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Distributed ledger technologies and blockchains: building trust with disintermediation

European Parliament resolution of 3 October 2018 on distributed ledger technologies and blockchains: building trust with disintermediation (2017/2772(RSP))

(2020/C 11/02)

The European Parliament,

— having regard to the question to the Commission on distributed ledger technologies and blockchains: building trust with disintermediation (O-000092/2018 – B8-0405/2018),

— having regard to the motion for a resolution of the Committee on Industry, Research and Energy,

— having regard to its resolution of 26 May 2016 on virtual currencies ([1]),

— having regard to its resolution of 28 April 2017 on 'FinTech: the influence of technology on the future of the financial sector ([2]),

— having regard to its resolution of 6 February 2018 on 'Geo-blocking and other forms of discrimination based on customers' nationality, place of residence or place of establishment' ([3]),

— having regard to the General Data Protection Regulation (Regulation (EU) 2016/679),

— having regard to the proposal for a regulation on extension of the duration of the European Fund for Strategic Investments (COM(2016)0597 – C8-0375/2016 – 2016/0276(COD)),

— having regard to its resolution of 11 October 2017 on the Council position on the draft general budget of the European Union for the financial year 2018 (11815/2017 – C8-0313/2017 – 2017/2044(BUD)) ([4]),

— having regard to the Commission initiatives for the exploration of DLTs, among them 'Blockchain4EU: Blockchain for Industrial Transformations', 'EU Blockchain and Observatory Forum', 'Blockchains for Social Good' and 'Study on the Opportunity and Feasibility of an EU Blockchain Infrastructure',

— having regard to Rules 128(5) and 123(2) of its Rules of Procedure,

A. whereas Distributed Ledger Technology (DLT) and blockchain can constitute a tool that promotes the empowerment of citizens by giving them the opportunity to control their own data and decide what data to share in the ledger, as well as the capacity to choose who else can see them;

B. whereas DLT is a general-purpose technology which can improve transaction cost efficiency by removing intermediaries and intermediation costs, as well as increasing transaction transparency, also reshaping value chains and improving organisational efficiency through trustworthy decentralisation;

C. whereas DLT can introduce, through the necessary encryption and control mechanisms, an IT-based paradigm that can democratise data and improve trust and transparency, providing a secure and efficient route for the execution of transactions;

D. whereas DLT promotes the pseudonymisation of users but not their anonymisation;

([1]) Texts adopted, P8_TA(2016)0228.
([2]) Texts adopted, P8_TA(2017)0211.
([3]) Texts adopted, P8_TA(2018)0023.
([4]) Texts adopted, P8_TA(2017)0408.

E. whereas DLT is a still evolving technology which necessitates an innovation-friendly, enabling and encouraging framework that provides legal certainty and respects the principle of technology neutrality, while at the same time promoting consumer, investor and environmental protection, increasing the social value of the technology, reducing the digital divide and improving the digital skills of citizens;

F. whereas DLT can provide a framework of transparency, reduce corruption, detect tax evasion, allow the tracking of unlawful payments, facilitate anti-money laundering policies, and detect misappropriation of assets;

G. whereas DLT makes it possible to ensure the integrity of data, and the ability to provide a tamper-evident audit trail permits new models of public administration and helps bring about improved safety;

H. whereas the regulatory approach toward DLT should be innovation-friendly and based on the principle of technology neutrality, enabling also the creation of innovation- friendly ecosystems and innovation hubs;

I. whereas blockchain is only one of several types of DLTs; whereas some DLT solutions store all individual transactions in blocks which are attached to each other in chronological order in order to create a chain which ensures the security and integrity of the data;

J. whereas cyberattacks are considered to have less impact on such chains, as they need to successfully target a large number of copies rather than a centralised version;

K. whereas DLT can significantly improve key sectors of the economy as well as the quality of public services, providing high-level transactional experience to consumers and citizens and reducing the costs incurred by them;

L. whereas questions and concerns related to the application of horizontal regulation and rules, on issues such as data protection or taxation, can inhibit the potential for development of DLT in the EU;

M. whereas DLT applications have the potential quickly to become systemic, similarly to how digital innovations have fundamentally changed services in other sectors, such as telecommunications;

N. whereas the risks and problems of the technology are not yet completely known;

DLT, decentralisation and applications

1. Stresses that DLT reduces intermediation costs in a trusted environment between the transacting parties and allows peer-to-peer exchange of value that can empower citizens, disrupt legacy models, improve services and reduce costs throughout value chains, in a wide range of key sectors;

2. Underlines the profound impact that DLT-based applications could have on the structure of public governance and the role of institutions, and asks the Commission to carry out a study assessing the potential scenarios of a wider uptake of public DLT-based networks;

3. Highlights the wide range of DLT-based applications that could potentially affect all sectors of the economy;

Energy- and environment-friendly applications

4. Underscores that DLT can transform and democratise the energy markets by allowing households to produce environment-friendly energy and exchange it on a peer-to-peer basis; stresses that such technologies provide scalability and flexibility for plant operators, suppliers and consumers;

5. Underlines that DLT can support the production and consumption of green energy and could improve the efficiency of energy exchanges; notes that DLT can transform the grid operation and allow communities and individuals to provide grid services as well as to integrate renewable resources more efficiently; also stresses that DLT can create alternatives to state-sponsored renewable investment schemes;

6. Notes that DLT can facilitate the energy transmission and distribution infrastructure and create a new transaction ecosystem surrounding electric vehicles; stresses that DLT improves energy reporting and enables accurate tracking of renewable or carbon certificates;

7. Stresses that DLT can support the electrification of poor rural communities through alternative payment and donation mechanisms;

8. Underlines the need to promote technical solutions that are less energy-consuming and are generally as environment-friendly as possible; stresses that several consensus mechanisms, among them 'proof-of-work', 'proof-of-stake', 'proof-of-authority' and 'proof-of-elapsed-time', have different energy consumption needs; calls on the Commission to add an energy efficiency dimension in its activities related to DLT and to explore through research initiatives the energy impact and energy efficiency of the various consensus mechanisms;

9. Calls for an assessment of governance models within the diverse consensus mechanisms under development, taking into account the potential needs of intermediary systems, actors and organisations in order to validate and verify the authenticity of the exchanges and to prevent fraudulent behaviour in good time;

10. Highlights that DLT can bring new opportunities to the circular economy by incentivising recycling and enabling real-time trust and reputation systems;

Transport

11. Underscores the potential of DLT for mobility and logistics, including registration and administration of vehicles, verification of driving distances, smart insurance and charging of electric vehicles;

Healthcare sector

12. Highlights the potential of DLT to improve data efficiency and the reporting of clinical trials in the health sector, allowing digital data exchange across public and private institutions under the control of the citizens/patients;

13. Recognises the potential for improvement of the efficiency of the healthcare sector through electronic health data interoperability, identity verification and a better distribution of medication;

14. Notes that DLT allows citizens to control their health data and benefit from transparency thereon, and to choose which data to share, also with regard to their use by insurance companies and the wider healthcare ecosystem; stresses that DLT applications should protect the privacy of sensitive health data;

15. Calls on the Commission to explore DLT-based use-cases in the management of healthcare systems, and to identify benchmark cases and requirements that enable high- quality data entry and interoperability between different DLTs, depending on systems and on types of institution and their work processes;

Supply chains

16. Underlines the significance of DLT in improving supply chains; notes that DLT can facilitate the forwarding and monitoring of origin of goods and their ingredients or components, improving transparency, visibility and compliance checking, by providing assurances that sustainability and human rights protocols are respected in the place of origin of a product, thus reducing the risk of illegal goods entering the supply chain and ensuring consumer protection; notes that DLT can be used as a tool to improve the efficiency of customs officers for counterfeit checking

Education

17. Stresses the potential of DLT for verification of academic qualifications, encrypted educational certification (e.g. 'blockcerts') and credit transfer mechanisms;

18. Stresses that lack of knowledge about the potential of DLT discourages European citizens from using innovative solutions for their businesses;

19. Highlights the need to establish non-profit-making entities, for example research centres, that would be innovation hubs which would specialise in DLT technology in order to perform educational functions regarding the technology in Member State;

20. Calls on the Commission to explore the possibility of creating an EU-wide, highly scalable and interoperable network that makes use of the technological resources of educational institutions in the Union, with a view to adopting this technology for sharing data and information, thus contributing to the more effective recognition of academic and professional qualifications; also encourages Member States to adapt specialised curricula at university level in order to include the study of emerging technologies such as DLT;

21. Recognises that for DLT to be trusted, awareness and understanding of the technology need to be improved; calls on the Member States to address this through targeted training and education;

Creative industries and copyright

22. Underlines that for 'digitalised' creative content, DLT can enable the tracking and management of intellectual property and facilitate copyright and patent protection; emphasises that DLT can enable greater ownership and creative development by artists through an open public ledger that can also clearly identify ownership and copyright; highlights that DLT could help link creators to their work, thus enhancing safety and functionality in the context of a collaborative and open innovation ecosystem, especially in areas such as additive manufacturing and 3D printing;

23. Notes that DLT might benefit authors by bringing more transparency and traceability to the use of their creative content, as well as cutting down on intermediaries, with regard to them receiving payment for their creative content;

Financial sector

24. Highlights the significance of DLT in financial intermediation and its potential for improving transparency and reducing transaction costs and hidden costs by better managing data and streamlining processes; draws attention to the interoperability challenges that use of the technology can pose for the financial sector;

25. Welcomes the research and experimentation that major financial institutions have undertaken in the exploration of the capabilities of DLT; stresses that use of the technology can also affect financial industry infrastructures and disrupt financial intermediation;

26. Calls on the Commission and the financial authorities to monitor developing trends and use-cases in the financial sector;

27. Emphasises the volatility and uncertainty surrounding cryptocurrencies; notes that the feasibility of alternative methods of payment and transfer of value using cryptocurrencies can be examined further; calls on the Commission and the ECB to provide feedback on the sources of volatility of cryptocurrencies, identify dangers for the public, and explore the possibilities of incorporating cryptocurrencies in the European payment system;

DLT ecosystem

Self-sovereignty, identity and trust

28. Underscores that DLT enables users to identify themselves while being able to control what personal data they want to share; notes that a wide range of applications can allow different levels of transparency, raising the need for applications to be compliant with EU law; stresses also that data in a public ledger are pseudonymous and not anonymous;

29. Underscores that DLT supports the emergence of new models to change the current concept and architecture of digital identities; notes that as a result digital identity is extended to people, organisations and objects, and further simplifies identity processes such as 'Know Your Customer' while enabling personal control over data;

30. Stresses that personal data management implies that users have the capacity and the technical knowledge and skills to manage their own data; is concerned about the dangers of misusing one's own data and vulnerability to fraudulent schemes due to lack of knowledge;

31. Emphasises that digital identities are imperative for the future of this technology; considers that Member States should exchange best practices on how to ensure the security of such data;

32. Underlines that although DLT promotes self-sovereign identity, the 'right to be forgotten' is not easily applicable in this technology;

33. Emphasises that it is of the utmost importance that DLT uses are compliant with the EU legislation on data protection, and notably the General Data Protection Regulation (GDPR); calls on the Commission and the European Data Protection Supervisor (EDPS) to provide further guidance on this point;

34. Stresses that trust in DLT is enabled by cryptographic algorithms that replace the third- party intermediary through a mechanism that performs the validation, safeguarding and preservation of transactions;

35. Stresses that trust in permissionless blockchains is enabled by cryptographic algorithms, the participants, the network design and the structure, and that third-party intermediaries can be replaced through a mechanism that performs the validation, safeguarding and preservation of transactions and accelerates the clearing and settlement of certain securities transactions; notes that the efficiency of the safeguards is dependent on the proper implementation of the technology, and that this calls for technological developments that ensure genuine safety, thus enhancing trust;

Smart contracts

36. Emphasises that smart contracts are an important element enabled by the DLT and can act as a key enabler of decentralised applications; stresses that the Commission needs to undertake an in-depth assessment of the potential and legal implications, e.g. risks relating to jurisdiction; believes that use-case monitoring will be beneficial in exploring the potential of smart contracts;

37. Emphasises that legal certainty surrounding the validity of a digital cryptographic signature is a critical step towards facilitating smart contracts;

38. Calls on the Commission to promote the development of technical standards with relevant international organisations such as ISO, ITU and CEN-CELENEC, and to conduct an in-depth analysis of the existing legal framework in individual Member States in relation to the enforceability of smart contracts; calls on the Commission, should potential barriers arise to the use of smart contracts within the Digital Single Market, to take appropriate measures to assess whether such barriers are proportionate; notes, however, that legal certainty can be enhanced by means of legal coordination or mutual recognition between Member States regarding smart contracts;

Interoperability, standardisation and scalability

39. Stresses that there is a constellation of DLT technologies with various technological characteristics as well as different mechanisms concerning governance (permissioned and permissionless distributed ledgers) and consensus;

40. Notes that ensuring efficiency requires interoperability: (i) between DLTs; (ii) between applications built on the same DLT; and (iii) between DLTs and legacy systems;

41. Welcomes the initiatives of organisations such as ISO to establish standards for DLTs; calls on the Commission to continue to collaborate with other international organisations in standards setting;

42. Emphasises the importance of taking a global approach to standards setting so that innovative companies are not regulated out of the EU;

43. Underlines that trust generation through DLTs requires extended numbers of robust and expanded distributed ledgers, in order to avoid the concentration of data in the hands of a few market players, since this might lead to collusion; encourages the creation of DLT hubs across the EU,

Infrastructure security

44. Recalls the importance of DLT infrastructure protection, and suggests that if we are to effectively reap the benefits of this technology, abuses of dominant position must not be allowed;

45. Calls on the Commission to closely monitor technological developments (such as quantum computing), assess technological risks, support resilience to a cyberattack or a system breakdown, and promote data protection projects that ensure the sustainability of DLT platforms as part of the agenda of the EU Blockchain Observatory; calls on the Commission to allocate resources accordingly;

46. Encourages the competent authorities and the Commission to develop stress testing for DLT applications;

Strategic importance of DLT for public infrastructure

47. Underlines the efficiency potential of DLT for public sector services and management as regards reducing bureaucracy, especially with a view to enforcement of the eGovernment Action Plan, with particular reference to the EU-wide adoption of the digital Once-Only Principle (TOOP) and thus further reducing administrative burdens for citizens, businesses and public administrations;

48. Underscores the potential of DLT to decentralise governance and improve the capacity of citizens to hold governments accountable; calls on the Commission to explore the improvement of traditional public services, including inter alia the digitalisation and decentralisation of public registries, land registry, licensing, citizen certification (e.g. birth or marriage certificates) and migration management, in particular by the development of concrete use-cases and pilots; calls on the Commission also to explore DLT applications that improve processes related to the privacy and confidentiality of data exchanges, as well as access to e-government services using a decentralised digital identity;

49. Is aware of the risks associated with DLT applications, in particular the use of unpermissioned blockchain applications for criminal activities, including tax evasion, tax avoidance and money laundering, and insists that these issues must be monitored and addressed urgently by the Commission and the Member States; calls on the Commission, to this end, also to explore the potential of DLT in the areas of law enforcement, tracking of money laundering and shadow economy transactions, and tax monitoring;

50. Calls on the Commission to monitor the potential of DLT for improving the social good, and to assess the social impact of the technology;

51. Calls on the Commission to create DLT-based platforms that will allow the monitoring and tracking of EU funding to NGOs, thus increasing the visibility of the EU assistance programmes and the accountability of the recipients;

52. Stresses, bearing in mind the efficiency opportunities DLT brings, the potential of DLT European public sector blockchains, compliant with EU law, that will enable decentralised cross-border transactions between Member States, thus facilitating the development of more secure and streamlined services, regulatory reporting, and data transactions between citizens and the EU institutions;

53. Underlines that EU public sector blockchains would enable greater transparency, as well as more streamlined processing of information and development of more secure services for European citizens; stresses how a permissioned blockchain network shared between Member States could be designed in order to store citizens' data in a secure and flexible manner;

54. Calls on the Commission to evaluate the safety and efficiency of electronic voting systems, including those that employ DLTs, for both private and public sectors; encourages the further exploration of use-cases;

SMEs, technology transfer and financing

55. Welcomes the potential of DLT to improve existing value chains, transform business models and thus promote innovation-driven prosperity; highlights the impact of streamlining supply chains and increasing interoperability among firms;

56. Highlights that open blockchain protocols can lower entry barriers for SMEs and improve competition in digital marketplaces;

57. Stresses that SMEs can benefit from disintermediation by reducing transaction costs, intermediation costs and red tape; notes that the use of DLT requires investment in specialised infrastructure or high-capacity services;

58. Notes that innovative SMEs and start-ups need access to funding in order to develop DLT-based projects; calls on the EIB and the EIF to create funding opportunities that support DLT-based entrepreneurial endeavours to accelerate technology transfer;

59. Asks the Commission to partner with Member States in order to ensure legal certainty for investors, users and citizens, both active and passive, while encouraging harmonisation within the Union and studying the idea of introducing a European passport of DLT-based projects;

60. Underscores the potential of Initial Coin Offerings (ICOs) as an alternative investment instrument in funding SMEs and innovative start-ups and to accelerate technology transfer; stresses that lack of clarity with regard to the legal framework applicable to ICOs can negatively affect their potential; recalls that legal certainty can be instrumental in increasing investor and consumer protection and reducing the risks stemming from asymmetric information, fraudulent behaviour, illegal activities such as money laundering and tax evasion, and other risks as highlighted by the European Securities and Markets Authority (ESMA) in its 2017 report on ICOs; calls on the Commission to provide guidelines, standards and disclosure requirements, especially in the case of utility tokens that qualify more as a distinct asset class and less as a security;

61. Emphasises the dangers related to ICOs; calls on the Commission and the regulatory authorities concerned to identify criteria that enhance investor protection and articulate disclosure requirements and obligations for the initiators of ICOs; stresses that legal clarity is essential for unleashing the potential of ICOs and preventing fraud and negative market signals;

62. Underscores that ICOs can be an essential element within the capital markets union; calls on the Commission to explore the legal requirements that will allow this asset class to be blended with other financial vehicles in strengthening SMEs' funding and innovation projects;

63. Calls on the Commission to create an Observatory for the Monitoring of ICOs, as well as a database of their characteristics and taxonomy, distinguishing security and utility tokens; suggests that a model framework of regulatory sandboxes and a code of conduct accompanied by standards could be the beneficial outcome of such an observatory in terms of helping Member States explore ICOs' possibilities;

64. Welcomes the decision by the Commission and Council to include DLTs as a legitimate sector for funding in EFSI 2.0;

Policies for boosting DLTs in Europe

65. Stresses that any regulatory approach toward DLT should be innovation-friendly, should enable passporting, and should be guided by the principles of technology neutrality and business-model neutrality;

66. Urges the Commission and the Member States to develop and pursue digital skills training and retraining strategies that can ensure European society's active and inclusive participation in the paradigm shift;

67. Encourages the Commission and the national competent authorities to swiftly build up technical expertise and regulatory capacity, allowing for rapid legislative or regulatory action if and when appropriate;

68. Underlines that the Union should not regulate DLT per se, but should try to remove existing barriers to implementing blockchains; welcomes the Commission's approach of following a use-case method in exploring the regulatory environment around the use of DLT and the actors using it by sector, and calls on the Commission and the Member States to foster the convergence and harmonisation of regulatory approaches;

69. Calls on the Commission to assess and develop a European legal framework in order to solve any jurisdictional problems that may arise in the event of fraudulent or criminal cases of DLT exchange;

70. Notes that the use of cases is essential to the development of best practices in the DLT ecosystem and to the assessment and management of the effects on employment structure of automatising procedures;

71. Welcomes forward-looking research frameworks aimed at improving assessment of the potential opportunities and challenges of emerging technologies in support of better decision-making, and, concretely, welcomes the Commission's project 'Blockchain4EU: Blockchain for Industrial Transformations';

72. Asks the Commission and the Member States to develop common initiatives to raise awareness and train citizens, businesses and public administrations with a view to facilitating the comprehension and uptake of this technology;

73. Highlights the importance of research into and investment in DLT; notes that the post-2020 MFF should ensure funding for research initiatives and projects based on DLT, as basic research on DLT is needed, including on the potential risks and societal impact;

74. Calls on the Commission to raise awareness concerning DLTs, to undertake initiatives for the education of citizens regarding the technology, and to address the problem of the digital gap between Member States;

75. Recommends that existing and future DLT-related initiatives and pilot projects carried out by the Commission should be closely coordinated, possibly under the guidance of the EU Blockchain Observatory, so as to realise synergy effects and ensure the creation of real added value while avoiding costly double structures; invites the Commission to undertake regular exchanges with Parliament on the progress achieved in DLT-related pilot projects;

76. Asks the Commission to undertake policy initiatives that promote the competitive position of the EU in the field of DLT;

77. Emphasises that the Union has an excellent opportunity to become the global leader in the field of DLT and to be a credible actor in shaping its development and markets globally, in collaboration with our international partners;

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78. Instructs its President to forward this resolution to the Commission and the Council.