

The background of the slide features a complex, abstract network diagram. It consists of numerous nodes, represented by small circles, some of which are solid blue, some are solid grey, and some are hollow with a blue outline. These nodes are interconnected by a web of thin, light-grey lines, creating a dense, interconnected pattern that resembles a blockchain network or a complex data structure. The network is most prominent in the top-left and bottom-right corners, with some nodes and lines extending towards the center.

QA's guide for demistifying blockchain



Hello!

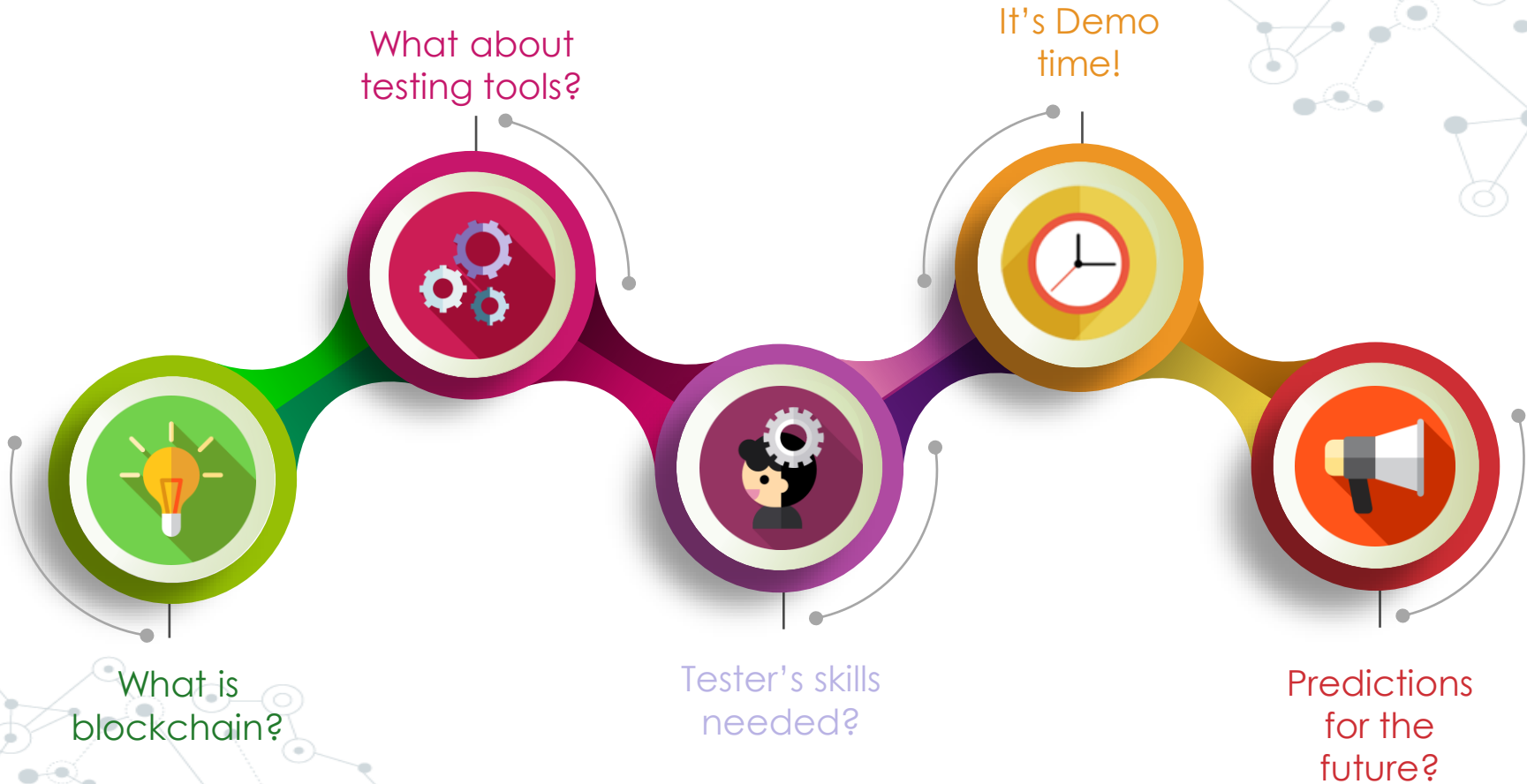
Stefani Majić

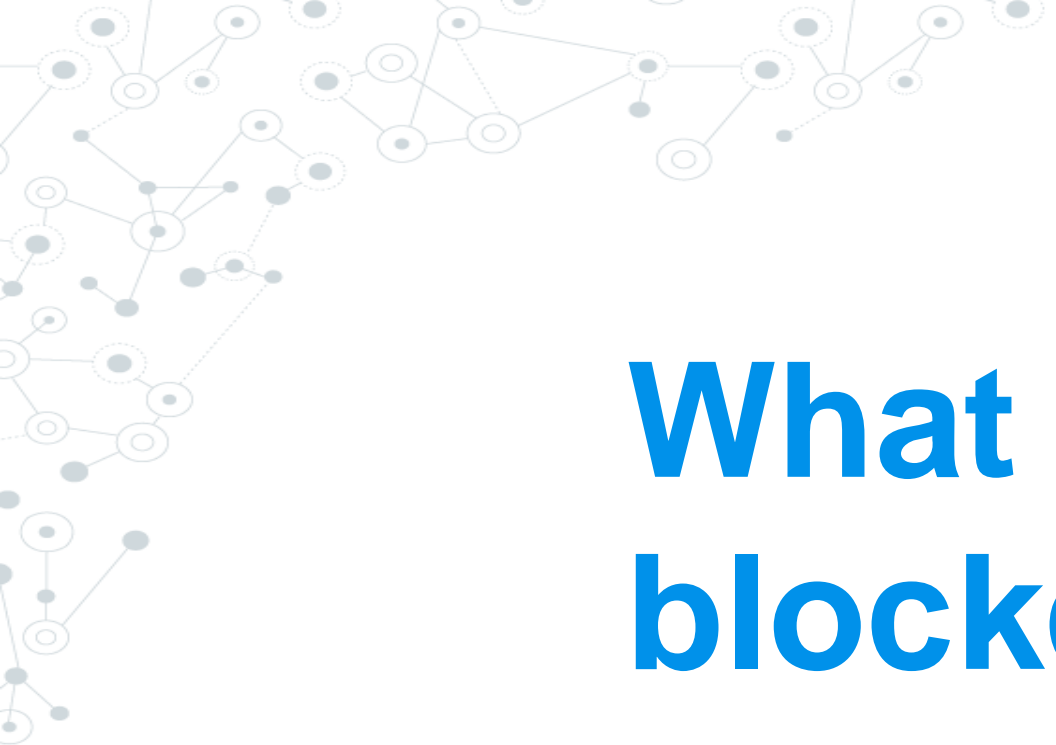
Software Test Engineer
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Software Test Engineer
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Agenda



A decorative network diagram in the top-left corner, featuring a complex web of interconnected nodes and lines. The nodes are represented by circles of varying sizes, some with concentric rings, and the lines are thin and grey. The diagram is partially cut off by the left edge of the frame.

What is blockchain?

A decorative network diagram in the bottom-right corner, similar to the one in the top-left. It shows a cluster of interconnected nodes and lines, with some nodes having concentric circles. The diagram is also partially cut off by the right edge of the frame.

A decorative network diagram at the top of the slide, featuring a complex web of interconnected nodes and lines. The nodes are represented by small circles, some of which are highlighted with larger, concentric circles. The lines are thin and gray, creating a mesh-like structure. A central node is highlighted with a larger, dashed circle, and a blue double quote icon is placed inside it.

“

*Not since the Web itself has a technology
promised broader and more fundamental
revolution than blockchain technology.*

Blockchain is:

- ◎ **Most recognized as the protocol underneath Bitcoin**
- ◎ **The „new internet”**
- ◎ **Offering data security in IoT applications**

How it works:



Someone requests a transaction.

The requested transaction is broadcast to P2P network consisting of computers, known as nodes.



Validation

The network of nodes validates the transaction and the user's status using known algorithms.



A verified transaction can involve **cryptocurrency**, contracts, records, or other information.



The transaction is complete.



The new block is then added to the existing blockchain, in a way that is permanent and unalterable.



Once verified, the transaction is combined with other transactions to create a new block of data for the ledger.

Cryptocurrency

Cryptocurrency is a medium of exchange, created and stored electronically in the blockchain, using encryption techniques to control the creation of monetary units and to verify the transfer of funds. Bitcoin is the best known example.



Has no **intrinsic value** in that it is not redeemable for another commodity, such as gold.



Has no **physical form** and exists only in the network.



Its supply is not **determined by a central bank** and the network is completely decentralized.

Benefits VS Unknowns

A decorative network diagram in the top right corner, featuring a series of interconnected nodes (circles) and lines, some solid and some dashed, creating a web-like structure.

- ◎ **Increased transparency**
- ◎ **Accurate tracking**
- ◎ **Permanent ledger**
- ◎ **Cost reduction**

- ◎ **Complex technology**
 - ◎ **Regulatory implications**
 - ◎ **Implementation challenges**
 - ◎ **Competing platforms**
- 
- A decorative network diagram in the bottom left corner, featuring a series of interconnected nodes (circles) and lines, some solid and some dashed, creating a web-like structure.

Blockchain

```
graph TD; Blockchain[Blockchain] --- PKC[Private Key Cryptography]; Blockchain --- P2P[P2P Network]; Blockchain --- Program[Program the blockchain's protocol]; PKC --- Cash[Cash vs. Plastic]; PKC --- Identity[Identity]; P2P --- Forest[Tree falls in a forest]; P2P --- Record[System of Record]; Program --- Commons[Tragedy of the commons]; Program --- Platform[Platform];
```

Private Key
Cryptography

Cash vs.
Plastic

Identity

P2P Network

Tree falls in a
forest

System of
Record

Program (the
blockchain's
protocol)

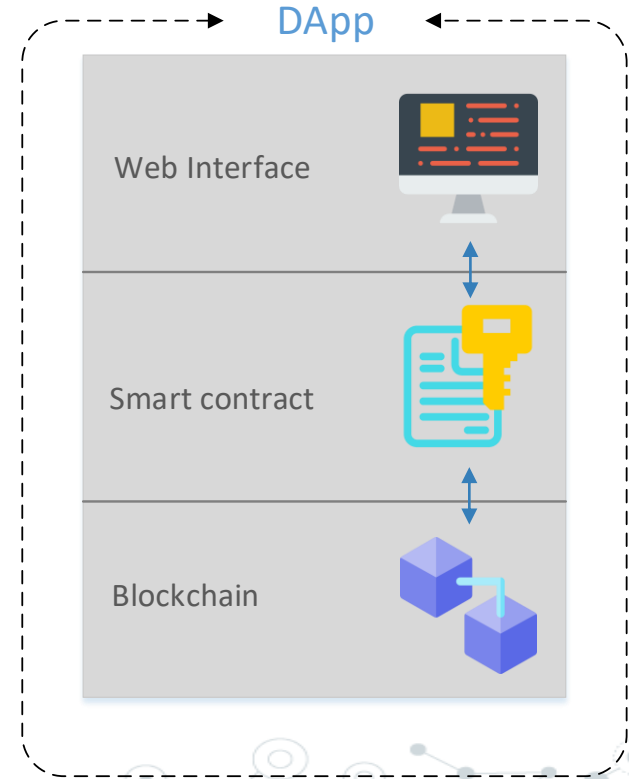
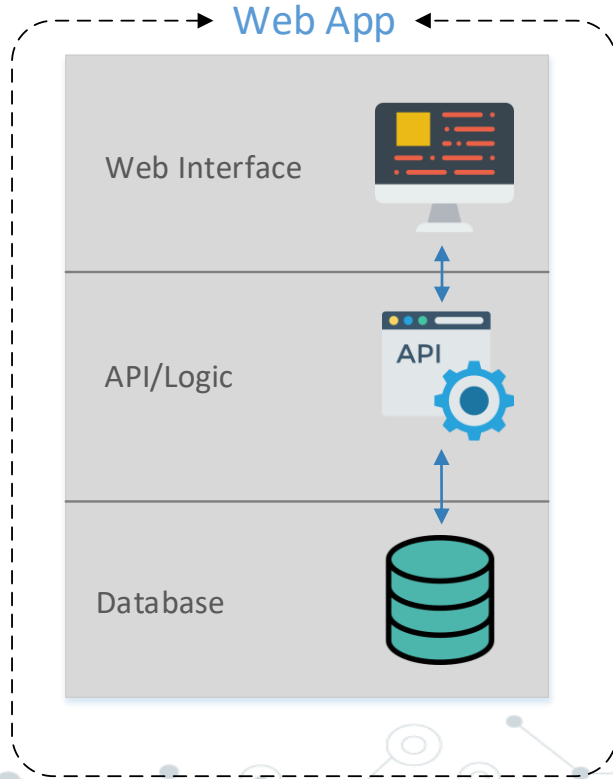
Tragedy of the
commons

Platform

The Icing On The Cake

- **Transparent**
- **Incorruptible**
- **Security**
- **Immutability**
- **Increased Capacity**

Web App vs DApp





BIG concept

**How will it affect QA
working process?**

What about testing tools?





© **There is already a great number of tools for testing blockchain.**

- © **We will discuss about two:**
- **Ethereum**
 - **Hyperledger composer**
- 



Ethereum

- ◎ **Best known tool for blockchain applications**
- ◎ **Framework with libraries for testing**

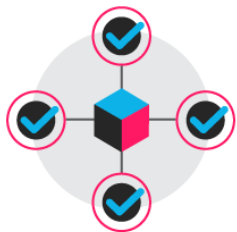
Benefits of Ethereum decentralized Platform:

1. **Immutability**
2. **Corruption & tamper proof**
3. **Secure**
4. **Zero downtime**

Recap!

Benefits of Decentralized networks

With no central point of failure and secured using cryptography, applications are well protected against hacking attacks and fraudulent activities.



Advantages:

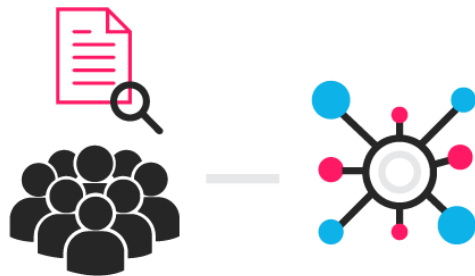
- ✓ Immutability
- ✓ Corruption & tamper
- ✓ Secure

ENTER ETHEREUM

The Ethereum makes the process of creating blockchain applications much easier and efficient than ever before. Instead of having to build an entirely original blockchain for each new application, Ethereum enables the development of potentially thousands of different applications all on one platform.

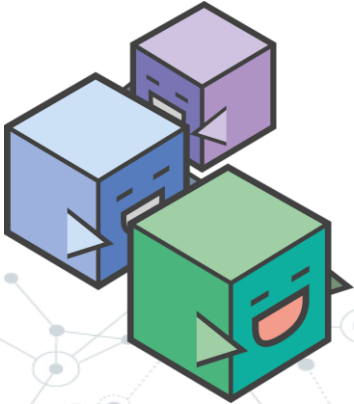
The Blockchain

Blockchain technology is like the internet in that it has a built-in robustness. By storing blocks of information that are identical across its network, the blockchain cannot:

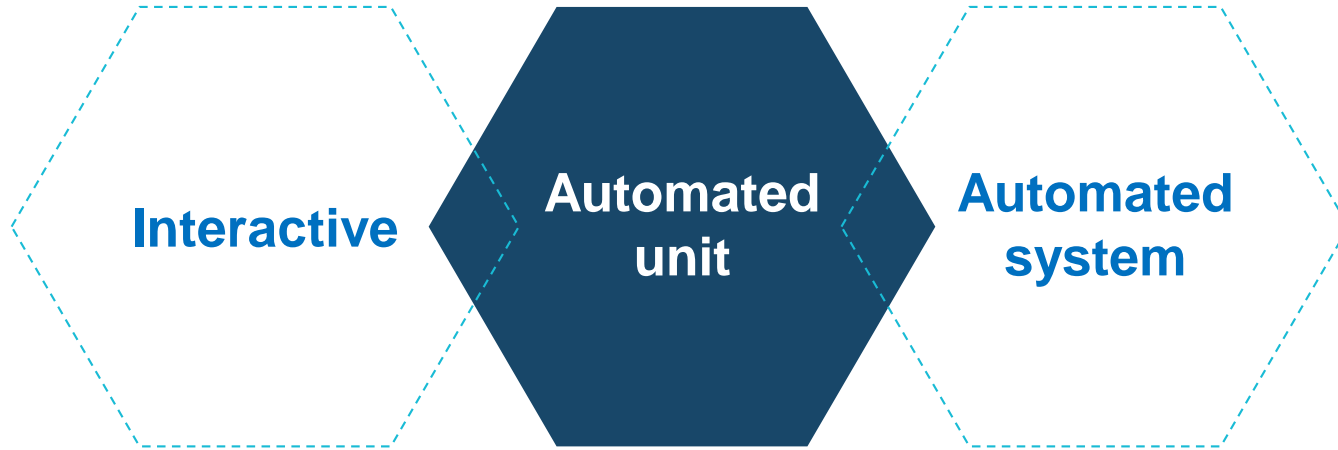


Hyperledger composer

- ◎ **Open-source tool**
- ◎ **Supports three types of testing**



Types of testing with HC:



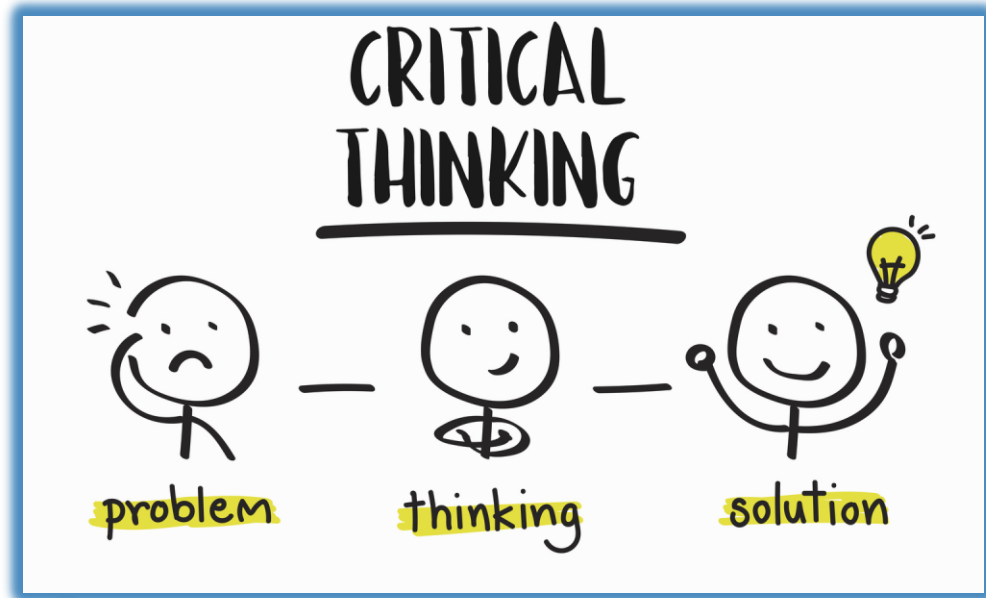
Tools checklist:

- ✓ Testnet indexing tool
- ✓ Bug and test tracking tools
- ✓ API testing tools (Postman, soapUI)
- ✓ Database testing tools
- ✓ Encoding and encryption software

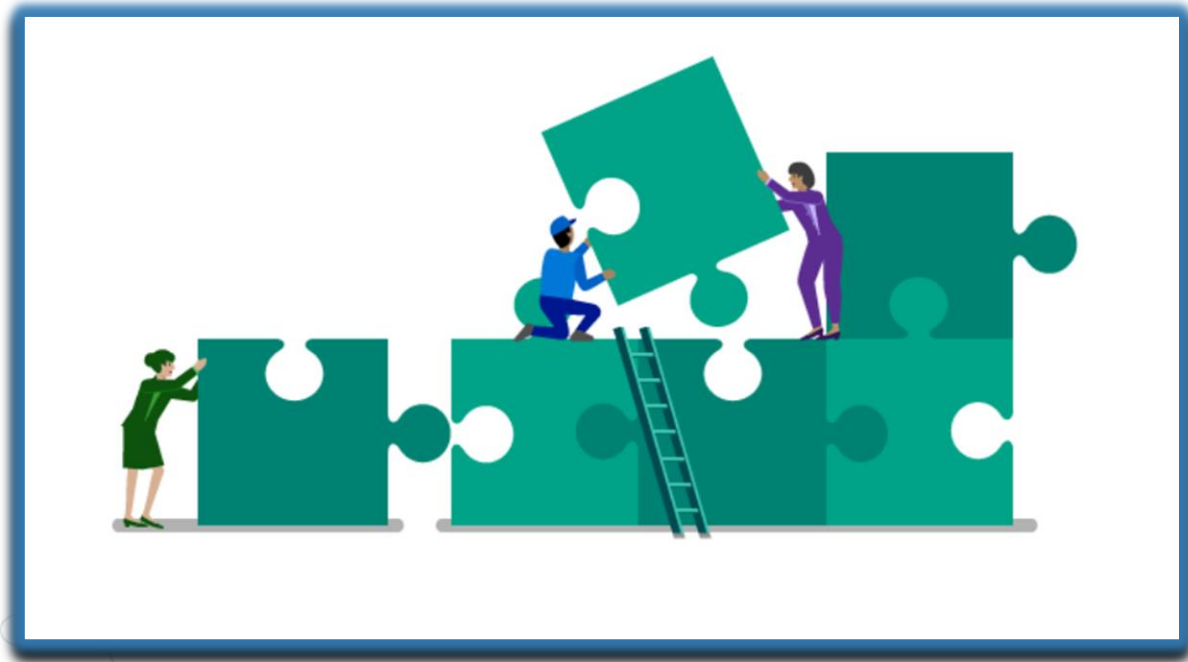
Tester's skills needed?



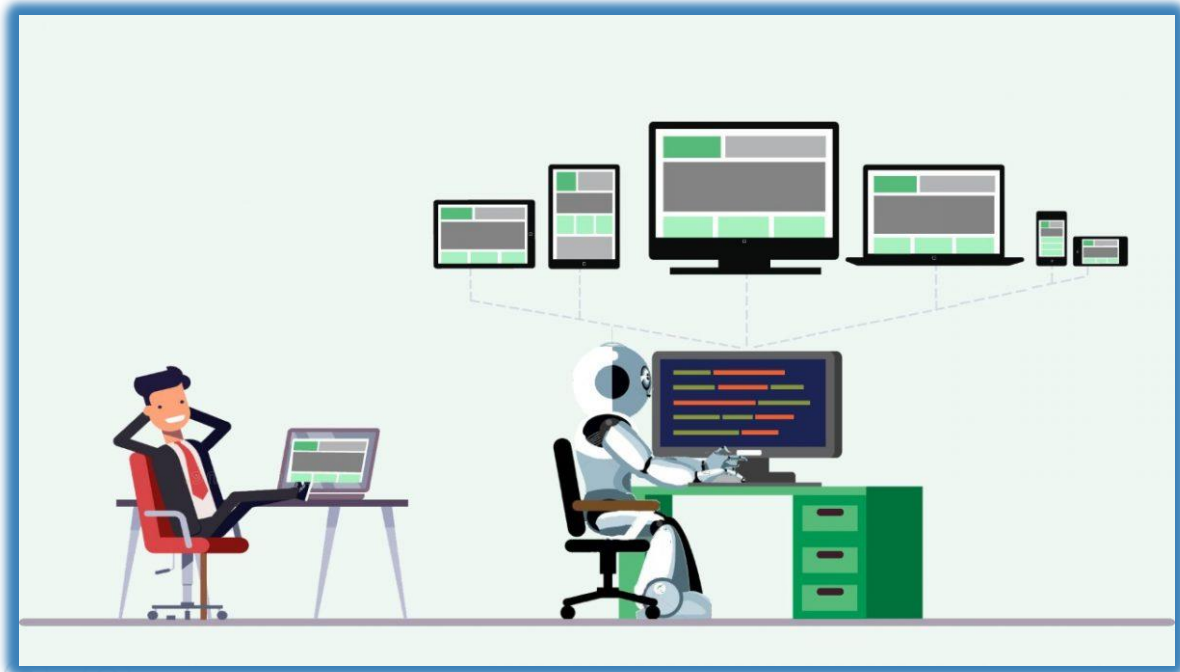
1. Critical thinking



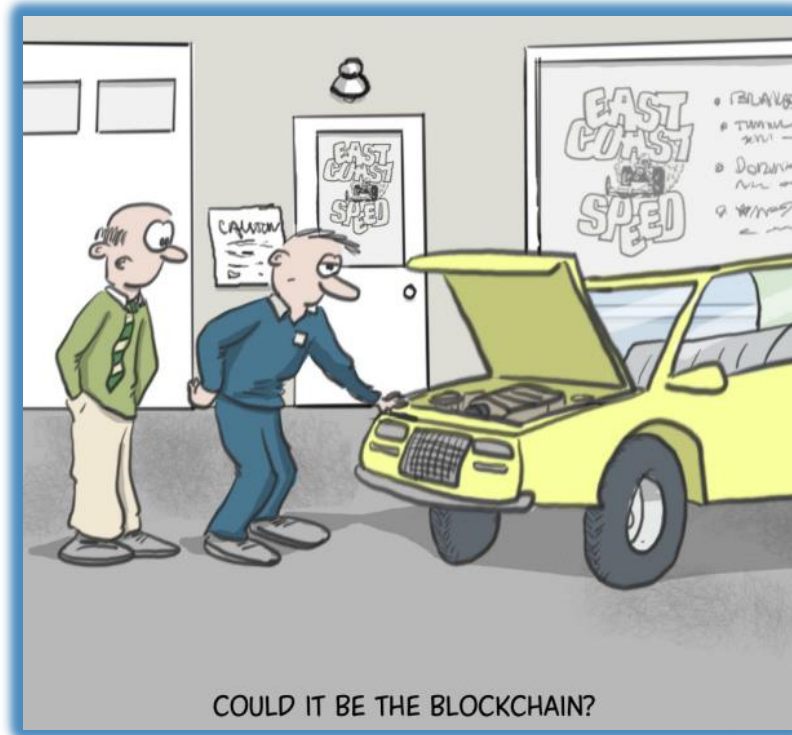
2. Test design techniques



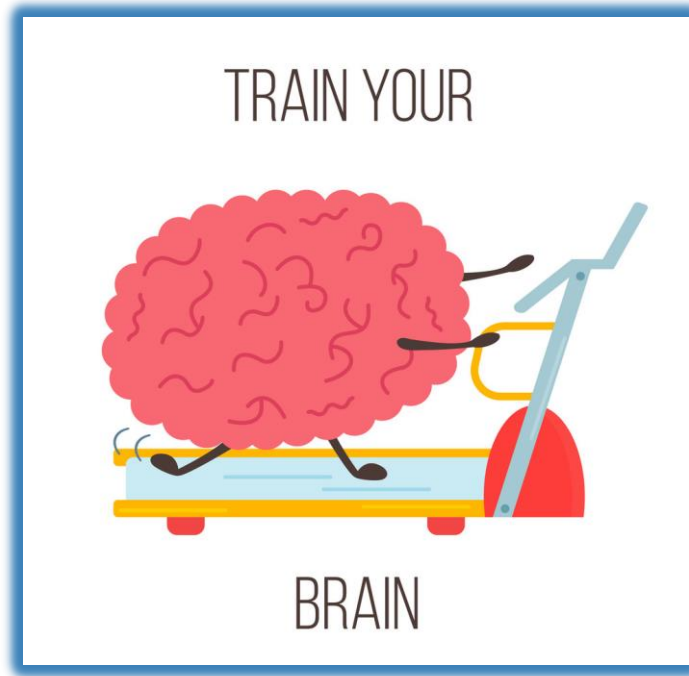
3. Automation



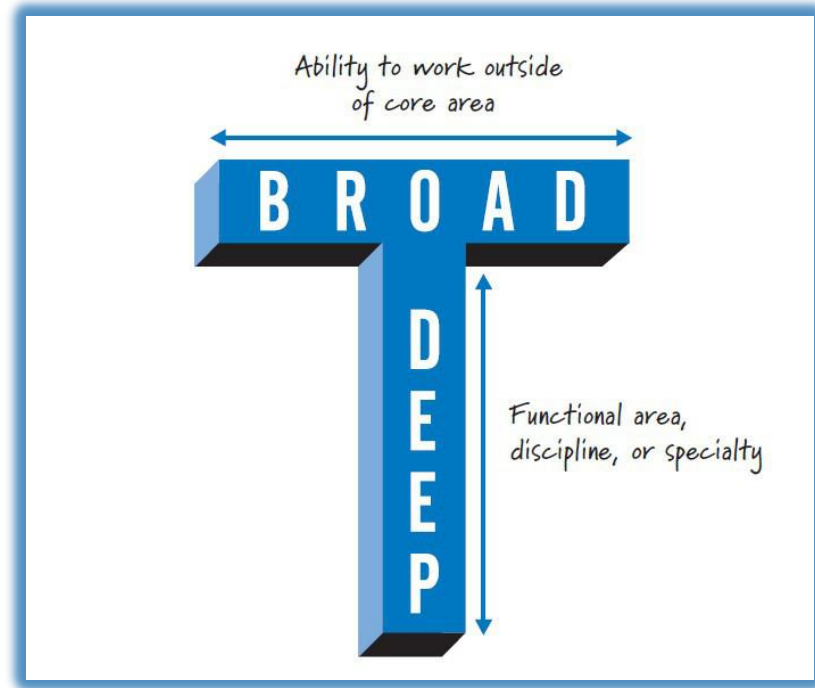
4. Manual testing



5. Learning to work with new tools quickly



6. Being a “T” shaped person



A decorative network diagram in the top-left corner, featuring a complex web of interconnected nodes and lines. The nodes are represented by circles of varying sizes, some with solid outlines and others with dashed outlines, connected by thin, light gray lines.

Types of tests?

A decorative network diagram in the bottom-right corner, similar to the one in the top-left, showing a cluster of interconnected nodes and lines. The nodes are circles of different sizes, some solid and some dashed, connected by thin, light gray lines.

Use tests that ensure:

- ◎ **high level coverage**
- ◎ **quality**

1. Unit tests

- ◎ **first line of defense**
- ◎ **ensure that code is performing correctly**

2. Integration tests


- ◎ **ensure code communication between different components**

3. User interface tests

- ◎ **uncover how the application works from the end user's perspective**



4. API tests

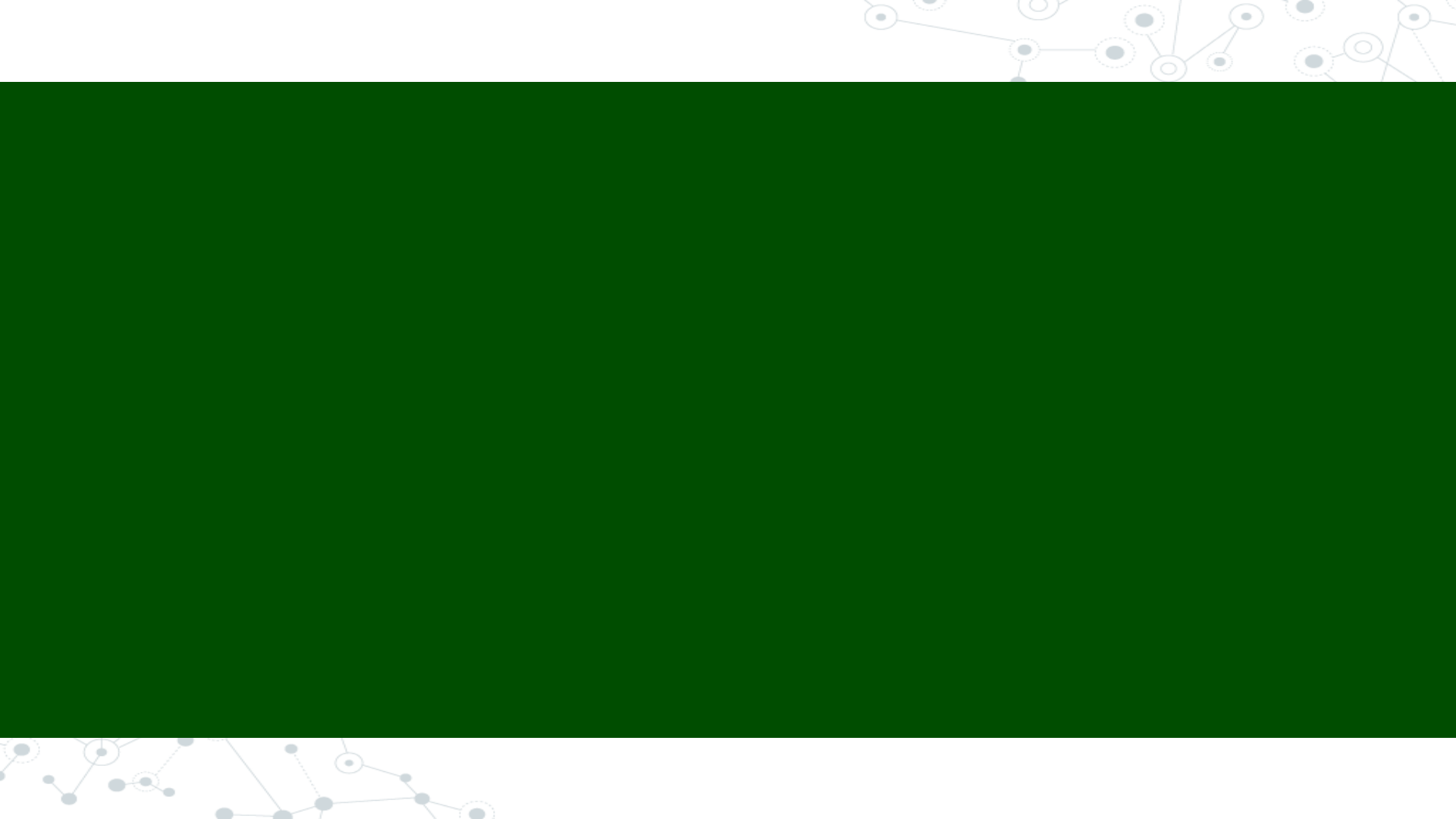
- ◎ **validate the responses that your application receives from external APIs**
 - ◎ **smart contracts**
- 



DEMO



Testing of the blockchain products slightly differs from testing payment apps and looks like a functional testing of the payment gateway system.



Challenges of testing blockchain apps:

- ◎ Specific testing environment
- ◎ Transactions are irreversible
- ◎ All transactions are paid
- ◎ It can be required to set up a local node for the given blockchain

A decorative background featuring a network diagram with nodes and connecting lines, primarily located in the top-left and bottom-right corners. The nodes are represented by circles of varying sizes, some with concentric rings, and the connections are thin, light gray lines.

Predictions for the future?

Potential applications



Automotive

Consumers could use the blockchain to manage fractional ownership in autonomous cars.

Financial services

Faster, cheaper, settlements could shave billions of dollars from transaction costs while improving transparency.



Voting

Using a blockchain code, constituents could cast votes via smartphone, tablet or computer, resulting in immediately verifiable results.

Healthcare

Patients' encrypted health information could be shared with multiple providers without the risk of privacy breaches.





1. More usage outside of finance

- © any industry or organization in which an oversight of transactions is necessary could benefit
- 



2. Blockchain meets the Internet of Things

- ◎ **keeping the ever-growing number of connected devices
safe**
- 



3. Smart contracts will come into their own

- ◎ **the idea is that contracts will execute automatically when conditions are met**
- 



4. A large number of blockchain initiatives will fail

- ◎ **blockchain undoubtedly has the potential to be revolutionary but like anything revolutionary it can be dangerous**
- 



240,000,000+

transactions on the Ethereum network since its inception

Whoa! That's a big number!





1,552

decentralized applications currently launched on
Ethereum

2.1 billion \$

global spending on blockchain solutions in 2018

2036.



when cryptocurrencies become the global standard for
transacting



Essentia –
Border control
in Denmark

Russian rail operator
Novotrans –
inventory data



US Department
of Homeland
Security – data
from security
cameras



Miaocal Network
- Taxation



Uport, Switzerland
– voter
registration



Chile's National
Energy
Commision –
updating electrical
infrastructure



De Beers Group
– tracking
import of
diamonds



Our conclusion is easy!





“

The Blockchain is a lot like sex in high school: everybody is talking about it, nobody really knows how to do it, everyone thinks everyone else is doing it, so everyone claims they are doing it...



Thank you!