

BoLT: Building on Local Trust

Seth Copen Goldstein

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10/13/20

Joint work with amazing students:

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Iris Zhang, Min Zhu, Yumeng Zou

BoLT: An Introduction



Alice has a loyal following in the community.

BoLT: An Introduction



- Alice wants to raise some money.

Alice creates a new bolt



- Alice wants to raise some money.
- She taps into local community and sells bolts: digital gift-cards

Alice creates a new bolt



- Alice wants to raise some money.
- She taps into local community and sells bolts: digital gift-cards
- They can pay interest

Alice creates a new bolt



- Alice wants to raise some money.
- She taps into local community and sells bolts: digital gift-cards
- They can pay interest or not

All Transactions Recorded on Public Ledger



- Alice mints $\$10$
- Alice transfers to Charlie
- ...

How can Charlie use his ↪Alice?

- He can hold onto it.
(Maybe it is
accumulating interest)



How can Charlie use his ↪Alice?

- He can hold onto it
- He can spend it at Alice's



How can Charlie use his ⚡Alice?

- He can hold onto it
- He can spend it at Alice's
- He can (potentially) use it at Bob's Hardware store!



This is key aspect of Bolt. Bolts are tradeable with people other than the issuer.

Why will Bob accept \triangleleft Alice?



Why will Bob accept \triangleleft Alice?

- He believes other people will take them!
- That is all it takes.



A closer look at Money

- What makes money work:
 - A metric/store of value
 - A method of accounting
 - A medium of exchange

I.e., we trust that it is transferable



Today's Money

- What makes money work:
 - A metric/store of value
 - A method of accounting
 - Trust that it is transferable
- So today's currency is:
 - A static token
 - Backed by the state



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Today's Money

- What makes money work:
 - A metric/store of value
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 - Trust that it is transferable
- So today's currency is:
 - A static token
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But remember, it has no intrinsic value!



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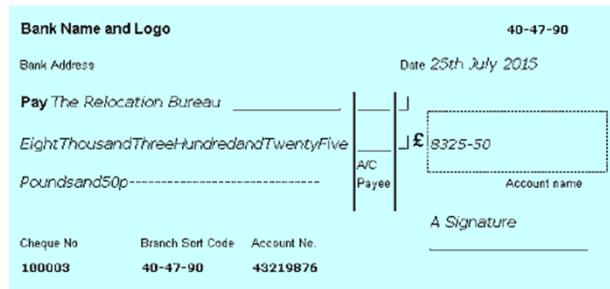
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Crypto & Money

- Currency doesn't need to be static token.
- Nor backed only by the state.
- Can we harness reputation using computation and networks to create a new form of money?
- Goal: Monitize IOUs
(I.e., Bolts)

Past Experience: Ireland

- Irish Banking Crisis ('60, '70, '76)
 - Banks closed
 - Checks can't clear
 - People used check as money



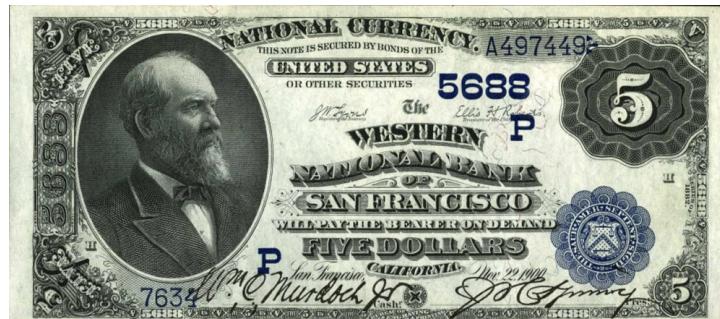
→ Good? →



Reputation Authority

Past Experience: Bank Money

- Irish Banking Crisis ('60, '70, '76)
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- Banknotes



Past Experience:

- Irish Banking Crisis ('60, '70, '76)
 - Banks closed
 - Checks can't clear
 - People used check as money
- Banknotes
- Local Currencies
 - BerkShares
 - Tenino, WA “wooden” currency
 - LETS
 - ...



BoLT

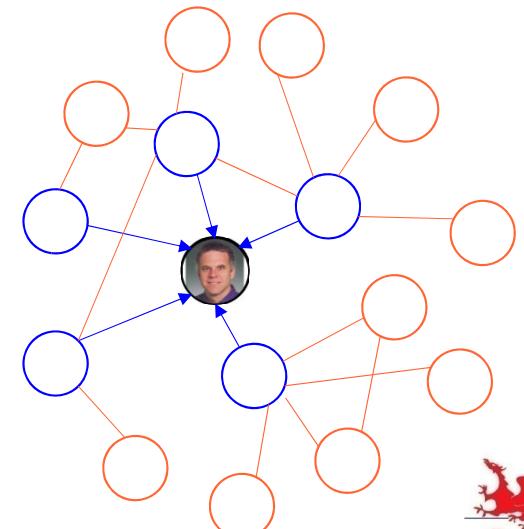
- Currency doesn't need to be static token.
- Nor backed only by the state.
- Imagine that everyone can issue their own digital gift-cards backed by their reputation.



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Who accepts ↲Seth?

- Certainly, I must.
- Anyone who expects to trade with me.
- People in my communities
- Most anyone who expects to trade with someone I trade with, etc.
- The further the separation the less likely.
- Everyone will decide their risk tolerance.



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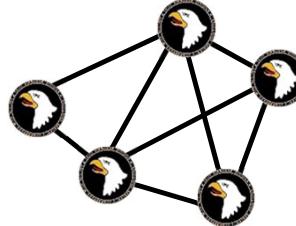
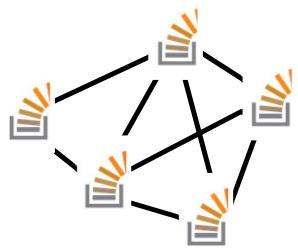
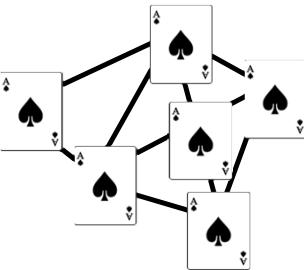
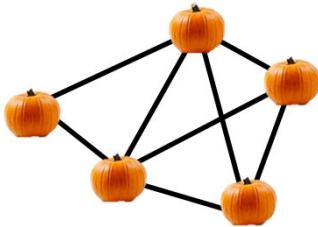
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Currency is “executable” and has means to reduce risk.

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We Are All Members of Multiple Communities



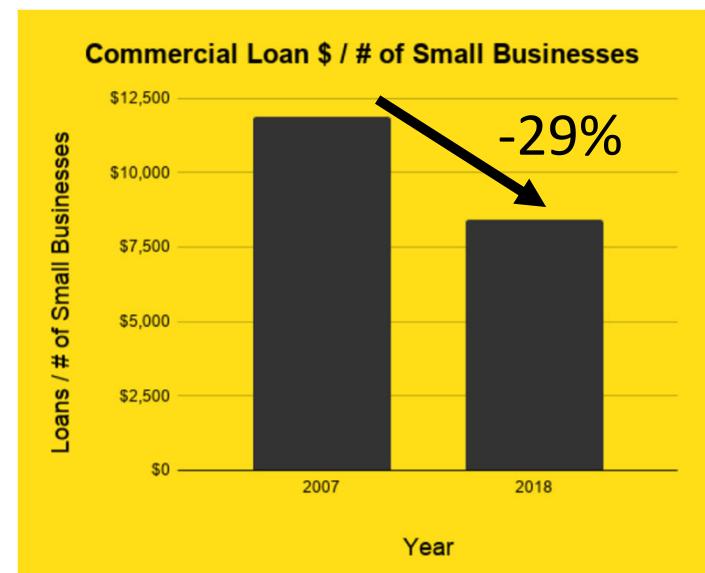
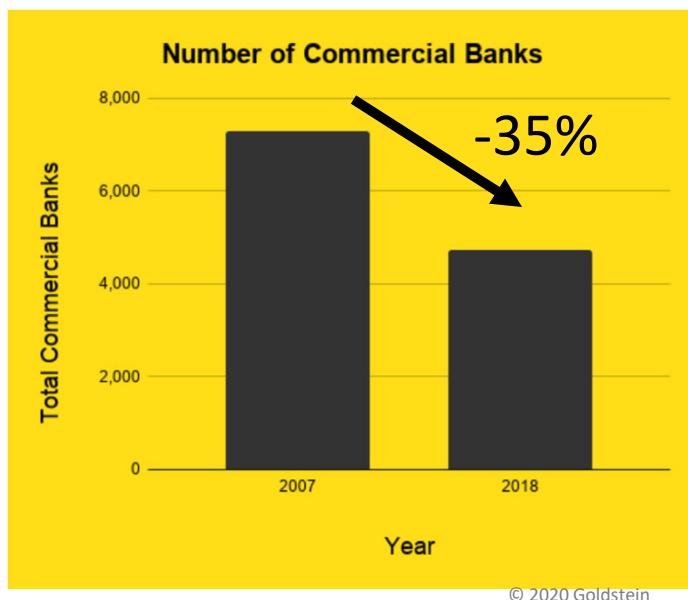
Public Ledger & Machine Learning replaces
Publican as distributed reputation authority.

BoLT Motivation

- Failure of mainstream banking system
 - Asymmetric information
 - Imperfect competition
 - Systemic racial bias
 - Small-business bias

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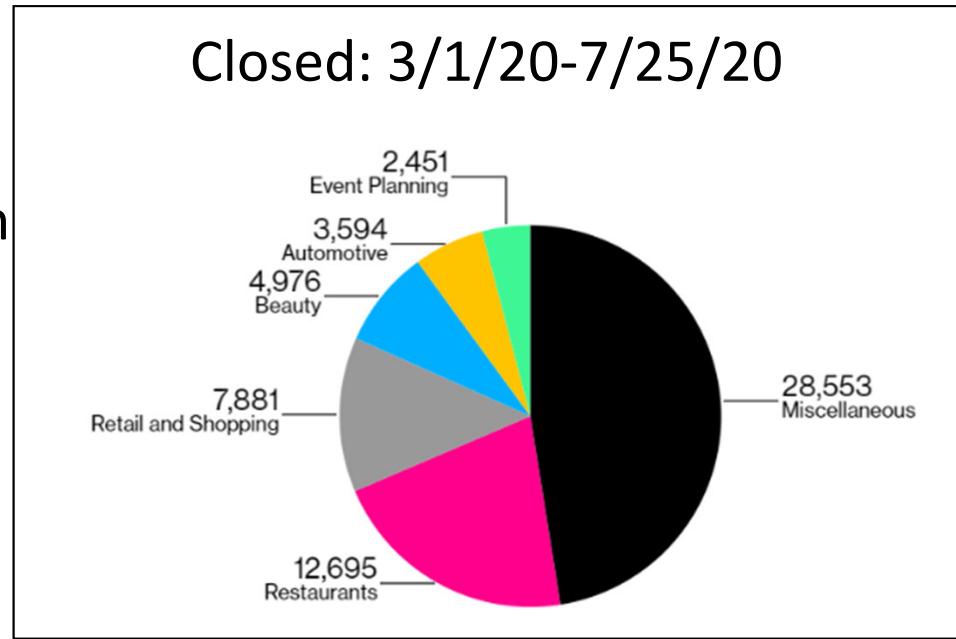


BoLT Motivation

- Failure of mainstream banking system
 - Asymmetric information
 - Imperfect competition
 - Systemic racial bias
 - Small-business bias
- Predatory Lenders are filling the gap
 - payday lenders: APR can be 700%
 - online: Lenio, Kabbage, Ondeck, Fundbox, ...: APR can be 94%

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- Covid-19 makes all this worse
 - Bankruptcy Filings up 36%
 - Just march-july over 80K businesses permanently closed



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**Solution: Use local reputation
to source funds locally
(but, export trust globally)**

Why Not Traditional Gift Cards?

- Gift cards trade at an extreme discount (often 10-60%)
- Tremendous friction
 - fees
 - only accepted at one store/chain
 - Hard to subdivide
 - Hard to transfer
- Subject to forgery
- Lack of transparency
- Cannot be used to build trust/reputation

BoLT is a lending & Trading platform

- BoLT: “Go Local” for capital
 - Businesses can raise money in the community
 - Customers use bolts to purchase goods & services from anyone on the system
 - Bolts flow around the community creating liquidity



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- BoLT: “Go Local” for capital
 - Businesses can raise money in the community
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 - Bolts flow around the community creating liquidity
- BoLT: gateway to global capital markets
 - Ledger data can be used to create global opportunities for investment



What is a bolt?

- A digital “gift-card” with
 - Issuer
 - Maturity date
 - Interest specification (optional)
 - Buyback specification (optional)
 - Redeemable for Fiat? (optional)

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Cryptographically verified

bolt-directory.com

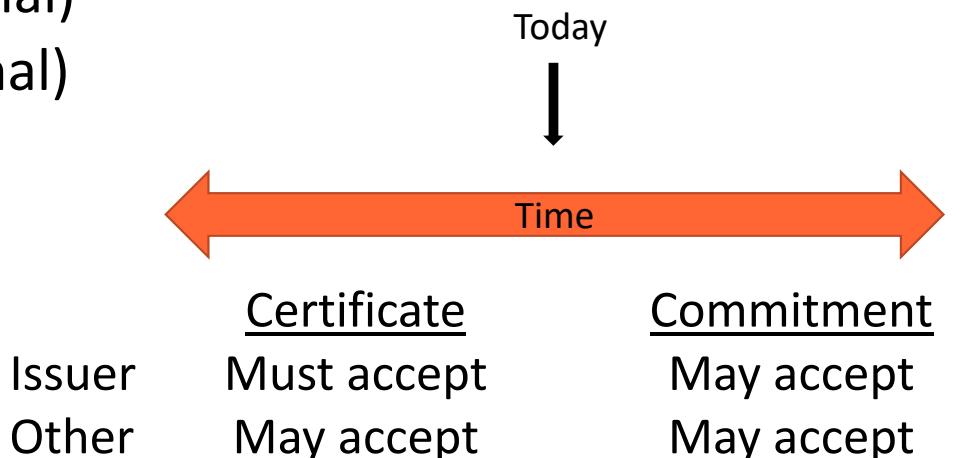
Issuer Page

- Their story
- Photos
- Documentation

- Issuer is just a public key.
- Most issuers will want to be verified.

What is a bolt?

- A digital “gift-card” with
 - Issuer
 - **Maturity date**
 - Interest specification (optional)
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 - Reedemable for Fiat? (optional)



What is a bolt?

- A digital “gift-card” with
 - Issuer
 - Maturity date
 - **Interest specification** (optional)
 - Buyback specification (optional)
 - Reedemable for Fiat? (optional)

Simple interest accumulating daily.

What is a bolt?

- A digital “gift-card” with
 - Issuer
 - Maturity date
 - Interest specification (optional)
 - Buyback specification (optional)
 - **Redeemable for Fiat?** (optional)

When presented to issuer after maturity can be used to:

- purchase goods and services
- trade for other bolts
- (optionally) redeemable for current value in fiat currency

BoLT protocol basics:

- Defining new bolts
- Issuing previously defined bolts
- Offering bolts for sale
- Trading bolts (for an outstanding offer)
- Used to purchase goods and services
- (optionally) Redeemed for fiat currency

Real World Issues and the Protocol

- Minimum raise needed in a funding campaign
- Reducing risk to the buyer
 - Default insurance
 - Community pooled bolts
- High-risk short-term loans

Escrow transactions

- Buyers of bolts want to know a business is raising sufficient capital
- Issuer can set minimum threshold for a campaign with a timeout
- Buyer commits to purchase bolts on ledger if and only if minimum commitment is met
- Issuer sets which bolts are allowed (which can be $\text{\textcircled{S}}\text{US}$)
 - Every $\text{\textcircled{S}}\text{US}$ is backed by 1\$
 - Also useful as bridge between thinly traded bolts

Real World Issues and the Protocol

- Minimum raise needed in a funding campaign
- Reducing risk to the buyer
 - Default insurance
 - **Community pooled bolts**
- High-risk short-term loans

Bolts From Individual Businesses



⚡10 Alice
8%



⚡10 David
8%



⚡10 Bob
8%



⚡10 Carol
8%



- John wants to support the local businesses he patronizes
- He wants to buy bolts from Alice, Bob, Carol, and David
- But, he worries one of them may go out of business

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The **TrustLine** Transaction

- A **TrustLine** From Alice to Bob for ⚡100 means:

Alice will accept up to 100 ⚡Bob as if they were her own.

- A way to explicitly extend the web of trust
- Also a way to pool risk

Bolts from the Community

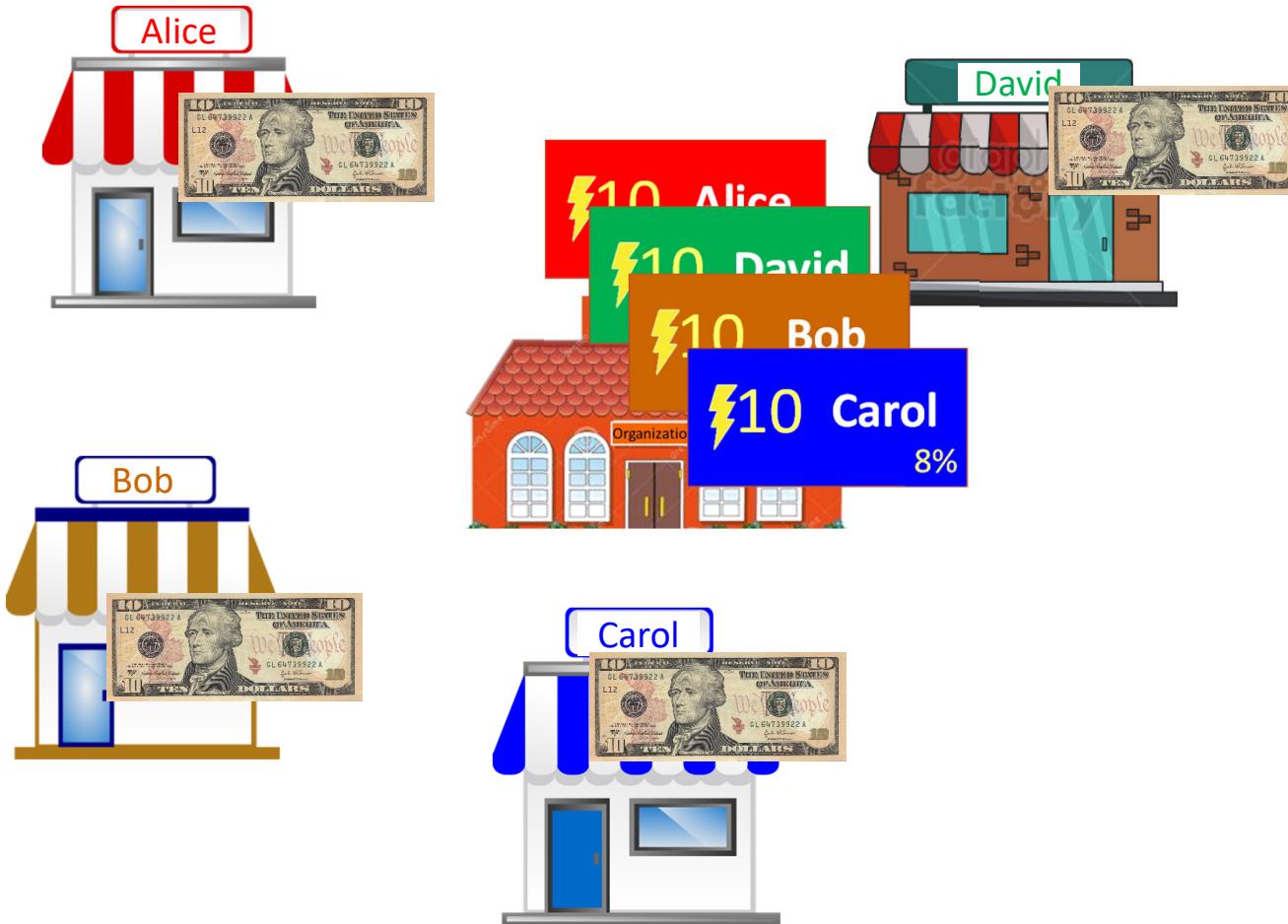
- Community Org Buys bolts from its members



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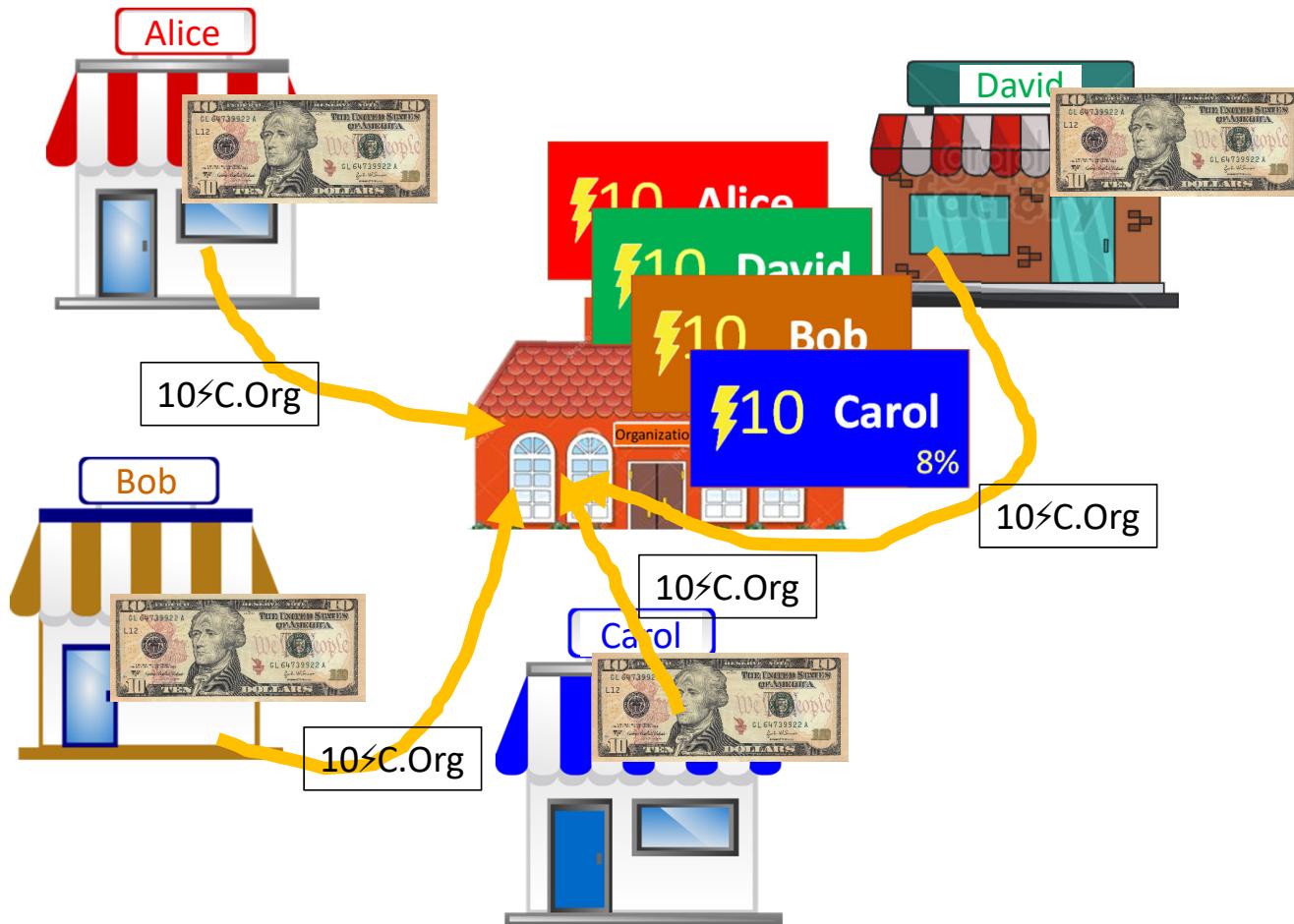
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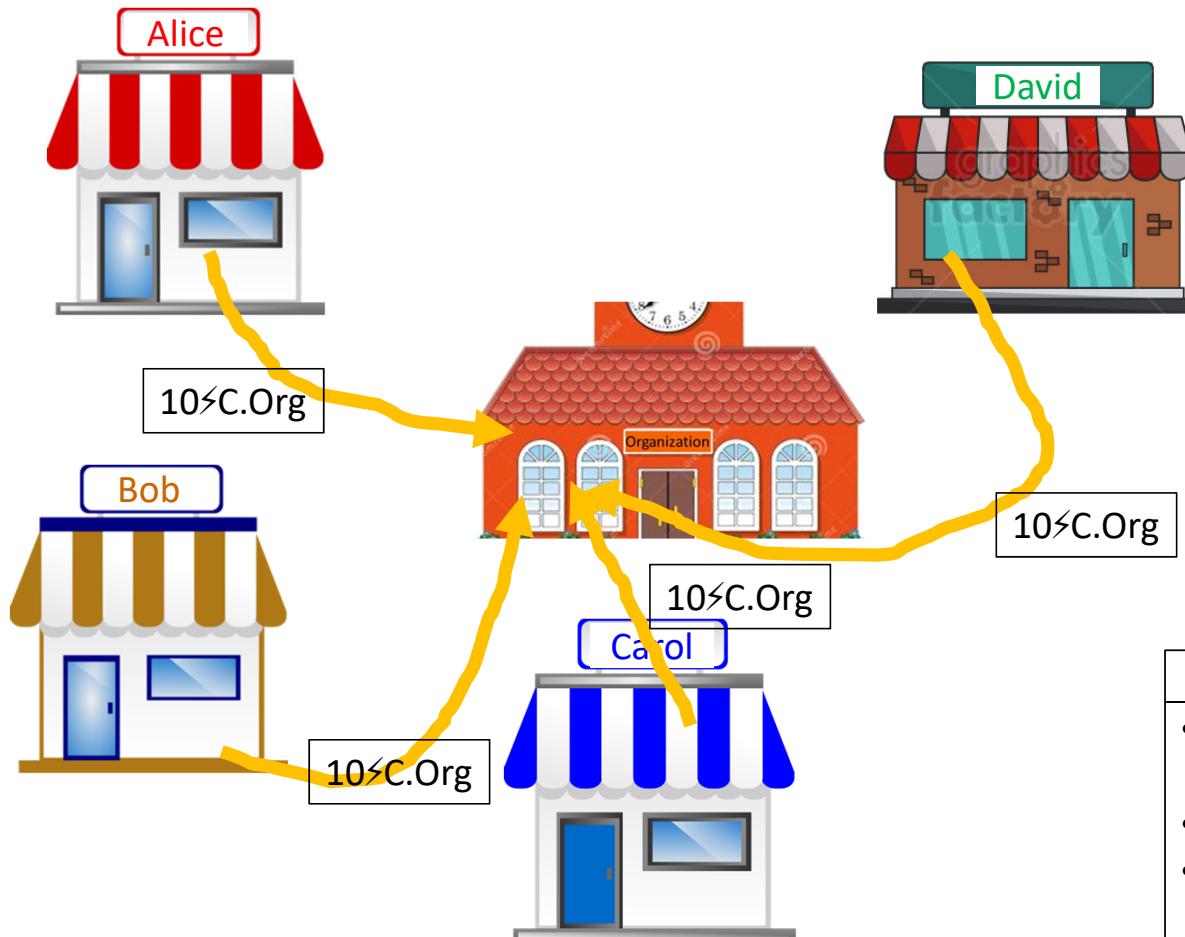
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Bolts from the Community



- Community Org Buys bolts from its members
- At the same time each member issues a **TrustLine** to the Community Org for the amount of bolts they sold to Community Org

Bolts from the Community

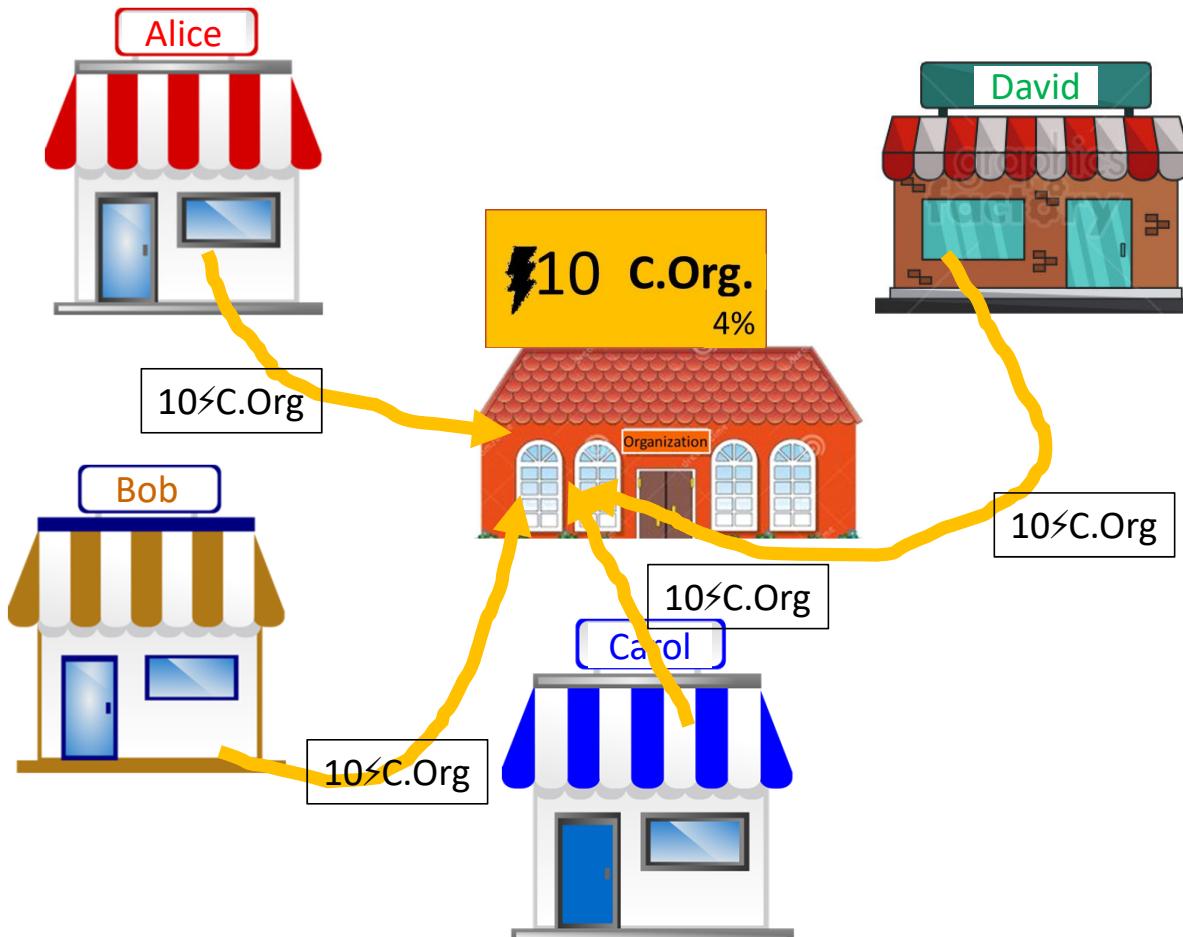


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So Far

- Local merchants have raised money from Community Org.
- Community Org is earning 8%
- All merchants must accept Community Org bolts.

Bolts from the Community

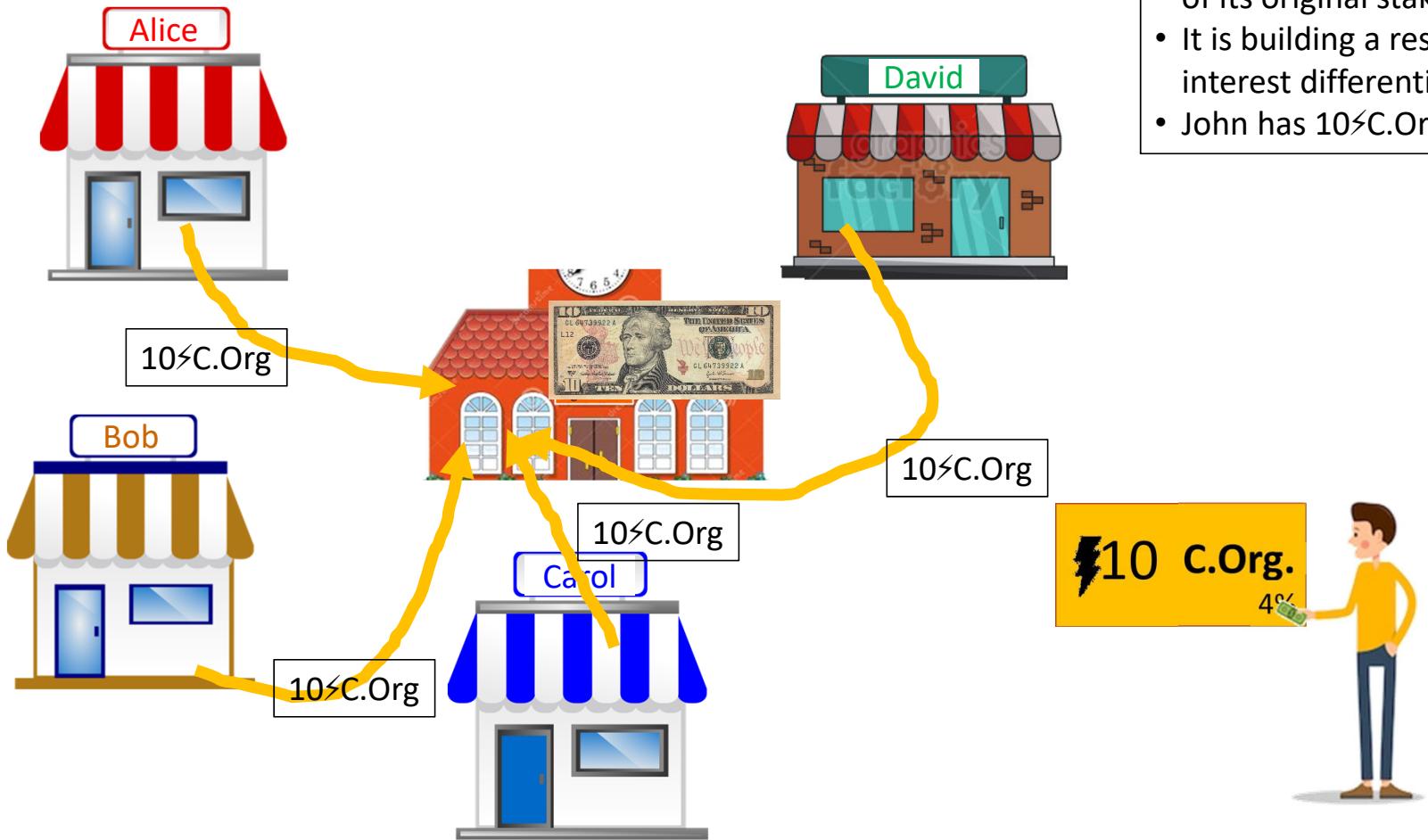


- Community Org Buys bolts from its members
- At the same time each member issues a **TrustLine** to the Community Org for the amount of bolts they sold to Community Org
- John wants to support local businesses he patronizes, **so he buys ⚡Community Org**



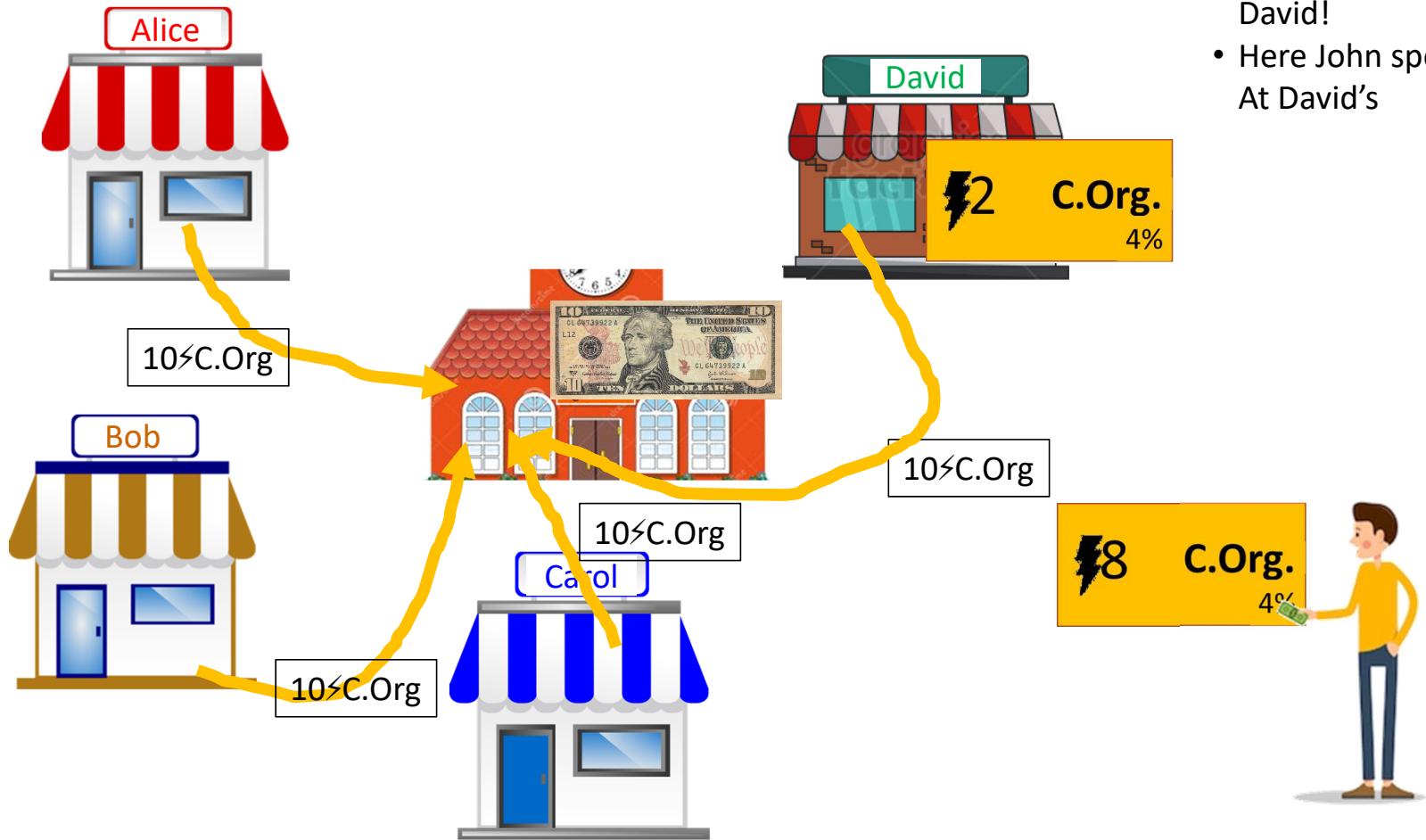
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Bolts from the Community



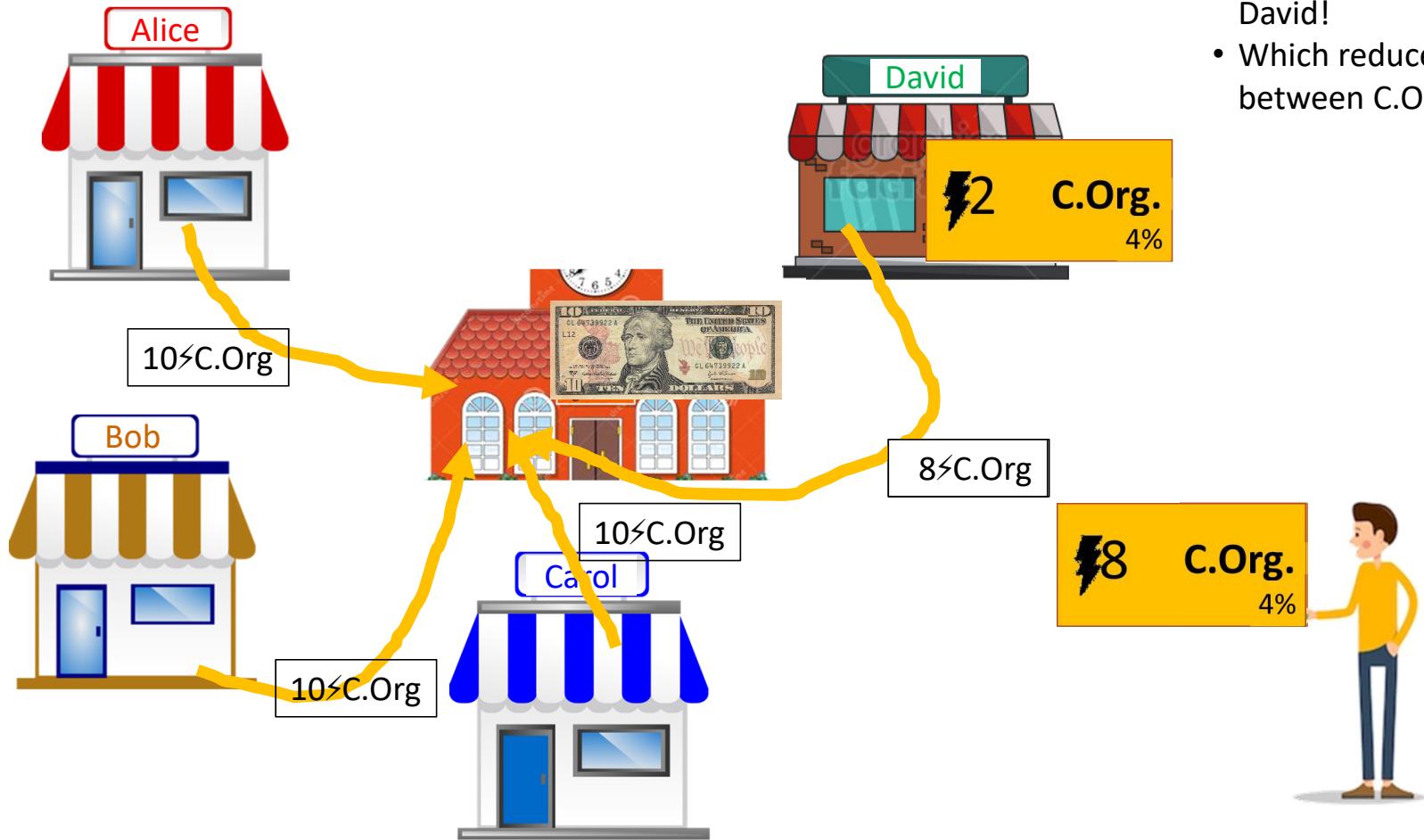
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Bolts from the Community



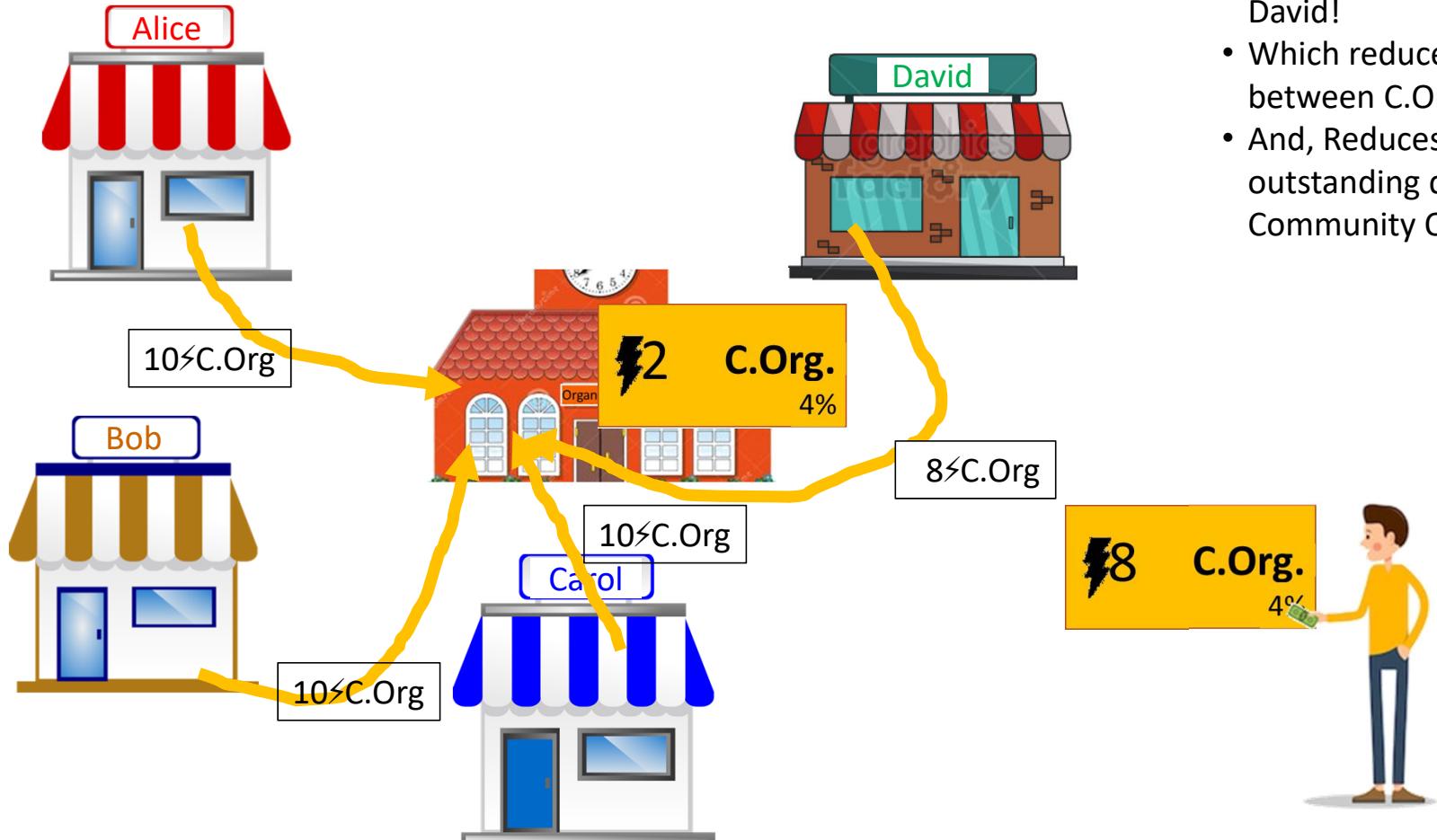
- John can spend his ⚡C.Org. at Alice, Bob, Carol, or David!
- Here John spends 2 ⚡C.Org. At David's

Bolts from the Community



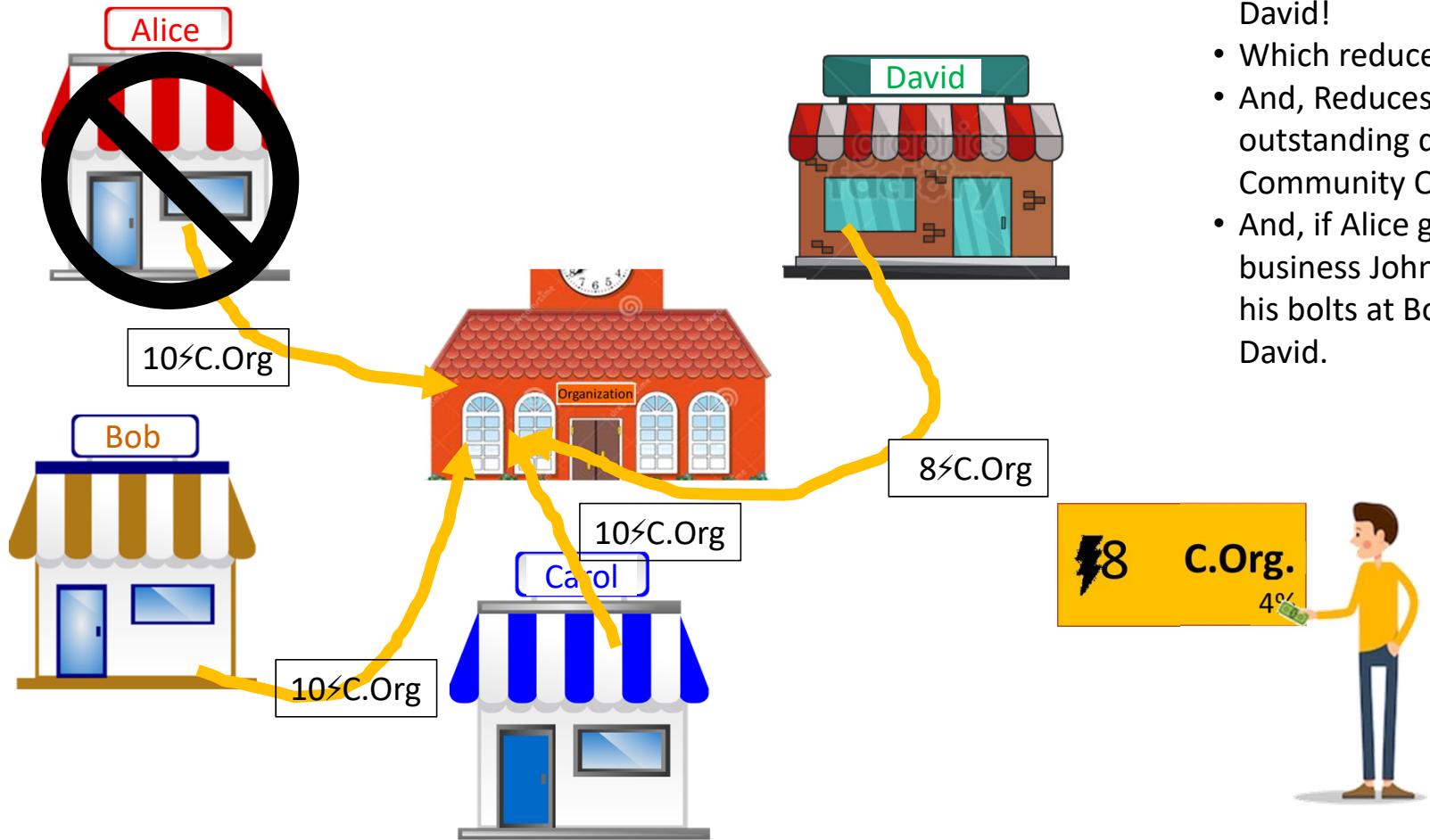
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Bolts from the Community



- John can spend his ⚡C.Org. at Alice, Bob, Carol, or David!
- Which reduces the TrustLine between C.Org and David
- And, Reduces their outstanding debt to Community Org

Bolts from the Community



- John can spend his $\triangleleft C.Org.$ at Alice, Bob, Carol, or David!
- Which reduces TrustLine
- And, Reduces their outstanding debt to Community Org
- And, if Alice goes out of business John can still use his bolts at Bob, Carol, or David.

TrustLine

- Used to build trust on the ledger
- Most important for
 - Early adoption of BoLT
 - New entrants to the BoLT system
- Can also be used for anonymity

BoLT: Building on Local Trust

- A public ledger based digital gift-card issuing and trading platform
- Addresses failures of mainstream banking
- Supports “go local” for raising capital
- Creates community by encouraging local trading/shopping
- Basic primitives support useful financial instruments
- Has the potential to export trust and bring in outside capital

More info at: www.cs.cmu.edu/~seth/bolt

BoLT: Building on Local Trust

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