



European Securities and  
Markets Authority

# Reply form for the Discussion Paper on the Distributed Ledger Technology Applied to Securities Markets



## Responding to this paper

The European Securities and Markets Authority (ESMA) invites responses to the specific questions listed in the ESMA Discussion Paper on the Distributed Ledger Technology (DLT) Applied to Securities Markets, 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\_DLT\_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;
- contain a clear rationale, including on any related costs and benefits; and
- describe any alternatives that ESMA should consider

### **Naming protocol**

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

ESMA\_DLT\_NAMEOFCOMPANY\_NAMEOFDOCUMENT.

E.g. if the respondent were XXXX, the name of the reply form would be:

ESMA\_DLT\_XXXX\_REPLYFORM or

ESMA\_DLT\_XXXX\_ANNEX1

### **Deadline**

Responses must reach us by **2 September 2016**.

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'.



## Introduction

***Please make your introductory comments below, if any:***

<ESMA\_COMMENT\_DLT\_1>

Nasdaq appreciates that ESMA is widely consulting the industry when looking into the appropriate regulatory approach to DLT and broadly agrees with most of the benefits of DLT and challenges identified by ESMA in the discussion paper.

Importantly, Nasdaq considers that DLT has the potential to bring significant benefits to financial markets, among which to accelerate, decentralize, automate and standardize data-driven processes and therefore to alter the way in which assets are transferred and records are kept. In particular, DLT allows cross-verification of information in a transparent and dependable way and can simplify complex verification and validation processes that currently require regulation to ensure adequate functioning.

In this light, Nasdaq believes that the financial industry and regulators have to commit time and resources to understand how DLT may be used to reduce red tape while maintaining protection to users of services concerned.

Nasdaq has so far focused on two use cases of DLT but is confident that many more will be possible because this new technology holds the promise of allowing capital markets to operate more efficiently while simultaneously providing greater transparency and security.

At the end of 2015, Nasdaq successfully enabled the first-ever private securities issuance documented with DLT. Application of DLT within Nasdaq Private Market aims to modernize, streamline and secure cumbersome administrative functions, and simplify the overwhelming challenges private companies face with manual ledger record keeping.

We indeed believe that currency, private and public equities, bonds, derivatives, commodities, derivatives, transaction records (e.g. trading), and settlement can all benefit from further real-time processing. As such, DLT holds great potential to provide increased efficiencies to the financial sector and its end clients.

Another use case on which we work is an e-voting service to allow shareholders of companies listed on Nasdaq's Tallinn Stock Exchange to vote in shareholder meetings using the Estonian digital ID solution (e-Residency platform) and DLT.

Nasdaq finds it important that regulation tries to facilitate innovation. In this respect, the approach of the US CFTC to "do no harm" and the initiative that the UK FCA envisages with its regulatory "sandbox" are interesting and we recommend that ESMA take a similar approach.

Given the breadth of the questions asked, we focus our contribution on the questions most relevant to Nasdaq. <ESMA\_COMMENT\_DLT\_1>

**Q1: Do you agree with the list of possible benefits of the DLT for securities markets? Please explain, e.g., are these benefits unique to the DLT, are some more important than others, are some irrelevant?**

<ESMA\_QUESTION\_DLT\_1>

Nasdaq agrees with the possible benefits listed in the discussion paper and considers the below benefits as particularly relevant.

#### Reconciliation

We see reconciliation, as mentioned in 3.1, as one of the areas where DLT will have the most direct impact. Any transaction between two systems usually requires some kind of reconciliation mechanism. However if the systems would share the same ledger the reconciliation would be rendered redundant. While this is achievable with other technologies, DLT has the unique benefit of ensuring transaction integrity and immutability without requiring that the transacting systems trust each other. In the securities markets, DLT could create significant operational benefits for market participants by reducing errors caused by manual processes and reconciliations and making disputes between counterparties less likely.

#### Collateral management

We foresee that DLT could revolutionize the current collateral management process. With securities issued directly on a distributed ledger. The speed with which collateral can be posted and returned will increase significantly, which in turn reduces the collateral in transit and increases the capital efficiency. We see a potential for increased competition in the tri-party/collateral optimization provider space where fintech firms can compete with incumbent custodians on providing the most efficient algorithms for calculating the ideal placement of collateral.

#### Security and resilience

Nasdaq, as operator of numerous regulated entities, agrees with the discussion paper's description of the potential benefits of DLT to regulators and compliance officers. The increased transparency that could be provided to the markets, including real-time access to data, would allow regulators and organizations to monitor and surveil market activities in a comprehensive manner that is not possible today.

Moreover, EMIR and CPMI-IOSCO principles mandate FMIs to have a two hour resumption of critical services no matter what. For a single FMI it is easy to imagine a plausible scenario where this requirement would not be possible to meet, e.g. if a successful cyber-attack would compromise both primary and backup databases. Using the inherent immutability of DLT, two or more FMIs could potentially collaborate on a shared data platform to allow failover to a non-similar facility in case of a disaster. <ESMA\_QUESTION\_DLT\_1>

**Q2: Do you see any other potential benefits of the DLT for securities markets? If yes, please explain.**

<ESMA\_QUESTION\_DLT\_2>

Nasdaq believes there can be additional benefits to securities markets as the potential for innovation based on DLT is far from fully explored. On a general level we believe benefits will come in form of either cost savings (operational, IT, capital) or allowing for new business models (some yet to be identified).

Also, decentralisation of data sources and data management can be seen as a benefit that reinforces resiliency. <ESMA\_QUESTION\_DLT\_2>

**Q3: How would the benefits of the technology be affected, in the case where the DLT is not applied across the entire lifecycle of securities (i.e., issuance, trading, clearing and settlement, safe-keeping of assets and record of ownership) but rather to some activities only?**

<ESMA\_QUESTION\_DLT\_3>

DLT is not a cure for all diseases and there are areas of capital market where it is difficult to imagine DLT being a better technology than what is already implemented. Hence, a critical activity on the route to wide



scale adoption of DLT in securities markets is to identify integration solutions allowing for efficient and secure integration between existing infrastructure and DLT implementations.

Although there are many possible use cases for DLT, the full benefit of DLP in the securities markets will not be realized until securities and other assets can be digitized, issued, recorded, traded and settled on a distributed ledger. However, since there are still significant legal, technological and practical challenges to achieve this objective in the short term, very focused use cases have the most likelihood of successfully bringing benefits to the markets.

For instance, Nasdaq has developed such focused initiatives on two fronts: private issuance of securities and electronic voting by shareholders to general meetings (see reply to question 7 for more details).

Other examples of where small-scale solutions could be successful are:

- two firms replicating their transactions onto a shared ledger in order to be able to act as each other's backup facility in case of a major disturbance at one of the parties;
- a clearing house replicating its transactions onto a distributed ledger in order for members to be able to replicate the data and reduce the need for reconciliation;

As the advancement and the acceptance of DLT grow, it is possible to add new services onto existing distributed ledgers that might originally have served different purposes (e.g. a DLT solution for collateral management could grow with services such as securities lending, settlement or issuance). A full replacement by DLT of the existing transactional infrastructure is likely to take decades so the initial successful implementations of DLT will probably be on a much smaller scale. |

<ESMA\_QUESTION\_DLT\_3>

**Q4: Which activities (e.g., post-trading, other activities), market segments and types of assets in the securities markets are likely to be impacted the most by the DLT in your opinion? How is the DLT likely to modify the way securities markets operate? Please explain.**

<ESMA\_QUESTION\_DLT\_4>

DLT is likely to have a significant impact on post-trade activities. For instance, from a technological and functional perspective, DLT can make it possible to provide CSD services without the same involvement of multiple layers of intermediaries that usually are involved in the holding and transfer of book-entry securities. It would therefore be beneficial with a simplified regulatory regime for "DLT-powered-CSD-service-offerings" where service is made available and used without involving CSDs. The same should be possible for settlement finality and legal recognition of holdings and dispositions of securities.

Settlement finality protection should also be designed and made available for "DLT-powered-CSD-service-offerings" where services are made available and used without the involvement of CSDs and their participants. Equally, a proper legal framework should be designed to support a clear and legally sound environment for circulation of securities through "DLT-powered-CSD-service-offerings" where securities holdings are evidenced without involvement of CSDs and their participants.

In addition to the above, it is Nasdaq's belief that the DLT has inherent features that, if appropriately leveraged, could help increase transparency in securities market, enhancing regulators ability to identify systemic risks, concentration risks, etc.

In Nasdaq's capacity as listing venue on both sides of the Atlantic we frequently hear statements from issuers and holders of securities that the distance between those parties is too long. It is in certain occasions difficult for an issuer to "reach" investors in relation to securities actions, communication and marketing. Through Nasdaq's implementation of a DLT proxy voting application we are also demonstrating DLT's potential in bringing issuers of securities closer to the holders of those securities. |

**Q5: According to which timeframe, is the DLT likely to be applied to securities markets in your view? Please distinguish by type of activities, market segments and assets if relevant.**

<ESMA\_QUESTION\_DLT\_5>

It is Nasdaq's belief that hurdles to wide scale adoption of DLT in securities markets are less related to possible limitations in the DLT itself but more related to contextual aspects such as for example business model/market model design, technical integration/transition, legal/regulatory complexity.

**DLT technology:** Though there are technical issues remaining to be solved before DLT is suitable for wide scale adoption in large scale securities markets, Nasdaq is of the view that it is likely such technical issues will be solved. While it may take some time, a large collective effort by incumbents and newcomers to the financial technology space is ongoing to solve such identified issues. Hence, it is a reasonable prediction that technical limitations at some point will be solved. Thus, development of DLT itself is not a showstopper but it has an impact on the timeframe for adoption of DLT in securities markets.

**Business and Market Model design:** Until recently most projections for DLT's applicability in securities market were on a high level and visionary level ("faster settlement", "more transparency", "cheaper payments solutions"). However, to get to a point where solutions based on DLT reach actual implementation in securities market, these visions first have to be broken down into defined descriptions of services and solution that not only are accepted and desired by its intended consumers but also meet legal, regulatory and technical requirements. The work needed to identify and define viable business and market models is not a showstopper for adoption of DLT in securities markets but has significant impact on the timeframe. It should however be noted that this process is well underway. E.g. Nasdaq has a number of these initiatives ongoing of which Linq for private equity and e-voting are two publicised examples (see reply to question 7 for more details). There are also numerous other recently announced projects that are being implemented by other companies.

**Technical integration and transition:** As discussed above DLT is not a panacea that will replace all existing infrastructure in securities markets. Hence, DLT solutions need to be integrated into the existing ecosystem of infrastructure in securities markets. Again, such integration is not a showstopper for the implementation of DLT in capital markets, but it will of course require efforts and time. Transition planning and execution is also important in DLT business cases based upon the intention that DLT's replacement of legacy technology. No-one will invest in a transition project if there is significant risk that such a transition process gets stuck half-way (leaving participants with the unattractive situation of having to support parallel infrastructures). Hence, agreement across market communities around transition planning and execution is critical and requires efforts impacting the timeline for implementation of DLT in securities markets.

**Legal and regulatory complexity:** Many parties involved in the DLT space are requesting regulators to take a light touch approach to businesses utilising DLT in order not to stifle innovation. While Nasdaq agrees with the request for a reasonable regulatory approach to technical innovation, we believe that legal and regulatory uncertainty can be an important challenge to the adoption of DLT on a large scale in securities markets. The situation of course varies across different jurisdictions and regulatory regimes but some proposed business models enabled by DLT are so innovative that they are simply not assumed by existing legislation and regulation. Hence, the problem is not that existing regulations prohibit the new models but that there is a lack of legal certainty in relation to activities in the new business model. Such examples include, but are definitely

not limited to, certainty about the representation of assets and ownership in DLT format, Settlement Finality, aspects of company law, cross border regulation, data privacy, etc. Hence, for these models based on DLT to get wide adoption in large scale securities markets some legal and regulatory “innovation” is required. Again, as with the above areas, this is not a showstopper but will take time and effort.

Taking the above into account it is reasonable to assume that early adoption of DLT in securities markets is likely to happen in markets where regulatory, technical and business complexity is relatively low and that adoption in more complex and demanding environments is likely to follow once DLT has proved its worth in small to medium sized implementations.<ESMA\_QUESTION\_DLT\_5>

**Q6: How might your organisation benefit from the introduction of the DLT?**

<ESMA\_QUESTION\_DLT\_6>

The introduction of the DLT can benefit our organisation in all of the ways described in the discussion paper given the scope of Nasdaq’s activities in the capital markets and because we provide technology services to market operators around the world.

We consider that benefits will be obtained in particular by allowing increased safety and efficiency reducing time needed to settle transactions and cutting costs as well as potentially allowing for new business models.<ESMA\_QUESTION\_DLT\_6>

**Q7: If you are working on a concrete application of the DLT to securities markets please describe it (i.e., which activities, which market segments, which type of assets and for which expected benefits) and explain where you stand in terms of practical achievements in relation to your objectives.**

<ESMA\_QUESTION\_DLT\_7>

Nasdaq has developed two different use cases of DLT.

In 2015, via its Linq blockchain-enabled system, Nasdaq facilitated the first-ever private securities issuance between an investor and issuer documented and recorded with blockchain technology. Blockchain technology allowed a private company to streamline and secure cumbersome administrative functions (record of ownership).

Nasdaq is developing in Estonia an electronic service: Estonia’s e-Residency platform (electronic identity system) which will be facilitating a blockchain-based e-voting service to allow shareholders of companies listed on Nasdaq’s Tallinn Stock Exchange to vote in shareholder meetings. |

<ESMA\_QUESTION\_DLT\_7>

**Q8: Do you agree with the analysis of the potential challenges? Please explain, e.g., are some more important than others, are some irrelevant in your view.**

<ESMA\_QUESTION\_DLT\_8>

We generally agree with the challenges listed in the paper. Some of these challenges are highlighted in our reply to question 5 as they impact on the timeline for application of DLT to securities markets. This includes legal and regulatory issues.

More specifically, we have comments on the following aspects:

4.1-30: Technological issues, Scalability issues

We disagree: the most obvious example is securities issued on the Bitcoin Blockchain with millions of users globally.

4.1-34: Position netting

We partially disagree. Although it presents a challenge there would be no problem for a system to create a view of the net position of a DLT account by adding the in- and outgoing transactions and e.g. use this information to calculate a margin requirement.

4.3-41: Privacy issues. Furthermore, even if the identity of participants on the DL would be encrypted, there might still be a possibility to derive the identity of the participant by analysing the content of their account which would typically be unencrypted.

5.1-46: Cyber risk, fraud and money laundering. This is typically a risk when “auditor” nodes (typically used by competent authorities which are allowed to read all activity of some or all other participants) are allowed in the DL system. It is important that competent authorities have proper security measurements in place to protect its private keys and also the unencrypted data.

5.4-53; 54,55: Fair competition and orderly markets. We do not see how any of these risks would apply specifically to DLT.

|  
<ESMA\_QUESTION\_DLT\_8>

**Q9: Do you see any other potential challenges? If yes, please explain.**

|  
<ESMA\_QUESTION\_DLT\_9>

Regime for resolving conflict-of-laws situations: Internationally binding regime/rules/procedures need to be designed to allow clear determination of applicable law in conflict-of-laws situations where securities holdings are evidenced without involvement of CSDs and their participants

For instance, "DLT-powered-CSD-service-offerings" need to function smoothly not only in national but also in an international context. This means that counterparties of the securities transactions or holders of securities are often located in different countries and laws of more than one country can influence the legal situation or legal dispute (e.g. buyer located in country A seeks to claim delivery of securities that were not delivered by seller located in country B). |

<ESMA\_QUESTION\_DLT\_9>

**Q10: Which solutions do you envisage for these challenges and where do the current initiatives stand in terms of practical achievements to overcome them?**

|  
<ESMA\_QUESTION\_DLT\_10>

Some regulatory and legal issues may be challenging. However, the approach to be taken in dealing with these issues should ensure that innovation is not prevented but on the contrary supported and encouraged. Some regulators around the world have decided to keep an open mind with respect to these regulatory and legal issues which we find praiseworthy. For instance, the UK FCA has set up a regulatory sandbox to provide a safe place where businesses can test innovative products, services, business models and delivery mechanisms in a live environment without incurring all of the regulatory consequences of that activity. Firms can also get individual guidance, waivers/modifications to FCA rules, and “no-action” letters. |

<ESMA\_QUESTION\_DLT\_10>

**Q11: Do you agree with the analysis of the key risks? Please explain, e.g., are some risks more important than others, are some irrelevant in your view.**

|  
<ESMA\_QUESTION\_DLT\_11>



To develop successfully, DLT will need appropriate data protection and transfer possibilities (including that of personal data). Current rules will need to be adjusted to the needs of DLT.

Due to technological peculiarities of DLT, data may be subject to processing in more than one country at (or close to) the same time. Thus international "DLT-powered-CSD-service-offering" can in no way function without cross-border transfer of data. This may also involve transfer of personal data about the holders of securities: for instance, processing and transfer of personal data (such as name, and national identity codes, and bank account details) may be required to complete the settlement or process and distribute proceeds of corporate actions.

Related to this, cyber resilience aspects have to be taken into account as DLT is also exposed to the same threats as other cyber technologies.

<ESMA\_QUESTION\_DLT\_11>

**Q12: Do you see any other potential risks? Please explain.**

<ESMA\_QUESTION\_DLT\_12>

[TYPE YOUR TEXT HERE ]

<ESMA\_QUESTION\_DLT\_12>

**Q13: How could these risks be addressed? Please explain by providing concrete examples, especially for the risks potentially affecting your organisation.**

<ESMA\_QUESTION\_DLT\_13>

[TYPE YOUR TEXT HERE ]

<ESMA\_QUESTION\_DLT\_13>

**Q14: Do you think that the DLT will be used for one of the scenarios above? If yes, which one(s)? If no, please explain?**

<ESMA\_QUESTION\_DLT\_14>

[TYPE YOUR TEXT HERE ]

<ESMA\_QUESTION\_DLT\_14>

**Q15: If the DLT is used for one of these scenarios, how compliance with the regulatory requirements attached to each scenario could be ensured?**

<ESMA\_QUESTION\_DLT\_15>

[TYPE YOUR TEXT HERE ]

<ESMA\_QUESTION\_DLT\_15>

**Q16: Do you think that the DLT will be used for one of the scenarios above? If yes, which one(s)? If no, please explain?**

<ESMA\_QUESTION\_DLT\_16>

[TYPE YOUR TEXT HERE ]

<ESMA\_QUESTION\_DLT\_16>

**Q17: If the DLT is used for one of these scenarios, how could compliance with the regulatory requirements attached to each scenario be ensured?**

<ESMA\_QUESTION\_DLT\_17>

[TYPE YOUR TEXT HERE ]



<ESMA\_QUESTION\_DLT\_17>

**Q18: Do you think that the DLT will be used for safekeeping and record-keeping purposes? Please explain, with concrete examples where appropriate.**

<ESMA\_QUESTION\_DLT\_18>

[TYPE YOUR TEXT HERE ]

<ESMA\_QUESTION\_DLT\_18>

**Q19: If the DLT is used for the safekeeping and record-keeping of ownership, how could compliance with the regulatory requirements be ensured?**

<ESMA\_QUESTION\_DLT\_19>

[TYPE YOUR TEXT HERE ]

<ESMA\_QUESTION\_DLT\_19>

**Q20: Do you think that the DLT will be used for regulatory reporting purposes? Please explain, with concrete examples where appropriate.**

<ESMA\_QUESTION\_DLT\_20>

[TYPE YOUR TEXT HERE ]

<ESMA\_QUESTION\_DLT\_20>

**Q21: If the DLT is used for regulatory reporting purposes, how could compliance with the applicable regulatory requirements be ensured?**

<ESMA\_QUESTION\_DLT\_21>

[TYPE YOUR TEXT HERE ]

<ESMA\_QUESTION\_DLT\_21>

**Q22: Do you think that the DLT could be used for other securities-related services than those already discussed, in particular trading and issuance?**

<ESMA\_QUESTION\_DLT\_22>

[TYPE YOUR TEXT HERE ]

<ESMA\_QUESTION\_DLT\_22>

**Q23: Do you see potential regulatory impediments to the deployment of the DLT in securities markets?**

<ESMA\_QUESTION\_DLT\_23>

[TYPE YOUR TEXT HERE ]

<ESMA\_QUESTION\_DLT\_23>

**Q24: Should regulators react to the deployment of the DLT in securities markets and if yes how? If you think they should not do so please justify your answer.**

<ESMA\_QUESTION\_DLT\_24>

DLT development is moving rapidly, certainly faster than the underlying legal and regulatory frameworks. A full set of rules to govern DLT are likely years away, leaving relevant industries with little clarity. Given that DLT is being developed quickly and the benefits to the financial and capital markets can be great, we consider that regulators should take an open approach to support innovation based on DLT. We therefore commend approaches taken by the UK FCA (see reply to Question 10) and of the U.S. Commodities Futures Trading Commission (CFTC ). CFTC Commissioner Giancarlo has proposed a “do no harm” regulatory



approach that is based on the regulatory model that was applied to the rise of the Internet two decades ago. As the Internet was entering a phase of rapid growth, the U.S. Congress and Clinton administration established certain foundational principles, including that governments and regulators should not harm the Internet's continuing evolution. In the same way, regulators should form an international consensus to avoid standing in the way of DLT innovation through rule uncertainty or uncoordinated actions. However, the "do not harm" approach should not mean a lack of action. Where regulatory uncertainty will stand in the way of the advancement of blockchain technology, quick, decisive and coordinated action by the regulators to provide clarity is supported.

<ESMA\_QUESTION\_DLT\_24>