

kadaster



Governance of distributed systems

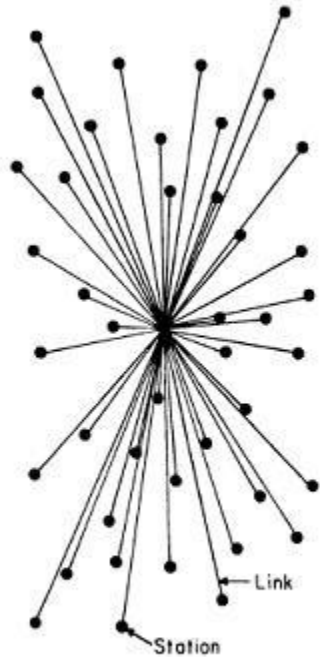
Organizing network trust



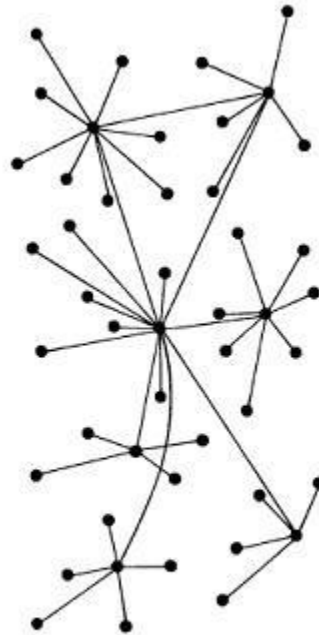
Bert Beentjes

Senior Advisor Strategy - Kadaster
Chairman Portfolio Board - Dutch Blockchain Coalition (BC3)

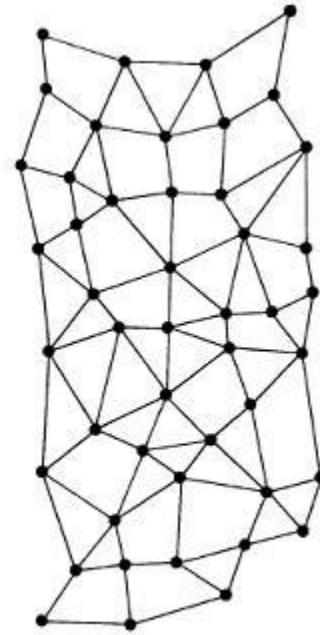
Distribution



CENTRALIZED
(A)



DECENTRALIZED
(B)



DISTRIBUTED
(C)

Distributed (2)

- Centralized:
 - One actor does all the work
- Decentralized:
 - Several actors do part of the work
- Distributed:
 - All actors do all of the work

Benefits of distribution

- Immutability
- Transparency
- Cost
- Scalability

Issues in distributed governance

- Bitcoin segwit
- Parity mistake
- Bitcoin transaction performance
- DAO hack
- Mt Gox (and others)

Governance

The goal of governance is to ensure the results of an organization's business processes meet the strategic requirements of the organization

Or: it's about trust

Trust has two parts:

- Competence
- Intention

(Rachel Botsman - global authority on the new era of trust)

Or: it's about trust

- Competence
 - Does it work as designed
- Intention
 - Does it protect our interests

Governance

- Competence
 - Work, expertise
 - Central, decentral or distributed
- Intention
 - Power, control
 - Central, decentral or distributed

Governance

- Hierarchy
- Paper - scissors - rock
- Majority

Levels of governance

- Institution level
- System level
- Transaction level

Competence

Institution level

- Land administration

System level

- Record keeping

Transaction level

- Transaction processing

Intentions

Institution level

- Legal certainty

System level

- Immutable records

Transaction level

- Valid transactions

Distributed systems

Institution level

- Transparency

System level

- Cost
- Scaling

Transaction level

- Predictability
- Cost

Distributed systems - issues revisited

Institution level

- Function boundaries (Bitcoin currency or asset)
- Legal certainty (Parity mistake)

System level

- System management (Bitcoin performance)
- Crisis management (DAO hack)

Transaction level

- System edges (Mount Gox and others)

What could possibly go wrong?

Institution level

- Function boundaries: land, mortgage, investment funds, insurance, ...
- Legal certainty: fork, leading to multiple truths

System level

- System management: slow (no) final settlement
- Crisis management: disappearing land

Transaction level

- System edges: identification, funds

System governance - zooming in

- How to control access to the system
- How to manage code and process feature requests
- How to monitor and manage system performance
- How to manage system security
- How to handle intellectual property
- How to prevent and repair damage to the system

Conclusions

Distributed governance models can improve competence, by providing:

- Transparency
- Immutability
- Security
- Cost

But are immature with respect to:

- Legal certainty
- Crisis management
- Responsibility and accountability

Recommendations

For distributed systems, in the current situation:

- Limit functional scope to work execution (competence)
- Create checks and balances using decentralized control approach (paper - scissors - rock)
- Have crisis management procedures
- Use open source
- Manage system edges