Privacy Technical Assistance Center
U.S. Department of Education
(855) 249-3072
privacyTA@ed.gov
https://studentprivacy.ed.gov

What is a Blockchain?

> *"Distributed ledger technology (DLT) and the narrower concept blockchain are the subject of significant curiosity, boosterism, criticism, investment, and genuine, fast-moving innovation."*[1]

A blockchain is a record of chronological transactions, much like a traditional financial ledger. Each new set of transactions, "blocks," are recorded and cryptographically linked to the previous record, forming a chain. Key characteristics of a blockchain are: (1) **Integrity** – records are cryptographically linked, making them nearly impossible to change; (2) **Transparency** – because every network user has their own copy of the entire blockchain, updates are shared and transparent; (3) **Democracy** – blockchains enable verification of peer-to-peer transactions to occur without a centralized mediator.

Blockchains and other types of Distributed Ledger Technologies (DLT) are the foundation of many high-profile technologies, like cryptocurrency (e.g. Bitcoin), and promise to change how data is managed and shared in a variety of industries, including education.

What Does This Mean for the Education Community?

Vendors, industry associations, and a range of education stakeholders are working to leverage blockchain technology to address the challenging data sharing and transparency issues faced by institutions, schools, and students, whether through adapting existing data products and processes or through entirely new applications. For example, blockchains present novel opportunities to create efficient and transferrable digital identity protocols; enable student-owned learning passports and new ways of storing and sharing digital credentials; ensure the security and accuracy of official data reporting; and many other applications.

Strategic Planning for Privacy

Blockchain is rarely a single technology solution, but when integrated strategically with other technologies, can provide unprecedented data utility, transparency, and trust. Any education stakeholder considering a blockchain solution should include plans not only for the technical implementation, but also for the risk management and potential privacy implications.

Because certain blockchain data is highly transparent, it can pose privacy concerns when applied to student data. Blockchain data that include students' personally identifiable information and education records may be protected by the Family Educational Rights and Privacy Act (FERPA) or other federal or state laws. While the complex nature of blockchain may make it challenging to track consent for the release of certain information under FERPA or require additional access controls to protect sensitive information, it represents an exciting new technological era with potential yet to be fully realized.

The U.S. Department of Education's Office of Education Technology (OET) and the Privacy Technical Assistance Center (PTAC) are available to provide best practices and guidance on leveraging DLT and blockchains for education data systems. To contribute and engage, visit: https://usedgov.github.io/blockchain.

[1] United States Agency for International Development (USAID), *Primer on Blockchain*. Available at: https://www.usaid.gov/sites/default/files/documents/15396/USAID-Primer-Blockchain.pdf.
More information on blockchain technology is available from the National Institute of Standards and Technology, https://nvlpubs.nist.gov/nistpubs/ir/2018/NIST.IR.8202.pdf.