



ΠΑΝΕΠΙΣΤΗΜΙΟ
ΘΕΣΣΑΛΙΑΣ

ΣΧΟΛΗ ΘΕΤΙΚΩΝ ΕΠΙΣΤΗΜΩΝ
ΔΙΑΤΜΗΜΑΤΙΚΟ ΜΕΤΑΠΤΥΧΙΑΚΟ ΠΡΟΓΡΑΜΜΑ
ΠΛΗΡΟΦΟΡΙΚΗ ΚΑΙ ΥΠΟΛΟΓΙΣΤΙΚΗ ΒΙΟΙΑΤΡΙΚΗ

Blockchain Technology in the Shipping Industry

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Λαμία, Ιανουάριος 2019

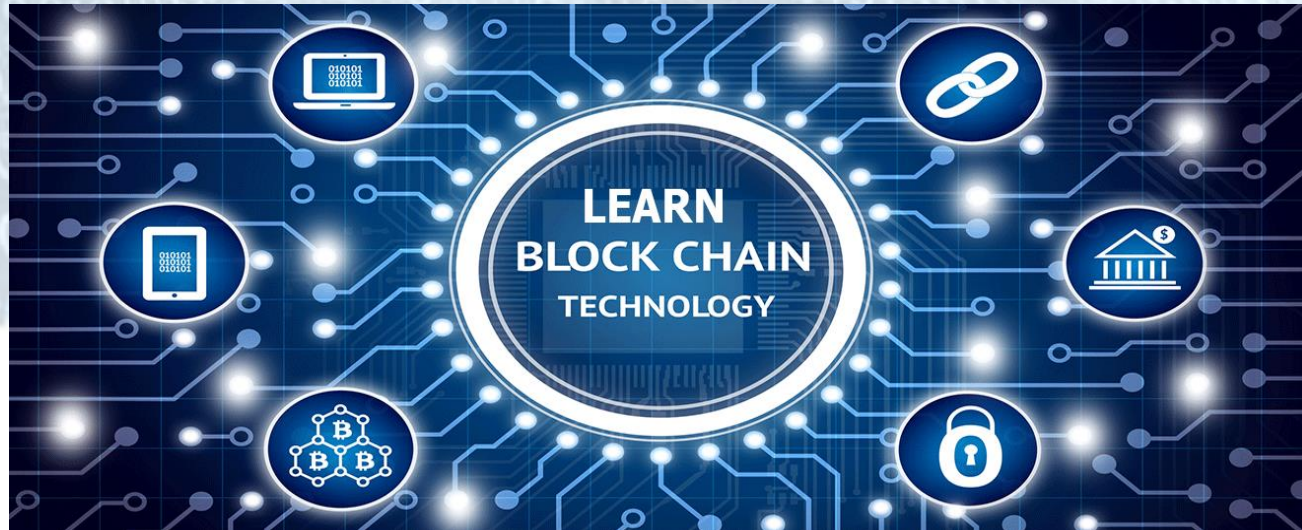
Introduction

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Bureaucracy

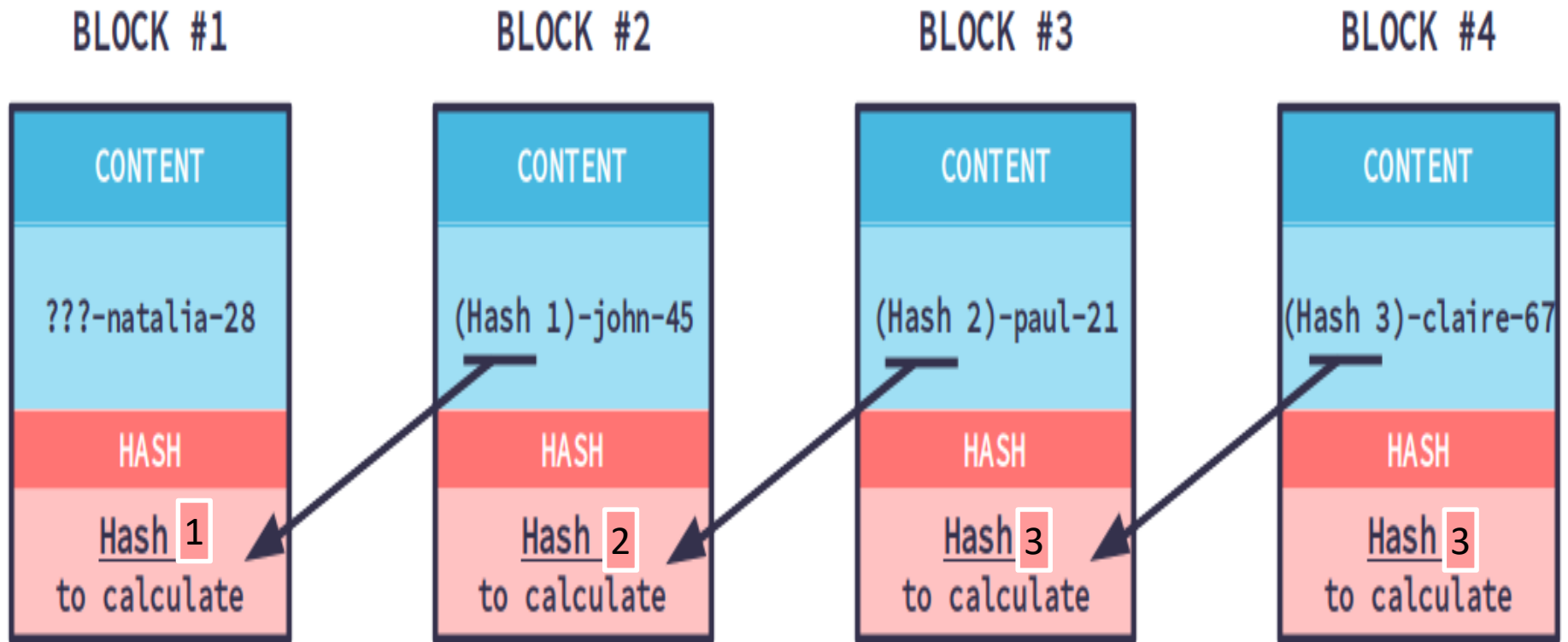


Expectations



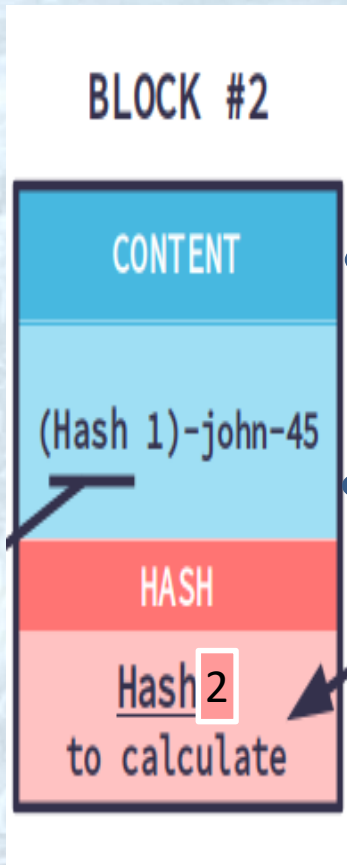
What is Blockchain

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What is Blockchain

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Data

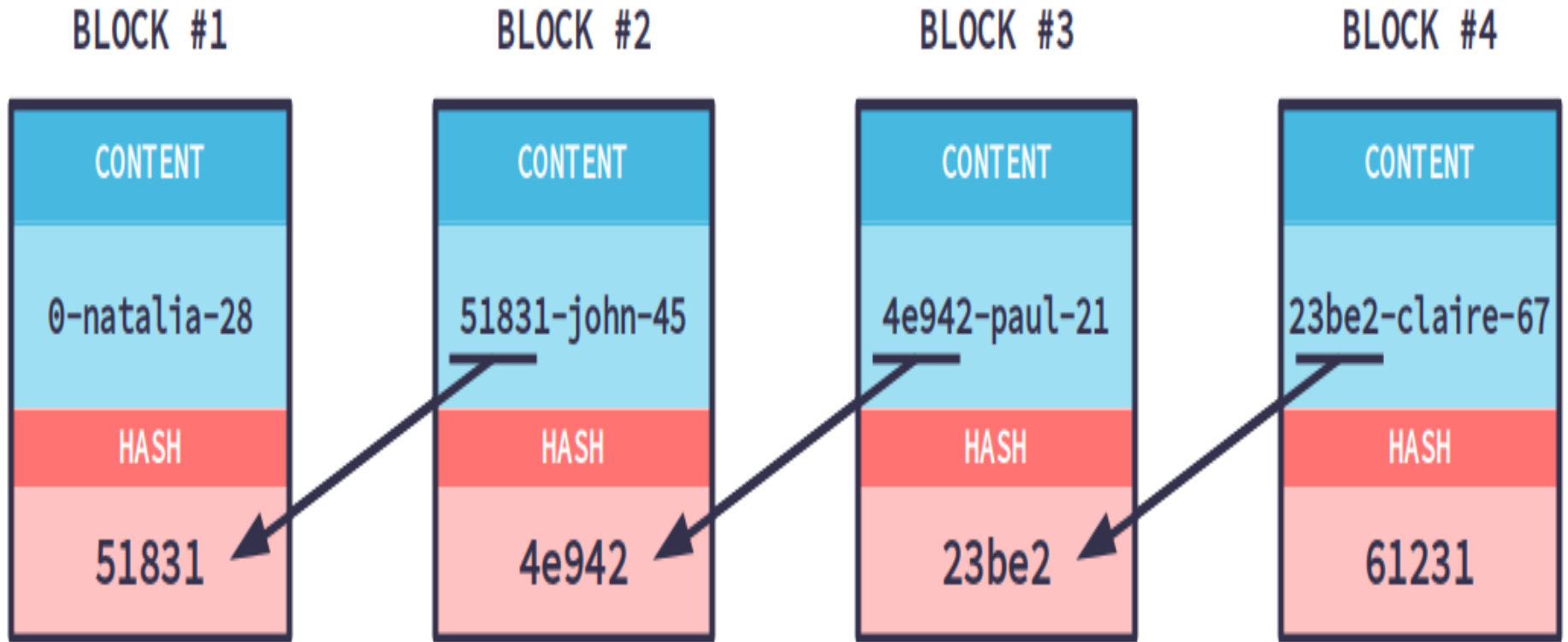
Hash
of previous
Block

Hash

```
4e942233bba491ab530669f
a78c03b3e72c4e3940834e3
e960d9ca32ed959429
```

What is Blockchain

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Blockchain Security Features

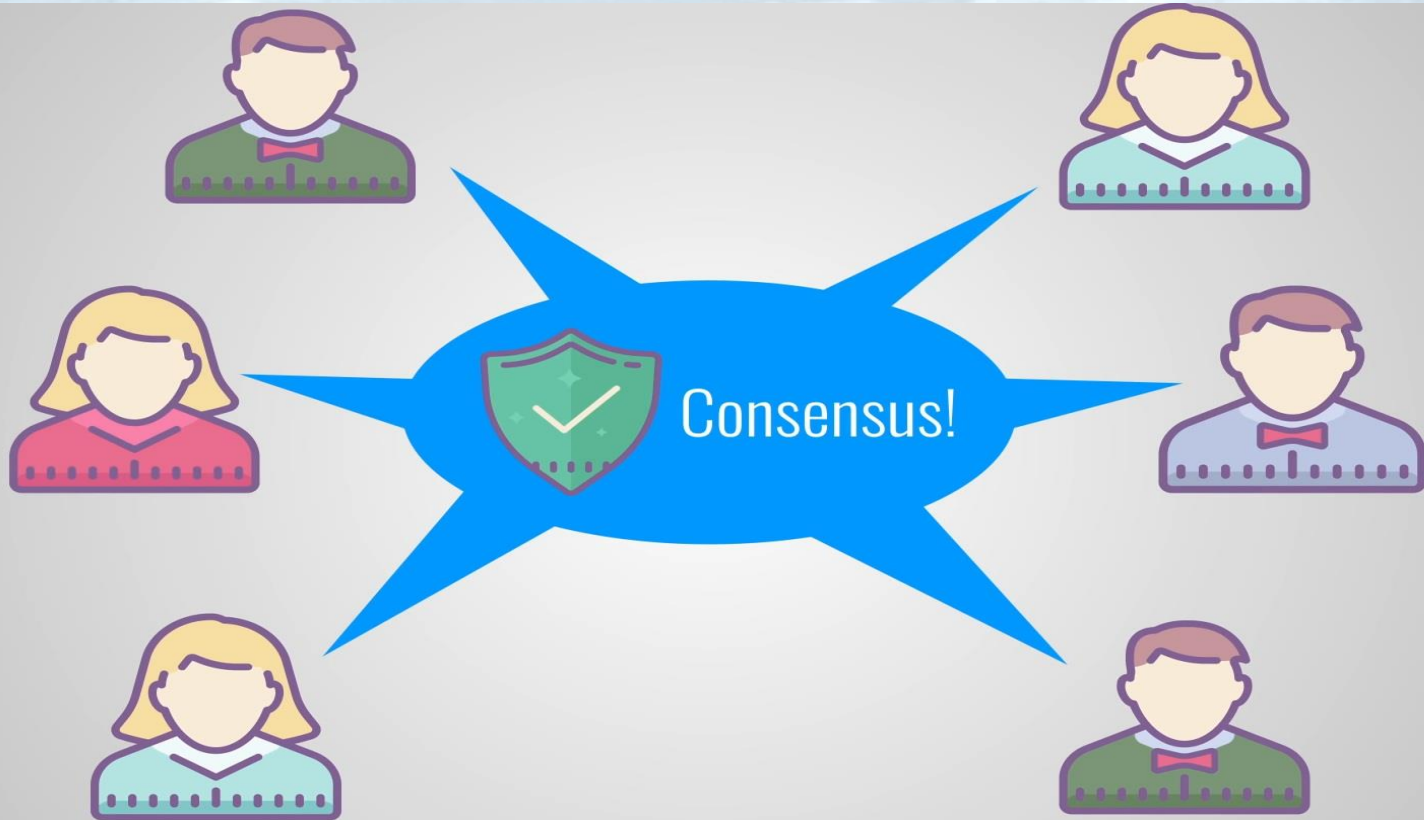
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Proof of Work

Blockchain Security Features

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Key Features of Blockchain

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✓ *Decentralization*

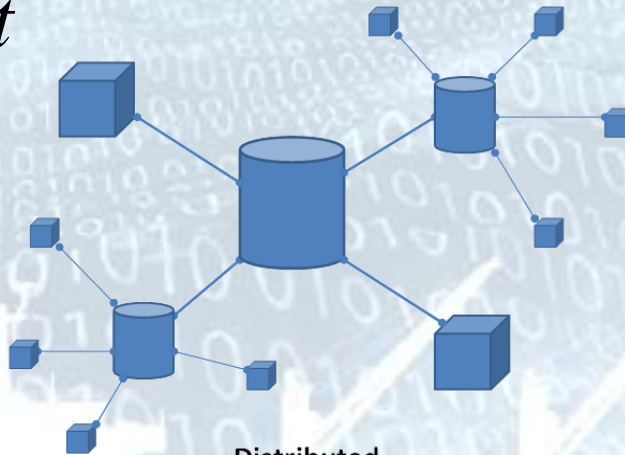
✓ *Trust*

✓ *Transparent*



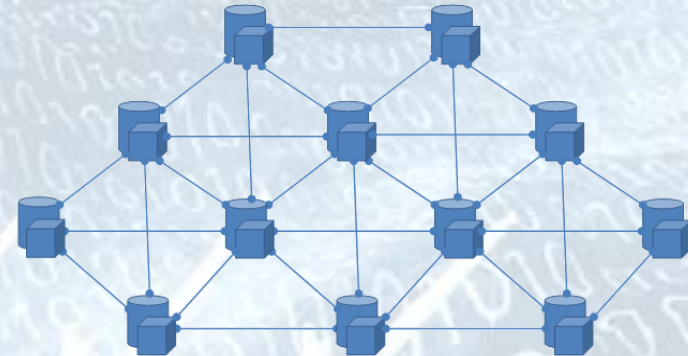
Centralized

one node does everything



Distributed

nodes distribute work to sub-nodes

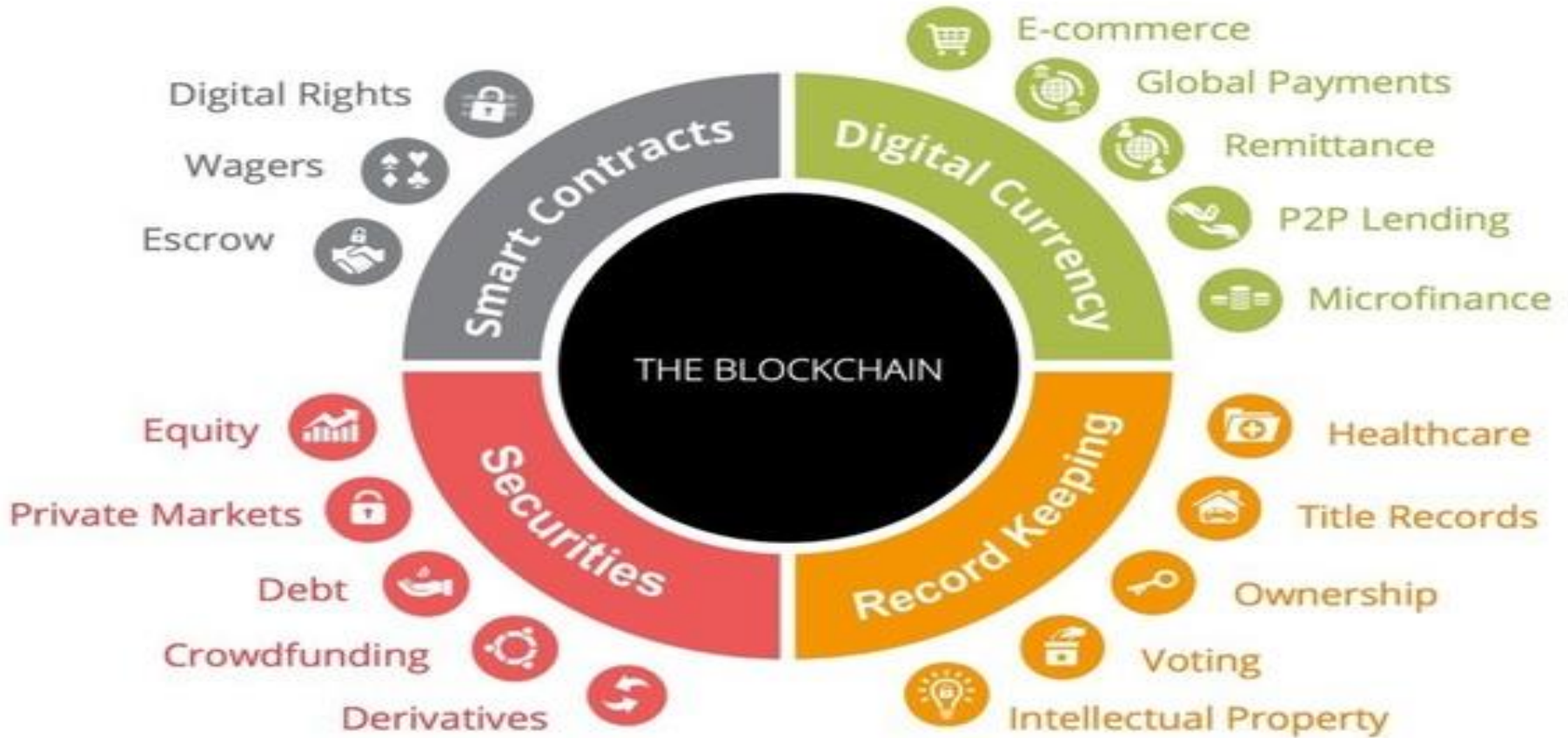


Decentralized

nodes are only connected to peers

Blockchain Present and Future Applications

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Opportunities From Using Blockchain in the Shipping Industry

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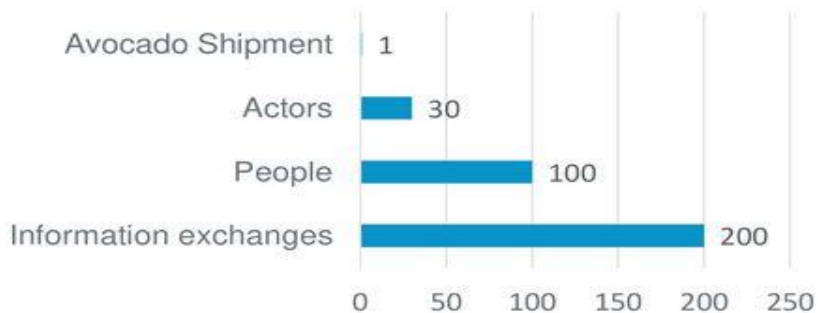
- ✓ Reduced paperwork

Global Trade Digitization

Example: Shipment case study

Maersk and IBM analyzed the shipment of avocados from Mombasa to Rotterdam

We followed the shipment from Mombasa to Rotterdam and tracked the actors, people and information exchanges. The findings illustrated the complexity and costs inherent in today's global supply chain



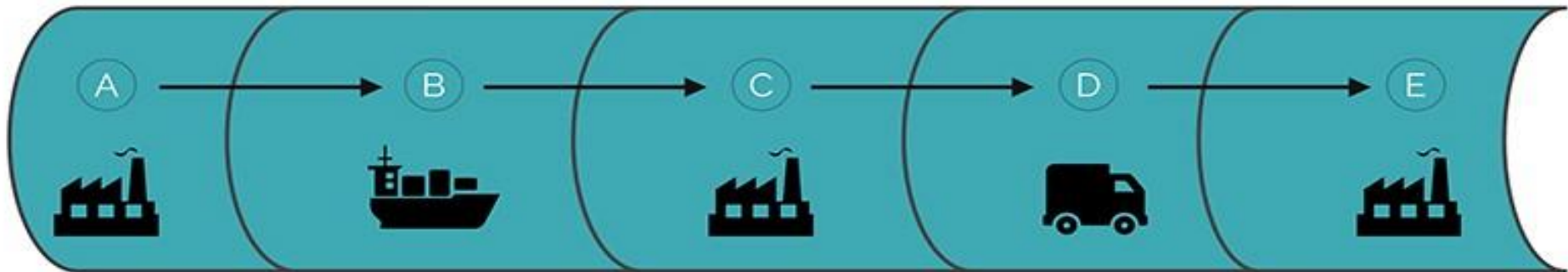
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✓ Visibility and Efficiency



DATA VISIBILITY IN SUPPLY CHAINS



With Blockchain

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✓ Reduction of Fraud and Theft



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✓ Counterfeit Reduction and Authentication



<https://businessadvice.co.uk/tax-and-admin/invoicing/what-is-ceo-fraud-and-how-can-i-identify-it/>

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✓ Enabling Performance and KPI Measurement

Fleet



95 %
Fleet Efficiency

Total Fleet	63
On the Move	60
In Maintenance	3

Delivery Status



Within time limit	549
Out of time limit	73

Deliveries by Destination



Germany	35%
France	25%
Switzerland	21%
Austria	19%

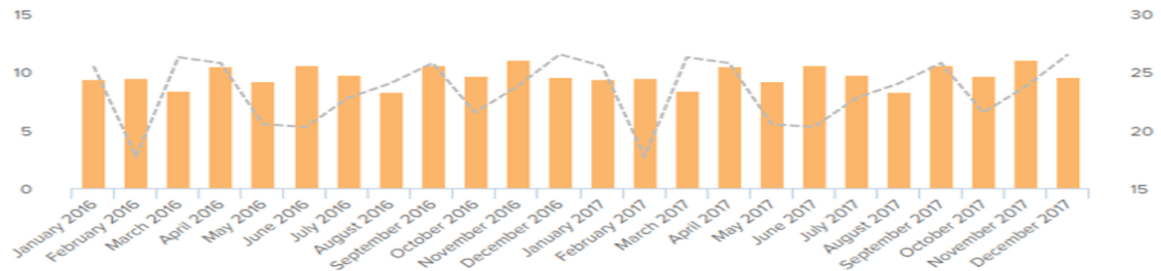


23 min
Avg Loading Time



10 tons
Avg Loading Weight

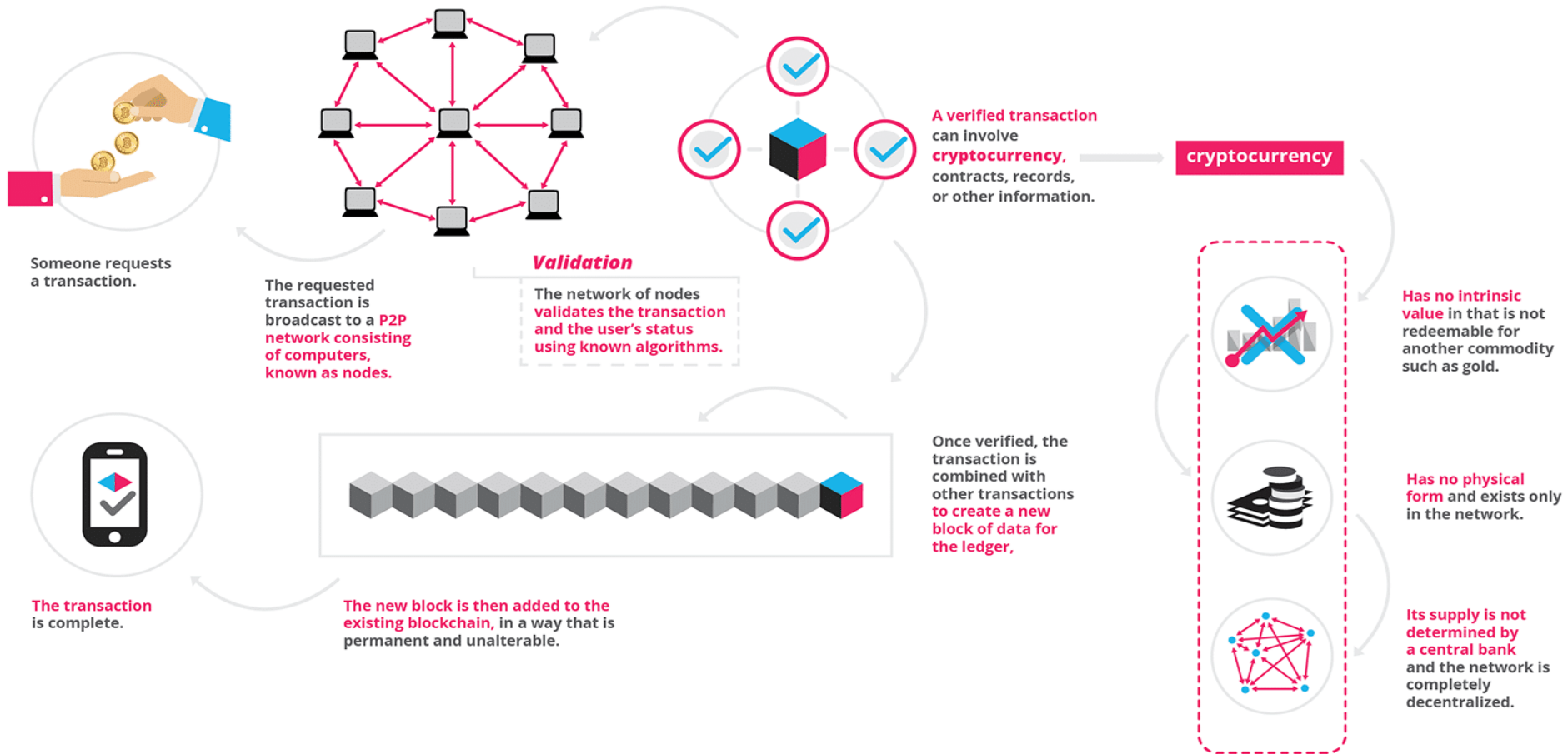
Loading Time & Weight



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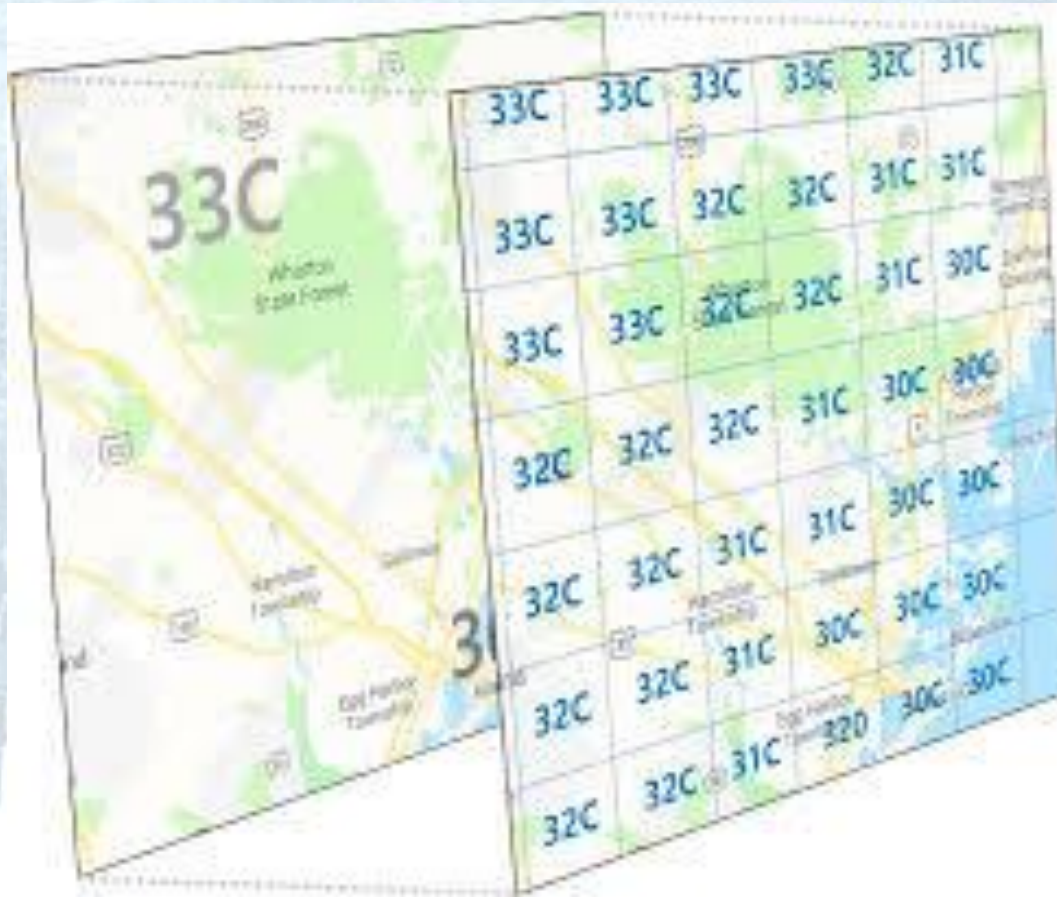
✓ Secure Payments



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✓ Weather forecasting



“Weather Mining : blockchain-based weather data trading platform”, by Observer Business note, May 18

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✓ Smart Ports

BLOCKCHAIN SMART PORT CASE - CONTAINER RELEASE

Efficient and secure container handling leveraging blockchain technology



www.portofantwerp.com/en/news/antwerp-start-t-mining-develops-blockchain-solution-safe-efficient-container-release

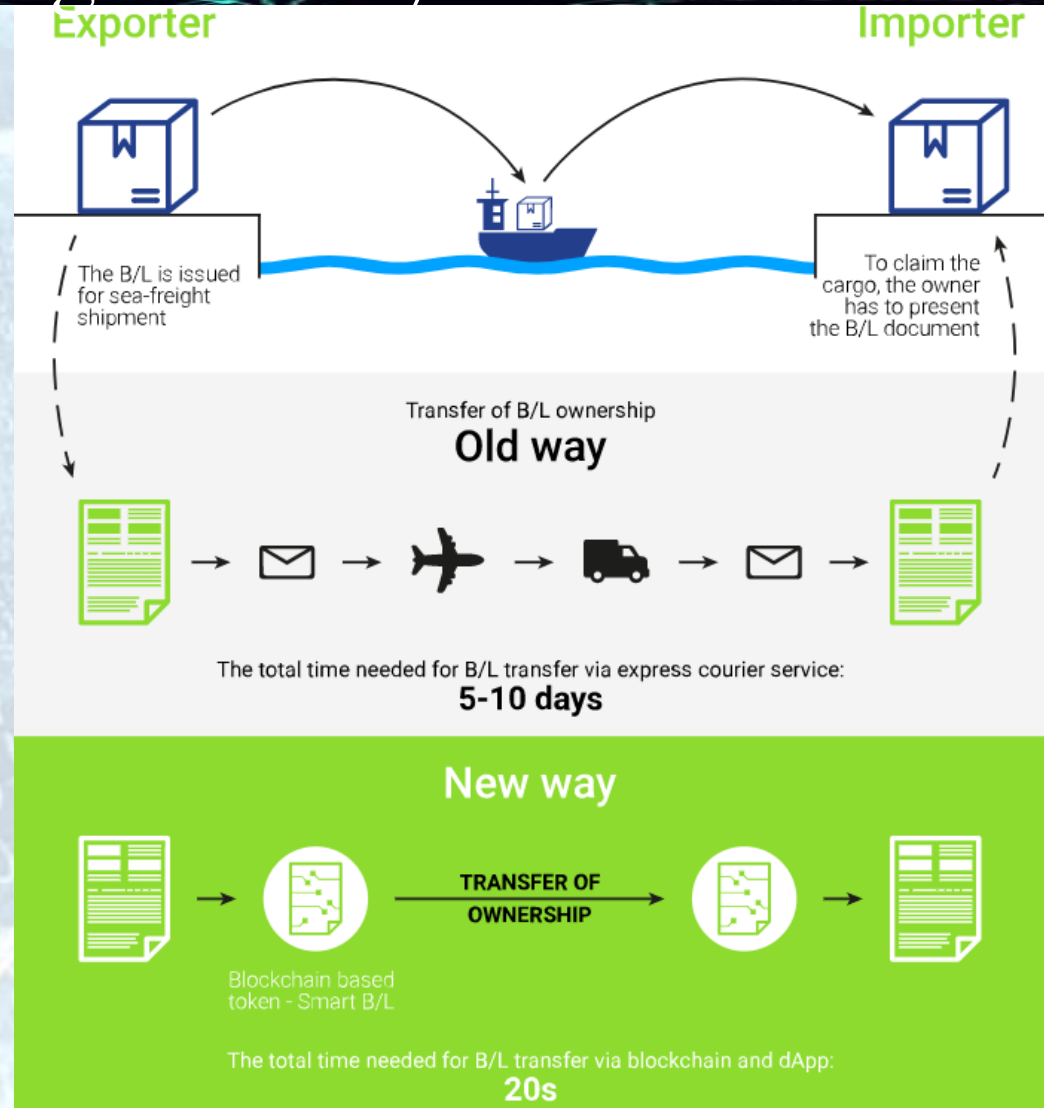
With the blockchain platform the right truck driver is given clearance to collect a particular container without any possibility of the process being intercepted. Furthermore the blockchain platform uses a distributed network, so that the transaction can go ahead only if there is consensus among all participating parties, thus excluding any attempts at fraud or undesired manipulations



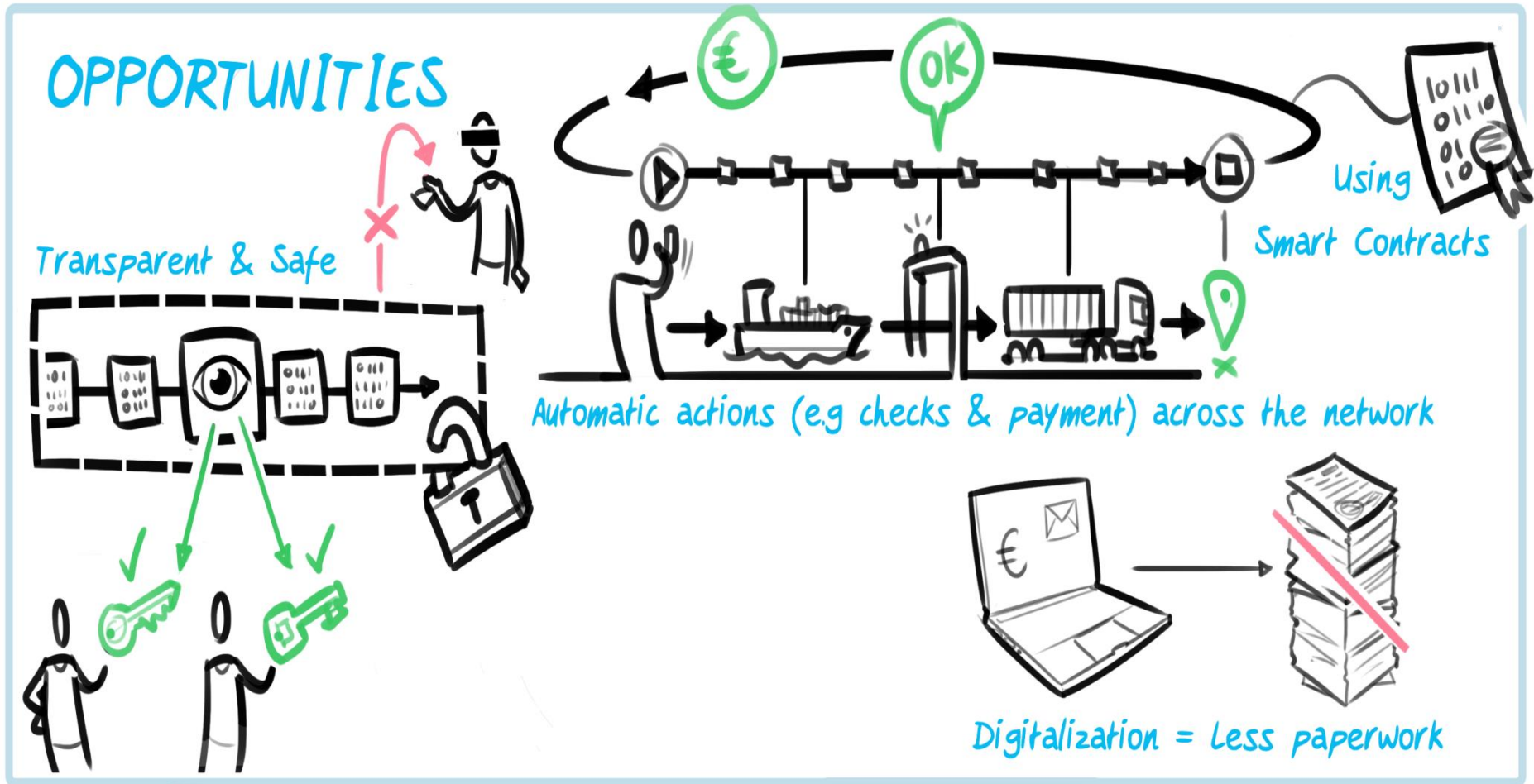
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✓ Smart Contracts



Opportunities From Using Blockchain in the Shipping Industry



Challenges of Blockchain in the Shipping Industry

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- ✓ Security and Privacy
- ✓ Scalability
- ✓ Standardization
- ✓ Implementation Cost, ROI, and Legacy Integration



<http://smart-port.nl/en/project/blockchain-voor-havenlogistiek/>