



# Technology Landscape: Blockchain

## Introduction

This publication forms part of the [IESBA's Technology Working Group's Phase 2 Report](#), which documents the impacts of disruptive and transformative technologies on the work of professional accountants, and provides extensive analysis and insights into the ethics dimension of those developments.

Specifically, this publication surveys the technology landscape in relation to Blockchain (including Cryptocurrencies, Tokens and Decentralized Finance) and summarizes the outcomes of the Working Group's fact-finding into the trends, opportunities, and impact/ risks related to ethics implications of such technologies.

The Working Group comprises Brian Friedrich, IESBA Member and Chair of the Working Group; Vania Borgerth, IESBA Member; David Clark, IESBA Technical Advisor; Christelle Martin, IESBA Member; and Sundeep Takwani, former IESBA Technical Advisor.

The full [Phase 2 Report](#) also discusses the relevance and importance of the overarching principles and specific provisions in the [International Code of Ethics for Professional Accountants \(including International Independence Standards\)](#) (the Code) in laying out the ethics guardrails for professional accountants as they face opportunities and challenges in their work as a result of rapid digitalization.

This publication does not amend or override the Code, the text of which alone is authoritative and reading it is not a substitute for reading the Code and is not intended to be exhaustive and reference to the Code itself should always be made. This publication does not constitute an authoritative or official pronouncement of the IESBA.

## Technology Landscape

This section covers the trends, opportunities, and impact/risks of the following technologies and related issues: Robotic Process Automation (RPA), AI, blockchain, cloud computing, and data governance, including cybersecurity. Key ethics-related concerns arising from these technologies and issues are covered in the subsequent subsection entitled [C: Potential Ethics Impact on the Behavior of PAs](#). The Working Group notes that most of the ethics-related impact/risks and key concerns are addressed by provisions in the extant Code and proposals in the Technology ED. Those that the Working Group believes can benefit from further guidance are outlined in [Section III: Insights and Recommendations](#).

Stakeholders report that the most common emerging technologies and technology-related issues currently impacting business processes are RPA, AI (including intelligent process automation (IPA)),<sup>1</sup> cybersecurity (including data privacy), and blockchain. It was consistently reported, however, that the uptake by organizations of AI and blockchain-related technologies is slower than

expected and slower relative to the publicity these technologies receive. Based on stakeholder and TEG commentary, as well as desk research, it appears that most organizations are finding these technologies challenging to effectively implement as a result of process fragmentation, resources being allocated to other priorities, difficulties in establishing business cases (for example, a lack of understanding of the return on investment (ROI) arising from the technology or a belief that the ROI is too slow), and the general lack of maturity, and accordingly lack of understanding, of the technologies.

Nevertheless, accelerated implementation of transformative technologies has been observed – particularly in the past couple of years – often connected with mitigating business issues related to the COVID-19 pandemic, such as RPA, cloud computing, tools to support remote working and access, and addressing cybersecurity concerns.

## Blockchain (Including Cryptocurrencies, Tokens and Decentralized Finance)

### Trends

1. In its basic form, blockchain is a decentralized digital ledger, and has been touted as having the potential to revolutionize the operations of businesses, governments, and economies, specifically in the way transactions are initiated, processed, authorized, recorded, reported, and verified. Such changes in business models and processes will impact back-office activities such as financial and non-financial reporting and tax preparation.
2. Stakeholders reported mixed views over whether blockchain can and will replace the financial reporting systems and activities of today. It was reported that organizations still see blockchain as an additional investment that ultimately does not function any differently from other enterprise resource planning (ERP) systems currently in use. In many instances, parallel systems continue to be run to ensure the data on the blockchain is accurate. Further, significant resources are being spent reconciling the blockchain data with more traditional systems in proof-of-concept trials, despite the promise that blockchain will remove the need for traditional approaches. As such, blockchain has not yet reduced the burden of organizational recordkeeping in most organizations. For mass uptake, other parties along the supply chain need to see the appeal of accessing the blockchain, have an extent of trust and knowledge about blockchain systems, and agree with its value proposition.
3. Nevertheless, emerging applications across finance, business, government, and healthcare are growing.<sup>2</sup> Such applications combine blockchain technology with the use of smart contracts (i.e., digital versions of the standard paper contract that automatically verify fulfillment and enforce and perform the terms of the contract).<sup>3</sup> From an industry perspective, banking leads the way in blockchain spending, accounting for nearly 30% of the worldwide total in 2021.<sup>4</sup> The next largest industries for blockchain spending are process manufacturing and discrete manufacturing, which together account for more than 20% of worldwide spending.<sup>5</sup>

### Cryptocurrencies, Tokens, and Decentralized Finance

4. Cryptocurrencies, such as Bitcoin and Ethereum, run on blockchain technology and are seen as a potential tool to promote and accelerate financial inclusion by providing those people who do not have access to traditional financial institutions with an alternative means of transferring funds.<sup>6</sup> The value of cryptocurrencies, however, remains extremely volatile and the related crypto-mining that comes with it brings enormous environmental costs.<sup>7</sup> This has led several governments, such as China, to restrict cryptocurrency trading and/or mining.<sup>8</sup>
5. Decentralized finance (“DeFi”) is an umbrella term for financial services on public blockchains, primarily Ethereum, which do not require paperwork or a third-party. Essentially, it creates an entire digital alternative to traditional financial markets, but without the associated costs (i.e., office towers, trading floors, banker salaries). This is being advocated as having the potential to create more open, free, and fair financial markets accessible to anyone with an internet connection.<sup>9</sup>



6. Unfortunately, as cryptocurrency advertises a combination of anonymity, ease of use, and the ability to circumvent international borders and regulations, it has also become the preferred currency for purchasing illicit goods and the demanded payment form in most ransomware attacks.<sup>10</sup> DeFi similarly also creates risks for money laundering and terrorist financing due to its technologically dynamic nature and evolving regulation<sup>11</sup> and anonymity of users. Note, however, that the anonymity of cryptocurrencies is not absolute, as immutable transaction trails are created, which allow law enforcement agencies using forensic techniques to track criminals, such as ransomware attackers (e.g., the Colonial Pipeline attack in the U.S.)<sup>12</sup> and child sex abuse traffickers.<sup>13</sup>
7. Despite the volatility and associated risks, businesses are increasingly accepting cryptocurrencies as a form of payment<sup>14</sup> and holding cryptocurrencies as investments or for trade on their balance sheets. In addition, there are governments looking to adopt cryptocurrency as legal tender, with El Salvador being the first country to accept a cryptocurrency (Bitcoin) as legal tender in 2021.<sup>15</sup>
8. Separately, but related, the development of central bank digital currency (CBDC) – virtual money backed and issued by a central bank – is being explored or has been launched by a variety of governments, including the United States, United Kingdom,<sup>16</sup> India,<sup>17</sup> China,<sup>18</sup> Nigeria, and the Bahamas. CBDCs are anticipated to enable individuals and businesses to send instant payments through their depository institution accounts at much higher transactions speeds as compared to traditional transactions (i.e., through Visa, Alipay, etc.) or cryptocurrencies (i.e., Bitcoin).
9. Finally, blockchain applications include the tokenization of physical or digital assets. These blockchain tokens represent the right to a physical or digital asset, for example, a property right on a luxury good, a share in a company, the fractional ownership of a building or property, or a digital artwork. Investors are increasingly trading and investing in such tokens. There are two distinct types of tokens:
- Fungible tokens: Store value and are divisible and non-unique. They can also be:
  - Utility tokens, which give holders access to products and services that are blockchain-based, such as cryptocurrency; or
  - Security tokens, which represent traditional assets like stocks and shares.
- Furthermore, security tokens can be “listed”, i.e., security token offerings (STOs), which is a type of public offering in which security tokens are sold on security token exchanges or cryptocurrency exchanges.
- STOs are more susceptible to regulation than initial coin offerings (ICOs), as ICO tokens offer cryptocurrency digital coins, which are often classified as utility tokens.
- Nonfungible tokens: Store data and represent one unique and indivisible item — physical or intangible — like a picture or intellectual property.

## Opportunities

10. Stakeholder outreach has indicated that there are many proof-of-concept projects being tested for blockchain technology use, in particular for governmental and public sector organizations. Such proofs-of-concept are broad, for example, to ensure validity in relation to academic and other credentials, land ownership, reputational history, and vaccine distribution.
11. Within businesses, use cases include supply chain tracking to increase transparency through verification against product counterfeiting and providing participants end-to-end, real time visibility on the movement and source of goods.<sup>19</sup> Examples include:
- Moving meat, including tracking the health status of animals, storage temperature, and even emissions, from the ranch all the way to the consumer;





- (b) Transporting containers and rail cars from port of origin to final destination; and
- (c) Supporting “know your client” processes by setting up new financial accounts more quickly through faster identity verification and providing anti-money laundering audit trails for transactions.

**12.** Looking ahead in the short-term, industry adoption is expected to increase as there are numerous pilots ongoing in various jurisdictions, and as many large corporations and organizations form consortia to create blockchain ecosystems.<sup>20</sup>

### Impact/Risks

**13.** Stakeholders indicated that when using or implementing blockchain technology, PAs should understand how it works and how other users will access and use the information on the blockchain. For example, do other users have access to only their own information or to all the other elements on the blockchain? Such understanding helps facilitate implementing appropriate data security and privacy protocols to maintain the integrity and confidentiality of the blockchain.

**14.** Stakeholders questioned how the role of the auditor and auditor independence issues will evolve as the use of blockchain becomes more commonplace. For example, a blockchain-enabled solution developed and implemented by a firm for a client (i.e., for product traceability, such as tracking of products from source to destination) might have participants that are the firm’s audit clients. It was highlighted that, among other potential independence considerations, firms should not build the application programming interface (API) to connect their audit client onto a blockchain that the firm developed or implemented. This is because building the API requires ensuring that the information being “pushed” onto the chain (to write a record, which in this case would be from an audit client) is accurate and suitable for the purpose, which might have independence implications. Furthermore, it was questioned whether such blockchain solution would impact the audit client’s financial reporting and related internal controls.



**15.** Specifically with respect to the audit of blockchains, stakeholders stressed that it is important for auditors to understand who all the participants on the blockchain are, as there might be business relationships and professional services provided to these other participants that could raise auditor independence issues. Such understanding might include, for example:

- Who the other participants on the blockchain are (i.e., recognizing that while this is possible for alliance (i.e., “closed”) blockchains, this might not be possible for fully “open” or public blockchain ecosystems);
- How participants benefit from the blockchain solution;
- Whether participants will rely on the information in the blockchain for their respective financial and/or non-financial reporting; and
- Whether the blockchain is closed (private) or open (public). In this regard, it was noted that in all blockchain ecosystems, information on the blockchain is open to all participants. Hence, if an audit firm has access to a blockchain, then technically it is able to view all transactions on that chain, not just those belonging to its clients. Therefore, understanding whether there are conflicts of interest amongst those who might have access is important.<sup>21</sup>

Stakeholders also noted that if the implementation and uptake of blockchain and smart contracts by companies transform the business ecosystem enough in the future, the auditor’s role is also expected to change and evolve. In addition, relevant upskilling will need to take place to audit blockchains and smart contracts. Where the requisite skills are lacking at this time, firms might rely on technology experts to gain comfort over the technologies applied. It was, however, noted that the technology experts available to rely on are a niche pool and likely be the established technology companies that also develop these tools, leading to potential conflicts of interest. Additionally, it was observed that the lack of requisite skills or standardized audit methodology policies might result in inadequate auditing processes.

16. In terms of potential auditor independence issues in relation to firm staff investing in digital assets issued by audit clients, stakeholders observed that this situation is nothing “new.” Stakeholders see it akin to firm staff investing in an audit client’s securities, which is prohibited.<sup>22</sup> However, it was also observed that some digital assets might not be classified as “securities” as many token issuers specifically state that their tokens are “utility tokens” and not “securities tokens.” As such, in the absence of specific independence guidelines addressing the holding of tokens or similar instruments issued by audit clients, firms might fall back on the measures that safeguard against potential conflicts of interest<sup>23</sup> situations, such as avoiding any transactions when the firm is providing a service (audit or non-audit services) to a token-issuing entity. Ultimately, PAs are required to comply with the Code’s fundamental principles, including objectivity and professional competence and due care, and for PAPPs, the requirements for independence<sup>24</sup> in fact and in appearance (which are linked to the fundamental principles of objectivity and integrity).
17. Finally, it is observed that accounting for, disclosure, and regulation of cryptocurrencies is an evolving area creating dynamic complexity for PAs who need to keep up to date with this changing landscape. For example, the:
- IFRS Interpretations Committee discussed and concluded in June 2019 how IFRS Standards should apply to holdings of cryptocurrencies.<sup>25</sup> However, at the IFRS Foundation’s June 2022 Conference, it was highlighted that there would be a future project to revisit IAS 38 *Intangible Assets*, which might address cryptocurrencies, among other items.<sup>26</sup>
  - IOSCO issued a roadmap in July 2022 to outline workstreams to explore market integrity, investor protection and financial stability risks with respect to crypto and digital assets and decentralized finance.<sup>27</sup>
  - EU Parliament has agreed on draft rules on supervision, consumer protection, and environmental sustainability of crypto assets.<sup>28</sup>
  - U.S. SEC has issued a Staff Accounting Bulletin on Accounting for Obligations to Safeguard Crypto-Assets an Entity Holds for its Platform Users.<sup>29</sup>
  - U.S. FASB has launched a research project on accounting for, and disclosing of, a subset of exchange-traded digital assets and commodities.<sup>30</sup>
  - AICPA has a practice aid on accounting for and auditing of digital assets.<sup>31</sup>





- <sup>20</sup> See, for example, Hyperledger: <https://www.hyperledger.org>, South African Financial Blockchain Consortium: <https://www.safbc.co.za>, and IBM Food Trust: <https://www.ibm.com/blockchain/solutions/food-trust>.
- <sup>21</sup> Bakarich, Katie, and Jack Castonguay. "Use of Blockchain in Corporate and Financial Reporting and Regulatory Implications." *IFAC*, June 2021, <https://www.ifac.org/system/files/uploads/IESBA/06.09-IESBA-Blockchain-Bakarich-Castonguay.pdf>.
- <sup>22</sup> Section 510 *Financial Interests* of the Code
- <sup>23</sup> Section 310 *Conflicts of Interest* of the Code
- <sup>24</sup> Paragraph 120.15 A1 of the Code
- <sup>25</sup> IAS 2 *Inventories* or IAS 38 *Intangibles Assets* apply, depending on the facts and circumstances of the holdings – IFRS Interpretations Committee. "IFRIC Update June 2019." *IFRS*, June 2019, <https://www.ifrs.org/news-and-events/updates/ifric/2019/ifric-update-june-2019/#8>.
- <sup>26</sup> More recently, the IASB Chair reiterated at the IFRS Foundation's June 2022 Conference that the June 2021 IFRS interpretation on accounting for crypto currencies continues to apply – IFRS Foundation Conference, IASB Chair Andreas Barckow's Keynote Speech: "Andreas Barckow— IFRS Foundation Conference keynote speech." *IFRS*, 24 June 2022, <https://www.ifrs.org/news-and-events/news/2022/06/andreas-barckow-ifrs-foundation-conference-keynote-speech/>.
- <sup>27</sup> "IOSCO Crypto-Asset Roadmap for 2022-2023." *IOSCO*, July 2022, [OR03/22 Crypto-Asset Roadmap for 2022-2023 \(iosco.org\)](https://www.iosco.org/workingpapers/IOSCO-Crypto-Asset-Roadmap-for-2022-2023).
- <sup>28</sup> "Cryptocurrencies in the EU: new rules to boost benefits and curb threats." *European Parliament*, 14 March 2022, <https://www.europarl.europa.eu/news/en/press-room/20220309IPR25162/cryptocurrencies-in-the-eu-new-rules-to-boost-benefits-and-curb-threats>.
- <sup>29</sup> "Staff Accounting Bulletin No. 121." *US SEC*, 8 April 2022, [SEC.gov | Staff Accounting Bulletin No. 121](https://www.sec.gov/staff-accounting-bulletin-no-121).
- <sup>30</sup> US FASB Research Projects: "OBJECTIVES OF RESEARCH PROJECTS." FASB, [https://www.fasb.org/Page/ProjectPage?metadata=FASB\\_OBJECTIVESOFRESEARCHPROJECTS\\_022820221200#btnTitle\\_1](https://www.fasb.org/Page/ProjectPage?metadata=FASB_OBJECTIVESOFRESEARCHPROJECTS_022820221200#btnTitle_1).
- <sup>31</sup> "Accounting for and auditing of Digital Assets practice aid." *AICPA*, Q1 2022, <https://www.aicpa.org/resources/download/accounting-for-and-auditing-of-digital-assets-practice-aid-pdf>.

## ABOUT THE IESBA

The International Ethics Standards Board for Accountants (IESBA) is an independent global standard-setting board. The IESBA serves the public interest by setting ethics standards, including auditor independence requirements, which seek to raise the bar for ethical conduct and practice for all professional accountants through a robust, globally operable *International Code of Ethics for Professional Accountants (including International Independence Standards)*.

The IESBA believes a single set of high-quality ethics standards enhances the quality and consistency of services provided by professional accountants, thus contributing to public trust and confidence in the accountancy profession. The IESBA sets its standards in the public interest with advice from the IESBA Consultative Advisory Group (CAG) and under the oversight of the Public Interest Oversight Board (PIOB).

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