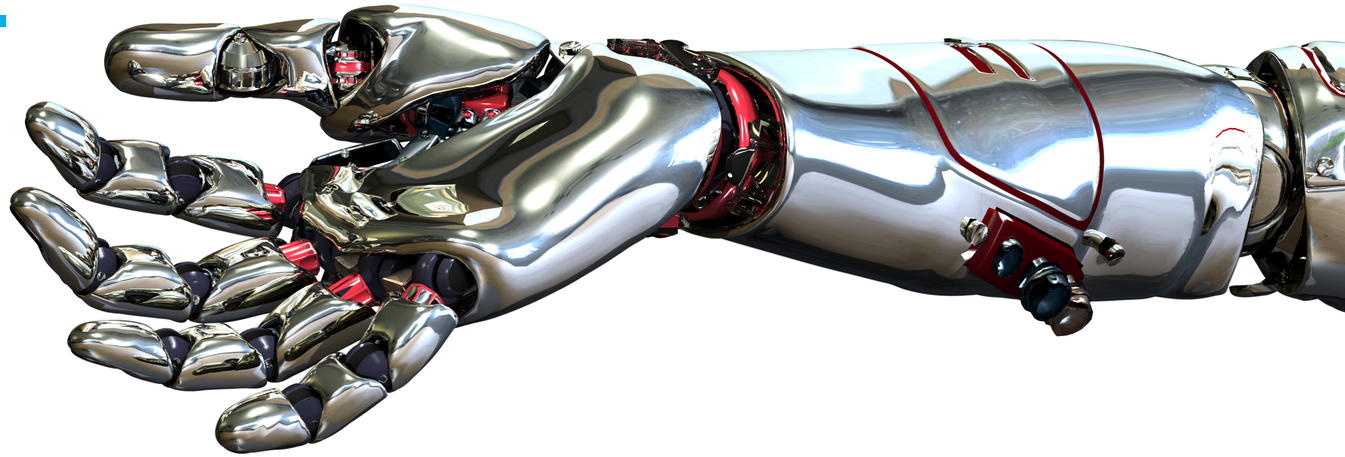
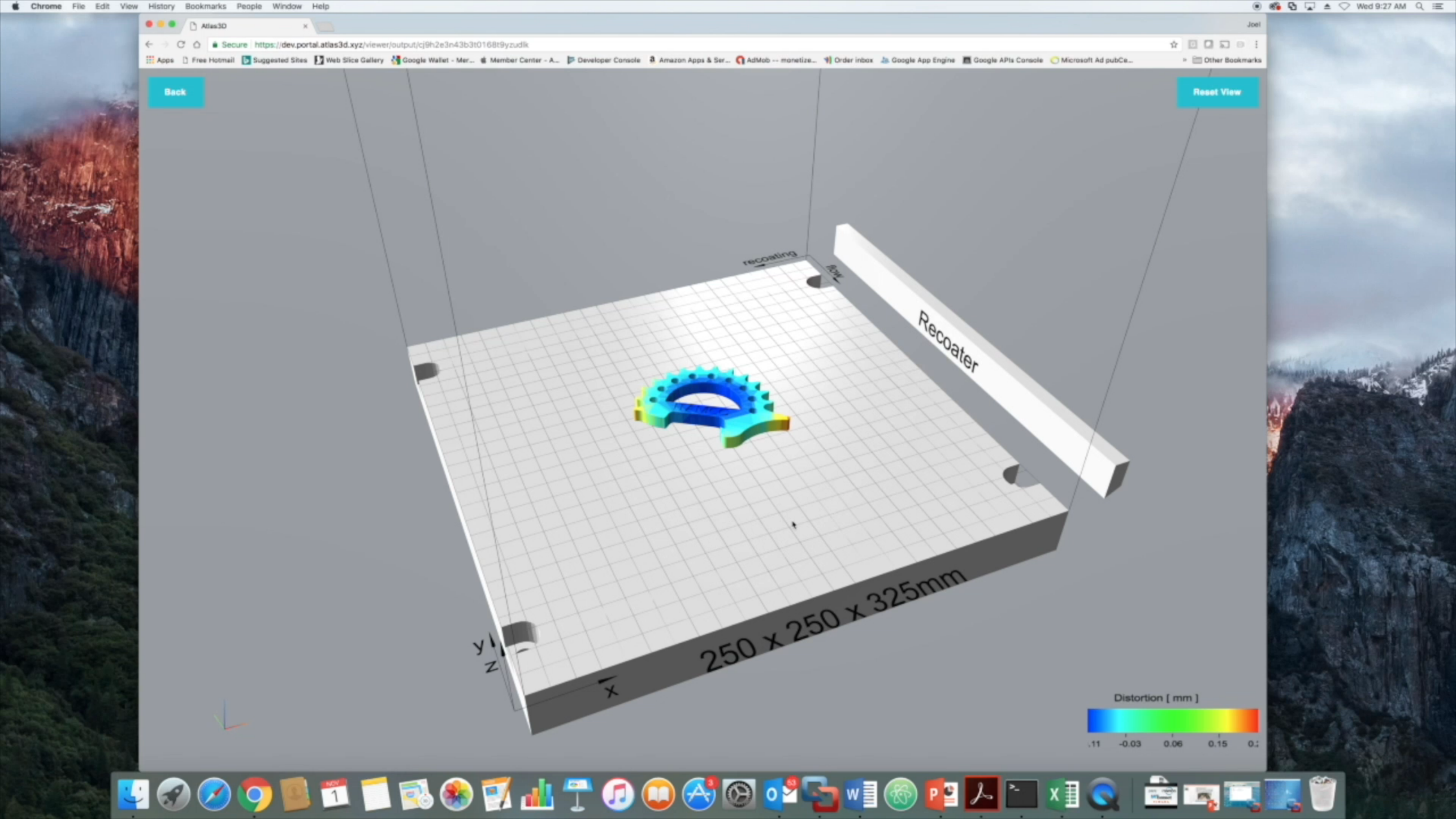
Joel Neidig, Director of R&D @ ITAMCO

DDRAM

Distributed Decentralized Rural Agile Manufacturing




Back
Reset View
recoating
Recoater
250 x 250 x 325mm
y
z
x
Distortion [mm]
.11
-0.03
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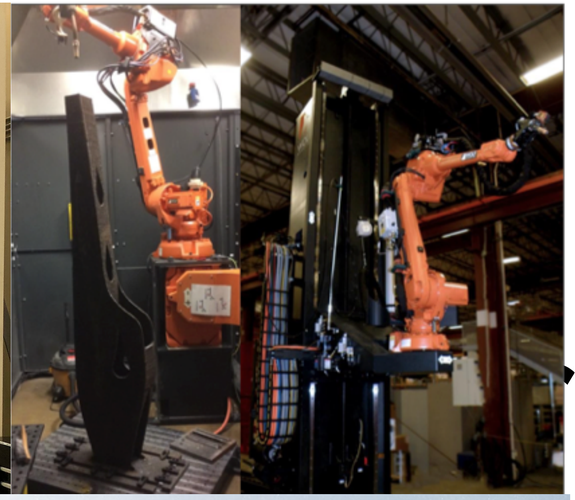
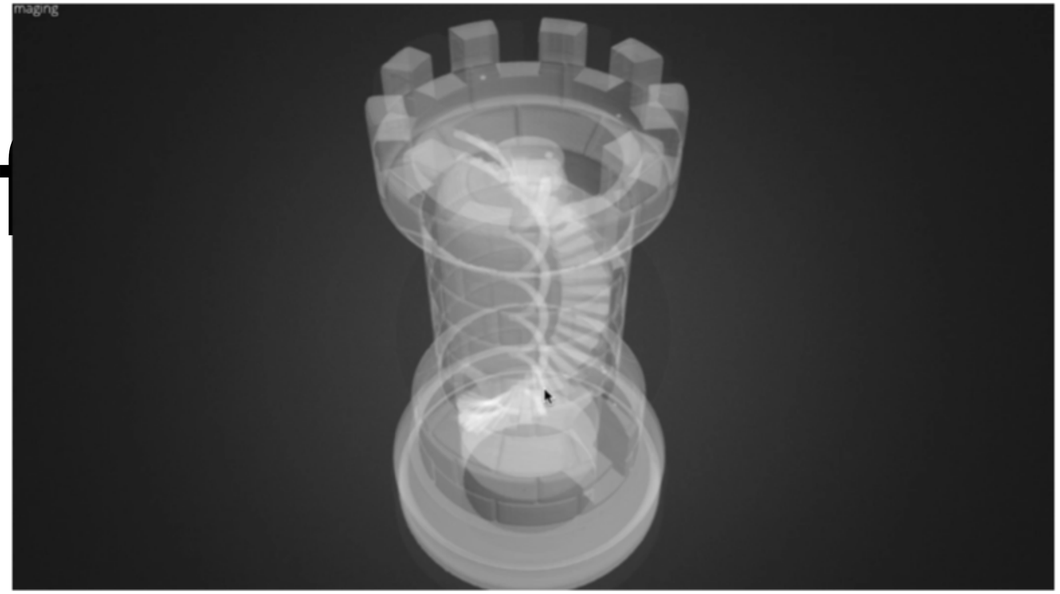
0.15

Supporting the Warfighter w/ AM

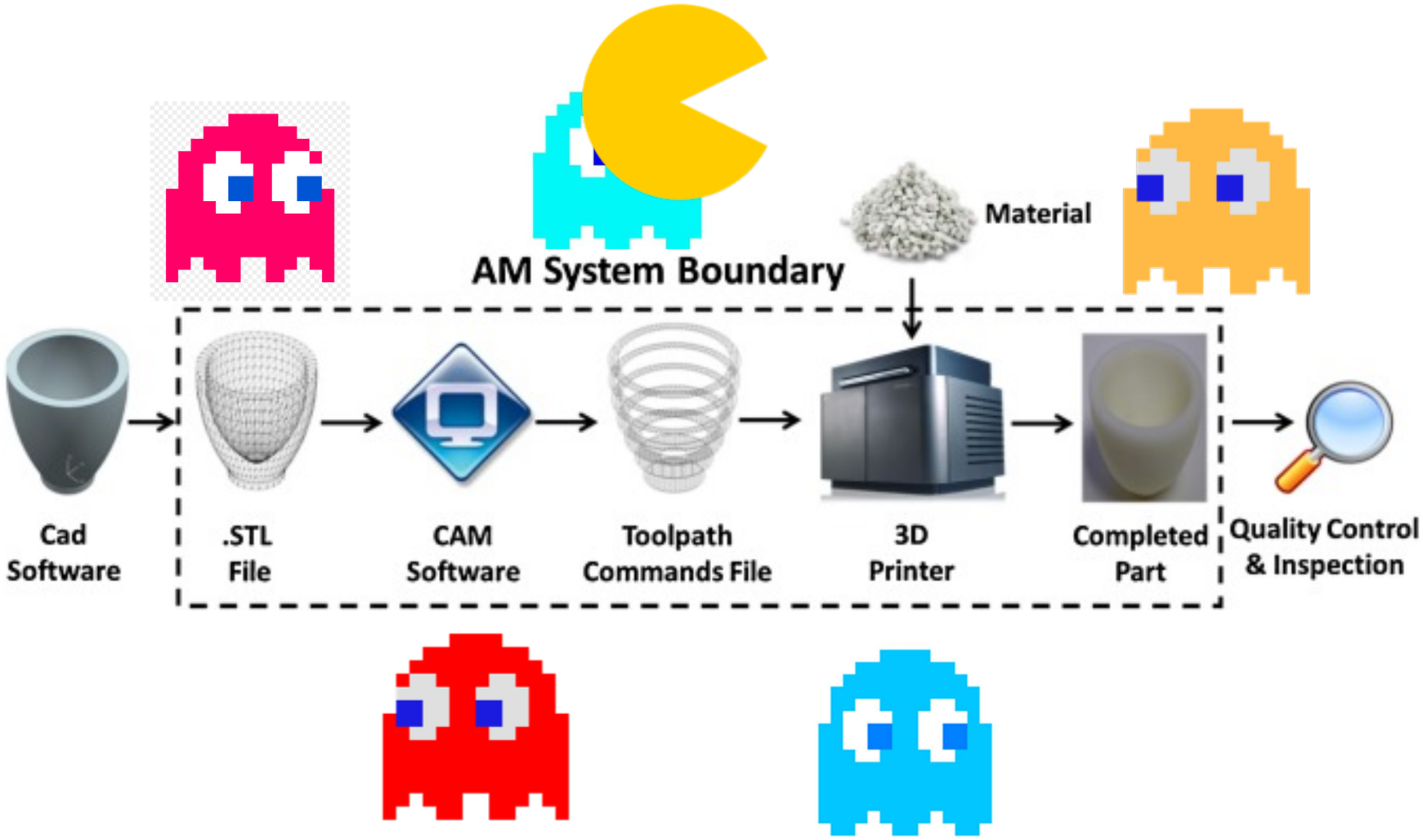


Digital Twin on the Blockchain,
QR Codes and CT Scans



MTConnect®

Digital Thread



Blockchain in its simplest form is digital information divided into blocks and linked together in a public or private peer-to-peer network.

The database this creates is not managed by any one person. Instead, everyone in the network gets a copy of the entire database.

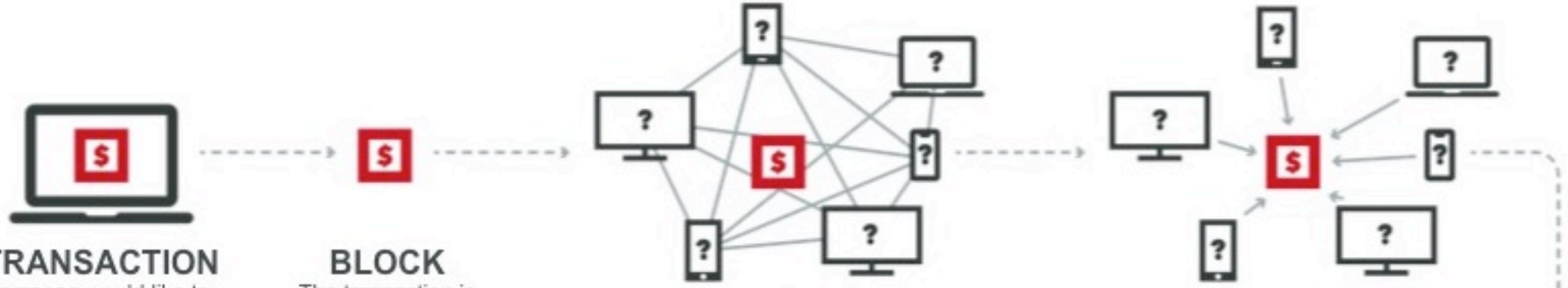
The old blocks are preserved forever while new blocks are irreversibly added. This makes it impossible to manipulate by faking documents, transactions and other information.

A SIMPLIFIED EXAMPLE OF HOW BLOCKCHAIN WORKS

- Each linked data block represents a country.
- Contained inside each block are city names from that country.

- Each block contains a set of unique characters, derived from the information contained inside that block. This is called a hash.
- The USA block has the cities Chicago, New York, and Houston. For this example, the hash could be “CNYH”.
- Every successive block includes the previous block’s hash, binding the blocks together.

BLOCKCHAIN IS SECURE



TRANSACTION
Someone would like to make a transaction

BLOCK
The transaction is represented online as a block

P2P NETWORK
The required transaction is broadcast as a P2P network consisting of computers, known as nodes.

VALIDATION
The network of nodes validates the transaction and the user's status using known algorithms.

BLOCK
Once verified, the transaction is combined with other transaction to create a new block for the ledger.

BLOCKCHAIN
The new block is added to the existing one in a way that it is permanently unalterable.

COMPLETE
The transaction is complete.

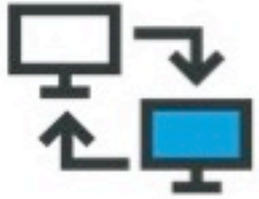
SMART CONTRACTS

PRE-PROGRAMMED CONTRACT

The agreement rules and conditions are established by all parties and then coded

CHAIN OF EVENTS

If the events specified by the conditions happen, then the code automatically executes



EXECUTION AND VALUE TRANSFER

Once in process, the terms of the contract will automatically transfer the value to the correct parties

SETTLEMENT

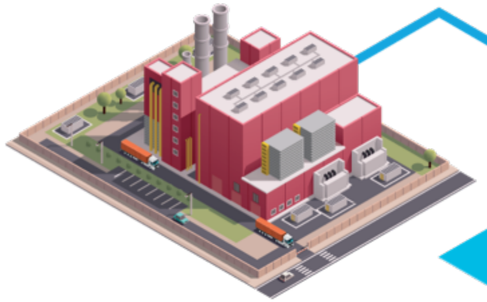
The transfer of value to counterparties are recorded to the blockchain

DAPPs

A DApp has its backend code (smart contract) running on a decentralized peer-to-peer network. The apps frontend (webapp) can be hosted on decentralized storage.

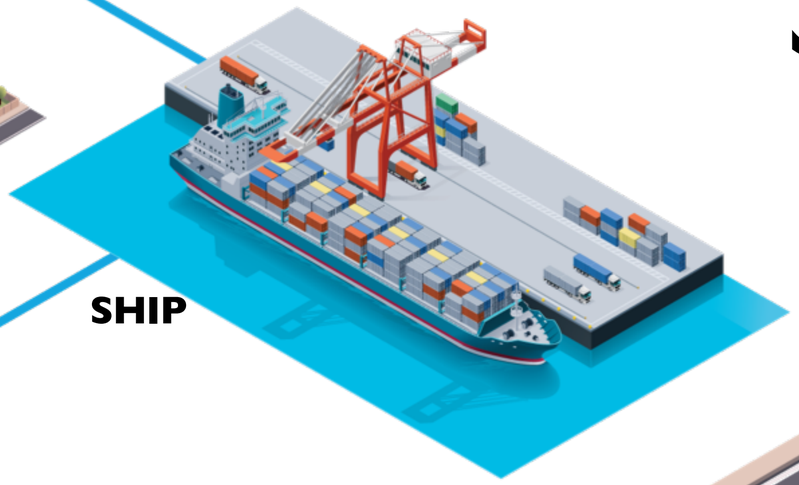
DAPP = FRONTEND + CONTRACTS

SUPPLY CHAIN

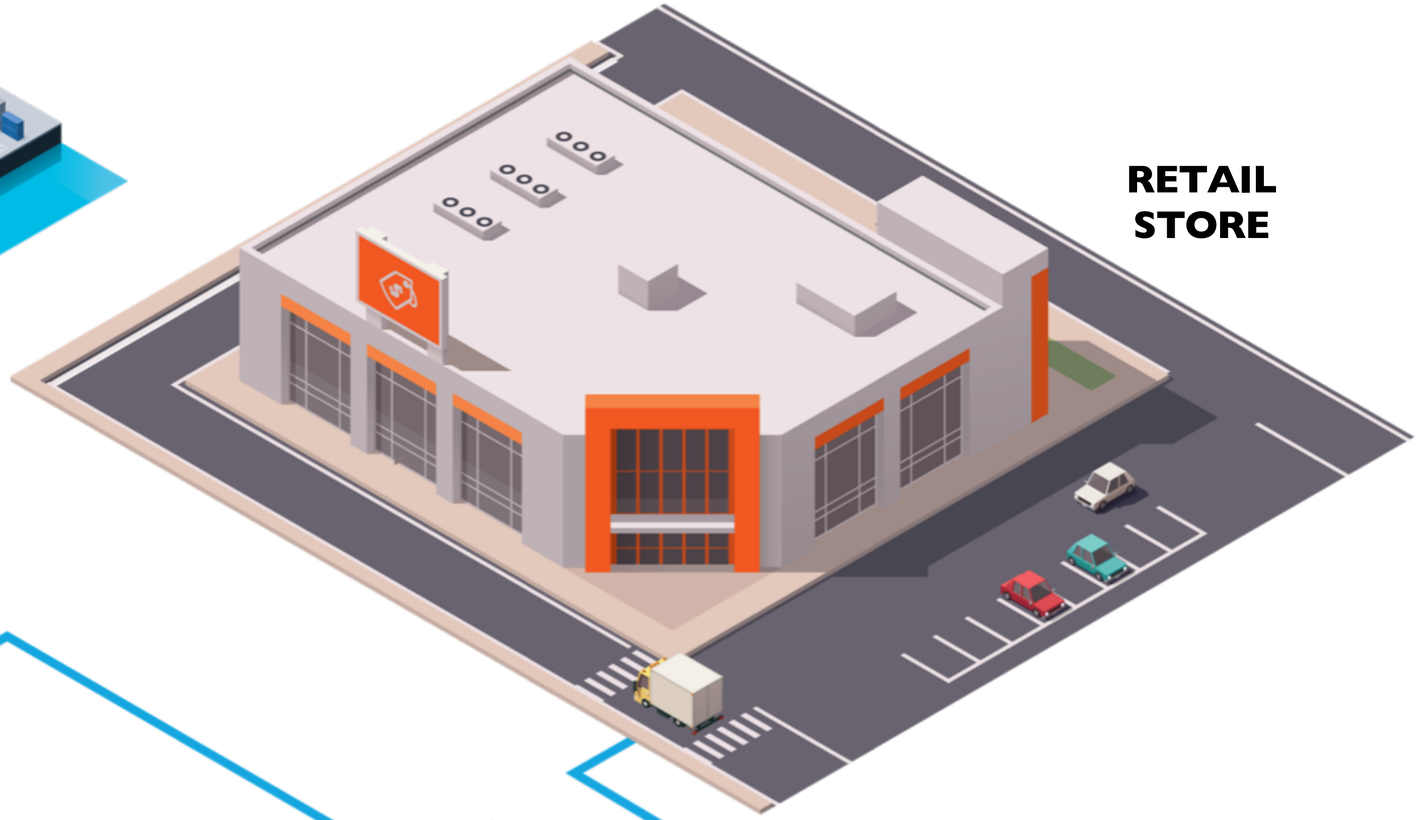


PRODUCER

SHIPPING TERMINAL



SHIP



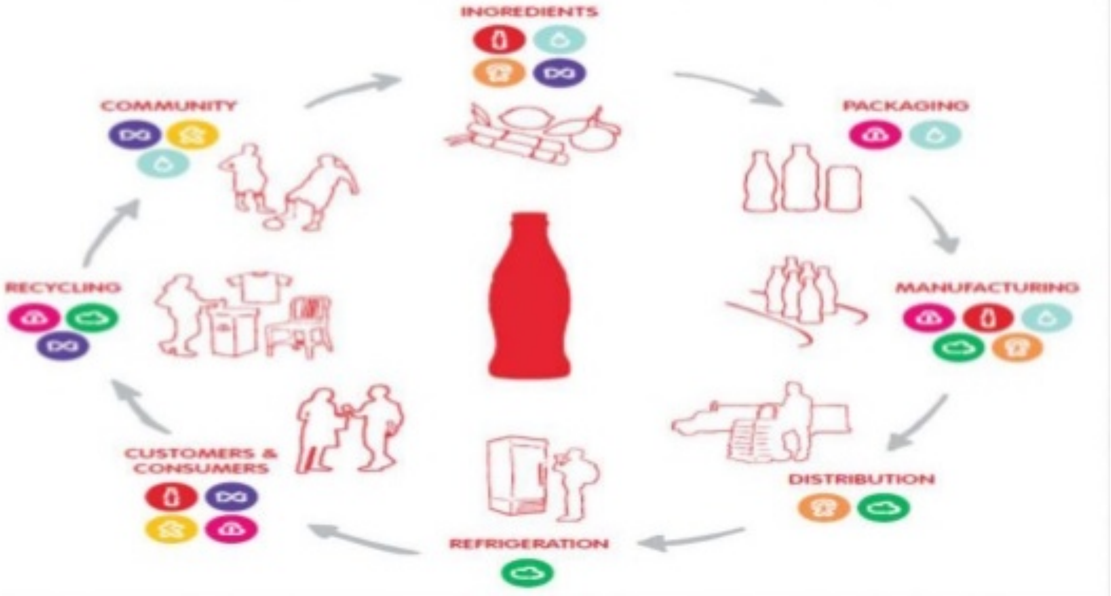
RETAIL STORE

CARGO TRAIN

DELIVERY TRUCK

Recording the transfer of physical goods from a **producer**, to a **shipping terminal**, to a **ship**, to a **cargo train**, to a **delivery truck,** and to a **store** with blockchain can increase trust and transparency**.**

KHS
Innopack Kisters SP


INGREDIENTS
PACKAGING
MANUFACTURING
DISTRIBUTION
REFRIGERATION
CUSTOMERS & CONSUMERS
RECYCLING
COMMUNITY

“You will not find it difficult to prove that battles, campaigns, and even wars have been won or lost primarily because of logistics”

~ Dwight D. Eisenhower

The Future of Manufacturing is Distributed,
Decentralized, Agile, and Rural

THANK YOU

HOW TO CONNECT WITH ME

Don’t hesitate to contact me.
I will be happy to answer your questions.

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