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# SMARTLOG - SUPPLY CHAIN AND LOGISTIC MANAGEMENT CONCEPT

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# PROJECT SMARTLOG

- EU Interreg Central Baltic pr. 3.1
  - “Improved transport flows of people and goods”
  - Finland, Sweden, Estonia and Latvia
  - Regional development entities and authorities, universities
  - Started in September 2016, duration 3+ years
  - Goal is to speed up corridor throughput times by 5%

# PROBLEM

- Containers move, but the information does not
- Transport companies' databases are siloed:
  - There is no network level sharing
  - Communication channels and formats are fragmented
- Each delay accumulates as the cargo travels downstream
- Ecosystem level **inefficiency** is enormous

A

B

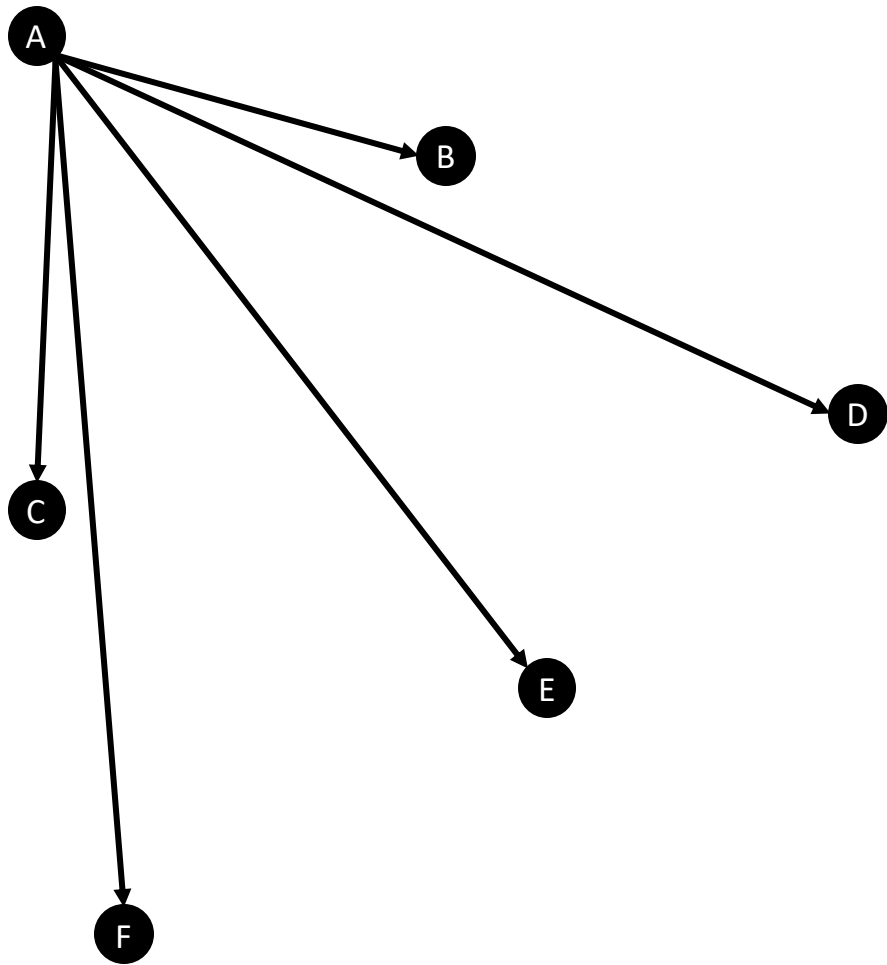
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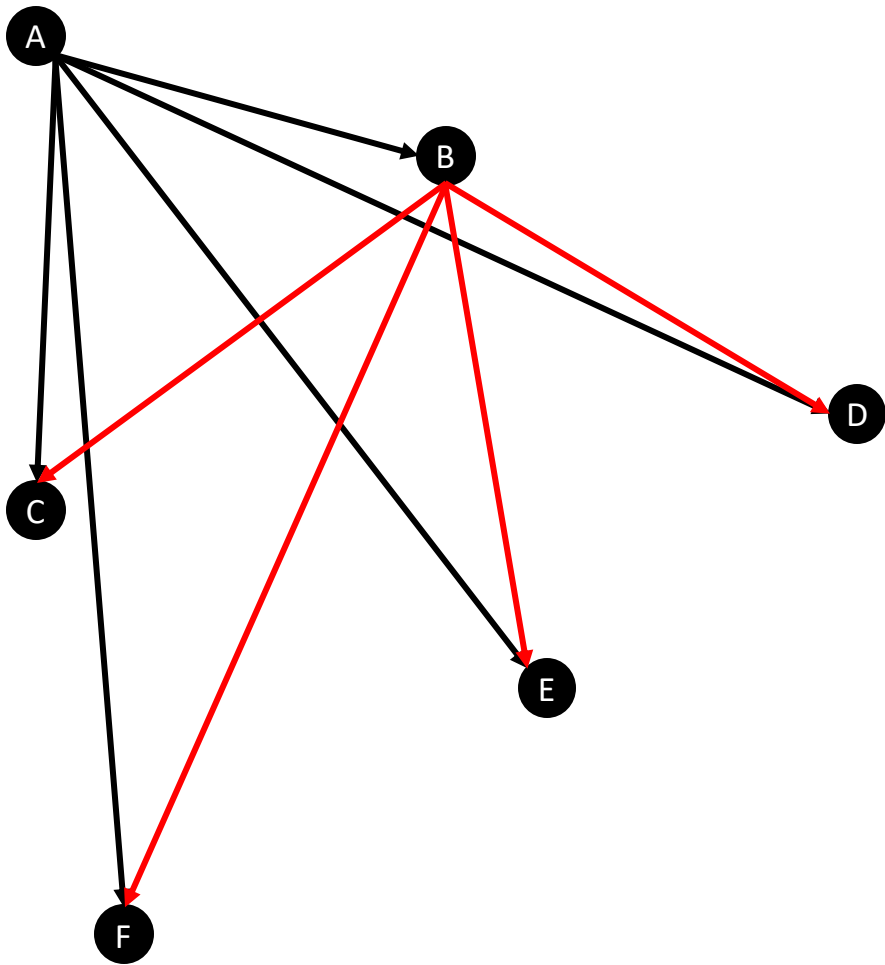
E

F

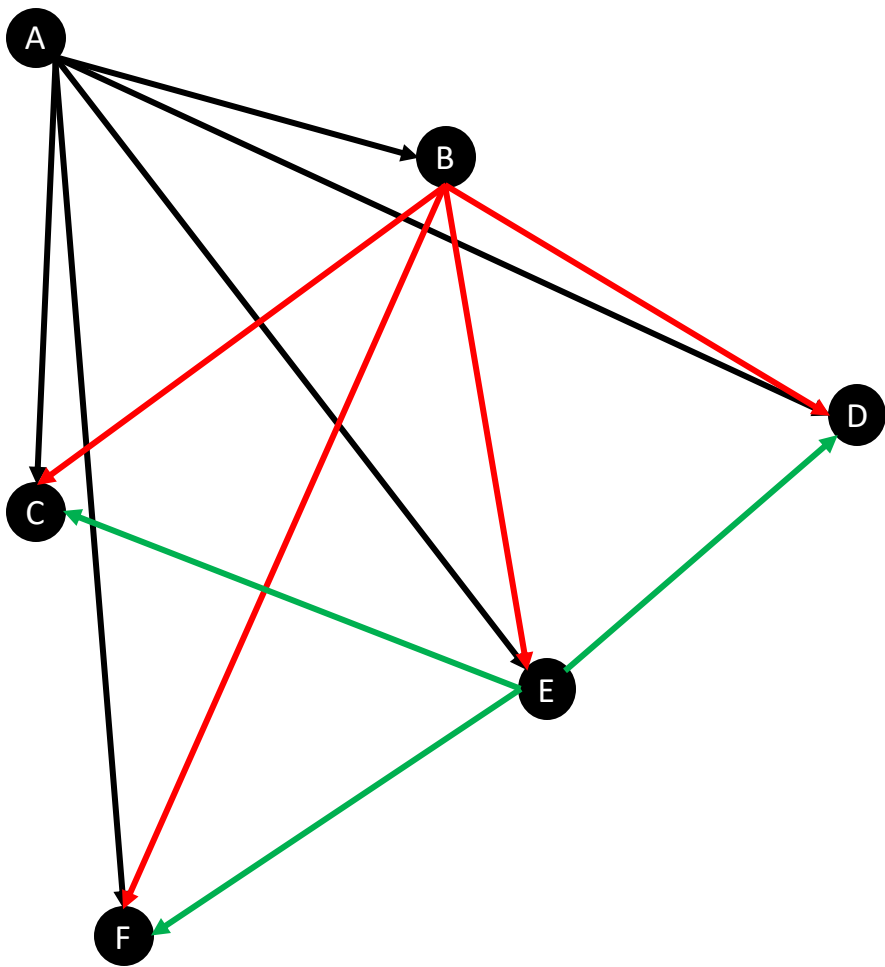
- Companies A-F form a part of a supply chain
- Company A is the supply chain owner
- Companies B-F provide transport, forwarding and stevedoring services
- In order to enable the processes, companies need to be able to communicate with each other



- Company A has either enabled direct integrations to the information management systems of B-F, or has granted access to them into their own system
- Direct integrations are expensive to create, and more so to maintain
- Granting access is more cost effective, but it limits the sphere of potential communication endpoints, resulting in reduced scalability



- Company B has needs to communicate with C-F also
- Connectivity provided via A does not make full communications possible, because of data confidentiality and security, forcing B to create direct integrations, or enable access also

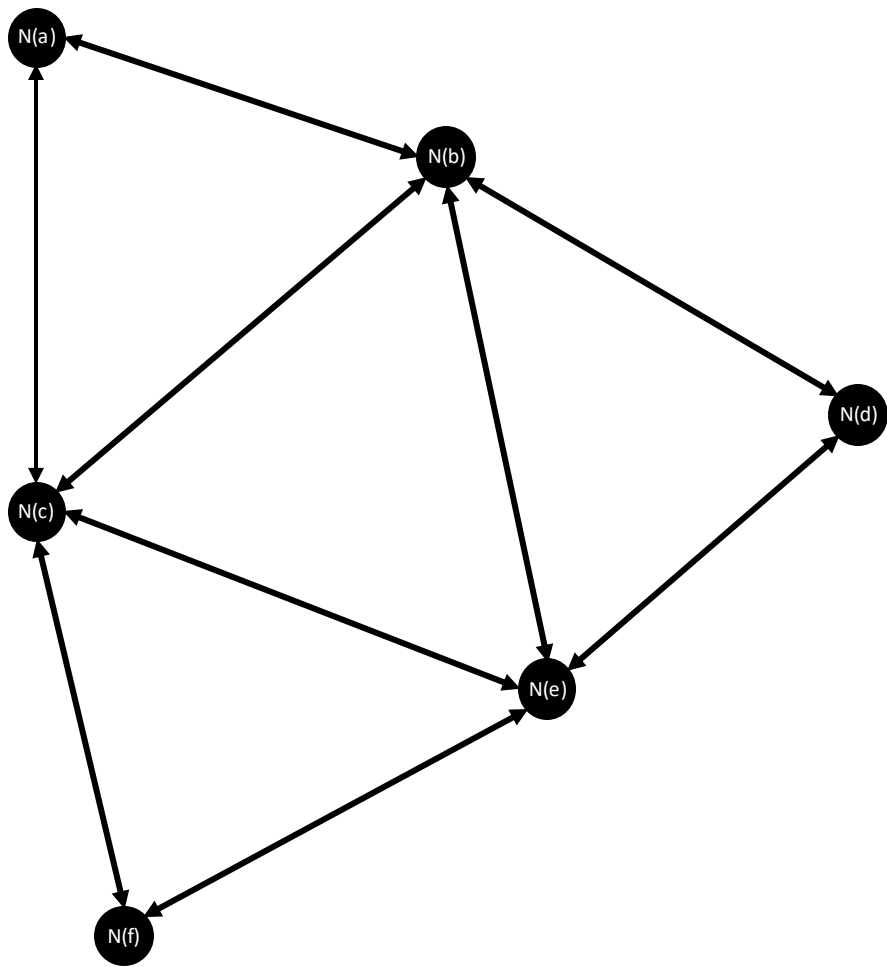


- Company E has similar needs, solved by similar and parallel solutions
- Directly integrated or centrally controlled access to messaging network is complex, expensive and ultimately increasingly ineffective way to provide messaging connectivity between multiple parties, be it in closed or open network of parties

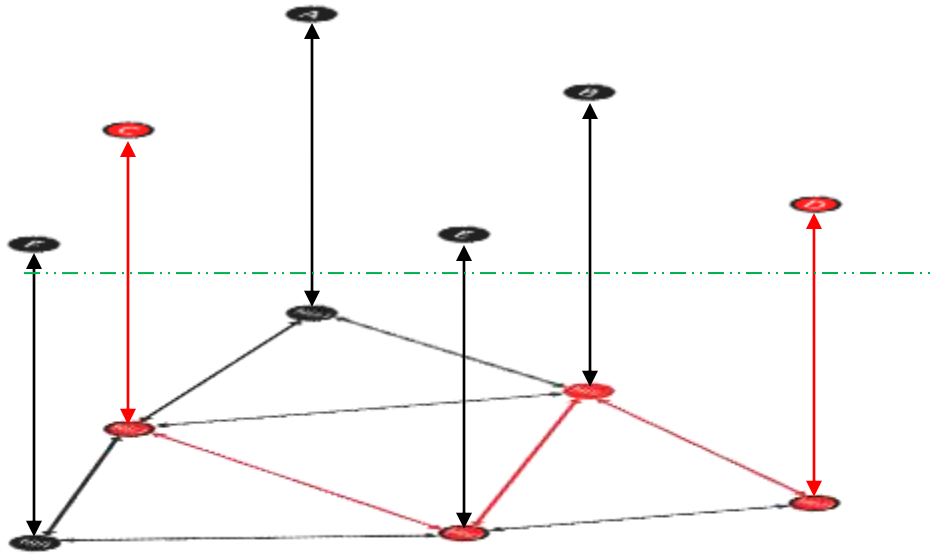
# SOLUTION

- We created a blockchain which connects the supply chain owners and operative transport companies.
- The messaging related to the movement of the cargo is added to the blockchain, in addition to the regular logging in the companies own systems.
- The access to the messages is limited to involved parties in each messaging context case.
- The data stored in the blockchain will be uniform standard.
  - UBL 2.3 standards based message types and data fields.





- An approach based on blockchain based messaging abstraction layer could be a very powerful solution
- Blockchain nodes receive and relay messages autonomously and securely
- Message retention, distribution and access control are all handled in the messaging layer itself, instead of the application layer
- This approach necessitates agreements on commonly agreed standards, ontologies of terminology and processes, and ultimately complete data models

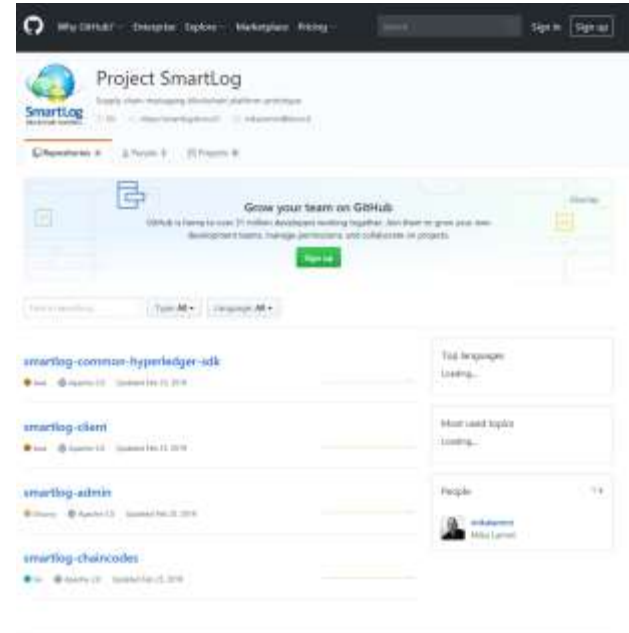


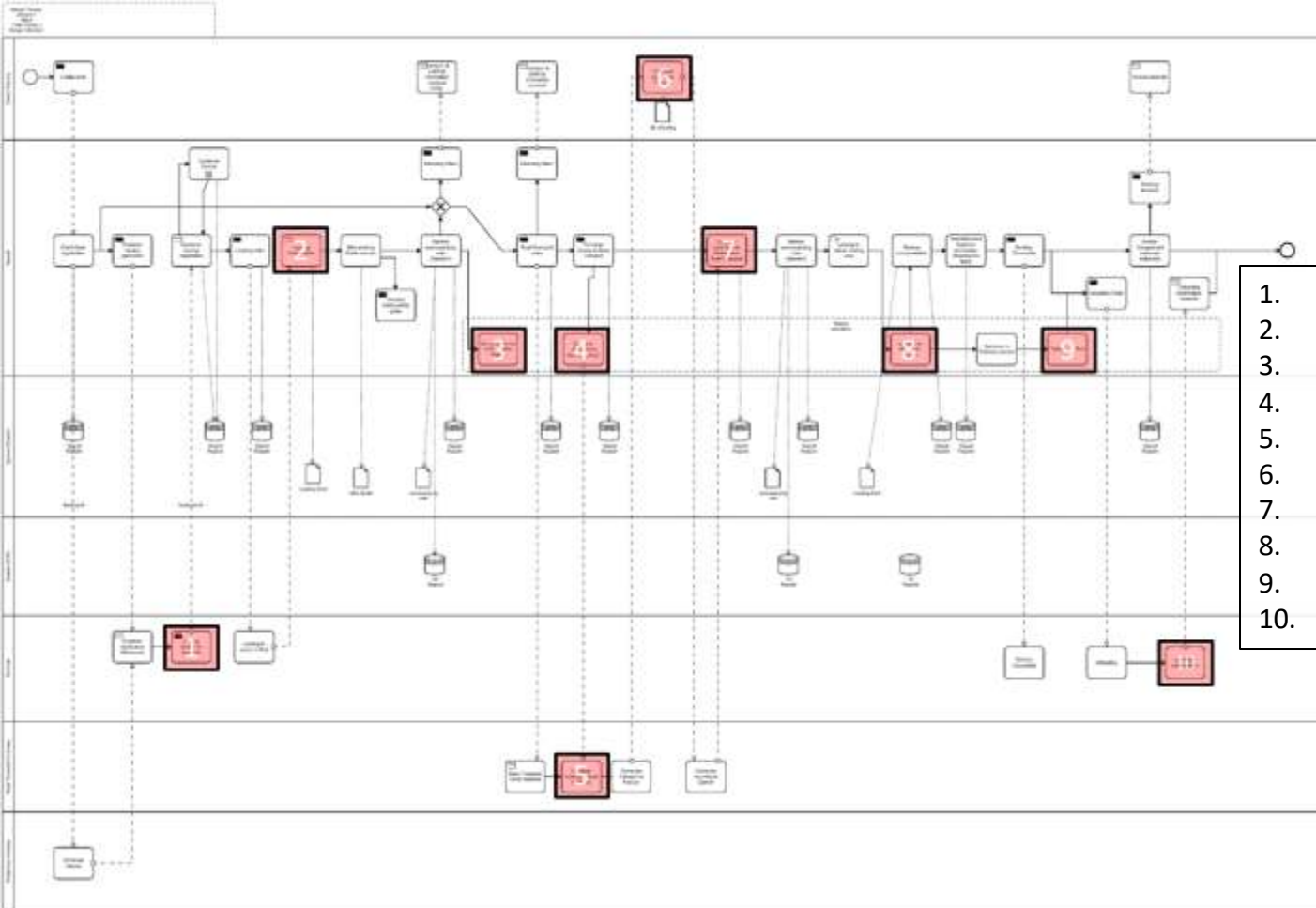
- Every participating company is able to reach every other company, or more precisely their individual digital business processes at the cost of one integration
- The messaging layer would provide connectivity potential to all in an unambiguous, secure and trusted way

# SMARTLOG OPEN SOURCE CODE

<https://github.com/project-smartlog>

- The application code has been released under Apache 2.0 open source license
- Optimal for commercial adaptation and third-party development





1. Issuing container number
2. Loading confirmation
3. Container Arrival to Station
4. Container unloading to truck
5. Container Loading to truck in Station
6. Container loading in Factory
7. Container received into Station
8. Loading to Railcar in Station
9. Entrance to Port
10. Unloading confirmation

# USE CASES: REFUSED

- Despite all our efforts, some companies decided against participating in the tests:
  - Offering testing the free of charge. The companies do not believe that the service will stay free (even if the beginning is free of charge)
  - Lack of resources. Even if the service is free of charge, somebody has to enter data, which means additional work in companies and they are not sure the benefit covers their costs
  - Lack of IT specialists employed in SMEs. The currently employed staff are afraid of IT-based approach (the only IT-based means used today are Excel tables)
  - No clear advantages. Transport companies, which SMEs use today, have similar software and the system work for them, so they don't want to break off their working ties and networks
  - No urgent need yet. The transport companies manage to meet their demands, so the production companies do not have to bother about their products when the products are on their way to the destination. It happens very seldom (once a year) that their clients do not receive cargo on time. And if it happens, transport companies are able to solve problems themselves.

# STRENGTHS AND WEAKNESSES

## Strengths

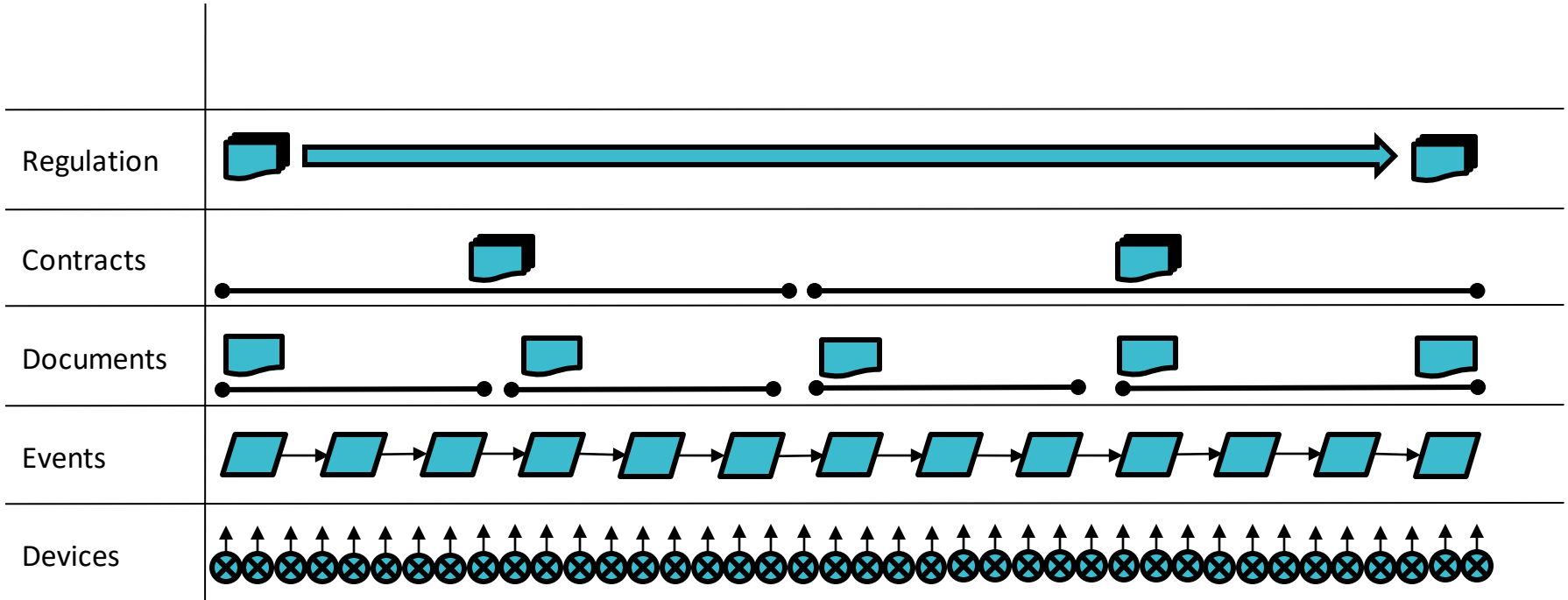
1. **Visibility**
  - Observe transactions across multiple tiers/participants
2. **Aggregation**
  - Information from multiple sources, types, times
3. **Validation = Trust in data**
  - Information is resistant to tempering
4. **Automation**
  - Execute transactions automatically
5. **Resiliency**
  - System can continue to operate even if nodes fail

## Weaknesses

1. **Lack of Privacy**
  - Personal records can be visible, subject to privacy regulation
2. **Lack of standardization**
  - Myriad of different protocols, technological uncertainty
3. **Garbage in, garbage out**
  - Incorrect information may be entered, physical reality may change after information has been entered
4. **Black box effect**
  - Users must trust the integrity of the process without understanding technology
5. **Inefficiency**
  - Transactions can be slow record and process, requiring greater computing power

Based on Babich V. and Hilary G. (2018) *Distributed Ledgers and Operations: What Operations Management Researchers Should Know About Blockchain Technology*.

# INFORMATION LAYERS



# WHY BLOCKCHAIN?

- The level of problem complexity is vast to start with, and scales all the way
- No single solution **can** be capable to solve it
- Network-as-a-service, or public infrastructure approach to blockchains seems to be an appropriate response here
  
- This calls for enabling-type of regulation, as well as standardized environments, in order to encourage investments for transitions and next generation application layers development



# FUNDED BY



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# THANK YOU!

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