

Thinking of a Blockchain for VIVO

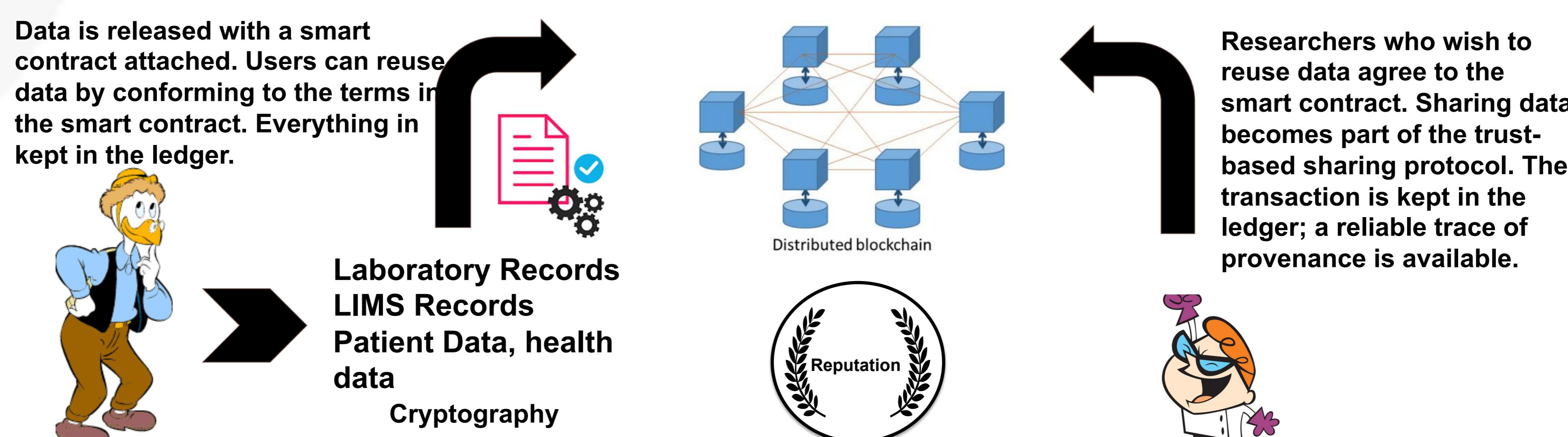
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Blockchain is a shared digital ledger keeping a secure and immutable list of transactions and states over digital assets. Every member of the community uses the same consensus mechanism to verify every transaction made through the network. It preserves the “digital continuum” of transactions over assets. There is no single point of failure.^{1,2,3}

VIVO is an example of a decentralized system; institutions publish VIVO data just by adhering to a simple data structure in the form of an ontology. Similar to a distributed ledger, VIVO is a decentralized database that is used to maintain a continuously growing list of records.

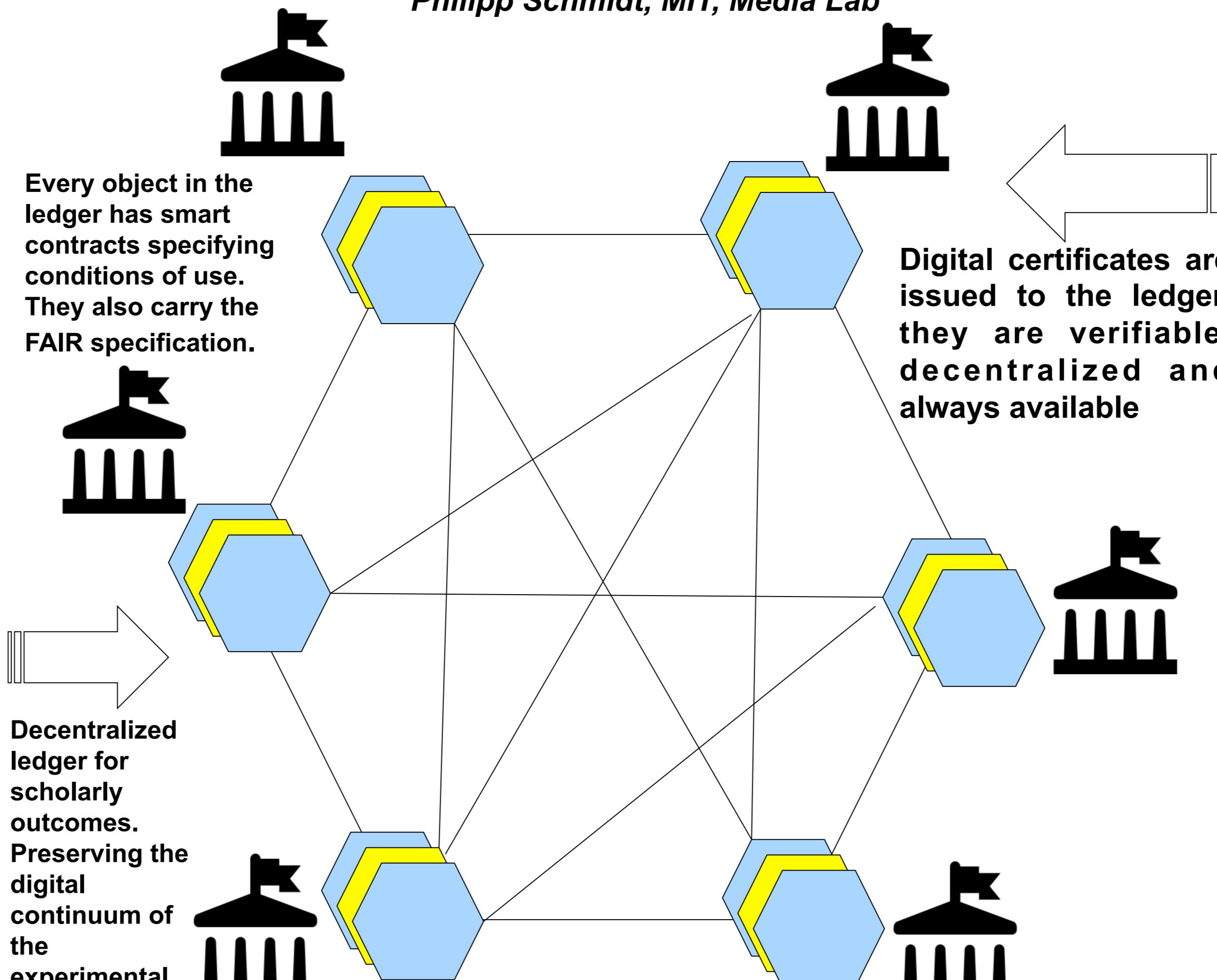


But... all assertions in the VIVO network are not part of a ledger. They are not verifiable, there is no formal issuer or formal sharing mechanisms. Moreover there are no transactions over the assets described in the network. The value is created but kept off the ledger.

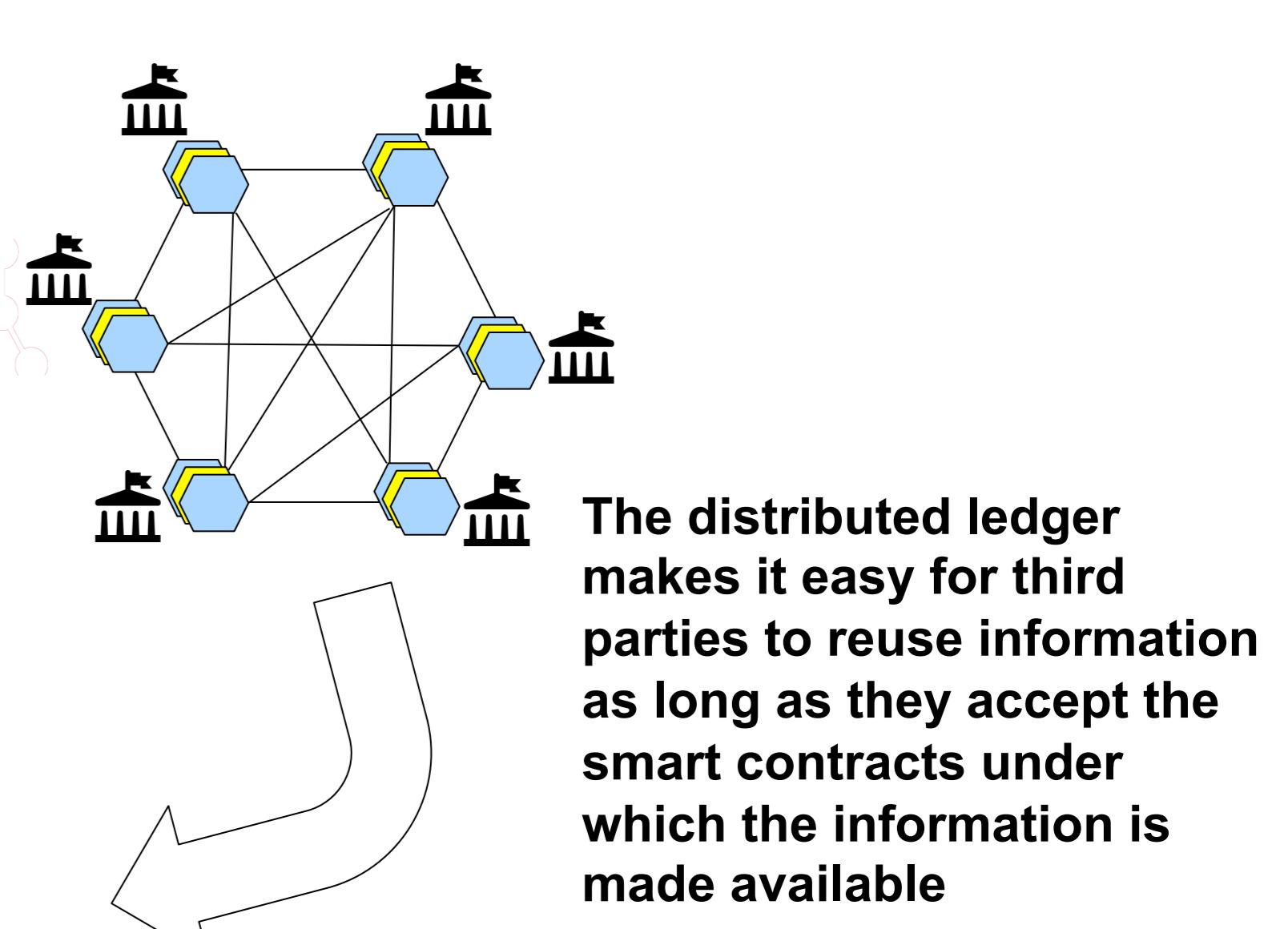


Blockchain is best known for its connection to the cryptocurrency bitcoin. But in essence it is a just a distributed ledger to record transactions. What makes it special is that it is durable, timestamped, transparent, and decentralized. Those characteristics are equally useful for managing financial transactions, as for a system of reputation. In fact you can think of reputation as a type of currency for social capital, rather than financial capital.

Philipp Schmidt, MIT, Media Lab



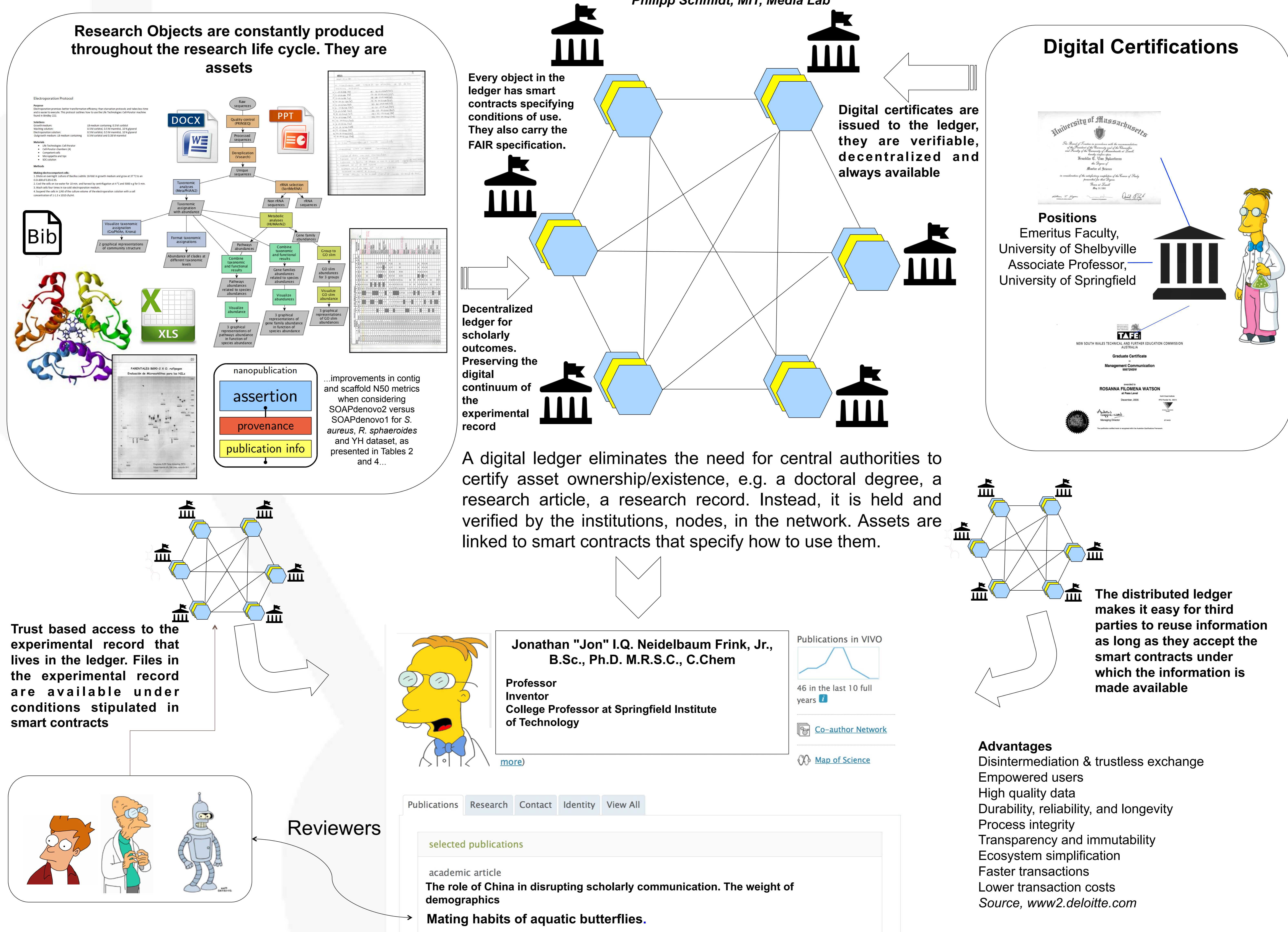
A digital ledger eliminates the need for central authorities to certify asset ownership/existence, e.g. a doctoral degree, a research article, a research record. Instead, it is held and verified by the institutions, nodes, in the network. Assets are linked to smart contracts that specify how to use them.



Advantages

- Disintermediation & trustless exchange
- Empowered users
- High quality data
- Durability, reliability, and longevity
- Process integrity
- Transparency and immutability
- Ecosystem simplification
- Faster transactions
- Lower transaction costs

Source, www2.deloitte.com



We argue that the entire value chain for assertions about the scholarly record should be kept in a distributed ledger. Institutions are suppliers of assertions to the ledgers of their people. VIVO is enhanced as a portal. It becomes an integral tool for researchers to increase the value of the scholarly record, and provides tools for reaping value from the distributed collection of ledgers. The distributed ledger makes it possible to account for all the value that is currently unaccounted for. In this context, the tragedy of the commons is not depletion of resources. Use of the commons generates additional resources. Higher use leads to higher value for all. Using smart contracts and distributed ledger technology, the protocols for the commons can easily be defined. Those wishing to be in the commons must adhere to the protocols. The protocols provide a technological barrier for third parties who wish to improperly take advantage of the commons. The protocols enforce good behavior throughout the scholarly ecosystem.