

# BoLT: Building on Local Trust

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10/13/20

Joint work with amazing students:

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# 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



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- 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  $\text{⚡}10$
- Alice transfers to Charlie
- ...

# How can Charlie use his $\neq$ Alice?

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





# How can Charlie use his $\neq$ Alice?

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



# How can Charlie use his $\neq$ 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 $\neq$ Alice?



# Why will Bob accept $\neq$ 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



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# 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



# Today's Money

- What makes money work:
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  - Trust that it is transferable
- So today's currency is:
  - A static token
  - Backed by the state

But remember, it has no intrinsic value!



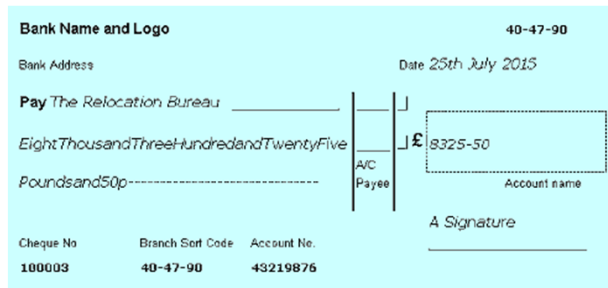
# Crypto & Money

- 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: Monetize IOUs  
(I.e., Bolts)



# Past Experience: Ireland

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



Bank Name and Logo 40-47-90

Bank Address Date 25th July 2015

Pay *The Relocation Bureau*

*Eight Thousand Three Hundred and Twenty Five Pounds and 50p*

£ 8325.50

A/C Payee Account name

A Signature

Cheque No. Branch Sort Code Account No.

100003 40-47-90 43219876

→ Good? →



↪ Reputation Authority





# 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

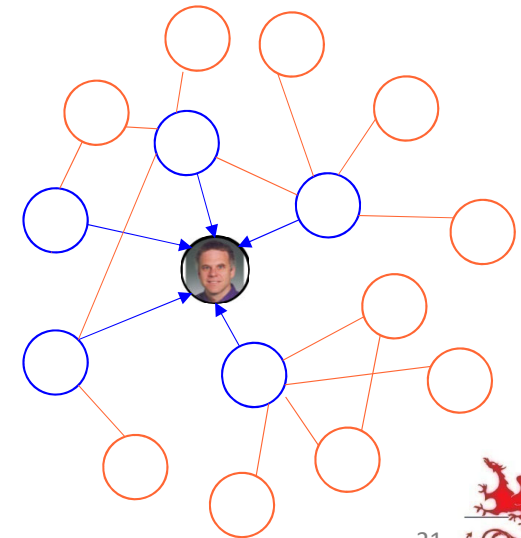
- Currency doesn't need to be static token.
  - Nor backed only by the state.
- 
- Imagine that everyone can issue their own digital gift-cards backed by their reputation.



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# Who accepts $\neq$ 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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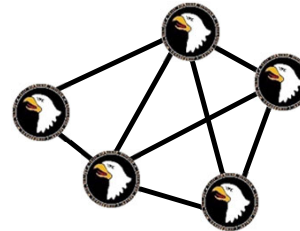
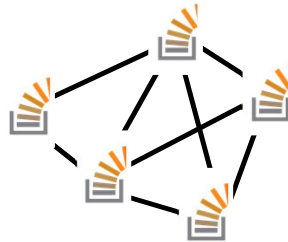
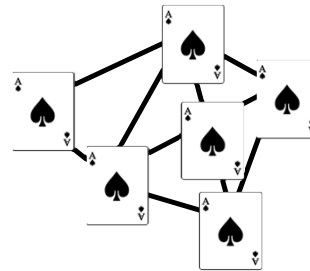
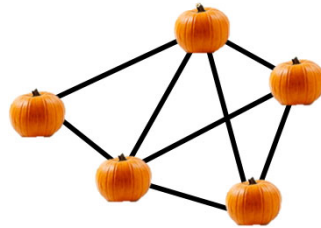
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Currency is “executable” and has means to reduce risk.

# We Are All Members of Multiple Communities



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

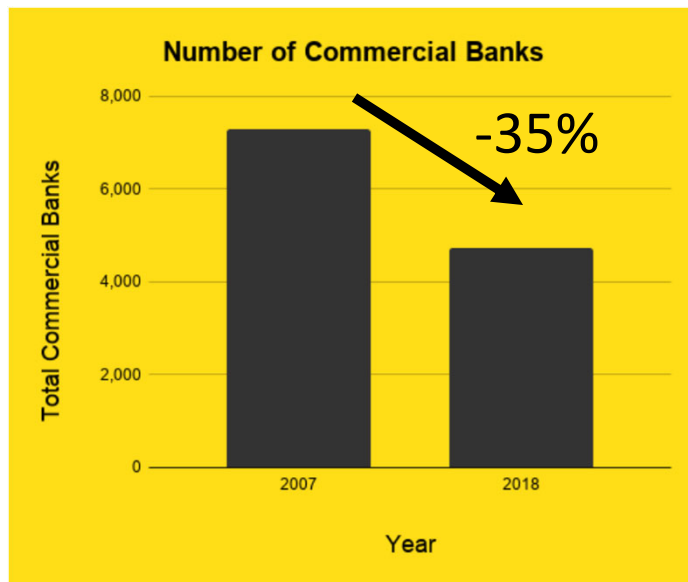


# BoLT Motivation

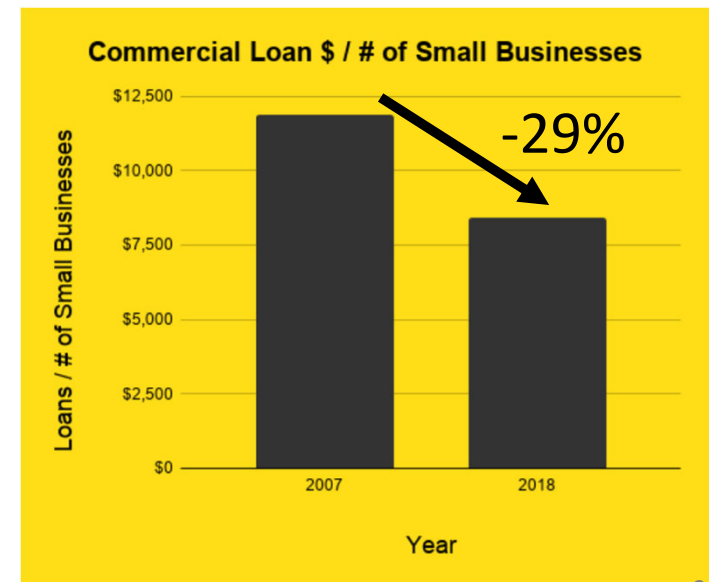
- Failure of mainstream banking system
  - Asymmetric information
  - Imperfect competition
  - Systemic racial bias
  - Small-business bias

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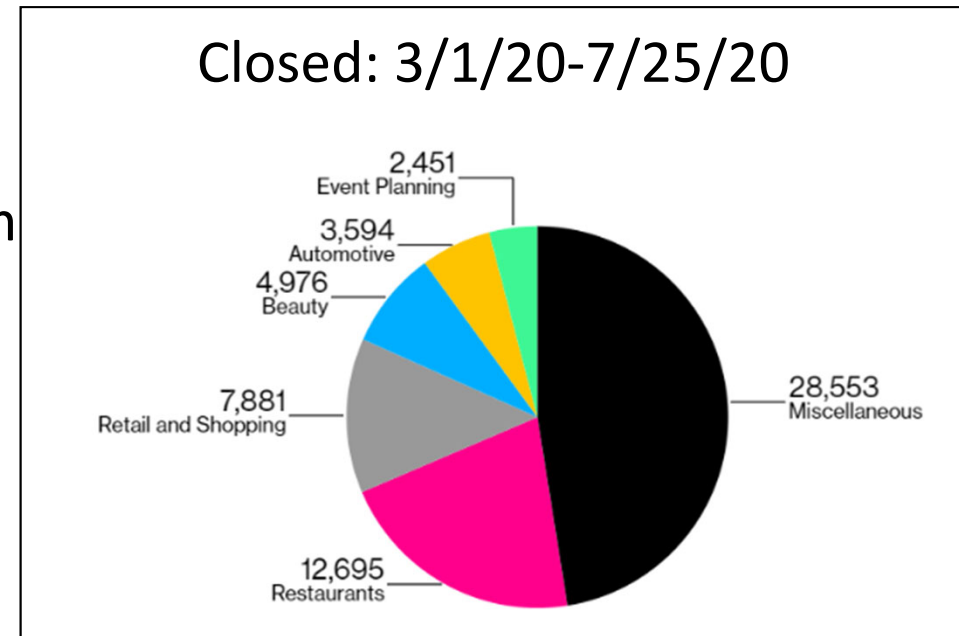


# BoLT Motivation

- 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

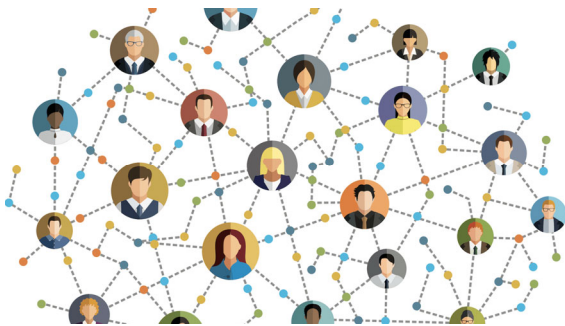
# BoLT is a lending & Trading platform

- 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



# BoLT is a lending & Trading platform

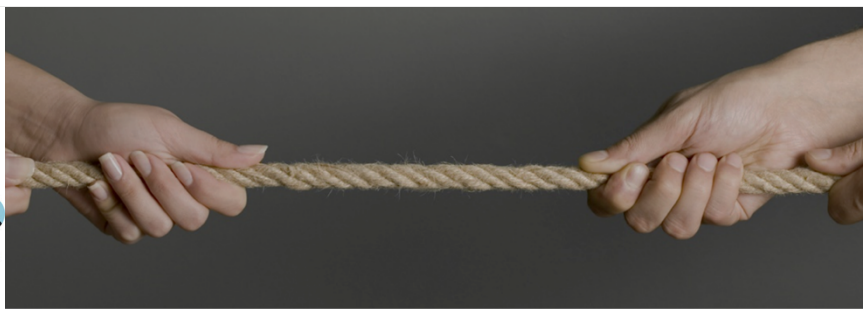
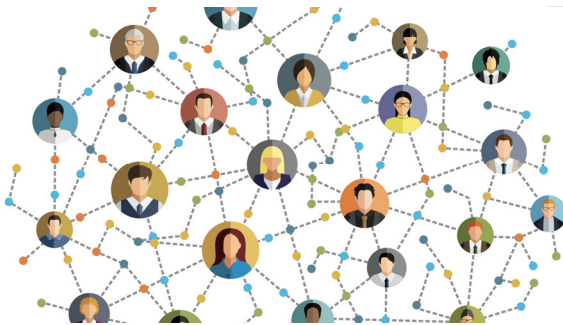
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# BoLT is a lending & Trading platform

- BoLT: “Go Local” for capital
  - Businesses can raise money in the community
  - Customers can use bolts to purchase goods and services from anyone on the system
  - 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)

# What is a bolt?

- A digital “gift-card” with
  - **Issuer**
  - Maturity date
  - Interest specification (optional)
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Cryptographically verified

[bolt-directory.com](https://bolt-directory.com)

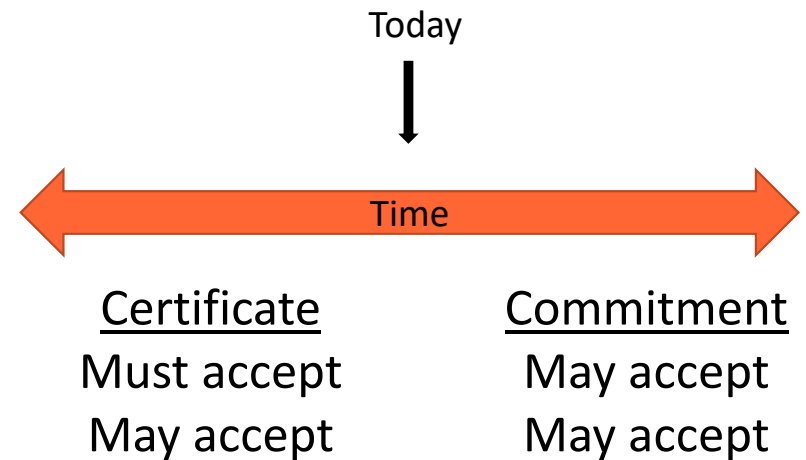
## Issuer Page

- 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)
  - Buyback specification (optional)
  - Redeemable for Fiat? (optional)



# What is a bolt?

- A digital “gift-card” with
  - Issuer
  - Maturity date
  - **Interest specification** (optional)
  - Buyback specification (optional)
  - Redeemable 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  $\neq$ US)
  - Every  $\neq$ 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

- 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



⚡10 Alice  
8%



⚡10 David  
8%



⚡10 Bob  
8%



⚡10 Carol  
8%



# The **TrustLine** Transaction

- A **TrustLine** From Alice to Bob for  $\leq 100$  means:

Alice will accept up to  $100 \leq$  Bob as if they were her own.

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

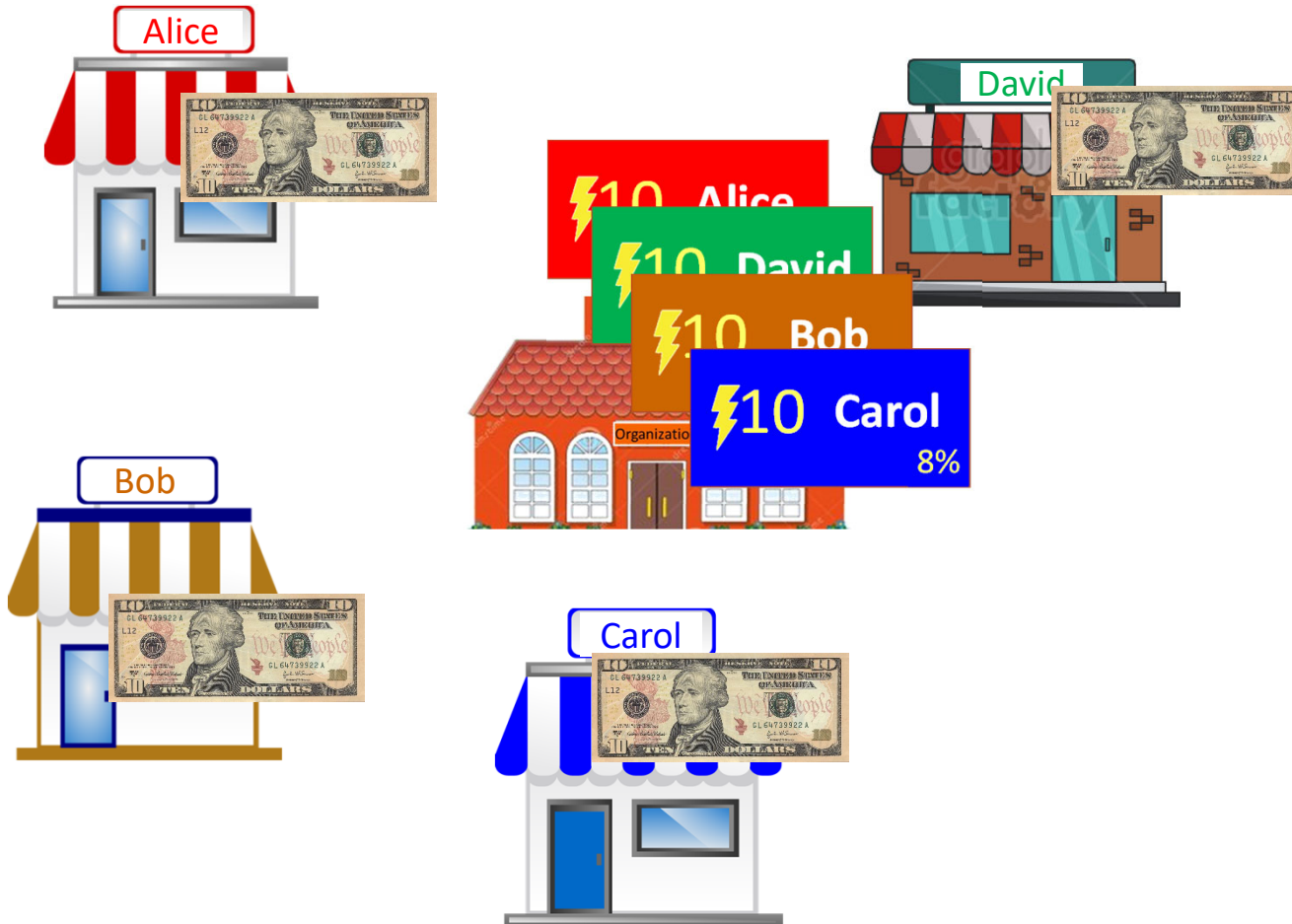
# Bolts from the Community

- Community Org Buys bolts from its members

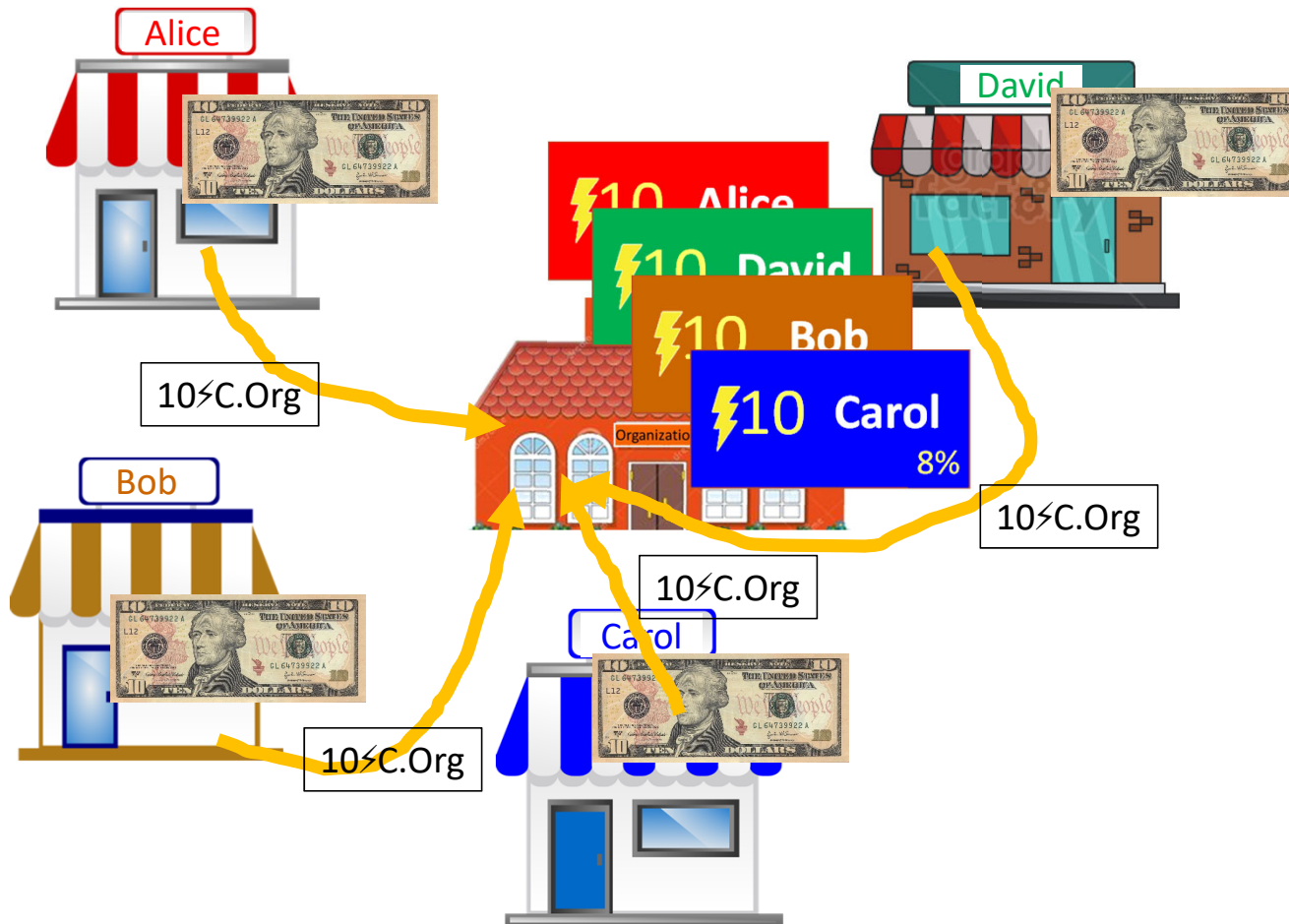


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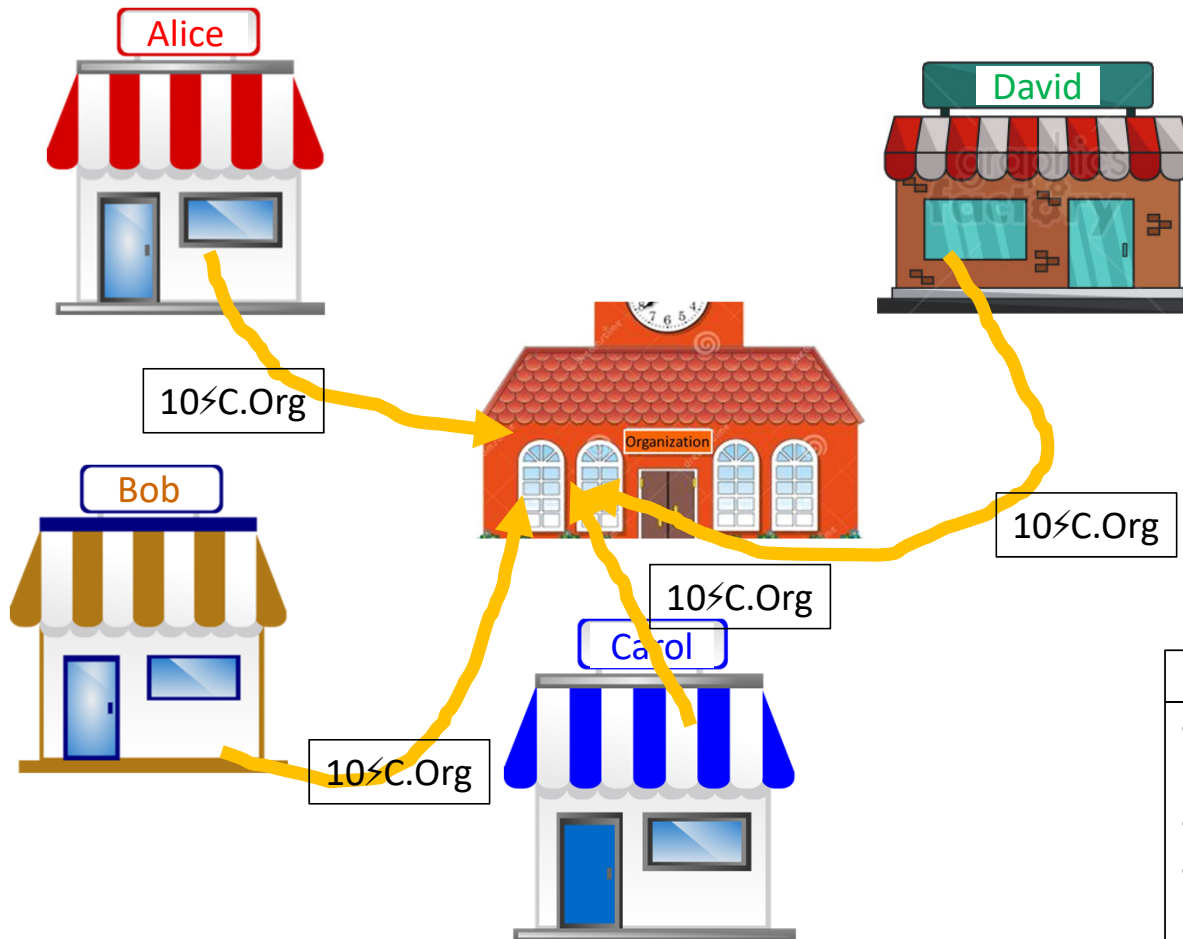


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- Community Org Buys bolts from its members
- At the same time each member issues a **TrustLine** to the Community Org for the amount of bolts they sold to Community Org

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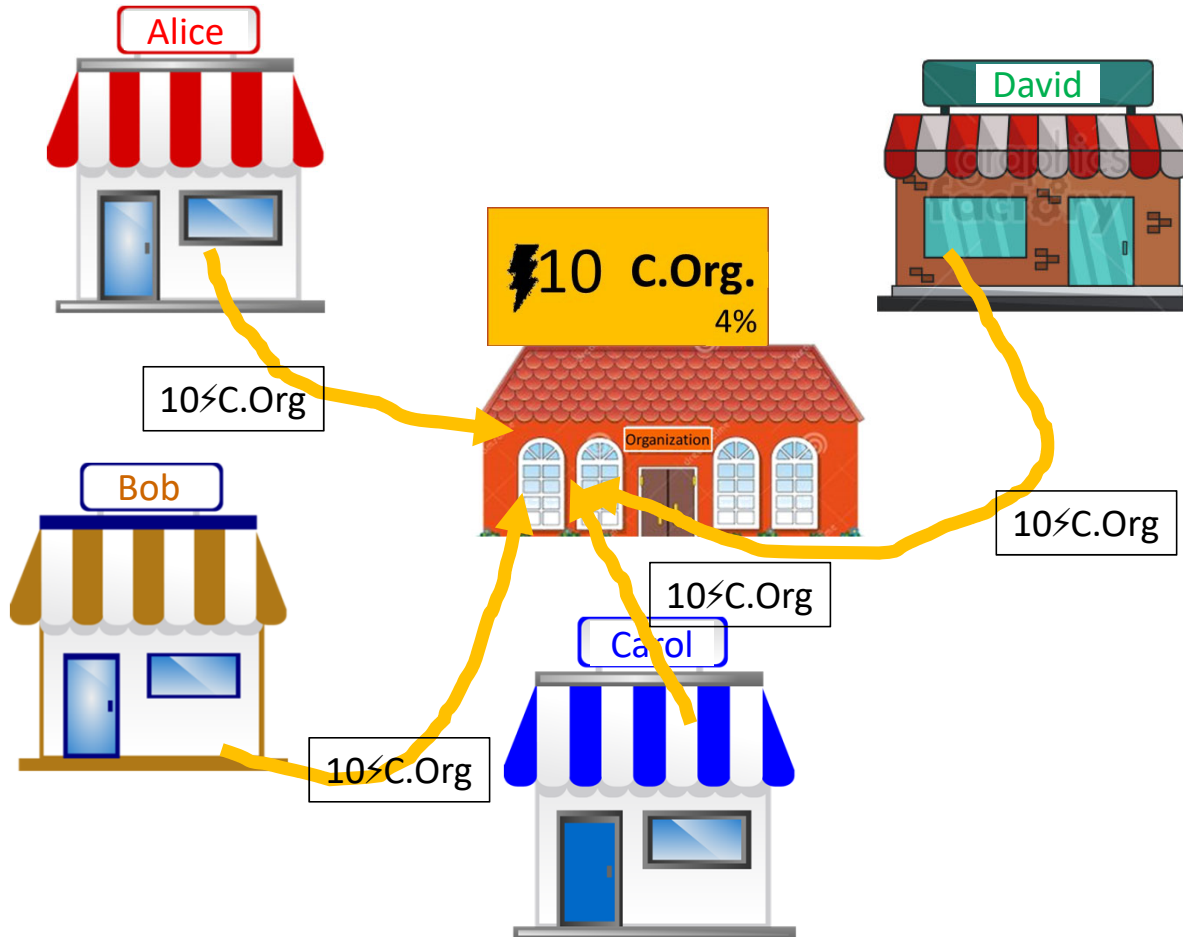


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So Far
<ul style="list-style-type: none"><li>• Local merchants have raised money from Community Org.</li><li>• Community Org is earning 8%</li><li>• All merchants must accept Community Org bolts.</li></ul>



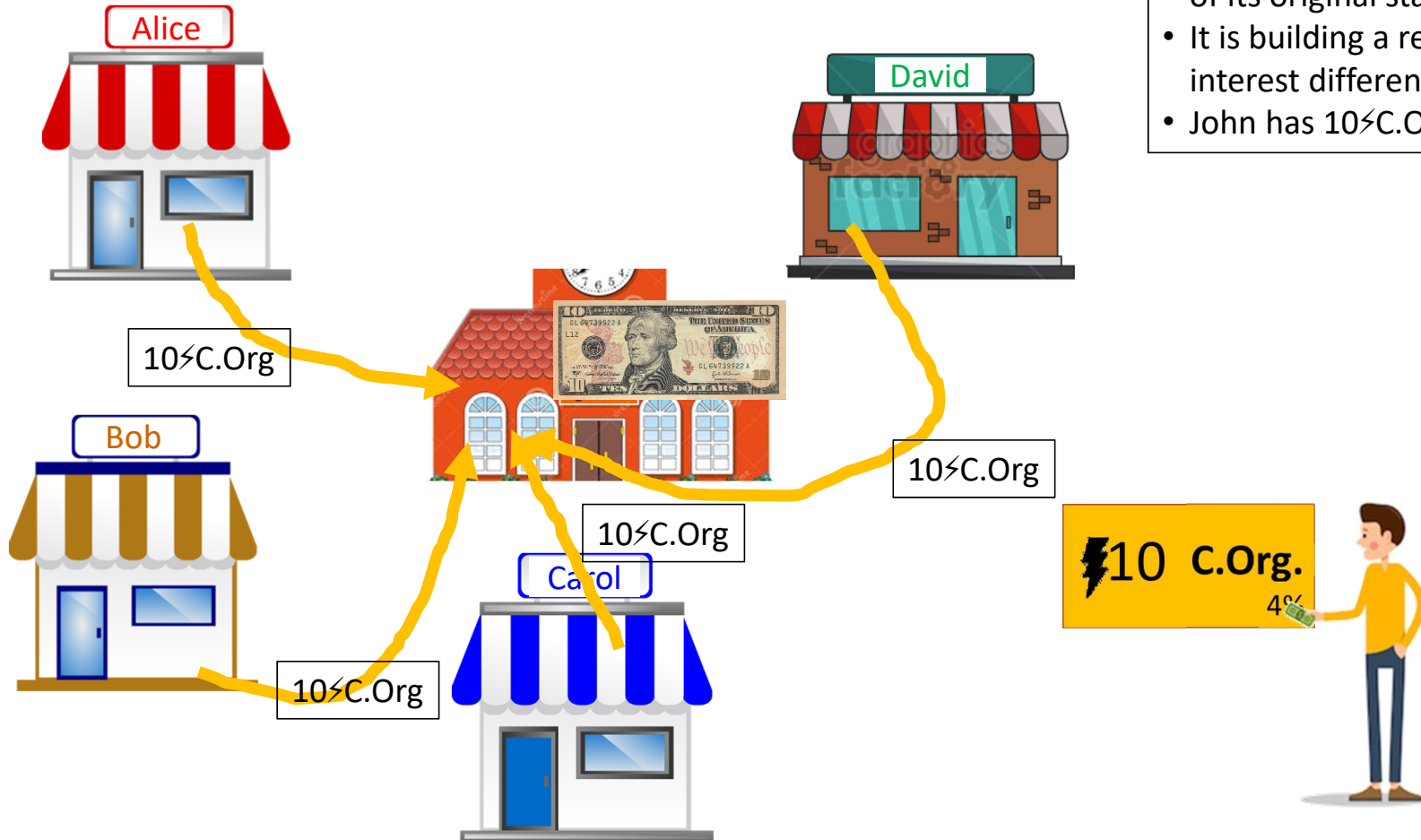
# Bolts from the Community



- 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

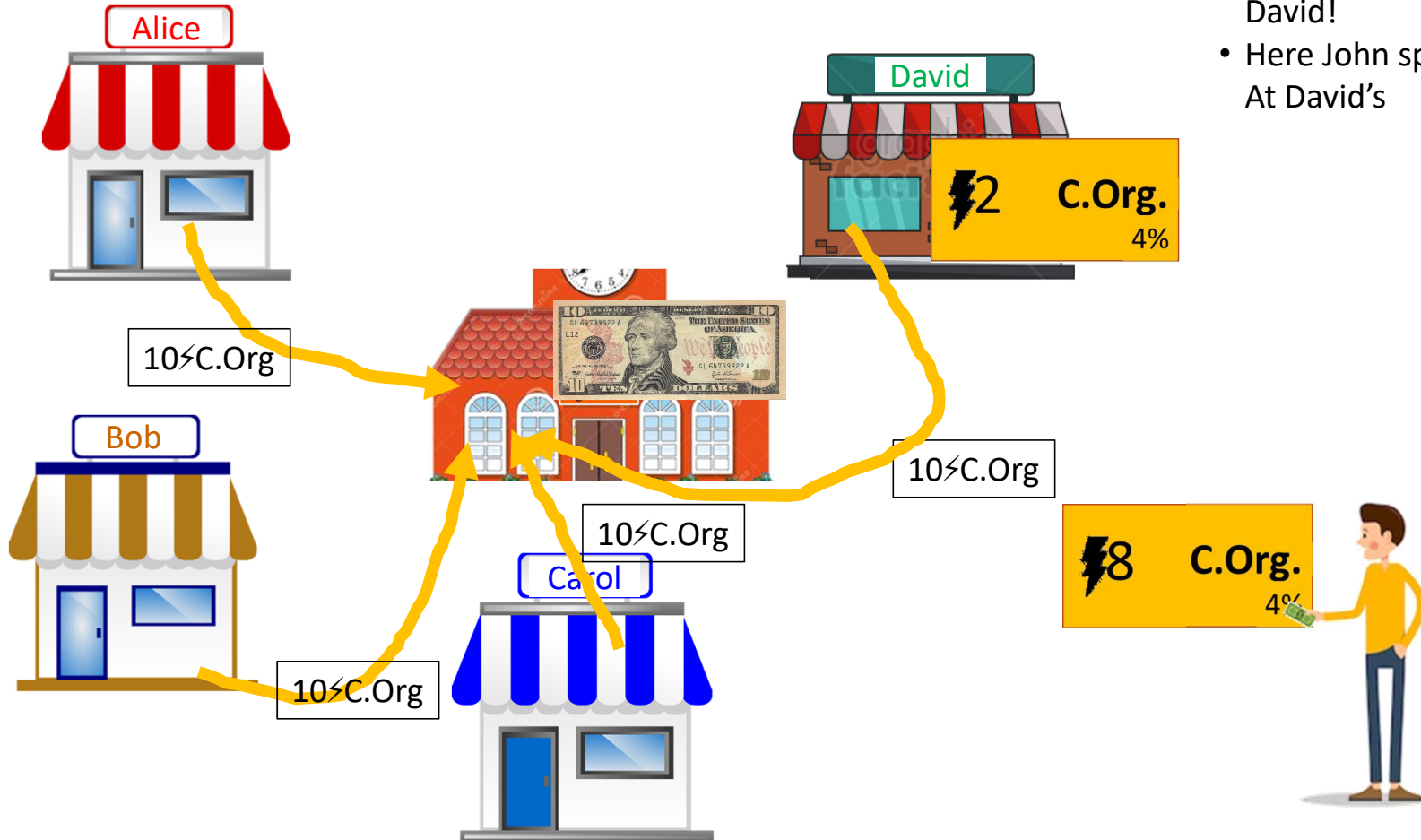


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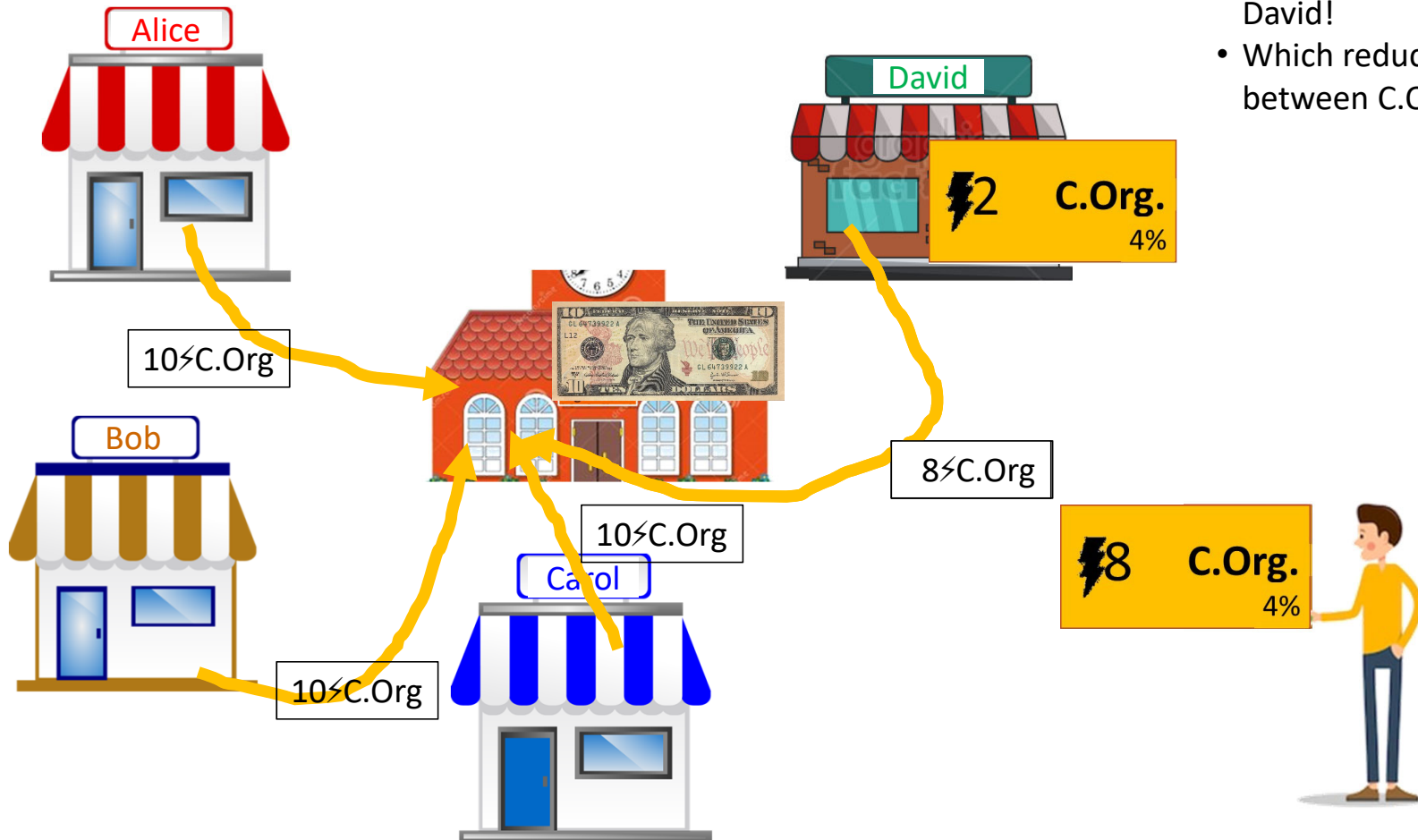
- So Far
- Community Org gets back some of its original stake
  - It is building a reserve with interest differential
  - John has 10 C.Org

# Bolts from the Community



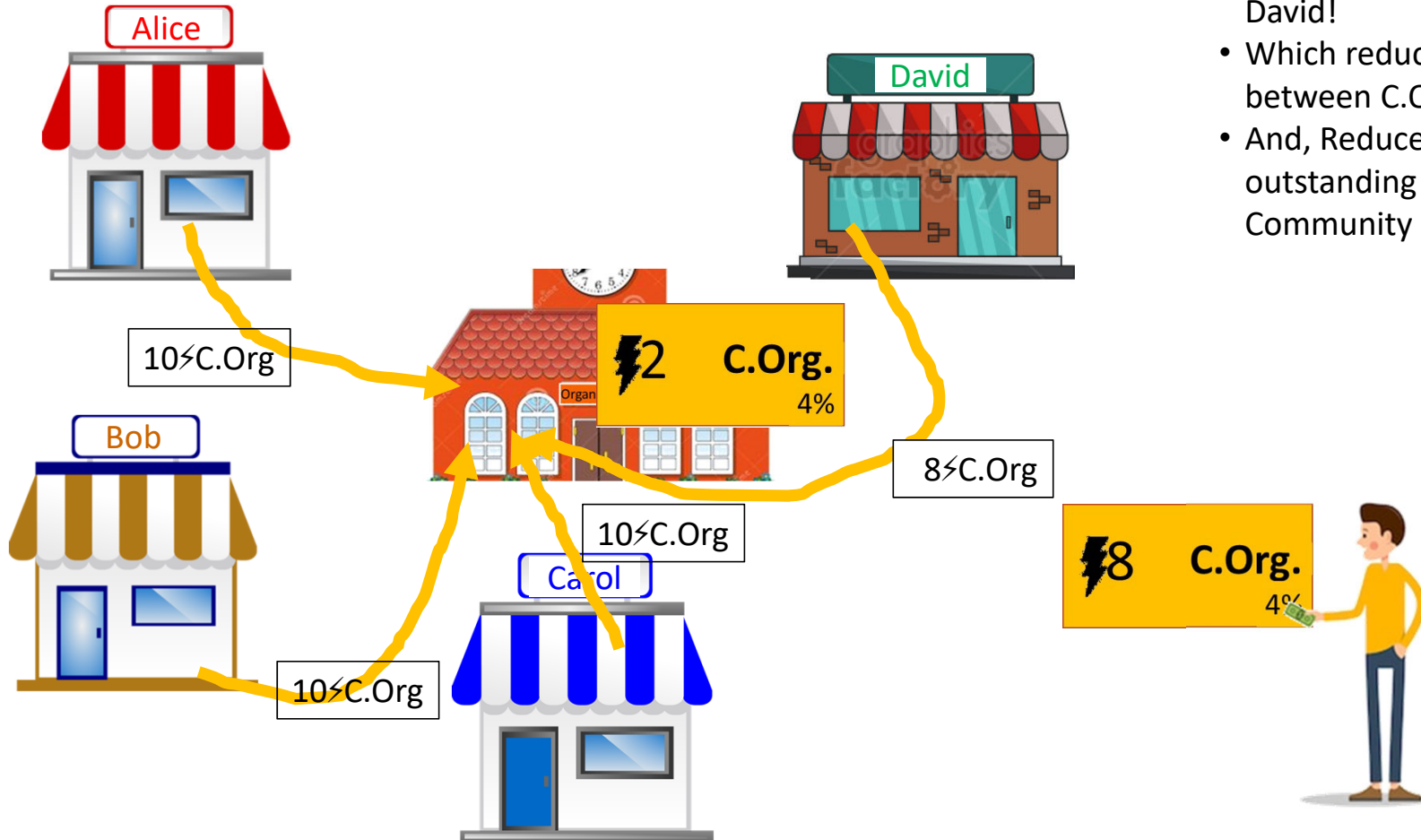
- John can spend his ⚡C.Org. at Alice, Bob, Carol, or David!
- Here John spends 2 ⚡C.Org. At David's

# Bolts from the Community



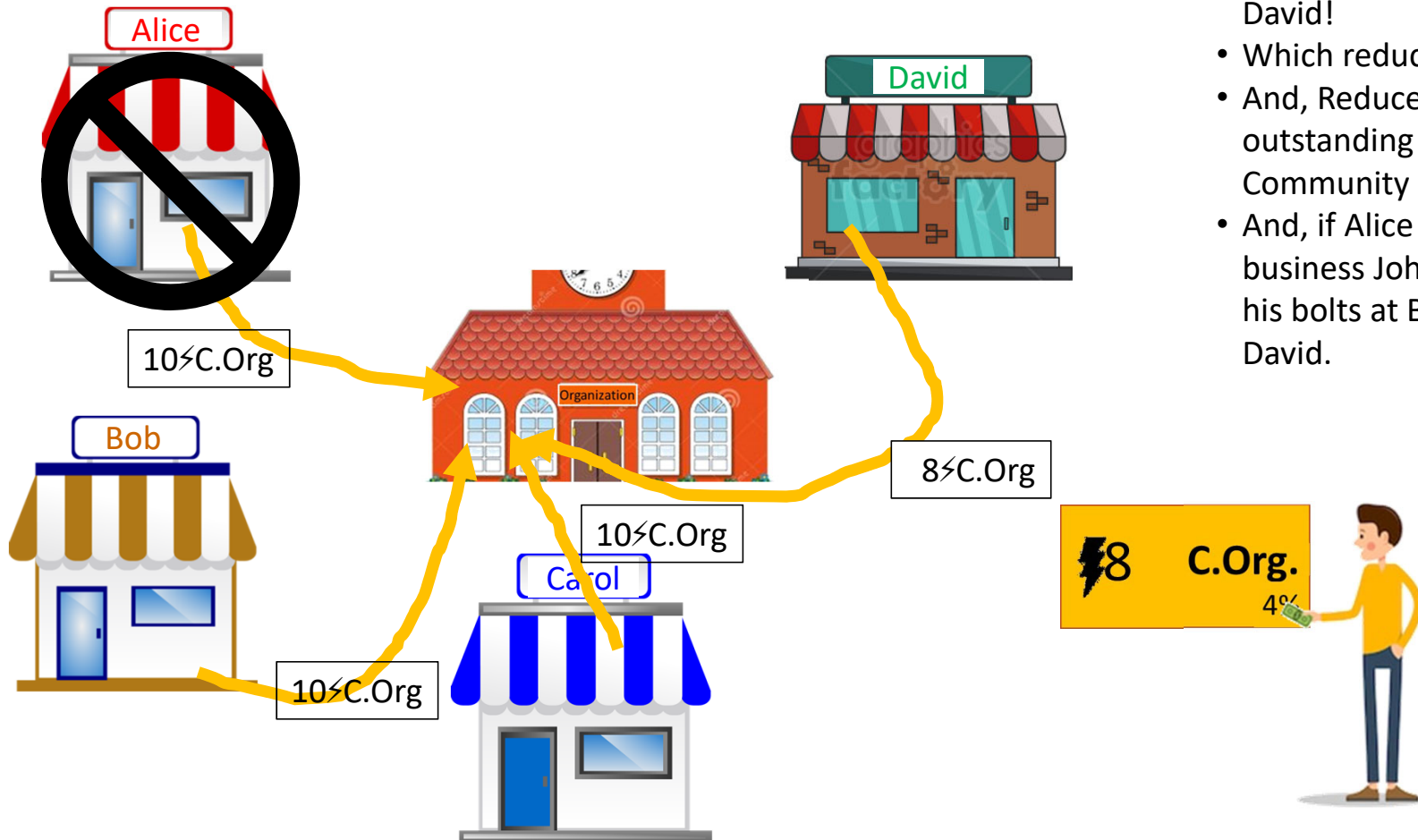
- John can spend his  $\not\prec$ C.Org. at Alice, Bob, Carol, or David!
- Which reduces the TrustLine between C.Org and David

# Bolts from the Community



- John can spend his  $\not\prec \text{C.Org.}$  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 ⚡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](http://www.cs.cmu.edu/~seth/bolt)

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