will not be imposed upon Metadium and its Affiliates by the relevant authorities in the future, or that Metadium and its Affiliates will be able to adapt in a timely manner to changing regulatory requirements. These additional or more stringent regulations may restrict Metadium and its Affiliates' ability to operate its business and Metadium and its Affiliates may face actions for noncompliance if it fails to comply with any of such requirements.
- (e) Further, should the costs (financial or otherwise) of complying with such newly implemented regulations exceed a certain threshold, maintaining the Metadium platform ©2018 Metadium, Next Generation Identity Standard for the New Era may no longer be commercially viable and Metadium and its Affiliates may opt to discontinue the Metadium platform and/or the META Tokens. Further, it is difficult to predict how or whether governments or regulatory authorities may implement any changes to laws and regulations affecting distributed ledger technology and its applications, including the Metadium platform and the META Tokens. Metadium and its Affiliates may also have to cease operations in a jurisdiction that makes it illegal to operate in such jurisdiction, or make it commercially unviable or undesirable to obtain the necessary regulatory approval(s) to operate in such jurisdiction. In scenarios such as the foregoing, the distributed META Tokens may hold little or no worth or value.

1.5.15 There may be risks relating to acts of God, natural disasters, wars, terrorist attacks, riots, civil commotions widespread communicable diseases and other events beyond the control of Metadium and its Affiliates

The sale of the META Tokens and the performance of Metadium, its Affiliates and/or the Metadium platform's activities may be interrupted, suspended or delayed due to acts of God, natural disasters, wars, terrorist attacks, riots, civil commotions, widespread communicable diseases and other events beyond the control of Metadium and its Affiliates. Such events could also lead to uncertainty in the economic outlook of global markets and there is no assurance that such markets will not be affected, or that recovery from the global financial crisis would continue. In such events, Metadium and its Affiliates' business strategies, results of operations and outlook may be materially and adversely

affected, and the demand for and use of the META Tokens, the Metadium platform and the Services may be materially affected. Further, if an outbreak of such infectious or communicable diseases occurs in any of the countries in which Metadium, its Affiliates, and the participants of the Metadium platform have operations in the future, market sentiment could be adversely affected and this may have a negative impact on the Metadium platform and its community.

1.5.16 Blockchain and cryptocurrencies, including the META Tokens are a relatively new and dynamic technology. In addition to the risks highlighted herein, there are other risks associated with your purchase of, holding and use of the META Tokens, including those that we cannot anticipate. Such risks may further materialise as unanticipated variations or combinations of the risks discussed herein.

1.6 No Further Information or Update

No person has been or is authorised to give any information or representation not contained in this Whitepaper in connection with the META Token, Metadium or its Affiliates and their respective businesses and operations, and, if given, such information ©2018 Metadium, Next Generation Identity Standard for the New Era or representation must not be relied upon as having been authorised by or on behalf of Metadium or its Affiliates.

1.7 No Advice

No information in this Whitepaper should be considered to be business, legal, financial or tax advice regarding the META Token, Metadium or its Affiliates. You should consult your own legal, financial, tax or other professional advisor(s) regarding the META Token, Metadium or its Affiliates and their respective businesses and operations. You should be aware that you may be required to bear the financial risk of any purchase of META Tokens for an indefinite period of time.

1. Introduction

Who are you? What is your personal or social identity? And how do you manage, protect, and use your identity in the 21st century? The Oxford dictionary defines identity as “The characteristics are determining who or what a person is.” So how do you describe all your different characteristics scattered around the web? Unfortunately, there is no single definitive answer to this rather simple question; as individuals, we do not have the opportunity to manage, protect, and use our own identities.

At Metadium, we are tackling the status quo. Currently, our identities are pieces of a puzzle scattered around the offline and online world. To consolidate a complete identity from such informational disarray, at Metadium, we believe in linking one’s traditional “mundane identity”¹ with the “virtual identity”². This principle acts as the core of our platform, which aims to give individuals the ability to manage, protect, and use their identity whenever, and wherever they wish.

Although a rigidly-controlled identity has been the norm for globalization, economic prosperity, and technological developments in the digital world, we are entering a new era. We have already been able to create previously unimaginable technologies such as artificial intelligence, self-driving vehicles, and virtual reality. The time has come to innovate the concept of identity, allowing it to be managed, protected, and used by their respective individuals.

Infrastructure to solve identity problems

We believe Metadium is the key to fixing the current flawed identification system. Metadium protocol aims to create a revolutionary next-generation digital identity³ that unquestionably proves your existence and features functionality over a broad spectrum of use cases in self-sovereign identity⁴.

¹ Mundane identity : The real world physical entity that is certified by central authorities.

² Virtual identity : The manifestation of one’s self in the digital world of ecommerce, email, social networking, and virtual worlds.

³ Digital identity : Representation of identity required in the digital generation and connection of mundane identity and virtual identity

⁴ Self-sovereign identity : Notion that individuals are the creators and have the ability to control their own identity. A decentralized identity connecting individuals offline and online with no geographical limitations

Metadium guarantees minimal disclosure of personal information and only provides such data with the user's consent, supporting a secure decentralized digital identity.

Our infrastructure is based on blockchain technology that supports the creation of an identity with optional verification. Furthermore, individuals can use Metadium and their Meta ID on other platforms and services, making it a gateway to support various other platforms. Metadium is designed to support off-chain and inter-blockchain identity with oracles. We believe our protocol will improve and raise awareness around the current digital identity while maintaining the integrity of personal data and achieving a comprehensive and interoperable identity.

2. Background

With the ever-increasing prevalence of technology in our society, the scope of our digital lives has grown exponentially in recent years. Significant aspects of our lifestyles and the proportion of social activities have shifted from offline to online. Despite this shift, most of the current identity infrastructures remain in the physical realm.

Origins of identity

Primitively, identity itself depends on self-consciousness, not on substance. Likewise, René Descartes said, "*Cogito ergo sum*" — "*I think, therefore I am*". A hierarchical society made identity an important tool when determining social class. Identity was a means to distinguish the privileged from the plebeians. After the institutionalization of social structures — starting with the emergence of feudalism — the control over an individual's identity was in the hands of the authorities. Widespread adoption of taxation and participation in trade necessitated identity management.

Traditional infrastructure with mundane identity

The importance of identity was acknowledged with the need to prove whether the subject had the right to be in a specific position or perform a certain action. Traditional identity infrastructures were developed to focus on these necessities. From the sanitary

certification during the Great Plague to more modern examples such as online certificates and financial services, mundane identity has been key to the infrastructure - until now.

2.1 Moving from an offline to an online world

The exponential growth of the internet has connected billions globally, allowing us to efficiently communicate and interact regardless of location or distance. Although technological developments have advanced, restrictions still exist with regard to how we interact online.

As online applications grow in number and complexity, one constraint remains – “identity”. As offline services have become online services, identity must also follow. But online is not a face-to-face environment, so it does not allow us to access services by simply providing our mundane physical identity. This highlights the problem of online identity.

To provide and use online services in a non-face-to-face environment, we’ve typically used a centralized Personally Identifiable Information (“PII”) system to create IDs and manage user data. In this situation, online users can face the following conditions :

- Experiencing inconvenience, ID theft, or the unintentional distribution of their personal information.
- Being forced to create a new user ID and or password every time they sign up for a new service.
- Having to remember different combinations of characters for passwords and IDs to enhance security, which in the process adds further complexity, frustration, and confusion.

Recently, Social network services, including Facebook and Twitter, have rolled out “Log in with SNS” feature to remedy the headache of creating a new ID for every platform. The feature allows users to log on to other websites or applications using their SNS account details.

However, because the system was based on an ID/password system, which was easy to steal, it suffered from ID theft. Additionally, as a centralized system, Facebook experienced data

leakage of user information. In this regard, businesses offering online services suffer from constructing and maintaining secure ID systems.

Systems are usually designed and implemented in a silo structure, making them a very attractive target for hackers. If someone opens the door of the silo, they can access millions of users' valuable and sensitive data. For the sake of their users and integrity, businesses have a vested interest in preventing this — and it is a costly endeavor. But due to the fundamental structural basis of this issue, it is a challenging problem to solve, regardless of how much money businesses pour into it.

In recent years, there have been numerous cases where companies — ranging from startups to Fortune 500 players — have suffered a breach, resulting in the loss of customer PII. The Office of Personnel Management (OPM) data breach of June 2015 is a clear example of how mismanagement of PII can have a significant tangible impact on society. The OPM breach resulted in the theft of approximately 21.5 million personal information records.

2.2 Demands of identity integration

Online services are no longer limited to emails or information sharing. Services that once only existed in our imagination have emerged, such as online shopping, banking, and insurance. These services request for our mundane identity. In order to resolve the gap between the mundane and digital identity, it is becoming more common to check a consumer's identity data through a third-party attestation agency.

As online service users, we constantly undergo numerous attestation procedures to prove our identity, such as the long and complex KYC and AML procedures for using mobile banking services. This process repeats each time we sign up for similar services.

Businesses face similar requirements at a much greater level of complexity. To overcome this, they must complete multiple identity attestation procedures for each user while simultaneously simplifying the system to avoid frustrating customers with lengthy attestation procedures.

There is no single international attestation agency or organization that sets universal guidelines. Therefore, to expand services globally, businesses are forced to establish relationships with attestation agencies worldwide. This results in an extra layer of prohibitive complexity for companies that may be interested in expanding internationally. Especially true in the case of startups, whose services may have the potential to provide essential global services.

Based on data ownership, we have already seen the phenomenon caused by the centralized PII systems of businesses. Today, we are at a critical junction and must act. If individuals can manage their own identity data with their authority for the required time, we must welcome this new online service paradigm based on a safe, trustworthy, and user-friendly identity system.

3. Metadium overview

3.1 Metadium, the next-generation identity

Metadium is the next-generation identity protocol layer of the internet, powered by blockchain with “trustless trust”.

It supports a decentralized digital identity and acts as the robust heart of the Metadium ecosystem to provide a secure, next-generation identity. This Meta ID has the ability to provide identity ownership to its users, allowing for a self-sovereign identity.

Self-sovereign identity

Metadium is based on the idea of self-sovereign identity — a concept which was explained by Christopher Allen in his essay “The path to self-sovereign identity”. In the essay, self-sovereign identity is defined as a decentralized identity where the data subject is not only the sole manager of their own identity but also where identity functions across multiple locations. Therefore, the subject has borderless autonomy over their own identity. Furthermore, self-sovereign identity contains borderless personal information that can include elements such as music preferences and favorite

colors. It also allows individuals to be verified effortlessly, without the need for intermediation or central authority.

Decentralized digital identity

Metadium supports the decentralization of a digital identity by eliminating the need for individuals to trust a centralized authority to manage their own identity. In other words, through Metadium, individuals or data subjects need not rely on a central authority or any other actor in the ecosystem to verify their existence. This way, users can assert who they are in the digital world and manage, secure, and use their data in a decentralized method, wherever and whenever they choose.

3.2 Identity in Metadium

We categorize identity into two categories to provide an ecosystem. This includes the general definition of identity from a Metadium angle under the current system: a mundane identity and a virtual identity. The mundane identity reflects how external entities define a subject with objective, definite, and material-based data in the physical world. The virtual identity encompasses an individual's online presence and activities. For instance, sharing a photo of one having dinner with their family at a fancy weekend restaurant forms one portion of their virtual identity. The virtual identity is, therefore, a notion where individuals can build their characteristics, preferences, and habits in the virtual world.

Mundane identity and virtual identity are not mutually exclusive. For instance, your bank account, a component of one's mundane identity, can be managed using applications accessed via your virtual identity.

We developed Meta ID to connect individual's mundane identity and virtual identity as a next-generation identity solution. It contains the internal features of a subject in addition to KYC-compliant identities based on attestation and a reputation system. That differentiates it from other decentralized digital identity projects using blockchain technology. Our technological, socio-economical ecosystem allows you to use your Meta ID as a self-sovereign identity, which in our opinion, is the pinnacle of the evolution of identity.

3.3 Metadium blockchain features

Metadium is the blockchain protocol for acquiring trustworthy records of identity data transactions. At its core, the Metadium protocol facilitates a next-generation identity platform that features scalability, performance, and extensibility.

Scalability

Scalability is a commonly cited concern of blockchain technology. To tackle this challenging problem, Metadium is designed to improve scalability compared to other blockchains. Metadium blockchain will handle block generation and transaction separately on top of Proof of Authority consensus. This will be explicitly stated in the technical paper.

As an identity blockchain specialist, Metadium recognizes enhanced scalability as a key factor in gaining future business opportunities, and we provide vital power to service providers who need to quickly and securely identify users.

Performance

Blockchain technology needs to perform exceptionally to be seamlessly integrated into real life. In this regard, Metadium allows for instant block creation, bigger block sizes, and larger transaction sizes to increase the efficiency and ease of transactions.

Expandability

Expandability is another game-changing feature of Metadium blockchain. Both DApps on the Metadium blockchain and other blockchains can be used in the Metadium ecosystem. This also includes ongoing services outside the blockchain. Furthermore, the Metadium blockchain can customize to create individual smart contracts.

Importantly, users are closely connected via our strong, sustainable Metadium architecture.

4. Metadium Features

4.1 Protocol baseline—trustless trust

Metadium is powered by blockchain using “trustless trust”. As a decentralized ledger, blockchain is regarded as “trustless”, meaning no central authority controls the process. Although the internet and online community have rapidly evolved, identity on the internet has been relatively overlooked. Our PKI-driven identity ecosystem challenges the status quo of identity centralization. Metadium fosters a virtuous identity ecosystem using protocol-baseline ideology to offer an unquestionable, distributed, and trustworthy identity online without the need for a central authority.

4.2 Decentralized PKI

Although the Public Key Infrastructure (PKI) remains working as an advanced system for identity, identity maintenance managed solely by a centralized authority (CA) often causes data ownership problems and can suffer from credibility issues. The CA is tasked with preventing data loss and leaks; and up until recently, users had no choice but to trust CAs.

Unfortunately, entrusted data can be compromised, leaving corporations and individuals alike exposed or threatened. These pain points also cost CAs great financial and social losses, forcing them to spend astronomical amounts of time, effort, and money to prevent failures and associated scandals.

“Trustless trust” means managing identities without wasting effort or money. Metadium’s decentralized PKI (dPKI) enables individuals to securely trust the integrity of their virtual identities, and through Metadium, corporations and individuals have ownership over their personal data and control how, when, and whom they share data with.

4.3 Data ownership and self-sovereign identity

Taking back the sovereignty of identity from centralized authorities enable the transparent and secure distribution of private data, allowing for absolute control over the use and distribution of personal digital assets. This means individuals can claim their right to own and use their private data when and how they choose to use it. Equally, service providers or third

parties cannot exploit data without permission.

Metadium's self-sovereign identity ecosystem enables users to retain their pseudonymity while verifying ownerships and rights. The users' mundane identities and private data are not revealed without permission.

Each individual or user can convey preferences or correlations between several digital identities by implementing a self-sovereign identity.

4.4 Regulations

As blockchain supports pseudonymity and "trustlessness", regulatory authorities have raised concerns regarding adopting such technology. In response, Metadium enables blockchains to be regulated without compromising the spirit of pseudonymity and trustlessness.

In the business, unregulated systems or infrastructure have not been easily accepted by major role players. Despite the blockchain's trustlessness and transparency, it can be difficult to track malicious actions. Of course, some of the resistance stems from a lack of knowledge about blockchain technology. In this sense, some of these issues can be partially resolved through a deeper understanding of blockchain technology.

In addition to greater knowledge, the development of the Meta ID is also about creating a more inclusive and efficient system. Incorporating "Trustless" blockchain technology into regulatory processes reassures individuals and organizations and encourages mass adoption. Metadium allows blockchain to be used practically, not just for trading value. This means users in the Metadium ecosystem can decide to use either a regulation-compliant identity with attestation or a self-sovereign identity for value-adding.

4.5 Identity of Things

Until recently, identity infrastructures have been more focused on eligibility and purpose rather than the intrinsic value of identity information or self-awareness. Of course, there are identity infrastructures dedicated to value-adding and preserving; Intellectual Property (IP) rights typically include elements of the Identity of Things (IDoT). However, IPs are more likely to focus on preserving financial or possessive value. With technological developments, implementing identity into IDoT devices, logistics, robotics, AI, and smart cities will increase

the demand to share and access information. Granting identities to devices and objects will be spontaneously generated. For example, the mass distribution of passports to meet increasing transportation requirements.

4.6 Attestation and verification

Although commonly assumed to have the same meanings, verification and attestation are different elements. While verification can be conducted more cognitively, attestation requires third-party notaries or other publicly-accredited intermediaries. For example, the verification process adds value to a pseudonymous identity, a relationship identity, or an Identity of Things. However, attestation is needed for more crucial information requirements or when it is necessary to prove the rights or genuineness of an identity.

Various certifications, such as the right to perform or possess, also require attestation. Metadium supports both attestation and verification processes to create a holistic identity via Meta ID.

5. Metadium Architecture

5.1 Meta Governance

Meta Consensus Algorithms utilize modified RAFT Consensus Algorithms with Proof of Authority. Above the ground level, the two pillars of the Metadium blockchain sustaining Meta IDs and dApps are:

- The **Community Pillar**, governed by **delegators** voted in by the community.
- The **Block Producer Pillar**, governed by the **authorities** proven to act reasonably and designated to secure the network.

These Pillars, along with identity and dApps, sustain the upper part of the architecture in two ways:

- **META Token** is a cryptocurrency that catalyzes the network, and it can be described as the fuel of the protocol to power the identity infrastructure. Users of the ecosystem access the network using META Token and can use identity-related features and services utilizing Meta ID.

Participants in Metadium block producer pillar

Block Producers (Nodes) are limited to publicly accredited or designated authorities by Metadium. Block producers are incentivized and rewarded for producing blocks and securing the network. They secure the network via high-performing Proof of Authority Meta Consensus Algorithms - an alteration of RAFT algorithms.

Participants in Metadium community pillar

The User is the subject of identity. Any subject possessing any form of identity can be a user of Meta ID. The Meta ID serves not only as a personal ID but also as an ID for devices, IDoT, content, and any subject requiring digital identity management for the basic infrastructure of identity.

Attestation agencies are providers of legitimacy in a trustless blockchain environment. Users may have their identities certified through attestation agencies, including public notary offices, financial institutions, and other qualified parties. Only eligible parties are allowed to act as attestation agencies on the Metadium blockchain.

Service providers are the parties to whom the user identities are in demand. Service providers can provide services through dApps via Meta ID smart contracts, which can be used to identify the Meta ID of the user.

5.2 META economics

With decentralized identity infrastructure at its core, Metadium enables various parties to seamlessly join the Metadium ecosystem. Using Meta ID infrastructure, a wide-range

of dApps and services will be built on top of the Metadium blockchain protocol. Then, communities will be formed around each of those services.

For decentralized identity infrastructure, META acts as a medium of exchange for identity attestation and sharing. Attestation agencies will be rewarded for providing attestation services once the validated data has been used. Service providers will reward attestation agencies and users with META in return for obtaining and using identity data. Users will be rewarded for providing their own identity data and can use META to purchase identity related services provided by Metadium and other service providers.

Once identity infrastructure has been constructed, Metadium will focus efforts on actively expanding the ecosystem to onboard various services. As more service providers, services, attestation agents, and users populate the network, the META token will play an increasingly important role in terms of facilitating transactions, rewarding participation, and rewarding contribution. We anticipate a diverse set of communities and digital economies being built on top of the Meta ID infrastructure.

The META token will also play an important role at the network protocol layer, where it will be utilized in the following capacities:

- Transaction Fees: every on-chain activity will require a transaction fee. These fees are designed to prevent DDoS attacks, where large amounts of transactions are intentionally submitted to overwhelm the network. Fees will be collected when META is transferred, upon dApp and smart contract deployment on the Metadium blockchain, and dApp and smart contract execution.
- Reward for block producers: META will be rewarded to the block producing nodes in return for their contribution to securing the network.

As the Metadium ecosystem expands, new business and economic models for using META will emerge. In the long run, Metadium aims to support META-based token generation. META economics is set to evolve along with the overall ecosystem to

offer optimized functionality for all Metadium participants. Details of META economics will be released separately in a token economics paper.

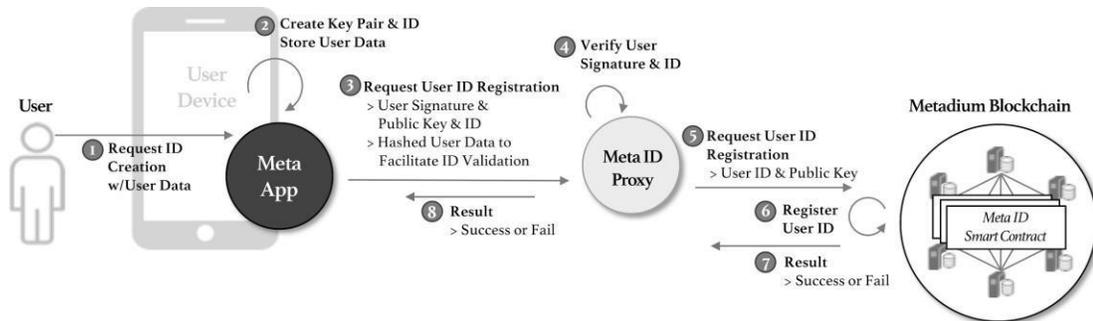
5.3 Implementation

CRUD & revocation and recovery

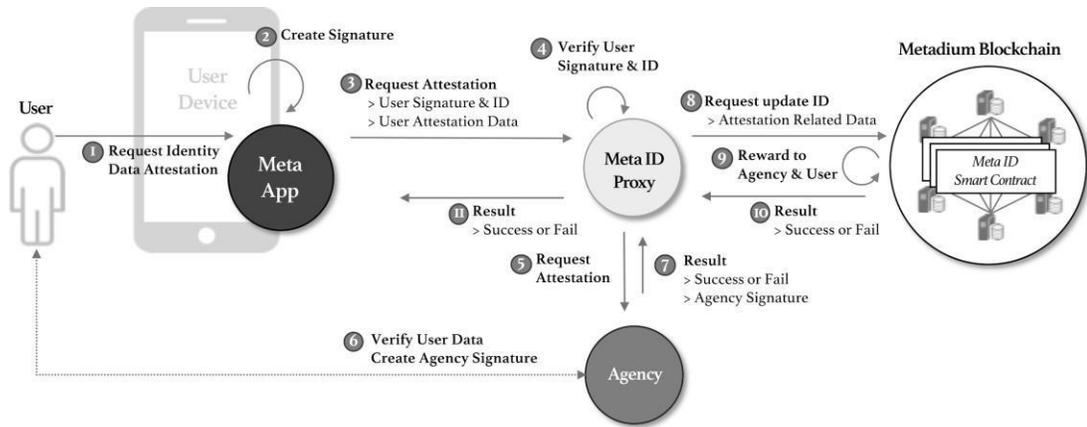
Users will be able to create Meta ID anytime, anywhere, and without boundaries. The requester of a user's Meta ID will only be able to read private data only when they have the user's consent to view the information.

The requester will only be granted to view selected private data permission by the user, ensuring data privacy. Owners of the Meta ID can update the status of their identities, but new private data that require attestation must be reapplied to the Meta ID.

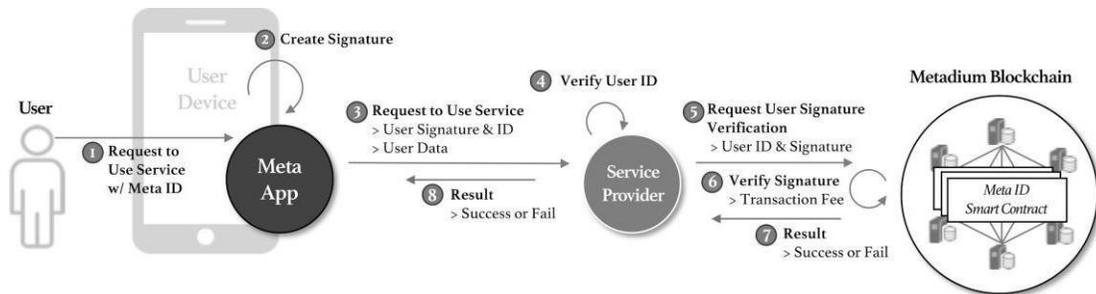
The Metadium protocol supports the revocation and recovery of Meta ID to prevent leaks and unwanted usage of one's identity. Users can also backup and recover Meta ID to prevent a potential loss of control over their identities.



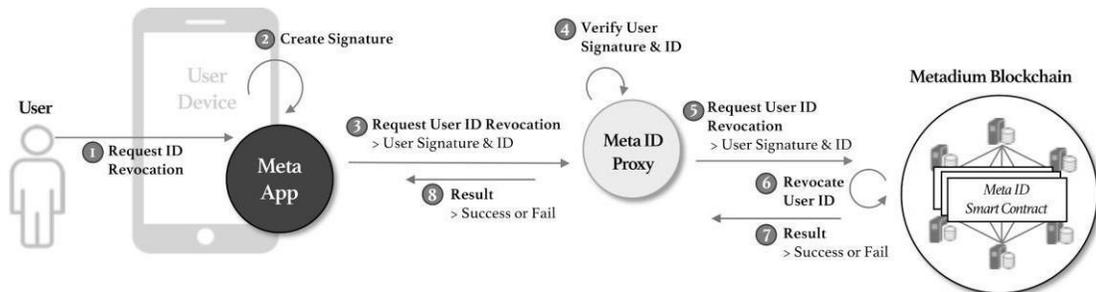
[Self-sovereign ID creation service flow]



[ID data update with attestation]



[Read & use Meta ID]



[Meta ID revocation]

A user-friendly human approach identity solution

Although great effort has been made to protect users from fraud and malicious hacking attempts on websites, browsers and online certificates cannot censor every web page — and blind spots do exist. Ultimately, this results in certificates losing their credibility.

Meta ID is verified by a user-friendly interface consisting of a mobile application and reputation system. This reduces human-driven mistakes and phishing attempts. The reputation system also works to fight against malicious attacks on virtuous websites. Metadium's decentralized PKI can be linked to a smart device, QR codes, and even FIDO data.

In early 2018, a phishing website pretended to be one of the most eminent cryptocurrency exchanges — Binance. This bogus website used URL visual spoofing to deceive victims. If users had scrutinized the details, they might not have been fooled. However, this simple unicode encoding trick fooled many. Metadium's reputation system and cognitive-friendly approach can prevent such social and economical losses.

Identity for regulated decentralization movements

As a regulation-compliant blockchain protocol, Metadium enables security tokens and decentralized exchanges to be regulation-compliant by extension. Project teams offering security tokens can acquire users who have been identified with Meta ID, allowing them to securely provide the qualification and private data required to satisfy the regulatory requirements. Decentralized exchanges can also request minimal information from the user to ensure a robust fiat gateway crypto exchange.

Oracles

Metadium's protocol is a highly expandable and sustainable blockchain. With meta oracles, communication between outer-blockchains and cross-chains is enabled. With oracles, Metadium bridges the gap from blockchain-to-blockchain in addition to the real-world data.

Tokenization of the identity

Meta ID can be tokenized to prove possession or the right to perform or make a decision. For instance, if Bitcoin creator Satoshi Nakamoto were actually a group of people, each participant in the group would possess a proportion of the **tokenized Meta ID** of Satoshi. To show the relationship between beloved ones or fandoms, certain individuals can share a Meta ID.

ID specialized blockchain

Metadium is an ID-specialized blockchain. Users can use our application on their smart devices and input FIDO data for authentication, verification, and attestation. Meta ID prevents fingerprinting without the owner's permission, thereby preventing malicious attempts on their identity. The security and value-added identity system of Metadium make it the most advanced identity protocol on the blockchain.

Technical execution and intellectual property

Metadium works in a technical partnership with Coinplug Inc., a top-tier player for global blockchain related patents.

Through this inspiring partnership, Metadium is recognized as one of Coinplug's significant patents in the realm of verification and identity. The following table lists a few of Coinplug's key patents:

Title	Application No.
CERTIFICATE ISSUING SYSTEM BASED ON BLOCKCHAIN	PCT/KR2016/002226
FINANCIAL INSTITUTION DOCUMENT VERIFICATION SYSTEM THAT IS BASED ON THE BLOCKCHAIN	PCT/KR2016/006483
METHOD AND SERVER FOR PROVIDING NOTARY SERVICE WITH RESPECT TO FILE AND VERIFYING THE RECORDED FILE BY USING THE NOTARY SERVICE	PCT/KR2017/001072
METHOD FOR PROVIDING CERTIFICATE SERVICE BASED ON SMART CONTRACT AND SERVER USING THE SAME	PCT/KR2017/011354
METHOD FOR AUTHENTICATING A USER WITHOUT A FACE-TO-FACE CONTACT BY USING MOBILE ID BASED ON BLOCKCHAIN, AND TERMINAL AND SERVER USING THE SAME	PCT/KR2018/000065
METHOD FOR PROVIDING PAYMENT GATEWAY SERVICE IN USE OF UNSPENT TRANSACTION OUTPUT BASED PROTOCOL AND SERVERS THAT USE THE SAME	PCT/KR2018/000475
METHOD FOR PROVIDING LOGIN FLOW VIA AUTHENTICATION	PCT/KR2018/000914

BASED ON PUBLIC KEY INFRASTRUCTURE IN RESPONSE TO USER'S LOGIN REQUEST FOR USING SERVICE, PROVIDED BY SERVICE PROVIDER SERVER IN USE OF SMART CONTRACT WITH BLOCKCHAIN DATABASE AND SERVER	
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6. Conclusion

A revolution can begin with the flip of a coin. The choice to develop an alternative path to existing norms means that, together, we can bring innovation to multiple areas of our everyday lives.

Metadium allows people to move from a restricted centralized method to a secure and transparent protocol that embraces limitless possibilities. Through Metadium, individuals will have full ownership of their mundane and virtual identities for the first time. Transferring ownership from central authorities to individuals not only protects their precious information from hackers and data leaks but also allows people to select which information they wish to provide to service providers or other organizations. With the blockchain powering Metadium's system, individuals finally have the power to manage, protect, and use their personal data when and how they want domestically and globally.

Cost reduction is one of the greatest benefits that we provide to our business partners. Our identity infrastructure helps domestic startups and organizations conduct business more efficiently and connect with potential customers securely and seamlessly on a global level. Using Metadium allows our business partners to streamline their registration funnel via a reusable KYC method, resulting in a more user-friendly process. Metadium also provides secure identity verification and authentication system.

The universal norm was to overload people with information in an attempt to gain as much data as possible. This encouraged malicious hacking attempts, contributing to data leaks and their subsequent financial and social costs for both businesses and individuals. If we are not prepared to flip the coin and harness the power of this innovative decentralized identity verification method, our personal information and data security infrastructure will suffer.

Metadium cannot be the only player in the evolution of identity. We believe that individuals and our future partners also have an important part to play in pioneering the Metadium protocol and realizing this vision.

No matter where you go or which service you wish to use, you can be reassured with the knowledge that your identity and proof of your existence will be secure through Metadium.