

Blockchain: Emerging Technology Offers Benefits for Some Applications but Faces Challenges - Policy Options

GAO developed four policy options that could help enhance benefits or mitigate challenges of blockchain technologies. The policy options identify possible actions by policymakers, which may include Congress, federal agencies, state and local governments, academic and research institutions, and industry. In addition, policymakers could choose to maintain the status quo, whereby they would not take additional action beyond any current efforts.

Blockchain combines several technologies to provide a trusted, tamper-resistant record of transactions by multiple parties without a central authority such as a bank. Blockchain can be used for a variety of financial and non-financial applications, including cryptocurrency, supply chain management, and legal records. GAO found that blockchain is useful for some applications but limited or even problematic for others. For example, because of its tamper resistance, it may be useful for applications involving many participants who do not necessarily trust each other. But it may be overly complex for a few trusted users, where traditional spreadsheets and databases may be more helpful. Blockchain may also present security and privacy challenges and can be energy-intensive.

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United States Government Accountability Office (GAO)

Stakeholder(s):

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National Academies of Sciences, Engineering, and Medicine :

Expert Participation ~ We collaborated with the National Academies of Sciences, Engineering, and Medicine to convene a two-day meeting of experts to inform our work on blockchain technology; the meeting was held virtually on July 14–15, 2021. The experts who participated in this meeting are listed below. Many of these experts gave us additional assistance throughout our work, including 5 who reviewed our draft report for accuracy and provided technical comment.

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Vision

Blockchain is appropriately used

Mission

To develop policy options to enhance benefits and mitigate challenges of blockchain technologies

Values

Trust: Economies rely on central authorities and trusted intermediaries to facilitate business transactions.

Verification: Blockchain is a technology that could reduce the need for such entities while establishing a system of verification. It might therefore improve a variety of financial and non-financial applications. However, the use of blockchain technologies raises a variety of ethical, legal, economic, and social concerns.

Decentralization

Interoperability

Data Security

Transparency

Accountability

Option 1. Standards

Unify standards that focus on the development, implementation, and use of blockchain technologies

Stakeholder(s)

Standard-Setting Entities :

This option could simplify the wide variety of standards that at least 30 standard-setting entities are developing in the U.

S. and abroad. It could also help identify gaps and reduce overlap in standard-setting efforts.

This policy option could help address challenges around interoperability and data security

Opportunity 1.1. Definitions

Policymakers could collaborate to establish clear, concise, and shared definitions for blockchain-related terms that can be used to create and update standards.

Opportunity 1.2. Priorities

Identify, develop, and update standards that would be most beneficial across different sectors of the economy or applications of blockchain

To operationalize this option, policymakers could identify the areas in which standards would be most beneficial across different sectors of the economy or applications of blockchain. Then policymakers could develop and periodically update those standards to help ensure that they remain current and relevant.

Option 2. Oversight

Clarify mechanisms and create new mechanisms to ensure appropriate oversight of blockchain applications

Policymakers could clarify existing oversight mechanisms, including regulations, or create new mechanisms to ensure appropriate oversight of blockchain applications. This policy option could help address challenges with legal and regulatory uncertainty and regulatory arbitrage.

Opportunity 2.1. Clarity

Enable individuals and firms to more successfully engage in blockchain-related commerce in the U.S.

Clear, industry-specific oversight frameworks could allow individuals and firms to more successfully engage in blockchain-related commerce in the U.S.

Stakeholder(s):

U.S.-Based Blockchain Firms :

U.S. oversight clarity could help keep U.S.-based blockchain firms from moving to other countries.

Opportunity 2.2. Regulatory Sandboxes

Use tools such as regulatory sandboxes to improve blockchain oversight

Efforts like this could provide mechanisms for policymakers to more effectively carry out their statutory obligations by better enabling compliance in the face of regulatory uncertainty.

Stakeholder(s):

Policymakers :

Policymakers, including regulatory entities and developers, could use tools such as regulatory sandboxes to improve blockchain oversight.

Regulatory Entities

Blockchain Developers

Arizona :

For example, 11 companies participated in the state of Arizona's financial technology sandbox from October 2018 to April 2021.

Consumer Financial Protection Bureau :

At the federal level, the Consumer Financial Protection Bureau has created a Compliance Assistance Sandbox for companies to obtain safe harbor for testing innovative products and services for a limited time while sharing data with the Bureau.

Opportunity 2.3. Illicit Activity

Promote safety and soundness, consumer protection, and compliance with applicable laws and regulations to combat illicit activity

Stakeholder(s):

Policymakers :

Policymakers could provide coordinated and timely clarity to promote safety and soundness, consumer protection, and compliance with applicable laws and regulations to combat illicit activity in blockchain-related commerce.

Consumers

Financial Crimes Enforcement Network :

For example, the Department of Treasury's Financial Crimes Enforcement Network (FinCEN) recently proposed a rule requiring banks to submit reports, keep records, and verify the identity of customers in certain cryptocurrency transactions to ensure the cryptocurrency industry appropriately addresses challenges around anti-money laundering and national security risks.

Department of Treasury

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Option 3. Educational Materials

Support the development of educational materials to help users and regulators better understand blockchain technologies

Stakeholder(s)

Policymakers :

Policymakers could support the development of educational materials to help users and regulators better understand blockchain technologies beyond existing financial applications.

Blockchain Users

Blockchain Regulators

This policy option could help address challenges around limited understanding and undefined benefits and costs.

Opportunity 3.1. Training

Enable instructors to train a workforce to be more skilled in developing, implementing, and using blockchain-based products

This option could enable instructors to train a workforce to be more skilled in developing, implementing, and using blockchain-based products.

Stakeholder(s):

Instructors :

Instructors could use the educational materials to develop vocational training that may help establish professional development courses and certifications in sectors affected by blockchain.

Workforce

Consumers :

It could also increase consumer literacy and help reduce negative public perceptions of blockchain.

Opportunity 3.2. Innovation

Stimulate critical thinking and innovation

Could stimulate critical thinking and innovation.

Stakeholder(s):

Pharmaceutical Supply Chains :

For example, additional education could prompt innovative research and development on blockchain

applications that track and trace prescription medicines in pharmaceutical supply chains.

Opportunity 3.3. Expertise

Expand beyond currently available education and training

Could expand beyond currently available education and training, which generally focuses on beginner-level knowledge and financial applications, according to an expert.

Opportunity 3.4. Latest Technologies

Help prepare policymakers to better use and regulate the latest technologies

Could help prepare policymakers to better use and regulate the latest technologies.

Stakeholder(s):

Policymakers

Department of Justice :

For example, following the 2021 Colonial Pipeline ransomware attack, the Department of Justice brought together a group of skilled investigators, trained law enforcement and prosecutors to success-

fully review the cryptocurrency ledger, track multiple transfers, and seize a portion of the cryptocurrency paid to the bad actors.

Option 4. Appropriate Uses

Determine when blockchain is appropriate to achieve goals and mitigate challenges

Stakeholder(s)

Policymakers :

Policymakers could support activities designed to determine whether blockchain is appropriate for achieving specific missions and goals or to mitigate specific challenges.

This policy option could help address challenges around risks to the financial systems and undefined benefits and costs.

Opportunity 4.1. Benefits

Capture the benefits the technology may offer

Actively investigating where and when blockchain would be the most useful could allow entities to capture the full benefits the technology might offer.

Opportunity 4.2. Systems & Processes

Modernize systems and processes

Blockchain technologies could help modernize some existing systems and processes.

Stakeholder(s):

U.S. Federal Agencies :

We previously reported that U.S. federal agencies have struggled with appropriately planning and budgeting for modernizing legacy systems; upgrading underlying infrastructure; and investing in high-quality, low-cost service delivery technology. Blockchain could be one means of improving or

replacing existing systems for greater efficiency and effectiveness.

Data Managers :

Additionally, it could be part of larger data management efforts by policymakers.

Opportunity 4.3. Pilots

Conduct pilots, identify lessons, and transition efforts beyond the pilot stage

Supporting blockchain use, where appropriate, such as by conducting new pilots, identifying lessons from existing pilots, or transitioning some efforts beyond the pilot stage could enhance transparency and accountability of existing systems and services... These efforts were designed to evaluate the potential for blockchain to offer operational benefits and cost savings.

Stakeholder(s):

Companies :

According to one think tank report, some companies have started experimenting with blockchain-based systems to add transparency, trust, and traceability to their operations.

Coffee Supply Chains :

For example, as we discussed earlier in this report, blockchain has been piloted for use in coffee supply chains.

Federal Government :

Further, we also described how the federal government has piloted using blockchain across several different proof of concept efforts.

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