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Via electronic submission to: dp17-03@fca.org.uk

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Re: Chamber of Digital Commerce Response to the UK FCA's Discussion Paper on Distributed Ledger Technology

The Chamber of Digital Commerce ("Chamber") appreciates the opportunity to respond to the UK Financial Conduct Authority ("FCA") Discussion Paper on distributed ledger technology.¹

The Chamber is the world's largest trade association representing the blockchain industry. Our mission is to promote the acceptance and use of digital assets and blockchain-based technologies. Our membership is comprised of over 100 companies innovating with and investing in blockchain-based technologies, including financial institutions, exchanges, software companies, top consultancies, and cutting edge fintech start-ups.

We are encouraged by the FCA's forward-thinking approach to considering blockchain and distributed ledger technologies, and hope to further that discussion with the below responses. We are happy to discuss any of this information with the FCA.

Q1: How will firms demonstrate appropriate outsourcing arrangements when relying on third parties (such as core developer groups of public, permissionless networks) to deliver DLT-based solutions?

We believe that outsourcing provisions, like any other provisions potentially applicable to DLT-based solutions, should be technology-neutral. In that context, the outsourcing provisions applicable to firms under SYSC 8² appear in line with the FCA's like-minded approach to regulation. Nevertheless, some of the areas customarily incorporated into such arrangements may present unique challenges, for example, access controls, disaster-recovery, and business continuity plans. Outsourcing arrangements may have unique facets with respect to DLT-based solutions, and we urge the FCA to consult with the industry closely to understand appropriate best practices and meaningful oversight in this area.

¹ The Chamber of Digital Commerce enlisted the help of the law firm of Norton Rose Fulbright in compiling the following responses to the FCA's questions. While it was instrumental in assembling the Chamber's responses, Norton Rose Fulbright has not adopted the responses as its own.

² <https://www.handbook.fca.org.uk/handbook/SYSC/8/1.html>

Q2: What operational risks have firms identified with (i) implementation of DLT systems (ii) system-wide issues affecting multiple firms, and how will they manage them?

Firms continue to manage challenges with respect to the implementation of DLT systems. One challenge is interoperability. Many different companies—and even sovereign nations and localities—throughout the world are developing their own DLT-based applications. However, these applications do not share a common blockchain. The distinct blockchains utilized by the applications may have limited or no connectivity with one another. Lack of interoperability in this context is analogous to a city road system that does not connect to roads outside the city. If drivers cannot connect between cities, they may be unable to take their optimal route or even reach their destination. Similarly, users of one blockchain may miss out on efficiencies or functionality that could be gained given interoperability. Blockchain developers are aware of the necessity that their respective solutions should, in time, be interoperable, and discussions among developers are ongoing.

The adoption of DLT will not likely happen across all entities in a market or industry at the same time. Participants may phase into the network, which could lead to further challenges with respect to interoperability. The Chamber suggests that guidance for interoperability would be best sourced from the industry itself, and across countries and continents. It would be helpful for regulators to work with industry working groups and/or self-regulated organizations around the world to support and guide global interoperability standards. The Chamber encourages the FCA to facilitate the development and implementation of DLT by supporting regulatory harmony across the EU and internationally. Consistency in regulatory treatment will be an important factor in industry growth. The Chamber also encourages the FCA to consider the various structures and levels of regulator-industry engagement currently in place in other jurisdictions when developing its own initiatives.

An issue that has been highly publicized in the media is scaling and limited transaction throughput capacity of some of the open blockchain networks, most notably, the Bitcoin blockchain. The Bitcoin network currently processes only a few hundred thousand transactions per day. The Bitcoin community has been debating various scaling proposals to upgrade the network. The Chamber views these debates as healthy discussions, best suited to take place between the technologists that are necessary to reach consensus and implement any kind of upgrade to the network.

Another challenge concerns privacy considerations while maintaining transparency and regulatory compliance. There have been some developments that attempt to address these challenges, such as Zero Knowledge Proofs and homomorphic encryption. However, the Chamber believes that discussion with regulators regarding privacy options and solutions to enable appropriate guidance would be welcomed.

Finally and relatedly, DLT companies face challenges relating to the right to erasure depending on whether and how certain information is stored on and off the blockchain. Specific technological modifications or solutions may be able to address such regulatory limitations. For example, one of the Chamber's members, Gem, offers a blockchain platform solution known as GemOS, which helps to track all of the events needed to automate the General Data Protection Regulation (GDPR) process. Nevertheless, UK regulators should evaluate whether circumstances exist necessitating the adoption of exemptions or exceptions. The benefits of an immutable blockchain record may, in some cases, outweigh the need for a specific GDPR requirement.

Q3: What is the best way for DLT networks to protect themselves against attempts to break DLT network security?

DLT networks are secured by cryptography and have proven to be highly resilient to breach or attack, as described in the response to Q4, below. Cybersecurity is an ongoing battle, and the Chamber's members are currently working on developments in the area of DLT network security, recognizing that it is a complex and very significant issue. Among the challenges developers face is the potential impact of quantum computing, which could change the landscape in this area and create issues with respect to network resiliency against cyberattacks. In thinking through this and other network security challenges,

the Chamber's members have begun to consider a number of potential best practices for implementers of blockchain technology to follow, such as:

- Make the public key and hashing algorithms configurable and upgradeable, ideally "on the fly" so that systems can adapt quickly if new attacks are discovered.
- Use digital signatures with keys of more than sufficient length.
- Release the full source code to the stack of technology so that it can be independently verified for quantum safety.
- Never store sensitive data directly on a blockchain even in encrypted form; instead store pointers to where that data may exist off-chain.
- Assume that at some future point all encrypted data can be decrypted, even if decades in the future. Design accordingly.

Further development and discussion is required in this area, however, in order to comprehensively address the network security issues facing blockchain implementers.

Q4: What technology resiliency advantages, if any, does DLT have over other types of systems currently available?

As ransomware cyberattacks have demonstrated, one organization's entire business can be at risk if its books and records are corrupted. In contrast, with respect to DLT using blockchain technology, the distributed nature of the system (where every participant has a complete copy of the ledger), combined with the use of MD5 hashing (where the header of each block of information is combined with the header of the preceding block to create a set number of characters), leads to a resilient technology. If one participant's books and records are corrupted, any "bad" information from that corrupted participant would be rejected by the other participants if the "hashes" do not match. If a corrupted participant attempts to alter previously accepted data, that change should also be rejected if the "hashes" do not match.

In other words, in a decentralized system, the greater the number of nodes hosting records, the more difficult it is for someone to compromise the network and manipulate records. DLT can for this reason be safer and more resilient than other types of systems currently available. When considered in the context of critical infrastructure, for example, the inherent resiliency of DLT networks could bring significant advantages.

Q5: What DLT use-cases are currently under development in the (re)insurance sector? Are there likely to be significant (re)insurance DLT deployments in the near term?

Simple DLT-enabled products reliant on IoT or parametric triggers are likely to continue to be launched in the retail sector. We may also see increased interest in alternatives to existing insurance models, including the development of discretionary peer-to-peer cover enabled through decentralised autonomous organisations (or other similar DLT-based protocols). This year, for example, AIG delivered the first blockchain-based multinational insurance policy to UK-based bank Standard Chartered, using IBM technology.

B3i, a consortium currently comprising 15 major insurers, is also experimenting with a potential blockchain for reinsurance, with an initial use case focused on using DLT to facilitate the exchange of data more efficiently across the reinsurance value chain.

Q7: How might DLT be deployed to mitigate financial crime risks, and will regulated firms adopt such solutions? If so, in what timeframe? If not, what are the barriers to adoption?

The deployment of DLT across regulated firms creates potential opportunities to mitigate the risks of fraud, money laundering, and other forms of financial crime. As regulated firms and technology providers have sought to develop applications of DLT in a financial services context, a key stage of that development has been to determine a methodology by which a participant on a particular DLT network

can verify their identity. The verification of a participant's identity marks a significant divergence from the permissionless ledgers that underpin cryptocurrencies such as Bitcoin, which have allowed for transactions to occur across the underlying network on a pseudonymous or anonymous basis.

In contrast, existing proof-of-concept and operational deployments of DLT across the financial services industry have largely involved the use of *permissioned* ledgers, whereby access is monitored and constrained by a central authority or by the participants themselves. Unlike the underlying blockchain network underpinning Bitcoin, any deployment of a permissioned ledger that facilitates the transfer of value or assets or the completion of transactions more generally has inherently involved a need to confirm the identity of the relevant participants of the network.

Firms are currently exploring a range of different mechanisms to address the procedures for confirming identity of participants on a particular network. One such mechanism involves the issuance of identity tokens to a participant that remain fixed throughout the lifetime of that participant's interaction with the network. Another mechanism involves reliance on participant attestations as to their identities. These developments demonstrate that, unlike existing Know-Your-Customer (KYC) and Anti-Money Laundering (AML) procedures, the process of identity management in the context of DLT is far more collaborative and effective, while significantly less labour-intensive. When one considers these factors in conjunction with the immutable nature of identity verifications or identity tokens, as well as the ability of all participants to validate such verifications or tokens independently, it is clear that DLT could help increase the security of financial transactions and limit instances of money laundering or fraud.

Further, DLT may provide new and effective ways to check and confirm identity creating a potential need to amend the current AML/KYC regulations to incorporate this new functionality as a legitimate means for regulated financial institutions to meet AML/KYC obligations. Chamber members are developing blockchain-based tools to monitor transactions and identify activity raising suspicions of money laundering and sanctions violations. For example, KPMG (together with BluZelle and with input from the Monetary Authority of Singapore and a consortium of local, regional, and global banks) has run a successful prototype test for a KYC platform to tackle the challenges that banks and other financial institutions face with customer onboarding. Banks using this platform will be able to conduct KYC checks to verify customers in real-time by utilizing a shared blockchain solution and other third-party sources. Preliminary estimates indicate that overall cost savings for banks would be approximately 25%-50% of what banks currently spend on their KYC processes. The Chamber urges the FCA to work with these companies to ensure that current regulatory frameworks allow for such advances in technology and compliance.

Additionally, a number of companies are developing digital identity solutions so that customers of financial institutions are readily identifiable to the chosen participants, but their identification information is otherwise kept confidential. For example, IBM has partnered with SecureKey Technologies to build the first ever digital identity network in Canada.³ Chamber member NuID is currently working to create a "silver-bullet" generalized identity and authentication system that would support DLT and many other technological solutions in financial services and more generally. NuID's protocol utilizes DLT and modern cryptographic schemes to abstract identity from devices to the individual, providing trustless authentication of trusted identity at any device. The NuID protocol allows for broad integration with almost any traditional login or data security system and could potentially serve as a standard in general authentication and identity validation. Ideally, financial services technologies that implement the NuID protocol could leverage the technology to comply with AML and KYC regulations and securely protect user data while offering easy audit solutions to regulators.

Q8: Is this a viable use case for DLT in the context of asset management? What other examples are there for this sector?

Yes. The Chamber's members develop and promote the adoption of a wide variety of DLT applications, many of which concern asset management.

³ <https://www.ibm.com/blockchain/identity>

For example, Digital Asset (“DA”) is building a permissioned DLT platform for the financial services industry (the “DA Platform”) that mutualizes financial market infrastructure across market participants while maintaining confidentiality and scalability, both vital for large, regulated markets. The DA Platform eliminates discrepancies between disparate but duplicative, siloed data records, reducing the current errors, latency, risk, cost, and capital requirements involved in processing financial transactions. Participants in the DA Platform share a single source of truth which provides continuous data integrity, any desired or mandated degree of transparency, and the opportunity for rapid innovation. The DA Platform does not share any confidential information with parties not entitled to view it, yet still has the same network integrity guarantees as typical blockchain solutions.

Natixis Asset Management has revealed that investors have successfully purchased shares in Natixis AM’s funds through a prototype of a proposed DLT-powered fund distribution platform, FundsDLT. FundsDLT is the result of collaboration between FundSquare (a subsidiary of the Luxembourg Stock Exchange), InTech (a subsidiary of POST Group), and KPMG in Luxembourg. The platform is being developed to enable asset managers to sell funds through a new distribution channel, while significantly reducing administration costs and the time to process transactions for both asset managers and other asset servicers. FundsDLT will streamline a range of fund administration and order-routing tasks by using blockchain to automate several processes in a secure manner. The model is applicable to a wide range of funds and does not depend on the jurisdiction.

As noted above, NuID could also serve a major role in asset management. NuID uses DLT technology and an innovative key-management protocol to secure digital information and interactions, which allows for simpler digital identity management, frictionless developer implementation, and improved security in multiple layers of Internet transactions. The NuID protocol can secure personal information on a blockchain related to financial payments, smart contracts, healthcare, and asset digitization, among other things.

In the United States, multiple state governments are employing DLT, including for uses related to the management of real property and secured property. The State of Illinois recently reported that it is using DLT to create “[a]n irreversible and distributed public record with the ability to prevent unauthorized or fraudulent property transfers through public key cryptography.”⁴ The State of Delaware, which is home to approximately two-thirds of the Fortune 500, is working with Symbiont to permit companies to issue and transfer shares via blockchain.⁵

Q9: What other examples are there of DLT providing direct and tangible benefits to consumers? What are the risks associated with these?

The Chamber believes that DLT offers a number of direct and tangible benefits to consumers. Several members point to DLT’s ability to improve “financial inclusion” and strongly believe that DLT offers a multitude of financial opportunities for the “unbanked” and “underbanked.” The Chamber has composed a detailed research piece concerning the “approximately 2 billion individuals who lack financial access and an additional 1.5 billion individuals who are underserved by the financial service industry,” who typically must pay much higher costs for basic financial services.⁶ (The research piece is not specifically UK-focused but addresses financial inclusion as a broader issue affecting consumers worldwide.)

By way of example, the use of mobile phones offers significant promise to open and operate bank accounts.⁷ The automation benefits of DLT can also help increase trust in financial products (e.g., insurance) by facilitating the automatic payment of claims using external triggers, significantly simplifying the claims process at a time of distress for customers. The Chamber also believes that consumers will benefit by obtaining financial services at faster speeds and lower costs. As a result, consumers worldwide

⁴ <http://statescoop.com/illinois-blockchain-initiative-launches-alongside-blockchain-business-liaison-role>

⁵ <http://www.coindesk.com/what-expect-delaware-blockchain-initiative-2017/>

⁶ Blockchain and Financial Inclusion: The role blockchain technology can play in accelerating financial inclusion.

⁷ *Id.*

are expected to benefit of multiple and varied ways by use of this technology in almost every industry. Ripple, for example, has also demonstrated the ability to use blockchain technology (and its own cryptocurrency) to process foreign currency transactions in less time with significantly reduced risk associated with variable exchange rates.¹

Q10: How do respondents see the use of smart contracts developing in financial services? Please provide examples, ideally which have been already live tested.

The Chamber sees smart contracts as potentially covering a large range of situations, stretching from natural language contracts with encoded payment mechanisms to contracts written entirely in code. Some innovations already taking shape include the use of smart contracts to automate aspects of both traditional securities and securities issued in natively digital form. Another example is an insurance-linked bond that could be issued in which a smart contract would be triggered to pay out investors as a result of a third party “oracle” showing that an extrinsically determinable event had occurred. Smart contracts could track securitized assets, prevent inconsistent conduct with respect to those assets, and even prompt consideration of an amendment of ratings of tranches. Smart contracts could enforce net capital maintenance requirements, prompt customer disclosures, and even carry out tender offers and redemptions.

Securities could be coded as smart contracts that automate much of the post-trade process, including processing, payment, amendments, and clearing and settlement. Real-time information sharing could enable buy- and sell-side firms to agree on trade details rapidly, further lowering costs and risks. Symbiont has developed “smart securities” to issue, manage, trade, clear, settle, and transfer financial instruments on a blockchain. As described above, AIG has also recently announced the use of DLT to deliver smart insurance policies in the United Kingdom, United States, Singapore, and Kenya. Other notable use cases include:

- tØ.com, a subsidiary of Overstock.com, has developed a post-trade blockchain platform that settles equities and bond trades in real time using cryptographically protected DLT to improve the security and efficiency of financial transactions.
- The Depository Trust and Clearing Corporation (“DTCC”) is working with IBM, Axoni, and R3 to re-platform its Trade Information Warehouse (“TIW”), building a derivatives distributed ledger solution for post-trade processing. DTCC is also working with DA to explore the potential use of a DLT-based platform to manage the netting process for start leg repo transactions. ASX Limited (“ASX”) and DA also are working together to build a candidate replacement to replace their clearing and settlement system (CHES) utilizing DLT.
- BNY Mellon, UBS, Deutsche Bank, Santander, and ICAP, along with technology provider Clearmatics, are working together to explore the possibility of using DLT to clear and settle financial trades over blockchain using a “Utility Settlement Coin”—that is, in effect, an electronic depository receipt for fiat currency to be held in central bank accounts.

Numerous blockchain use cases are likely to involve cooperation with other market players. Consortiums, like Hyperledger (an umbrella project of open-source blockchains), will be extremely important to the development and growth of blockchains, particularly for the use cases of financial service back office solutions.

Q11: Does the use of digital currencies to provide financial services carry with it different or more benefits and risks than current systems available? Are there examples of this already occurring in industry?

Digital currency transactions are transferred and settled much faster than many transactions using fiat currency, and typically incur fees that are much lower than traditional transactions. This combination of factors, in addition to blockchains that enable peer-to-peer networking, enables people worldwide to

transact with each other much more efficiently and effectively than ever before. For example, digital exchange Circle offers a practical, DLT-based application that can be used by anybody to send and receive money via a mobile app or text messaging. The Circle application offers zero transaction fees and allows consumers to conduct consumer p2p transactions in multiple currencies in numerous geographic locations.

As such, digital currency has the potential to reach millions of individuals that currently do not have easy access to traditional banks, as well as enable complex commercial transactions in a much more efficient and accurate manner. Digital currencies can also be divided into very small units, enabling micropayments where not previously possible, such as for reading an article or playing a song.

A number of countries have already begun experimenting with sovereign-backed digital currencies. Some of the benefits cited by other national regulators and governments include the potential for increased visibility of value flows in the economy, and hence increased ability to conduct advanced analytics on systemic and market risks. The increased visibility of value flows may also be helpful to tax authorities in developing and executing tax policies.

Q12: What are the benefits and risks of using a public, permissionless DLT network on an existing protocol, rather than the development of proprietary DLT protocols?

For many applications, the Chamber believes there are advantages to utilizing a public, permissionless DLT system instead of a proprietary system. First, since records are held in a decentralized manner, more individuals and entities can participate, making it more difficult for bad actors to compromise a permissionless system. Generally, the more nodes that host records, the stronger the security, as no one node is critical to the integrity of the DLT platform.

Additionally, a permissionless system is essentially a consensus system, so a wide range of parties can contribute to the system as a community of developers. This structure helps to keep maintenance and development costs low, as well as foster innovation and creativity. Permissionless blockchains yield permissionless innovation, which a centralized governing entity may not have been able to predict or develop unilaterally. Finally, and along these same lines, there are several proven permissionless DLT systems already in existence (e.g., the Bitcoin blockchain), which may be leveraged by industry participants who do not want to assume the costs of developing their own proprietary systems.

On the other hand, permissioned DLT networks address potential privacy and other regulatory compliance concerns in certain cases and in certain highly regulated industries (e.g., financial services). For example, a permissioned DLT network can be operated by a financial institution for use by its customers, who are identified through the network in a manner compliant with KYC and AML requirements. Additionally, permissioned blockchain systems may avoid issues of scalability more nimbly than permissionless systems.

Q15: Do firms see the above examples of realistic use cases for DLT in securities issuance and trading?

Please see the Chamber's response to Question No. 10, above.

Q16: What legal and regulatory challenges do firms find in fitting initial coin offerings into our regulatory framework?

As a preliminary matter, the Chamber views initial coin offerings or "token sales" as a positive development for businesses and citizens that stands to democratize investment and provide funding for important technology development. Token sales have the ability to foster greater innovation by making capital available to entrepreneurs who would not otherwise be able to raise funds through traditional avenues efficiently. Most of the Chamber's members have not yet undertaken a token sale but, like others, take a keen interest in the development of this concept. That said, some members have considered the

issues, which are complex because they vary from one jurisdiction to another and because few jurisdictions have designed or updated their regulatory frameworks to take token sales into account.

In any token sale, the first question is which laws apply, given that the entity selling tokens may not be incorporated or based in the UK, and purchasers may be located anywhere in the world. Consider, for example, where the token is governed by a distributed autonomous organization or “DAO” - without a single organization behind it. These are complicated questions even for the most sophisticated.

The question of whether securities laws apply requires a detailed analysis under long-established laws designed for traditional financial instrument offerings. These can include what rights and obligations the tokens provide against a long list of specified investments and other concepts such as electronic money and payment accounts. The analysis has to be done on a case-by-case basis because the tokens that are being offered vary quite widely in their purpose or potential uses. As a new innovation, token sales may not readily fit within existing standards and parameters. Nevertheless, we support the need for sound financial operations and the need to protect consumers while allowing evolution of this development in finance.

While UK regulation may not directly apply to the majority of token offerings, the Chamber believes that in an absence of industry best practices, a few bad apples could tarnish an otherwise vibrant and important ecosystem. To that end, the Chamber is actively working with its members to develop industry best practices for the development and issuance of new tokens.

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We appreciate the FCA’s opportunity to provide comment. If you have any questions, please do not hesitate to contact us.

Yours truly,

A handwritten signature in cursive script that reads "Perianne Boring".

Perianne Boring
Founder and President
Chamber of Digital Commerce

cc: Amy Davine Kim, Global Policy Director and General Counsel, Chamber of Digital Commerce
Ron Smith, Norton Rose Fulbright
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