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| 4 January 2022 |

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| Reply form for the Call for Evidence (CfE) on the DLT Pilot Regime |
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| Date: 4 January 2022 |

Responding to this paper

The European Securities and Markets Authority (ESMA) invites responses to the specific questions listed in the Call for Evidence (CfE) on the DLT Pilot Regime for published on the ESMA website.

*Instructions*

Please note that, in order to facilitate the analysis of the large number of responses expected, you are requested to use this file to send your response to ESMA so as to allow us to process it properly. Therefore, ESMA will only be able to consider responses which follow the instructions described below:

* use this form and send your responses in Word format (pdf documents will not be considered except for annexes);
* do not remove the tags of type <ESMA\_QUESTION\_DLTP\_1> - i.e. the response to one question has to be framed by the 2 tags corresponding to the question; and
* if you do not have a response to a question, do not delete it and leave the text “TYPE YOUR TEXT HERE” between the tags.

Responses are most helpful:

* if they respond to the question stated;
* indicate the specific question to which the comment relates;
* contain a clear rationale; and
* describe any alternatives ESMA should consider.

**Naming protocol**

In order to facilitate the handling of stakeholders’ responses please save your document using the following format:

ESMA\_DLTP\_NAMEOFCOMPANY\_NAMEOFDOCUMENT.

e.g. if the respondent were ESMA, the name of the reply form would be:

ESMA\_DLTP\_ESMA\_REPLYFORM or

ESMA\_DLTP\_ANNEX1

***Deadline***

Responses must reach us by **4 March 2022.**

All contributions should be submitted online at [www.esma.europa.eu](http://www.esma.europa.eu) under the heading ‘Your input - Consultations’.

***Publication of responses***

All contributions received will be published following the end of the consultation period, unless otherwise requested. **Please clearly indicate by ticking the appropriate checkbox in the website submission form if you do not wish your contribution to be publicly disclosed. A standard confidentiality statement in an email message will not be treated as a request for non-disclosure.** Note also that a confidential response may be requested from us in accordance with ESMA’s rules on access to documents. We may consult you if we receive such a request. Any decision we make is reviewable by ESMA’s Board of Appeal and the European Ombudsman.

***Data protection***

Information on data protection can be found at [www.esma.europa.eu](http://www.esma.europa.eu) under the headings ‘Legal notice’ and ‘Data protection’.

# General information about respondent

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| --- | --- |
| Name of the company / organisation | Kaiko |
| Activity | Other Financial service providers |
| Are you representing an association? |  |
| Country/Region | France |

1. Please provide any general observations or comments that you would like to make on this call for evidence, including any relevant information on you/your organisation and why the topics covered by this call for evidence are relevant for you/your organisation.

<ESMA\_QUESTION\_DLTP\_1>

Kaiko appreciates the opportunity to comment on this important call for evidence on the DLT Pilot Regime. Kaiko is a market data infrastructure provider in the digital assets industry and has acted as an early architect of industry standards. Today, we operate robust data pipelines connecting more than 100 digital asset exchanges and we work with hundreds of enterprises in the digital and traditional finance industry who leverage our data services for financial activities. We also read and write market data to blockchain networks, thus have extensive experience interacting with DLT infrastructure. Since 2014, we have developed taxonomies mapping hundreds of thousands of traded instruments, and in 2021 we led the development of FIGI (Financial Instrument Global Identifiers) for crypto assets, alongside Bloomberg and the Object Management Group.

As market data experts in the digital assets industry, our objective is to ensure that the implementation of DLT in the financial industry is efficient and employs practical standards, within the constraints of the technology. DLT processes are data-heavy and require unique solutions for managing the trading lifecycle. Kaiko’s experience building and managing digital asset data feeds and interacting with DLT infrastructure gives us a unique perspective for this call for evidence.

<ESMA\_QUESTION\_DLTP\_1>

1. Please indicate whether you/your organisation is planning to operate a DLT MI under the DLT Pilot and provide some high-level explanation of the business model

<ESMA\_QUESTION\_DLTP\_2>

DLT enabled market infrastructure will require operators to interact via smart contracts on the post trade cycle, leveraging atomic settlement. Any settlement operating model will require trusted 3rd party sourced market data to provide accurate and reliable prices, reference data and additional data points to operate. Kaiko believes that the most efficient model should be for data providers to directly supply the settlement smart contract on the DLT, rather than having one of the agents subscribe to a 3rd party source and act as such in the workflow. In that sense, Kaiko is looking forward to providing DLT-native market data feeds to supply the DLT MI.

One may however consider that combination of both DLT MTF and DLT SS is not relevant in the sense that for a DLT MTF, trade, transaction and record keeping are all three encapsulated in the same event of trade on the MTF by nature.

Accordingly, two situations can be envisaged :   
1) a traditional MiF2 venue which post trade cycle is operated on a DLT SS or  
2) a DLT MTF (which automatically implies the subsequent DLT SS).

<ESMA\_QUESTION\_DLTP\_2>

1. What are the key elements supporting the increased use of DLT in the field of financial services? What are the main obstacles, including in the technical standards, for the development and up-take of DLT-based solutions (listing, trading and settlement)? Do you plan to operate a restricted (permissioned) or unrestricted (permissionless) distributed ledger?

<ESMA\_QUESTION\_DLTP\_3>

DLT enabled market infrastructure proposes an alternative operating model that   
(i) is more efficient from a cost perspective as demonstrated through experiments in the digital asset space (that can be considered as sandbox to larger MI),   
(ii) is more efficient process wise, through DLT and smart contract enabled automation   
(iii) is less risky through the disintermediation of centralized monopolies that represent single point of failures (SPOFs) of the current model through technical multiparty networks rather than central hubs   
(iv) allows to deal with obsolescence management since most of the post trade industry runs on multi decade old systems barely maintainable, occasionally  running on almost obsolete hardware such as mainframes.<ESMA\_QUESTION\_DLTP\_3>

1. Would you consider operating a DLT MTF Would you consider operating a DLT SS without operating at the same time a DLT MTF? If yes, under which conditions?

<ESMA\_QUESTION\_DLTP\_4>

Kaiko itself will not operate neither a DLT MTF nor a DLT SS. However, we observe benefit in both the full DLT (trading and post trade) model as well as the hybrid one (centralized trading platform connected to a DLT for the post trade cycle) :

(i) Full DLT setup (of which so-called decentralized exchanges in the digital asset industry can be considered a Proof of Concept) allows for P2P OTC trading and immediate settlement based on pre-established rules set by the MTF smart contract. These rules establish the MTF trading rules and rulebook, including Liquidity Provision. They are described by the MTF's  Automated Market Maker (AMM) model. Such platforms optimize OTC non-latency sensitive, and large-In-Scale wholesale trading. One can demonstrate that via data driven studies comparing trade sizes on such infrastructure (e.g. Curve Finance) vs centralized digital exchanges (e.g. Coinbase).

(ii) Hybrid systems allow for latency sensitive trading, bringing efficiency and liquidity to the market as well as minimizing trading costs, leveraging centralized platforms, while relying on DLT for the settlement and record keeping post trade infrastructure. Such setup are particularly adapted to run markets operating similarly to the regulated 'Lit' markets which have dedicated liquidity requirements.

<ESMA\_QUESTION\_DLTP\_4>

1. Please provide an overview of how DLT securities trade in the current market structure (incl. what types of trading system are used, the relevance of secondary market trading)? Do you see any challenges with the current market structure following the application of the DLT Pilot?

<ESMA\_QUESTION\_DLTP\_5>

DLT enabled securities trading runs on one of the two models referred to in Question 4. The SDX exchange is an example of a hybrid model, while the series of experiments under the patronage of Banque de France are more representative of the full DLT MI. These experiments have focused on bonds, and this market is known to be heavily driven by P2P OTC wholesales trading rather than lit electronic trading, hence the appropriate approach taken by these experiments.

In both cases, a permissioned DLT was used (either R3's Corda or IBM's implementation of Linux' Hyperledger), even though some experiment where also conducted on the Ethereum permissionless DLT, demonstrating that the permissionless nature of the ledger did not introduce any risk to the infrastructure itself, however leveraging it to produce a native market transparency.

The DLT is used for both issuance and settlement, and when applicable for trading. It is also used for corporate actions (e.g. bond refinancing) through an automated management of distributed roles under the operating smart contract rules.

The common rule that will challenge current market structure relies on the pre-funded nature of trading. In current market infrastructure, trading actors rely on their back office for the financing of the trade they execute. Trade execution and trade financing are de-correlated, leading to (i) counterparty risk and (ii) settlement failure risk (one should keep in mind that failure on settlement is accepted to some extent in CSDR).  
  
On DLT powered infrastructure, all trading activities are pre-funded, which in other means that trading can only trade what they already have at their disposal in a wallet, and cannot rely on post trade financing. This removes structurally the counterparty risk, making the CCP obsolete, and eliminates risk of settlement failure through immediate atomic settlement, and removes the possibility of settlement failure. This is achieved at the expense of the front trading flexibility, through the hard constraint of pre-funding of all trades.<ESMA\_QUESTION\_DLTP\_5>

1. Instrument status: Do DLT financial instruments have different characteristics than ‘standard’ shares, UCITS-ETFs and bonds? If yes, please elaborate and explain whether these different characteristics call for a different approach for the application of the transparency requirements?

<ESMA\_QUESTION\_DLTP\_6>

Tokensized instruments will carry their token representation alongside their representation as financial instruments. Tokens obey standard rules determined by the edger on which they are issued. For interoperability purposes, tokens must be representable on multiple ledgers and as such one can end up with one financial instrument having multiple tokenized views to be operated on multiple environments (e.g. both HyperLedger and Corda).

This representation paradigm has already been seen in the digital asset industry. If one takes into consideration the USDC (Circle USD) token. Each one of these tokens represent 1 USDC , an asset pegged to the US Dollar (e.g. a stablecoin). Tether tokens are however available on multiple DLT ecosystems such as Ethereum, Avalanche, Bianance Smart Chain. One USDC token on Ethereum is an ERC20 token. One USDC token on the Binance Smart Chain is a BEP20 Token. These different technical standards of tokens are not fungible and there are technicalities involved to bridge from one ecosystem to the other.

To translate in the context of equities as an asset class, if a company decides to issue a number of digital shares as part of the DLT regime, this must be done taking into account that these shares may require multiple representations so that the same share can be seen as a HyperLedger Token, an ERC20 Ethereum Token or an R3 Corda Token.

In that sense, Kaiko has developed under the Object Management Group umbrella and the FIGI (Financial Instrument Global Identifier) standard an open source framework for technical representation of financial assets, applicable to both crypto assets and tokenized traditional assets to enable multiple token representation of the same asset. Users will be able to fetch all the metadata associated with an asset, including all the ecosystems it is available on, the smart contract operating them in each ecosystem, the token standard and technical properties for each ecosystem.

Kaiko does not intend to monetize the framework and intends to operate it in a decentralized fashion in the sense that users of the standard will have the possibility to propose and vote for evolution of the standard to meet their needs.

<ESMA\_QUESTION\_DLTP\_6>

1. Transactions: Where are DLT financial instruments traded? Could there be OTC trading in those instruments?

<ESMA\_QUESTION\_DLTP\_7>

DLT financial instruments are subject to OTC the same way traditional assets are subject to this type of trading. Regulation and tracking of the OTC transactions is however made significantly easier via DLT since digital native assets can be traced from issuance to current holders, and their full history.

<ESMA\_QUESTION\_DLTP\_7>

1. Transactions: Do the lists of transactions in Article 13 of RTS 1 and Article 12 of RTS 2 reflect relevant transaction types for DLT financial instruments? If not, please explain which types of transactions are missing and why they should be added to the lists of transactions.

<ESMA\_QUESTION\_DLTP\_8>

All transactions listed in Article 13 of RTS 1 / Article 12 of RTS 2 could be relevant via DLT enabled platforms. The one transaction structure that should catch the regulator's eye is the give-up / give-in in the sense that in a DLT enabled environment, trade and transaction should atomicly (via atomic settlement) represent one and one same thing. Give ups were introduced in current market infrastructure to decorrelate the executed trade ownership from the transaction ownership from a settlement and clearing perspective.

Theoretically speaking there is no space for give-up and give-in (i.e. the transaction of respectively transferring [give-up] / claiming [give-in] ownership of a transaction emanating from a 3rd party trade) in a DLT environment. However, transitionally, give-up and give-in may be needed if some DLT ready trading actors act on behalf of 3rd parties that are not trading ready but are post trade ready. IN that sense, a temporary operational need for give-up / give-in equivalent mechanisms may remain required at inception and in the first phase of rolling out DLT enabled MI.

<ESMA\_QUESTION\_DLTP\_8>

1. Can the current transparency requirements in RTS 1 and 2 be applied for DLT financial instruments (e.g. liquidity assessment, thresholds, flags, reporting fields) or would they need to be adjusted? If not, what should be the appropriate approach?

<ESMA\_QUESTION\_DLTP\_9>

We must make here the distinction between (A) Hybrid MI where trading is operated on a traditional venue model, and post trade and record keeping on a DLT and (B) Full DLT MI.

(A) in a hybrid setup (DLT SS), all pre-trade transparency requirements would be applicable as is, because the execution venue operates as in current markets, and therefore, pre-trade operations are not kept in the post trade record keeping.

(B) in a full DLT setup (DLT MTF), the trade and the transaction are one and the same thing. As such the transparency requirement should be aligned accordingly : (i) pre trade transparency, (ii) post trade transparency - Market Data (iii) record keeping and reporting (also referred to as post trade tape).

<ESMA\_QUESTION\_DLTP\_9>

1. Are there any standards (e.g. messaging, identification of accounts/users, product identifiers, reporting, etc.) in a DLT environment that should be taken into account when revising the RTS 1 and 2?

<ESMA\_QUESTION\_DLTP\_10>

In current markets, post trade transparency rules and MiFID enforcement have led to the massive enforcement of ISO standards and FIX MMT flags.

The policy has unequivocally allowed unification to some data formats and to some extent interoperability.

However, two caveats have risen :

1- FIX MMT flags are technically costly in format and sizes making them unfit to be managed efficiently when manipulating datasets at scale. The consequence is that were an actor to build MMT compliant native datasets, they would have to accept processing times that do not meet technical performance requirements of their systems. As a consequence, most actors have built side systems to rebuild MMT compliant messages *ex-post facto*. Such systems are built solely for the sake of producing these messages out of the internal formats. These systems are costly, generally not the core focus of any industry actors, making them a source of bugs and deteriorating the quality of the data produced (RTS24 files, market data messages and so on). They  consist in large scale "mapping systems" that compensate for the non-adoption of the standard in internal systems natively. These systems are pits of inefficiencies built for the sake of meeting an enforced standard.

2- ISO Standards (ISIN, CFI, etc.) are effective from a financial standpoint but are not flexible from a pure technical standpoint. An ISIN is a string unfit to serve as a key in a database, and as a consequence, required to be indexed by a secondary field, which will be the lead in any internal system.

DLTs bring efficiencies in how MI operate but they bring also their own technical paradigms. Any DLT is set up with ecosystem level parameters such as the block size (expressed in bytes) which caps the amount of data one can record in a single block. Each block has then encapsulated additional layers of parameters that are not constrained by any standard aside from the one of the ecosystem itself.

In another word, R3's Corda DLT will not change its backbone structure as a DLT that can be used by multiple industries (including the financial markets one) to solely allow for the adoption of a FIX standard because MMT flags have been enforced.

As such, Kaiko's stance on the matter of standards (as both a market data provider and the sole certified issuer of Object Management Group's Figis for Digital assets) is to facilitate the interoperability not by enforcing a standard but rather by enforcing that all eligible standards must be interoperable. Hence, Kaiko has provisioned the Digital Token Identifier (DTI) as the secondary key to the FiGI at asset level in the native data model of FiGI for digital assets. The objective is to make sure that using a DTI, one can fallback on the FiGI representation, and using FiGI, one can fallback on ISO representation. Similarly, a reporting relying on FiGI would be 100% mappable by nature to ISO and vice versa.

Such an approach may be harder to monitor but allows true technical adoption of standards by the relevant systems, or adoption of multiple ones across multiple systems of a MI but ensuring interoperability, data continuity and efficiency.

<ESMA\_QUESTION\_DLTP\_10>

1. Do you anticipate any problems that may emerge from the current liquidity concepts in Delegated Regulation (EU) 2017/567 and RTS 2 for the application of related transparency requirements for DLT financial instruments? Please explain and make proposals on how such problems could be solved.

<ESMA\_QUESTION\_DLTP\_11>

Articles (5) to (9) of the 2017/567 of the Delegated Regulation (EU) 2017/567 [COMMISSION DELEGATED REGULATION (EU) 2017/ 567 - of 18 May 2016 - supplementing Regulation (EU) No 600 / 2014 of the European Parliament and of the Council with regard to definitions, transparency, portfolio compression and supervisory measures on product intervention and positions (europa.eu)](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32017R0567&from=EN) are at the core of everything data related in RTS2. The main drivers are that (i) the costs aspect of things remains an unknown as we speak, (ii) that data consumption (reading a DLT versus connecting to a multicast feed or an API) is completely different and subject to costs that are not controlled by Market Data providers (e.g. gas fee if the DLT is a permissionless one).

<ESMA\_QUESTION\_DLTP\_11>

1. Are DLT securities traded on different trading systems as ‘standard’ shares and UCITS-ETFs (mostly continuous trading and periodic auctions) or bonds (RFQ, voice trading)? Please explain.

<ESMA\_QUESTION\_DLTP\_12>

DLT securities are traded either on

1/ Central Order Book of venues operating very close to current market (with the significant distinction of the pre-funding of all trades)

2/ DLT MTFs /venues / protocols that rely on systems of Liquidity Pools and Automated Market Makers (AMM).

The latter model significantly differs from 'standard' systems.

DLT enabled trading via Liquidity Pools rely on the common distinction of two roles :  
- Trader

- Liquidity Provider.

The Liquidity Provider supplies the pool primarily with an amount of all assets traded via those pools, according to a predefined formula by the AMM, that depends on the state of the pool (amount of respective token in balance at liquidity provision time). In exchange for this provision, the LP receives a passive incentive.

The amount of assets and their balance in the pool determine its price according to a pre-defining rule set by the smartcontracts automated market maker.The trader then 'swap' one eligible asset in their wallet to another available via this pool. The transaction changes the pool balance and impacts the price. Since assets are solely "swapped", LPs can retrieve their provision at any point in time, however complying with the new balance of the pool at liquidity retrieval time. In the meantime, AMMs are exposed to a loss of value of their provision, if the balance of the pool is negatively impacted by the market movement. This risk is known as "impermanent loss"

Multiple AMM models implement various rules and balance mechanics according to the protocols.

<ESMA\_QUESTION\_DLTP\_12>

1. To what extent would the choice of trading protocols and applications have an impact on the trading of instruments and on the requirements to publish information according to RTS 1 and 2?

<ESMA\_QUESTION\_DLTP\_13>

For DLT MTFs the information published must reflect the market mechanism. RTS 1 and 2 cover for Central Order Book based trading as well as Large-In-Scale, alongside other secondary trading mechanisms. None of them reflect the trading model of observable trading protocol of DLT securities.

<ESMA\_QUESTION\_DLTP\_13>

1. Do the systems on which DLT financial instruments trade require tailored pre-trade transparency requirements as those per Table 1 Annex I of RTS 1 and Annex I of RTS 2?

<ESMA\_QUESTION\_DLTP\_14>

Tailored pre-trade transparency model must be established for non Central Order Book based trading via full DLT MI, in the sense that pre-trade and post trade are one and the same thing for such a set-up. The trade, its settlement and the transaction being one same atomic event, pre-trade transparency rules as they stand cannot be neither executed nor enforced.

<ESMA\_QUESTION\_DLTP\_14>

1. Would the use of restricted (permissioned) vs unrestricted (permissionless) DLT represent any difference in how the pre-trade transparency requirements should be applied?

<ESMA\_QUESTION\_DLTP\_15>

The permissioned versus permissionless character of the DLT should not impact transparency requirements if defined according to the atomic settlement paradigm.

<ESMA\_QUESTION\_DLTP\_15>

1. Is it in your view necessary to make changes to the calibration of waivers for DLT shares and UCITS-ETFs in RTS 1? Do you expect any implementation issues in the application of waivers also taking into account the above considerations?

<ESMA\_QUESTION\_DLTP\_16>

The DLT Pilot Regime caps the total market capitalization of DLT shares to 6bn on a given platform, among other constraints. Such a set of restrictions dwarfs all the activity / volume that will be driven by DLT shares under the regime. This should allow us to loosen the policy around waivers of RTS1 to allow for experimentation and observation in open market conditions through effective data driven studies instead of theoretical studies and approaches to the use cases they cover.

<ESMA\_QUESTION\_DLTP\_16>

1. Is it in your view necessary to make changes to the calibration of waivers for DLT bonds in RTS 2? Do you expect any implementation issues in the application of wavers also taking into account the above considerations?

<ESMA\_QUESTION\_DLTP\_17>

The DLT Pilot Regime set of restrictions dwarfs all the activity / volume that will be driven by DLT Bonds under the regime. This should allow us to loosen the policy around waivers of RTS1 to allow for experimentation and observation in open market conditions through effective data driven studies instead of theoretical studies and approaches to the use cases they cover

<ESMA\_QUESTION\_DLTP\_17>

1. What can be considered as close to real-time as possible for the publication of post-trade reports in the context of DLT-securities on DLT MIs?

<ESMA\_QUESTION\_DLTP\_18>

Post trade reports could be made available by DLT-compatible market data providers within a fixed number of blocks from the record keeping process.

As an example, consensus for the ethereum DLT is framed in such a way that :  
 (1) all transactions eligible to be operated in the next 'N+1' block cycle are recorded in a queue ("mempool").

(2) all transactions validated in the current 'N' block cycle are recorded on the current 'N' block

(3) validation of the current 'N' block by the network takes additional steps post publication of the block. This post publication validation can take up to 8 cycles. The transaction is fully confirmed after the publication of the block 'N+8'.

At a speed of one block every ~15s, publication of post trade reports could be expected in such a framework after 2mn. A provisional (not fully validated by the network's consensus) one can be made available as soon as 15s after block publication and transaction execution.

The only additional time required is for the market data provider to consume the block, interpret the data, normalize it and distribute it.

Additionally, it is critical to note that in a context of permissioned DLT ecosystem, the Market Data provider must be considered a full participant to the network, running a node to produce the data accordingly (DLT record data format are not market data per se and require to be engineered to produce market data out of the technical DLT records).

<ESMA\_QUESTION\_DLTP\_18>

1. Are the current deferral periods for equity and non-equity instruments appropriate for DLT securities? Please, distinguish between DLT shares, ETFs and bonds.

<ESMA\_QUESTION\_DLTP\_19>

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<ESMA\_QUESTION\_DLTP\_19>

1. Is it necessary to amend the current fields and flags for post-trade transparency (modifications/cancellations/additions) for their application to DLT shares, ETFs (Tables 2, 3 and 4 of Annex I of RTS 1) and bonds (Annex 2 of RTS 2)? Do you expect any implementation issues on basis of the current fields and flags?

<ESMA\_QUESTION\_DLTP\_20>

In the context of  DLT MTFs, there must be full alignment between post trade transparency and pre trade transparency fields and flags, as the record will be one and the same.

<ESMA\_QUESTION\_DLTP\_20>

1. Is it necessary to amend RTS 3 for the purpose of the DLT Pilot? Do you anticipate any problems with the application of RTS 3 under the DLT Pilot?

<ESMA\_QUESTION\_DLTP\_21>

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<ESMA\_QUESTION\_DLTP\_21>

1. Do you agree with the approach indicated in the above paragraph? Please justify your answer.

<ESMA\_QUESTION\_DLTP\_22>

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<ESMA\_QUESTION\_DLTP\_22>

1. Private individuals: Do you agree that DLT MTFs could report transactions on behalf of the private individual as part of the compensatory measure foreseen by Article 4(1)(c) of the pilot regime? Please explain your statement. What other solutions can be explored to address this data gap?

<ESMA\_QUESTION\_DLTP\_23>

DLT MTFs see their full trade life cycle recorded on the DLT. As long as a Market Data provider is able to read the DLT on a real time basis, all transaction recorded on the MTFs (including originating addresses and target addresses), the market data provider shall be in position to provide 3rd parties with pseudonymous externally sourced, verifiable and neutral records of the MTF's full activity. The market data provider does not require the knowledge of KYC of each address which should remain when applicable the sole right of the MTF / regulator. However the produced tape by the market data provider could be interpreted accordingly by any party able to map the addresses to private individuals.

The same applies to DLT SS. Should a Market Data provider role be enforced on any DLT SS structure, the ecosystem would benefit from a full record keeping capability in a pseudonymous format.

The whole ecosystem would benefit by such a model by having neither the MTF, nor the Private Individual, nor the regulator providing with transaction report, but the pseudonymous report produced in RT (or async if required via batches) by a neutral, supervised, liable trusted 3rd party.

<ESMA\_QUESTION\_DLTP\_23>

1. Reporting status and transaction reference numbers (Fields 1 and 2): How will DLT MTF treat cancellations to correct previously submitted information as per Section 5.18 of ESMA Guidelines on transaction reporting being the information stored on DLTs immutable? Is it necessary to amend the current fields 1 and 2 for their application in the context of a DLT environment? Do you foresee any other reporting status other than New and Cancellation in the context of a DLT environment?

<ESMA\_QUESTION\_DLTP\_24>

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<ESMA\_QUESTION\_DLTP\_24>

1. Trading Venue Transaction Identification, TVTIC (Field 3): Is it necessary to amend the current field for its application in the context of a DLT environment? Do you expect any implementation issues on basis of the current fields? Should new fields be added in the context of a DLT environment?

<ESMA\_QUESTION\_DLTP\_25>

TVTIC approach in a DLT environment is obsolete in the sense that each atomic transaction recorded on a DLT is uniquely identified via a transaction hash (unique cryptographic key). As such even if multiple venues operate on the same DLT, none of their transactions could end up carrying the same cryptographic key. The transaction hash of a DLT (under the format of a cryptographic key) should become the standard applicable to any DLT ecosystem, uniquely identifying a transaction across venues. The transaction hash can also identify the originating address (the venue), and both sides (via their addresses) of the transaction.

<ESMA\_QUESTION\_DLTP\_25>

1. Executing entity and submission entity identification codes; MiFID II Investment Firm indicator (Fields 4-6); Buyer details and decision maker (Fields 7-15); Seller details and decision maker (Fields 16-24): Is it necessary to amend the current fields for their application in the context of a DLT environment? Do you expect any implementation issues on basis of the current fields? Should new fields be added in the context of a DLT environment?

<ESMA\_QUESTION\_DLTP\_26>

The requirements must explicitly discriminate between the fields that should appear on the transaction itself (ie as published on the DLT) compared to fields that must be reconcilable from the data available on the Ledger. The underlying technical caveat is that DLTs have their own enforced technical representation of a transaction and constraints around data which vary from one DLT to the other. Should the regulator produce an ecosystem neutral ruling, the rule should be to minimize the data published on the DLT itself at transaction level (for DLTs cap the size in bytes of a transaction record) as long as a reconciliation process can rebuild off DLT the information.

In this context, Investment Within Firm shortcode would be eligible, while buyer details and other fields should be treated off DLT (e.g. associated to the originating address : one address for one decision maker)

<ESMA\_QUESTION\_DLTP\_26>

1. Transmission of an order (Fields 25-27): Is it necessary to amend the current fields for the application in the context of a DLT environment? Do you expect any implementation issues on basis of the current fields? Should new fields be added in the context of a DLT environment?

<ESMA\_QUESTION\_DLTP\_27>

The requirements must explicitly discriminate between the fields that should appear on the transaction itself (ie as published on the DLT) compared to fields that must be reconcilable from the data available on the Ledger. The underlying technical caveat is that DLTs have their own enforced technical representation of a transaction and constraints around data which vary from one DLT to the other. Should the regulator produce an ecosystem neutral ruling, the rule should be to minimize the data published on the DLT itself at transaction level (for DLTs cap the size in bytes of a transaction record) as long as a reconciliation process can rebuild off DLT the information.

<ESMA\_QUESTION\_DLTP\_27>

1. Trader, algorithms, waivers and indicators (Fields 57-65): Is it necessary to amend the current fields for the application in the context of a DLT environment? Do you expect any implementation issues on basis of the current fields? Should new fields be added in the context of a DLT environment?

<ESMA\_QUESTION\_DLTP\_28>

The requirements must explicitly discriminate between the fields that should appear on the transaction itself (ie as published on the DLT) compared to fields that must be reconcilable from the data available on the Ledger. The underlying technical caveat is that DLTs have their own enforced technical representation of a transaction and constraints around data which vary from one DLT to the other. Should the regulator produce an ecosystem neutral ruling, the rule should be to minimize the data published on the DLT itself at transaction level (for DLTs cap the size in bytes of a transaction record) as long as a reconciliation process can rebuild off DLT the information.

<ESMA\_QUESTION\_DLTP\_28>

1. Short selling field (Field 62): Is short selling possible? Does it depend whether it is a DLT MTF or a DLT MTF+DLT SSS? Is it necessary to amend the current field for the application in the context of a DLT environment? Do you expect any implementation issues on basis of the current fields?

<ESMA\_QUESTION\_DLTP\_29>

DLT MTF without DLT SS is not possible (if the MTF is DLT enabled, the traded assets must exist - hence issued and settled - on the same DLT). Short Selling is not possible since all Trades on a DLT are pre-funded. Leveraged trading is possible. Complex transactions through instantaneous leverage (also known as flash-loans) have been observed on the DLT enabled digital markets, a highly risky speculative mechanic made technically available via Lending and Borrowing MTFs.

When it comes to fields, the requirements must explicitly discriminate between the fields that should appear on the transaction itself (ie as published on the DLT) compared to fields that must be reconcilable from the data available on the Ledger. The underlying technical caveat is that DLTs have their own enforced technical representation of a transaction and constraints around data which vary from one DLT to the other. Should the regulator produce an ecosystem neutral ruling, the rule should be to minimize the data published on the DLT itself at transaction level (for DLTs cap the size in bytes of a transaction record) as long as a reconciliation process can rebuild off DLT the information.

<ESMA\_QUESTION\_DLTP\_29>

1. Transaction details (Fields 28-40): Is it necessary to amend the current fields for their application in the context of a DLT environment? Do you expect any implementation issues on basis of the current fields? Should new fields be added in the context of a DLT environment?

<ESMA\_QUESTION\_DLTP\_30>

The requirements must explicitly discriminate between the fields that should appear on the transaction itself (ie as published on the DLT) compared to fields that must be reconcilable from the data available on the ledger. The underlying technical caveat is that DLTs have their own enforced technical representation of a transaction and constraints around data which vary from one DLT to the other. Should the regulator produce an ecosystem neutral ruling, the rule should be to minimize the data published on the DLT itself at transaction level (for DLTs cap the size in bytes of a transaction record) as long as a reconciliation process can rebuild off DLT the information.

<ESMA\_QUESTION\_DLTP\_30>

1. What are your views on the arrangements that DLT MTFs would need to establish to ensure the provision of complete and accurate reference data to ESMA? Do you think that the current arrangements described in RTS 23 should be amended to ensure its application in the DLT environment? Do you expect any implementation issues on basis of the current RTS 23?

<ESMA\_QUESTION\_DLTP\_31>

ESMA will not only require reference data in the sense described by RTS23 (financial instruments), ESMA will also require the reference data made available from a tokensiation perspective, ie for a given share (ISIN), of which portion of the capital is digital (a DTI, and an Asset FiGI), on which DLTs does such an asset live, for each one of them what is the technical nature of the token and associated attributes.

This is critical in the sense that bridges exist across ecosystems irrespectively of the asset but via token standards. For example, any ERC20 Ethereum token can be locked to produce an equivalent BEP20 token for it to be manipulated on the Binance Chain. This is technically possible irrespectively of the business nature of the token, allowing them to circulate across DLTs.  
  
The latter also makes the permissioned vs permissionless debate obsolete at large : both ecosystems are not technically isolated. An actor participating in a permissioned DLT environment could very well transfer technically via token representations its asset on a public DLT and vice versa. This is the same as per Intranet(s) and the Internet or Extranets (private networks such as ICE Global Network) and the Internet.

<ESMA\_QUESTION\_DLTP\_31>

1. Issuer related fields (Field 5): Is it necessary to amend the current field for the application in the context of a DLT environment? Do you expect any implementation issues on basis of the current fields? Should new fields be added in the context of a DLT environment?

<ESMA\_QUESTION\_DLTP\_32>

We observe today no traceability of Digital securities issuers on the existing digital assets markets, allowing for issuance of scam tokens with very little liability. As such we strongly recommend use of a legal entity identifier (e.g. LEI) for such traceability of any digital asset issuer.

<ESMA\_QUESTION\_DLTP\_32>

1. Venue related fields (Fields 6-12): Is it necessary to amend the current field for the application in the context of a DLT environment? Do you expect any implementation issues on basis of the current fields? Should new fields be added in the context of a DLT environment?

<ESMA\_QUESTION\_DLTP\_33>

The requirements must explicitly discriminate between the fields that should appear on the transaction itself (ie as published on the DLT) compared to fields that must be reconcilable from the data available on the Ledger. The underlying technical caveat is that DLTs have their own enforced technical representation of a transaction and constraints around data which vary from one DLT to the other. Should the regulator produce an ecosystem neutral ruling, the rule should be to minimize the data published on the DLT itself at transaction level (for DLTs cap the size in bytes of a transaction record) as long as a reconciliation process can rebuild off DLT the information.

In the particular context of the venue : each DLT MTF and DLT SS will be operating smart contracts which are located on the DLT via an address (a cryptographic key). Such a key is unique, immutable and allows to identify all belonging activity on the DLT since inception. We strongly recommend identifying DLT MTFs and DLT SS via their addresses. One or multiple addresses may belong to a venue the same way one to multiple MICs may belong to the same regulated exchange today. However the smart contract identifier (the address) is the more compliant (it 'physically' identifies the operating MI deployed on the Ledger) to a DLT environment.

Other subsequent venue related fields may require to be reviewed in the sense that they suffer today from a geographic blueprint. On a DLT, one may use the same MI operating agent (smartcontract) globally as long as the various local regimes are all implemented through its smart contract rules (if-then-else model enabling it). As such geography based attribution may become obsolete, and even sometimes redundant.

Taking the case of a double listing on the current market, two ISINs would be issued. If the DLT SS has a single smart contract managing both local regimes, there shall be only one DTI and only one token - enforcing a geographic rule will solely enforce further un-needed fragmentation, replicating on the DLT the constraints of current centralization via hubs, transferring linearly inefficiencies of the current MI in a DLT based one.

<ESMA\_QUESTION\_DLTP\_33>

1. Notional (Field 13): Is it necessary to amend the current field for the application in the context of a DLT environment? Do you expect any implementation issues on basis of the current fields? Should new fields be added in the context of a DLT environment?

<ESMA\_QUESTION\_DLTP\_34>

Notionals could be expressed in any type of currency and / or cryptocurrency made legal in a medium term future or commoditized (already the case for some under SEC and CFTC ruling in the US).

<ESMA\_QUESTION\_DLTP\_34>

1. Bonds or other forms of securitised debt related fields (Fields 14 – 23): Is it necessary to amend the current field for the application in the context of a DLT environment? Do you expect any implementation issues on basis of the current fields? Should new fields be added in the context of a DLT environment?

<ESMA\_QUESTION\_DLTP\_35>

Kaiko is currently working on a fully fledged model covering Bonds, Equities, ETFs, Equity Derivatives and Digital assets - Digital Securities, Stablecoins, Utility Tokens (digital fungible commodities).

<ESMA\_QUESTION\_DLTP\_35>

1. Do you agree with ESMA’s assessment that no major amendments to RTS 25 appear necessary for the implementation of the DLT Pilot?

<ESMA\_QUESTION\_DLTP\_36>

Clock Synchronization should reflect the reality of the latencies observed. PTP Clock Synchronization enforced in an ultra low latency environment is completely coherent in MIF2. In the context of DLT enabled environments, which are (by essence of a DLT) a lot less latency sensitive, PTP synchronization could reveal a significant cost for no added value in the sense that distributed block publication enforces a synchronicity of its own. A DLT environment is not a synced scale of time (subsecond) but a scale of blocks.

<ESMA\_QUESTION\_DLTP\_36>

1. Do you think the definition of “order” is still applicable to the DLT context? Are the order record keeping requirements in Article 25 and related RTS 25 applicable in the DLT context? If yes, how do you envisage to comply with such requirements? If no, please justify your answer.

<ESMA\_QUESTION\_DLTP\_37>

For a DLT MTF the notion of 'an order' is somewhat obsolete. An order is by definition a record of the intention to buy or sell and enters an order book.

On a DLT enabled MTF, such a notion does not exist, only trade (transactions) do. The one closest notion is a transaction submitted to the MTF yet not executed (cf. question 18) and in the queue of the MemPool (pending transaction). Such a transaction could very well be canceled before being executed in the next cycle and even (on permissionless DLTs) prioritized by its owner through paying an additional fee to the network. As such the closest notion to an order would be a submitted transaction to the MTFs, queued in the Mempool, awaiting DLT network execution.

<ESMA\_QUESTION\_DLTP\_37>

1. Can chains of transmission on DLT financial instruments occur?

<ESMA\_QUESTION\_DLTP\_38>

Yes, if access to the MTF is done via intermediaries.

<ESMA\_QUESTION\_DLTP\_38>

1. Is it possible to split or aggregate orders? In or out the DLT? Or both?

<ESMA\_QUESTION\_DLTP\_39>

It is possible to split and aggregate orders in DLT and out DLT. It is done in DLT via the DLT equivalent of SIs (cf. Q40).

<ESMA\_QUESTION\_DLTP\_39>

1. Does the concept of “Transmission of an order” defined in Article 4 of RTS 22 make sense in the context of DLT? If so, when would you consider an order to be transmitted?

<ESMA\_QUESTION\_DLTP\_40>

Yes, it does, when orders are routed via 3rd parties.

Example : on the permissionless Ethereum DLT, 1Inch is a so-called DEX Aggregator. Essentially it is an SI with its own execution capacity on inflow, with embedded DLT equivalent of SORs to multiple underlying venues (so-called DEXes) - DLT MTFs.

Trader orders can be partially executed on the SI (on 1INch) then split and routed to these underlying venues.

Kaiko makes available a data driven view of these mechanics in its DLT market data feed. Users of the Data feed can trace the whole lifecycle (across split and routings) of transactions submitted to 1Inch.

<ESMA\_QUESTION\_DLTP\_40>

1. What do you consider are the phases of a DLT transaction? At what point in time can such a transaction in DLT securities be considered executed? How do you think “broadcast the transaction to the network” should be defined?

<ESMA\_QUESTION\_DLTP\_41>

Answered in Q18.

<ESMA\_QUESTION\_DLTP\_41>

1. Do you think the definition of “transaction” is still applicable to the DLT context?

<ESMA\_QUESTION\_DLTP\_42>

In a DLT MTF+DLT SS context, trade and transaction are one and the same thing, while an order and a pending transaction are also one and the same thing. As such revision of the definition of a transaction may be required.

<ESMA\_QUESTION\_DLTP\_42>

1. General fields (Fields 1 - 3), ISIN for RTS 1-3: Is it necessary to amend the current fields for the application in the context of a DLT environment? Do you expect any implementation issues on basis of the current fields? Should new fields be added in the context of a DLT environment?

<ESMA\_QUESTION\_DLTP\_43>

Cf. Questions 10 and 33

<ESMA\_QUESTION\_DLTP\_43>

1. Should a new field indicating the DTI be added to RTS 23 and RTS 1-3? What kind of analysis could be performed on a tokenised security by coupling ISIN and DTI information?

<ESMA\_QUESTION\_DLTP\_44>

Kaiko agrees that both DTI and ISIN should be added. If we consider the case of an Equity, only a portion of its capitalization may be tokenized, represented by a DTI (no DTI on not-tokenized shares). However the DTI does not capture (i) the token side of things as well as (ii) the transactional side of things. In short, the DTI only allows identifiers to be issued at the asset level, while the FiGI framework allows to identify not only the ISIN but the instrument at quote and venue level :  
1- If the DTI is quoted in multiple countervalue (currencies), each pair will be represented by a dedicated FiGI (covering stablecoins, CBDCs, any commoditized cryptocurrency)  
2- If the DTI is quoted in the same countervalue on two venues, each instrument will be represented by a different FiGI).

In a reporting to regulators framework, the transaction being at venue / quoting asset (DLT MTF Liquidity Pool) level, only FiGI allows today to operationally produce viable data feeds where all transactions are clearly identified in a discriminating way depending on their origin, solely via an identifier.

<ESMA\_QUESTION\_DLTP\_44>

1. Is the ISIN sufficient to ensure uniqueness of a given tokenised financial instrument? Is there any element of the DTI standard that you consider should be added as a separate field in RTS 23 and RTS 1-3?

<ESMA\_QUESTION\_DLTP\_45>

Both situations where having multiple ISINs for a single DTI (multi listings) and multiple DTIs for a single ISIN (share A / B type of capital structure will necessarily require two different tokens, two DTIs in the sense that the object represented is not the same) will appear with 100% certainty. ISIN must be coupled with DTI, and furthermore coupled with FiGI which carries the technical tokenized view alongside its relevance from a technical and operational standpoint for data distribution given its issuance at the highest granularity (cf Q44).

<ESMA\_QUESTION\_DLTP\_45>

1. Traditional reporting systems - RTS 22/23: Does the setting up of the traditional reporting systems as illustrated in Annex 1 of the ESMA Guidelines on transaction reporting make sense in the context of the pilot regime?

<ESMA\_QUESTION\_DLTP\_46>

The Annex 1 must be reviewed in its entirety when considering both DLT SS or DLT MTF+DLTSS in the sense that :  
(i) for a DLT MTF+DLT  SS, the ledger recording is in a sense the reporting itself. However, the reporting requires a reverse application of the MTF rules to deduce the chain of events, enrichment via some metadata and formatting to be produced out of the raw DLT technical records. The needed effort for a data provider with the ability to run a node of the DLT, technically go through the chain of blocks to build the tape from the raw cryptographic data encapsulated in the DLT.

<ESMA\_QUESTION\_DLTP\_46>

1. Execution and IT infrastructure - RTS 22/23: Does the fact that execution takes place on a DLT has an impact on the investment firm’s reporting system and requires setting up of separate/new IT infrastructures?

<ESMA\_QUESTION\_DLTP\_47>

IT infrastructure will require its own capacity or to source a third party able to produce the reporting from the DLT where transactions are represented in raw cryptographic data.

<ESMA\_QUESTION\_DLTP\_47>

1. ISO standards 20022 and RTS 22/23: Can ISO 20022 be implemented and used by DLT MTFs or DLT TSS and/or their members/participants to comply with the reporting required under Article 26 and 27 of MiFIR. Do you think ISO 20022 would represent an opportunity or an issue for DLT MTF? Please explain your statement.

<ESMA\_QUESTION\_DLTP\_48>

ISO formats are key for readability of the report themselves however they are not fit for purpose for DLT infrastructure in the sense that they consist of lengthy string based fields, unfit to accommodate with the reality of data as represented on a DLT. DLT tends to optimize data space and usage (for it is not a distributed database). A bloc is a handful of kb in size. As such, no DLT enabled MI will ever technically be able to implement any FIX or ISO standard as is on DLT. It must rely on numeric only standards that are optimized to fit cryptographic standards to be then translated out of DLT in readable FIX or ISO standard by a reporting system. However, a numeric standard mappable to ISO and FIX must be used on DLT, and we strongly recommend the use of FiGI (truncated of its 3 first chars).

<ESMA\_QUESTION\_DLTP\_48>

1. XML template of RTS 22/23: do you think that different formats might be more suitable to the DLT while keeping the common ISO 20022 methodology? If yes, please explain what the most appropriate format would be and for which reasons.

<ESMA\_QUESTION\_DLTP\_49>

XML templates represent a data representation stack that is not DLT compatible. XML would have to be produced off-DLT from DLT data and additional metadata. <ESMA\_QUESTION\_DLTP\_49>

1. Do you/your organisation plan to offer settlement of DLT securities in e-money tokens? If yes, what would be the most appropriate way for reporting these transactions? Do you agree with ESMA’s proposal on how to populate the currency fields when the financial instrument is priced in e-money tokens?

<ESMA\_QUESTION\_DLTP\_50>

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<ESMA\_QUESTION\_DLTP\_50>

1. Do you consider it possible that transactions in DLT securities could be settled in different currencies and/or different e-money tokens? If yes, please explain what would be the most appropriate way for converting such transactions in EUR.

<ESMA\_QUESTION\_DLTP\_51>

Any CBDC, form of eMoney (private stablecoins are being considered in the US) or commoditized cryptocurrency could be eligible for settlement. As such, any conversion must rely on an ESMA recognized benchmark to produce the conversion rate to EUR. Such rates must comply with BMR rules and be globally available 24/7, with at least 3 fixings a day for the three US / EMEA and APAC time zones as the eMoney market has such a structure.

<ESMA\_QUESTION\_DLTP\_51>

1. What are your views on the arrangements that DLT MTFs and DLT TSSs would need to establish to grant direct and immediate access to transaction data to regulators by admitting them as regulatory observer participants? Do you expect any implementation issues in relation to the obligation to make MiFIR transaction data available to the NCAs and MiFIR transparency/ reference data to ESMA?

<ESMA\_QUESTION\_DLTP\_52>

In the current market, the regulator requires all venues and CSDs / CCPs to produce their reporting to oversee the market. In a DLT MTF+DLTSS environment, the regulator does not need such a requirement besides the one of enforcing the presence of at least one market data provider (neutral) technical player to permissioned DLT environments.

Then the overseeing regulator would either acquire or build its capacity to nativey produce all required reporting. As the data is immutable, for both permissionned and permissionless DLTs, the regulator will be in capacity to oversee any DLT MTF / DLT SS in full autonomy and objectivity without having to rely on the venue's reporting to oversee these very same venues, which is one of the main pitfall of the current structure.

<ESMA\_QUESTION\_DLTP\_52>

1. Is it technically feasible to store on the DLT the details of the transaction according to ISO 20022 methodology in order to enable regulators to pull that data directly into a readable format without any transformation of the data? Do you believe that the use of ISO 20022 could have a significant negative impact in terms of scalability of the system and the related congestion risk? If yes, please justify your answer and specify if the impact is dependent on the type of governance model and technology that the DLT is using.

<ESMA\_QUESTION\_DLTP\_53>

As indicated in Q48 neither ISO or FIX methodologies are compatible with data encryption on any DLT at scale. The transactions are stored in cryptographic format optimizing data usage for DLTs are not databases, and as such none of both above are directly implementable on any DLT. Any ISO 20022 compliant reporting (or FIX MMT flags or any other equivalent standard) will have to be produced off DLT. The one strong requirement is to have a standard that is both DLT compatible and ISO20022 interoperable. The standard built over the past 3 years to enable the above is FiGI for Digital Assets. <ESMA\_QUESTION\_DLTP\_53>

1. Can all information to be reported under MiFIR Article 27 pursuant to Table III of the Annex to RTS 23 be recorded on the DLT according to the ISO 20022 methodology? Please explain your answer also in relation to scalability impact at DLT level.

<ESMA\_QUESTION\_DLTP\_54>

As indicated in Q48 and 53, neither ISO or FIX methodologies are compatible with data encryption on any DLT at scale. The transactions are stored in cryptographic format optimizing data usage for DLTs are not databases, and as such none of both above are directly implementable on any DLT. Any ISO 20022 compliant reporting (or FIX MMT flags or any other equivalent standard) will have to be produced off DLT. The one strong requirement is to have a standard that is both DLT compatible and ISO20022 interoperable. The standard built over the past 3 years to enable the above is FiGI for Digital Asset

<ESMA\_QUESTION\_DLTP\_54>

1. Can all data necessary to perform the transparency (Article 2 of RTS 3) and DVC (Article 6 of RTS 3) calculations be recorded on the DLT according to the ISO 20022 methodology? Please explain your answer also in relation to scalability impact at DLT level.

<ESMA\_QUESTION\_DLTP\_55>

As indicated in Q48, 53 and 55, neither ISO or FIX methodologies are compatible with data encryption on any DLT at scale. The transactions are stored in cryptographic format optimizing data usage for DLTs are not databases, and as such none of both above are directly implementable on any DLT. Any ISO 20022 compliant reporting (or FIX MMT flags or any other equivalent standard) will have to be produced off DLT. The one strong requirement is to have a standard that is both DLT compatible and ISO20022 interoperable. The standard built over the past 3 years to enable the above is FiGI for Digital Asset

However in this very case, some key data to allow the computation will be recorded on the DLT (though not complying to the ISO methodology).

<ESMA\_QUESTION\_DLTP\_55>

1. Do you see any issue with obtaining the data elements required by RTS 22 and 23 from external databases like GLEIF, ISO 4217 list (currencies), ISO 10383 (MIC) or ANNA-DSB (ISIN) before the data is permanently stored into the distributed ledger? Please explain your answer.

<ESMA\_QUESTION\_DLTP\_56>

A DLT is not a database, but a chain of individual transaction reporting blocks very small in size. As such the listed databases above will never make it to a DLT. However, the DLT data is immutable and as a consequence, if any modification is brought to the aforementioned databases, if such data is used in the DLT, the past data becomes obsolete (pending painful reconciliation processes keeping track of changes that happened on centrally maintained databases).

As such the sole standards that can operate on a DLT ecosystem are its own or simple numeric identifiers that are also immutable.

The driving standard thus must be (i) a numeric one (ii) allowing to map multiple DLT ecosystems (iii) technically immutable. The sole identifier that fit those three constraints is FiGI.

However a (iv) must be introduced : interoperability with ISO and FIX, which has been enforced in FiGI.

<ESMA\_QUESTION\_DLTP\_56>

1. Do you see any major impediments for the regulator as a regulatory observer participant to pull large size of encrypted data from the distributed ledger? Please explain your answer in the context of encryption of data and key management, and in relation to any scalability impact at DLT level.

<ESMA\_QUESTION\_DLTP\_57>

Pulling data is not the main constraint as long as the regulator has enough time and hardware resources (cost driven question). The difficult however is to interpret the pulled data from :

(i) the technical data as recorded on the DLT

(ii) the underlying DLT MTFs rules (smartcontract implementation) and metadata, reference data

The observant will have to reverse engineer the smartcontract to be able to replay the sequences and produce market data out of the cryptographic records.

<ESMA\_QUESTION\_DLTP\_57>

1. Taking into consideration the variety of technologies available in the DLT world, what is, in your opinion, the most efficient way to admit regulators as regulatory observer participants? Please explain your answer.

<ESMA\_QUESTION\_DLTP\_58>

Regulators should rely on specialized market data providers as the process is infrastructure heavy and technically complex. Such actors like Kaiko have emerged (though still rare) and have been building these capacities over the past seven years, while growing with the fast changing ecosystem. It will objectively be a challenge to make it for these 7 years of acquired knowledge and expertise while also building the supervision model and interpreting the produced data - the core mission of the observant.

<ESMA\_QUESTION\_DLTP\_58>

1. Do you have any suggestion to ensure interoperability among DLT MTFs, DLT TSS and the regulators as described in Paragraph 126? Please explain your answer.

<ESMA\_QUESTION\_DLTP\_59>

Interoperability of multiple standards is key, rather than the enforcement of a few, particularly in a very fast changing environment worldwide where the EU is an actor among many in a global environment.<ESMA\_QUESTION\_DLTP\_59>

1. Do you have any suggestion to ensure interoperability among different DLT MTFs and/or DLT TSS as described in Paragraph 127? Please explain your answer.

<ESMA\_QUESTION\_DLTP\_60>

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<ESMA\_QUESTION\_DLTP\_60>