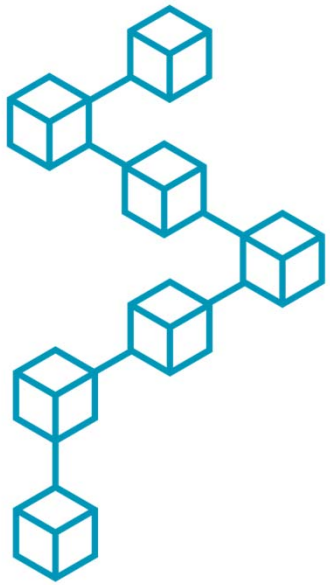
Improving Grants Management Using Blockchain Technology



Federal Demonstration Partnership (FDP) Fall Meeting

September 2019

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Who is MITRE and Why Focus on Improving Grants Management?

- **MITRE is a not-for-profit organization**, chartered in the public interest to address issues of national importance, and **operates the US Treasury Department's and seven other Federally Funded Research and Development Centers (FFRDCs)**
- **Our expertise is in "systems of systems" thinking** and the interrelationship between technology and people
- **Through public-private partnerships and the FFRDCs we operate, we work across government** to tackle challenges to the safety, stability, and well-being of our nation
- **Improving grants management is a cross-government priority**
  - President's Management Agenda (PMA) Cross Agency Priority (CAP) Goal #8, Strategy #1: Standardize grants management business processes and data
  - OMB M-18-24, Strategies to Reduce Grant Recipient Reporting Burden

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MITRE Efforts to Improve Grants Management

- **Support PMA CAP Goal #8 Cross-Agency Working Groups** by developing cross-government common grants management business capabilities, use cases, and data element standards, and a grants risk management framework
- **Conduct MITRE-funded research** to explore the hypothesis that a number of current state problems could be addressed through changes to grants management business operating model and use of blockchain technology to enable those changes
- **Exchange information with Federal Agencies such as**
  - **National Science Foundation (NSF)** who is exploring sharing pre-award grant application information among Federal agency components using blockchain technology
  - **Treasury Fiscal Service** who is exploring the ability to add, transfer, and redeem funding commitments ("vouchers") using blockchain technology

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MITRE Research Study

https://www.mitre.org/publications/technical-papers/assessing-the-potential-to-improve-grants-management-using-blockchain

MITRE Research Study Background

- In October 2018, MITRE began working with a number of government agencies to assess the potential to improve grants management by using blockchain technology
- **MITRE interviewed and analyzed input from**
  - Agency personnel who work in **grants management, financial management, and Inspector General** offices
  - Grant recipients in the public and private sectors, including **state government agencies, public and private universities, community-based service organizations, and a tribal nation**
  - Agencies and subject matter experts working on **blockchain solutions in the government environment**

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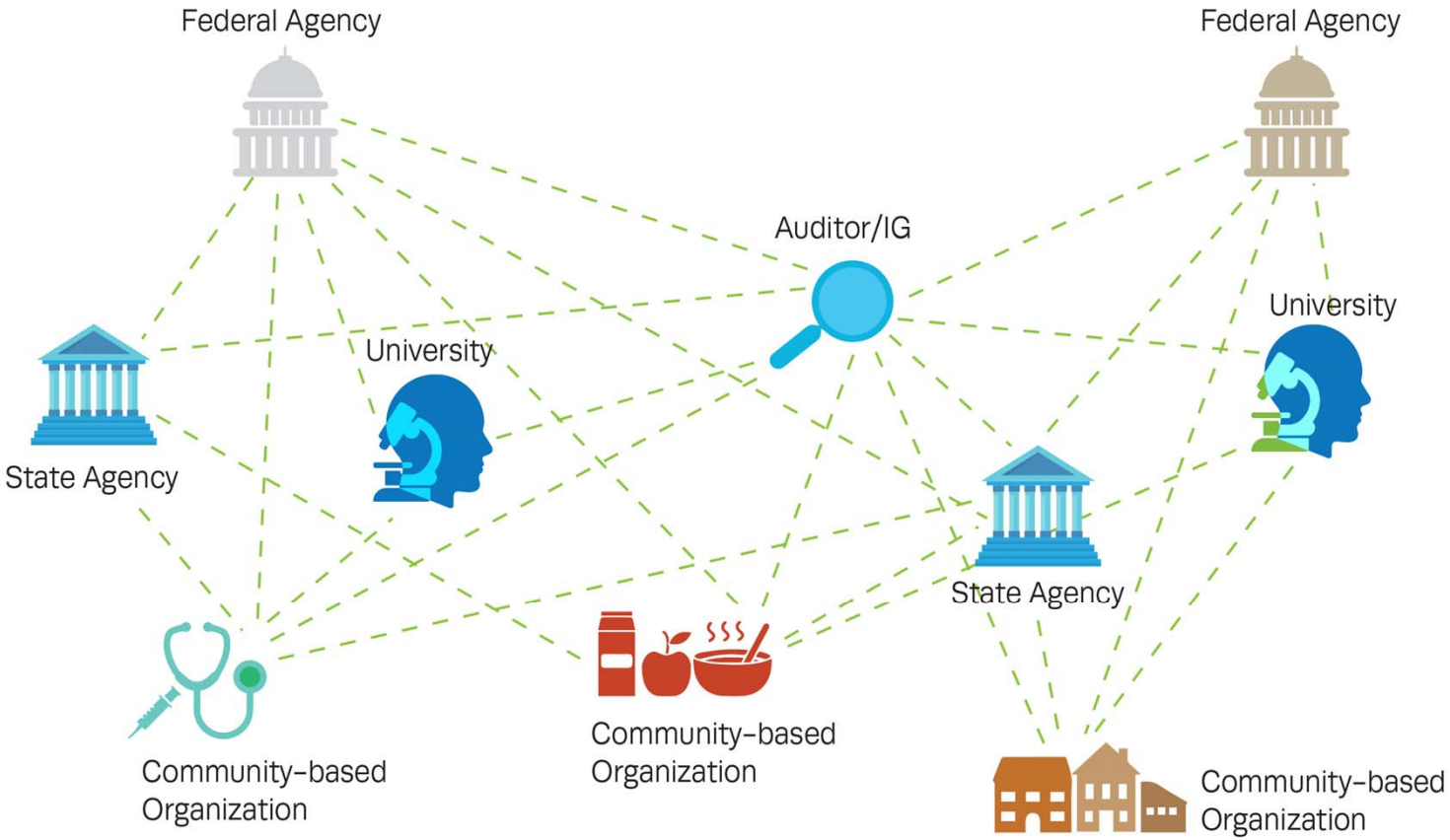
Current Grants Management Business Operating Model

Grants Recipients: Burdensome and Redundant Reporting and Payment Processing

Grantmaking Entities, Auditors/IGs, and the Public: Lack of Transparency and Timeliness in Grants Financial and Performance Information Sharing



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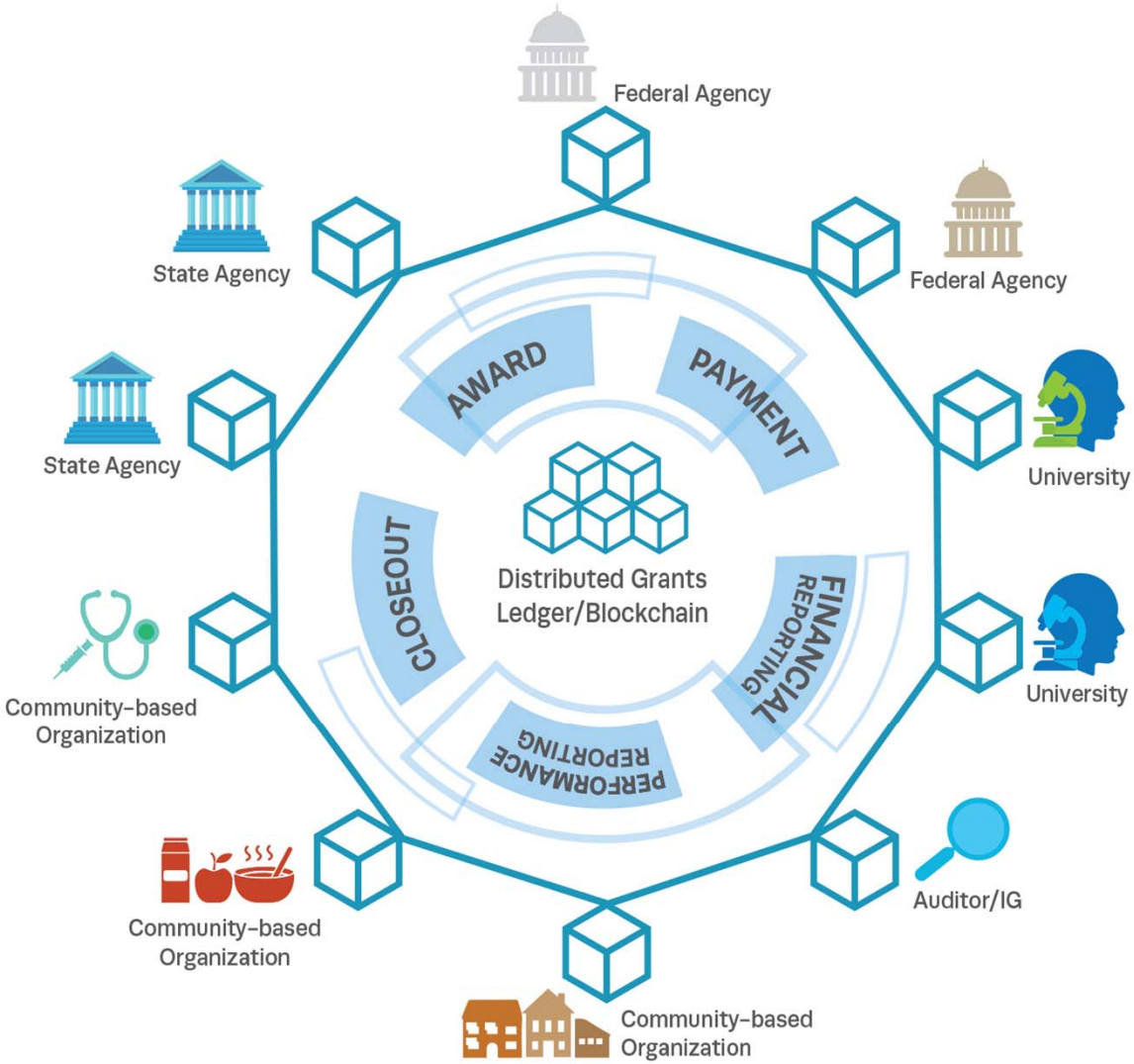
Desired Future State Business Operating Model

Grants Recipients: Less Burdensome Reporting and More Timely Payments
Grantmaking Entities, Auditors/IGs, and the Public: More Transparent and Timely Grants Financial and Performance Information



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What makes blockchain different?

- Transactions recorded into an electronic ledger that is decentralized and replicated
- It is open and distributed, which allows anyone with proper access permissions to the ledger to update and/or view it
- Each transaction is digitally signed
- Each transaction has one or more addresses ("to" and "from" endpoints for the transaction) and a recording of what happened

Why is this distributed, decentralized ledger called a blockchain?

- Transactions are grouped together into a block
- A new cryptographic hash (unique key) is created for each new block and recorded within the block's header data
- Each block is chained to the previous block by adding the hash of the previous block to the header of the new block, forming an immutable chain

Who gets to read or write to these blocks?

- Some blockchain systems are permission-less, meaning anyone can read and write to them
- Other implementations limit participation to specific people or organizations and provide finer grained controls

Who manages a blockchain?

- Information is accessed and/or updated using one or more "nodes"
- Nodes may be managed by a central entity or separately by multiple entities that have a documented agreement of how they will jointly manage the blockchain and its nodes

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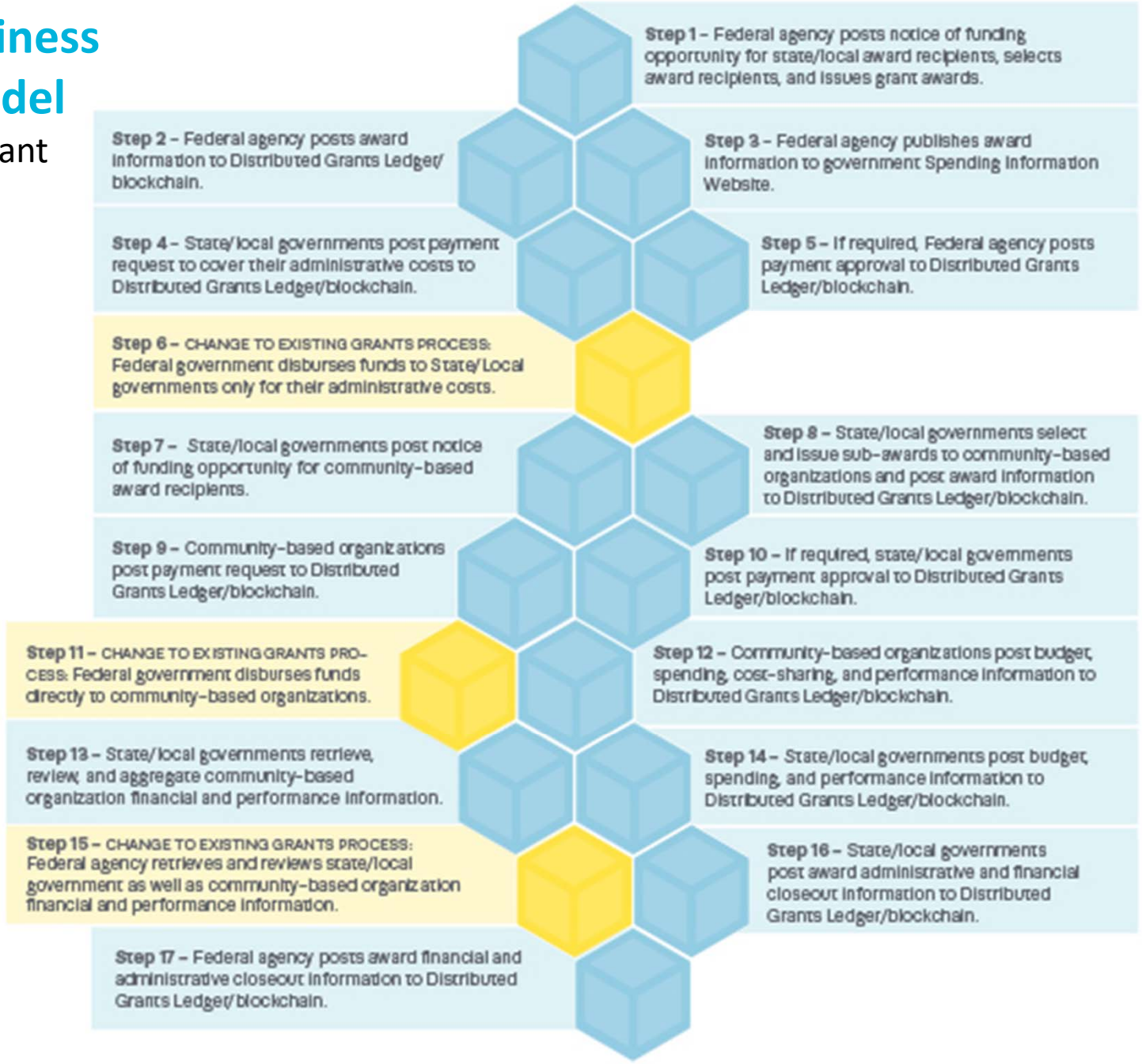
Proposed Business Operating Model

Multi-Tier Block Grant Example



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MITRE Research Study Conclusions

- In March 2019, the MITRE study concluded that improvements in grants management for both Federal agencies and grant recipients could be enabled, but **it would require implementation of a modified grants management business operating model in addition to the use of blockchain technology**.
- The MITRE study participants identified the following benefits of a modified grants management business operating model and use of blockchain technology:
  - **Federal Agencies: Improved decision making** through improved transparency, quality, and timeliness of grant financial and performance information.
  - **Public: Improved transparency, quality, and timeliness of grant financial and performance information** made available by the Federal Government in addition to the current award information
  - **Grant Recipients: Reduced redundant reporting** to multiple grantmaking entities and auditors; and payment efficiency for second- and third-tier grant recipients
  - **Inspector General Community: Improved ability to detect fraud, waste, and abuse** and improved ability to efficiently conduct audits

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MITRE Research Study Conclusions (con't)

- Achieving the identified benefits will require addressing:
  - **Control of access to and protection of PII and sensitive/proprietary information**
  - **Need for artificial intelligence and analytics** to make effective use of all the information
  - **Changes to regulations, policies, and procedures** to clearly define responsibilities and accountabilities
  - **Barriers identified by states** which have implemented centralized grants management solutions or have laws that require Federal award funds to flow through the state treasury and be appropriated by state legislatures before they are awarded

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MITRE Research Study Recommendations

- **Execute a grants management blockchain demonstration project** (proof of concept) to validate a subset of benefits and further explore a subset of actions needed, challenges, and mitigation actions
- **Establish a consortium of Federal, public, and private sector grantmaking and grant recipient entities** to govern, plan, fund, and assess the results of the demonstration project
- In parallel, **conduct further analysis of complex challenges and barriers** and determine the magnitude and the extent of the state-related barriers

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MITRE's mission-driven teams are dedicated to solving problems for a safer world. Through our federally funded R&D centers and public-private partnerships, we work across government to tackle challenges to the safety, stability, and well-being of our nation.

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