

# Blockchain & Test Automation

Hetzelfde, maar toch anders

- Richard Ammerlaan, Testtool Consultant Sogeti
- TestNet Voorjaarsevenement NBC 15-05-2018

# Waar hebben we het over?

- Geautomatiseerd Testen
  - Tools/Code als hulpmiddel bij uitvoering
  - “druk op de knop”
  - Unit Testen/Test Driven Development/Business Driven testen/....
  - Acceptatie testen van Apps en Services
  - Multi platform testen/multi browser testen
  - Indien er bijna geen andere manier is van testen
- Test Automatisering
  - Aandacht voor Tool en Environment Infrastructuur
  - Real-life situaties zoals
    - Security Testen
    - Performance Testen
    - Acceptatie Testen onder Load
    - Data Testen
  - Opzoeken van de grenzen van tool inzet

```
var SmartContract = artifacts.require('./SmartContract.sol');
contract('SmartContract:SendMessage', function(accounts) {
  it("should return a correct string", function(done) {
    var smart_contract = SmartContract.deployed();
    smart_contract.then(function(contract){
      return contract.SendMessage.call(); // **IMPORTANT
    }).then(function(result){
      assert.isTrue(result === 'Hello World!');
      done();
    })
  });
});
```

JUST IN TRUMP FIRES STARTING GUN ON TECHNOLOGY TRADE WAR WITH CHINA

## Poor smart contract coding exposes millions of dollars in Ethereum

Researchers have discovered over 30,000 contracts are open to exploit.

## Bitcoin boom may be a disaster for the environment

by Daniel Shane @CNNTech

December 7, 2017: 9:44 PM ET

Recommend 5 BK

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NEWS ANALYSIS

## Ethereum explores a fix for blockchain's performance problem

The Ethereum Foundation is seeking outside developers to help solve a performance issue native to blockchain – its inability to sufficiently scale.

Hackers Have Stolen \$400 Million From ICOs

f t in e

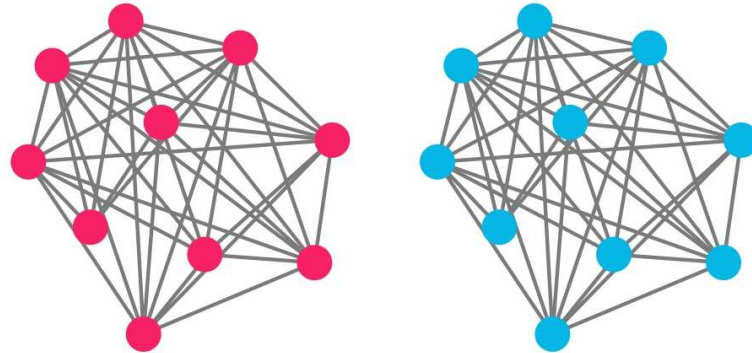
THE LEDGER • INITIAL COIN OFFERING

## Hackers Have Stolen \$400 Million From ICOs

Waarom Test  
Automatisering ipv  
Geautomatiseerd  
Testen?

Potentiele  
productie  
situatie (1)

## Distributed Ledgers

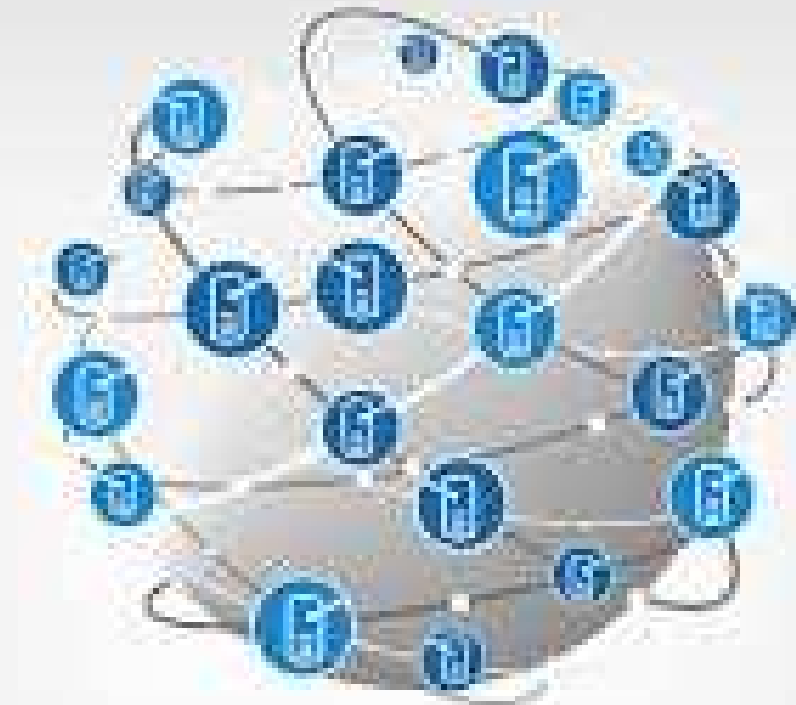


## Potentiele productie situatie (2)

Vragen:

Kunnen we de wereld simuleren?

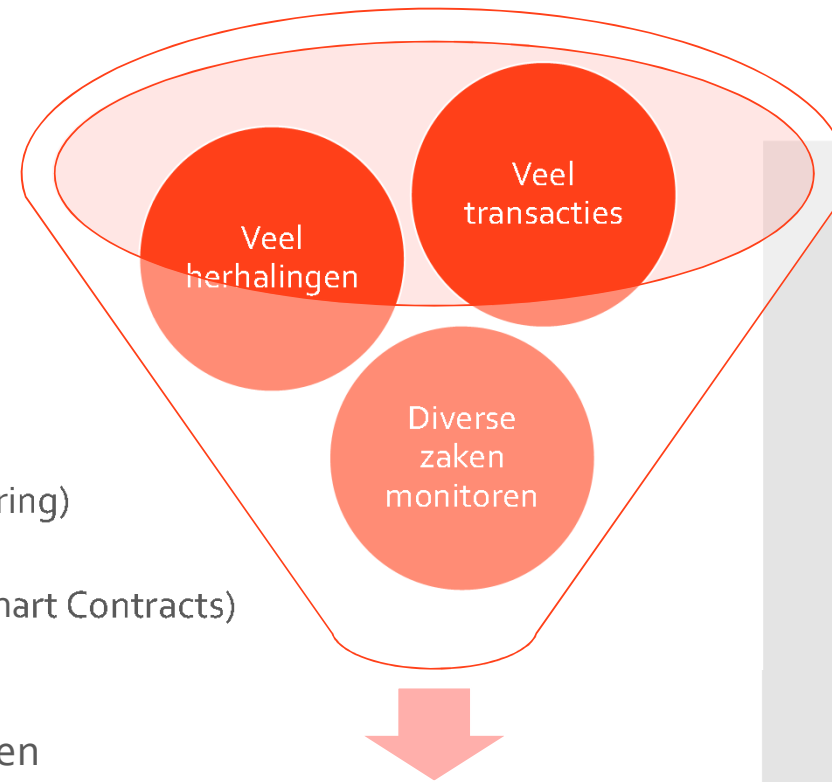
Wat betekent een beperking in (geautomatiseerde) testbaarheid voor Design en Development?



BLOCKCHAIN

# Blockchain – Wat moet er gebeuren?

- Data
  - Creatie (blocks)
  - Synchronisatie
  - Verificatie
- Transacties
  - Huishoudelijke zaken (incl monitoring)
  - Individuele transacties
  - Geautomatiseerde transacties (Smart Contracts)
- (Combinaties van) Transacties worden meerdere keren uitgevoerd
  - Testmaat 1
  - Testmaat 2
  - .....
  - Testmaat 1.000?????



## Test Tooling

```
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i ci contract('SmartContract:getMessage', function(accounts) {  
    it("should return a correct string", function(done) {  
        var smart_contract = SmartContract.deployed();  
        smart_contract.then(function(contract){  
            return contract.getMessage.call(); // **IMPORTANT  
        }).then(function(result){  
            assert.isTrue(result === 'Hello World!');
```

# Welke Kennis en Tooling is nodig?

Welk probleem lost Test Automation nu eigenlijk op voor blockchain testen?

## Security Testen:

- Dat is een vak apart!  
(slaan we vandaag over)

## Performance Testen:

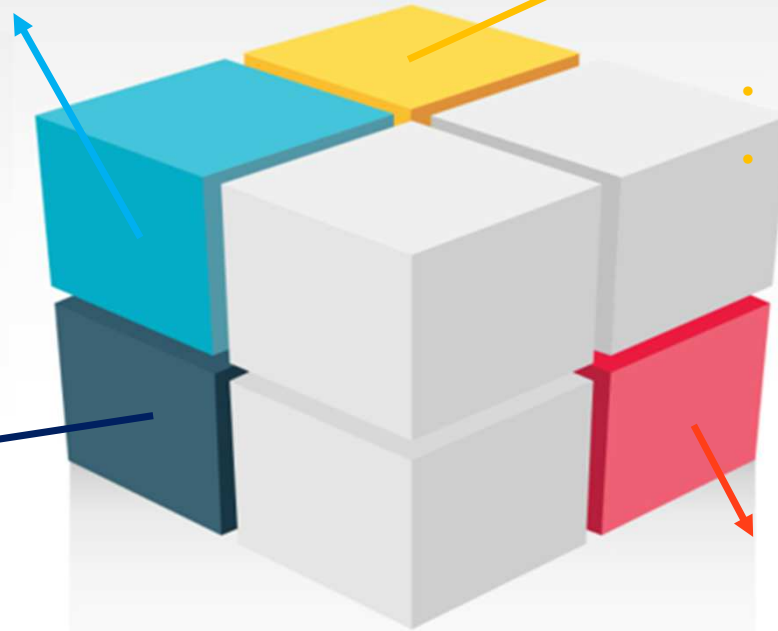
- Aantal transacties
- Transacties per tijdseenheid
- Monitoring
- etc

## Acceptatie testen onder Load:

- Create
- Read
- Update
- Execute
- (Delete)

## Data Testen:

- Correct & complete
- Omvang
- Snelheid



# Te gebruiken Tool combinaties

## Voorbereiding

- Testgevallen en Test Flow
- Test Data
- Test omgevingen en load generatie

- Model Based Testen
- Test Data Management
- VM's (cloud en/of Docker)

## Uitvoering

- Functionele Acceptatie
- Performance Acceptatie
- Functionele Acceptatie onder load

- Unit testen
- Performance Test Tools
- SOAP/REST Tools

## Afronding

- Rapportage mbt
- Monitoring
- Resultaten (incl performance test aantallen)

- Rapportage Tooling

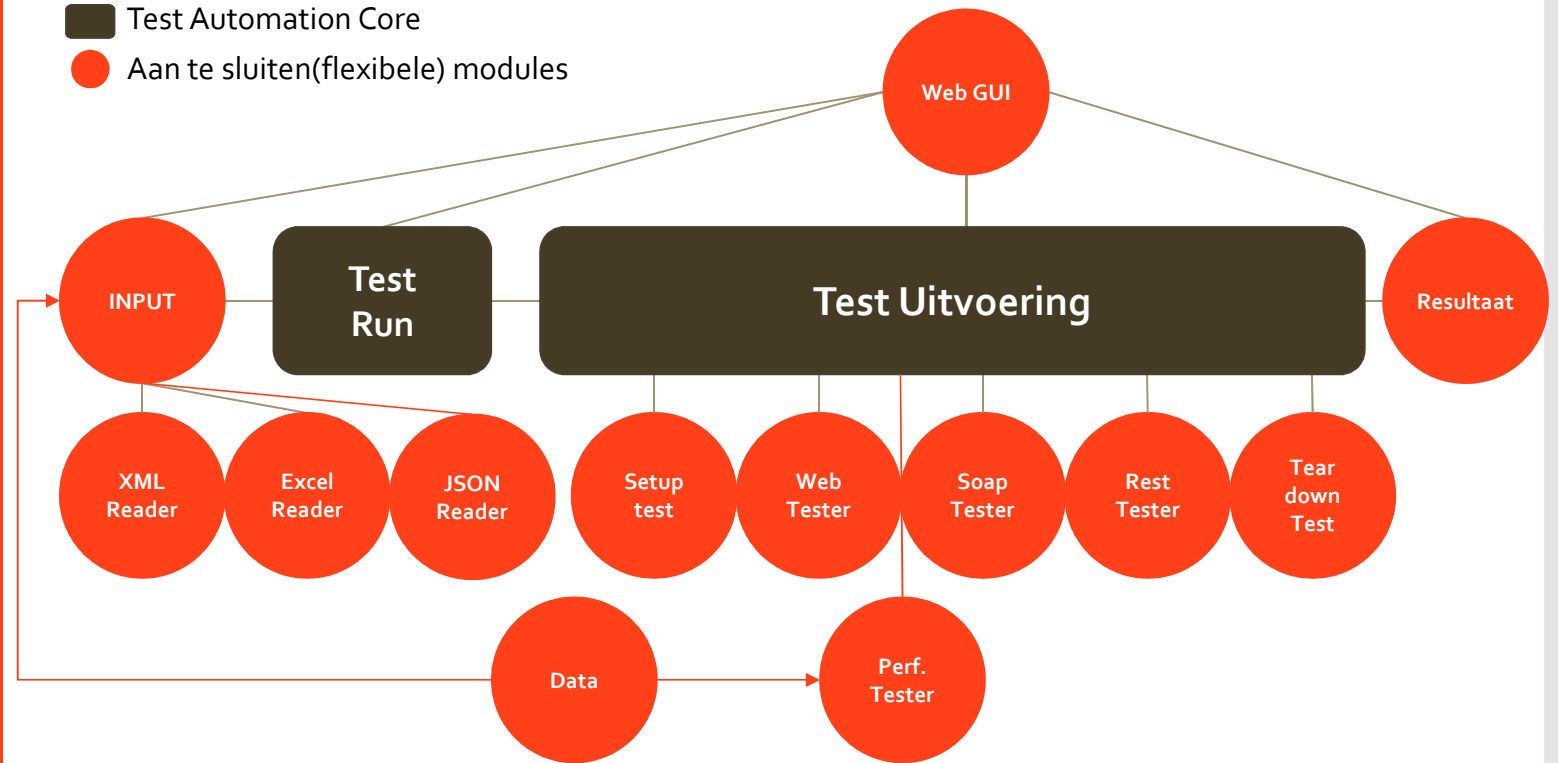


# Hoe richt je Test Automatisering in?

- Uitdagingen:
  - Meerdere expertises
  - Meerdere testmomenten
    - Agile testen tijdens ontwikkeling
    - Acceptatie testen inclusief real-life omgevingen
- Te maken keuzes:
  - Development pipeline -> koppelen van diverse tools aan bijv Jenkins
  - Stand-alone oplossing (acceptatie testtool omgeving)
  - Hybride oplossing

# Test Execution Operating Model

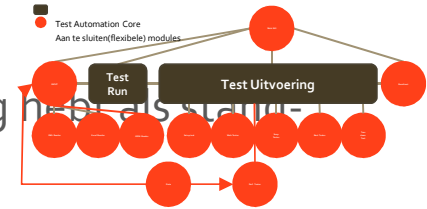
- Test Automation Core
- Aan te sluiten(flexibele) modules



# Meerdere smaken:

Afhankelijk van je project

- Doe niets speciaals, gebruik de tools die je nodig hebt als standalone oplossingen
- Bestaande Build servers
  - Indien de scope van het project het toelaat (o.a. load generatie omvang)
- Bestaande ALM tools
  - Indien alle noodzakelijke test uitvoering tools gekoppeld kunnen worden
- Frameworks
  - Software Testing Automation Framework (STAF/STAX)
  - Nieuwe ontwikkelingen in event driven frameworks
    - Vert.x
    - Node.js
    - Etc.



Dus wat  
hebben we  
nodig?

- Duidelijkheid over het doel van de blockchain oplossing
  - Als het niet volledig (geautomatiseerd) testbaar is heb je dan voor de juiste oplossing gekozen?
- Kies op basis van je risico calculatie voor de diepgang van security/performance/data en functionaliteit onder load testen
- Bouw de Test en Tooling Infrastructuur die je nodig hebt

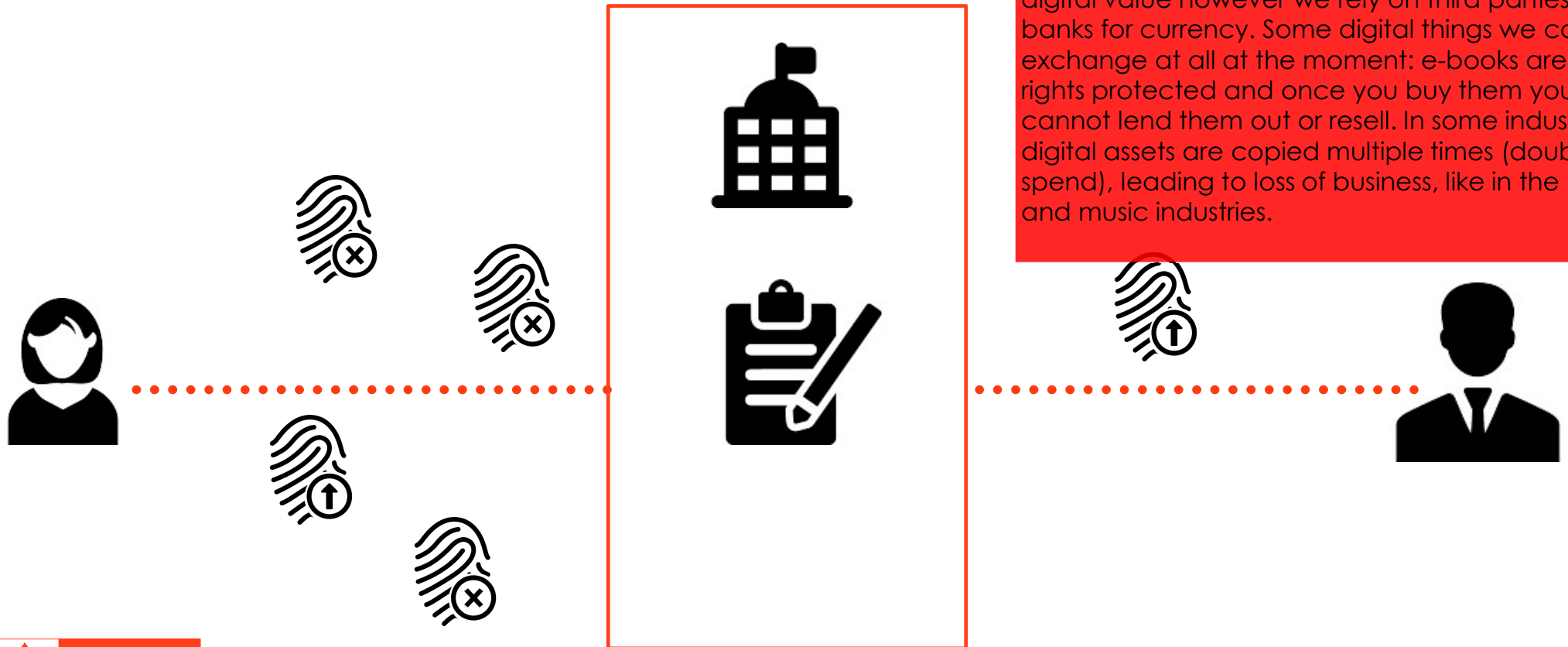
**En ga dan pas beginnen aan je blockchain project!**





# Blockchain Achtergrond

# What is blockchain (1)?



In the physical world, "things" are unique and not replicable. This means we can safely exchange them between multiple parties. To exchange digital value however we rely on third parties, like banks for currency. Some digital things we cannot exchange at all at the moment: e-books are often rights protected and once you buy them you cannot lend them out or resell. In some industries, digital assets are copied multiple times (double spend), leading to loss of business, like in the movie and music industries.

# Blockchain benefits

**Six critical qualities: distributed – no central database to hack or shut down. Encrypted – virtual security, string and secure identification, means no dependencies on f.e. weak firewalls or corrupt staff.**

**In a public blockchain: anyone can view everything, not limited to central authority. In a public blockchain this means literally anyone. In a private blockchain only permissioned participants.**

**Inclusive: a smartphone is enough to do business with a blockchain.**

**Immutable: transactions recorded in a block cannot be altered. Historical: the complete audit trail of all assets is kept.**

**This means, we do not need the “middle man” anymore to transfer digital value from one party to another.**

*Bitcoin gives us, for the first time, a way for one Internet user to transfer a unique piece of digital property to another Internet user, such that the transfer is guaranteed to be safe and secure, everyone knows that the transfer has taken place, and nobody can challenge the legitimacy of the transfer. The consequences of this breakthrough are hard to overstate.” Marc Andreessen, inventor of the first browser, thought leader and top VC.*

# What is blockchain (2)?

Blockchain solves the “double spend problem” – it makes it possible to uniquely identify something digital and securely transfer it from one owner to the other, without a third party involved

Smart contracts are a way to automate contract initiation and execution. If a set of predefined conditions is met – the transaction is executed.

