QA’s guide for demistifying blockchain

Hello!

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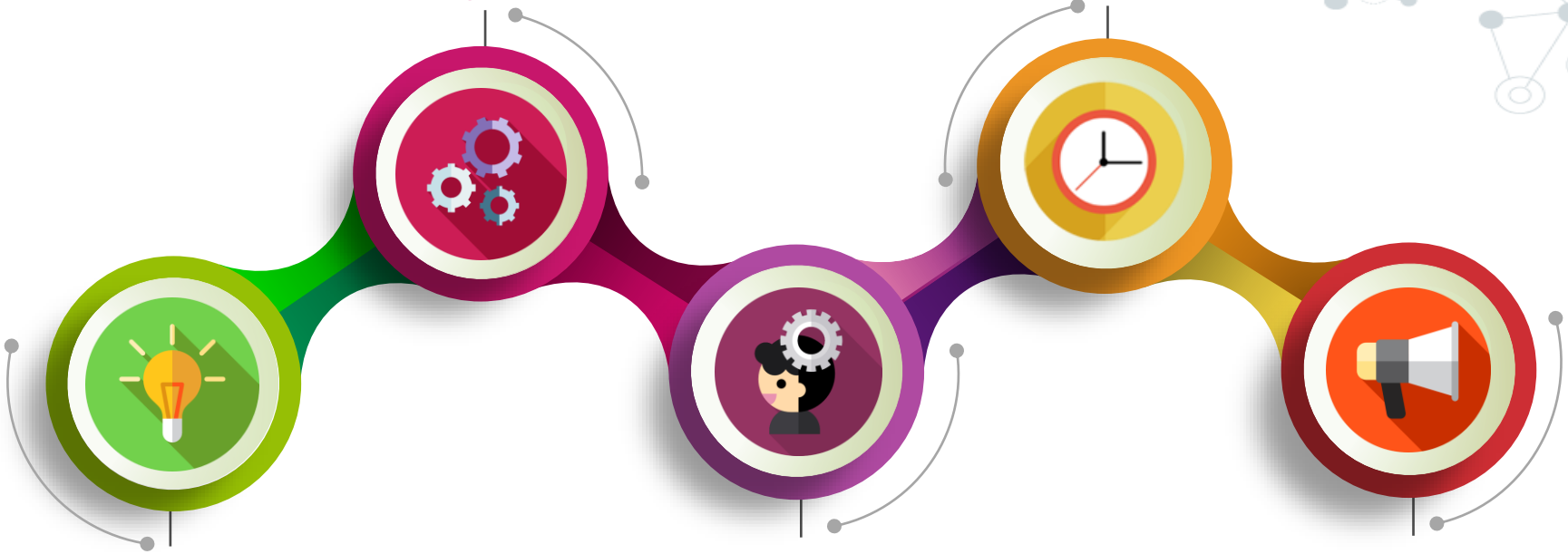
Agenda



What is blockchain?

What about testing tools?

Tester's skills needed?

It's Demo time!

Predictions for the future?

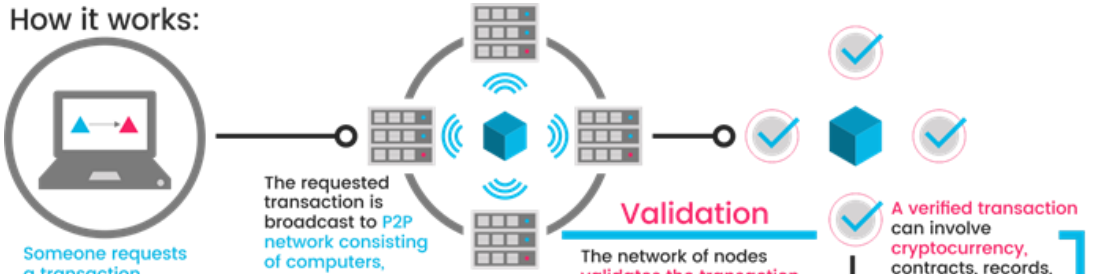
What is blockchain?

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.

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

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

The transaction is complete.

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.

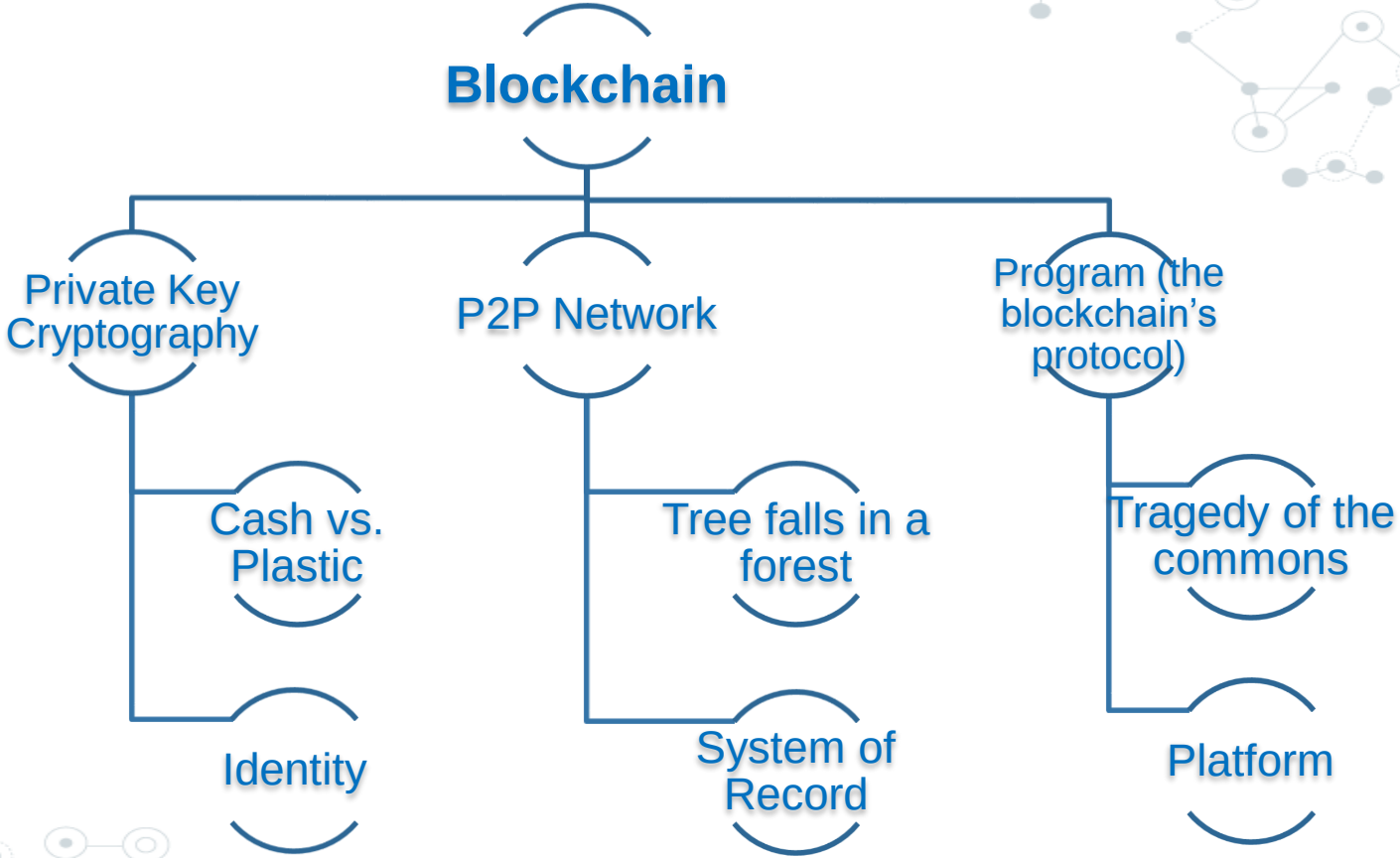
Its supply is not determined by a central bank and the network is completely decentralized.

Blockgeeks

Benefits VS Unknowns

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

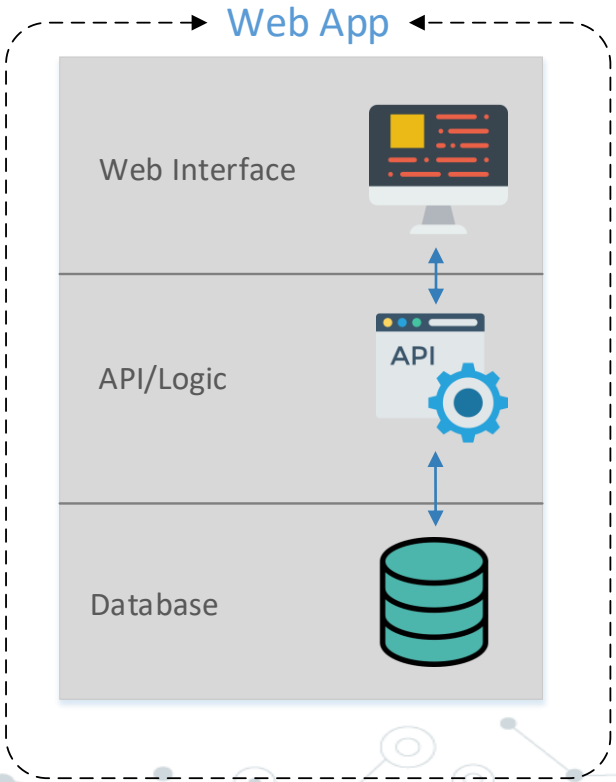
- **Complex technology**
- **Regulatory implications**
- **Implementation challenges**
- **Competing platforms**

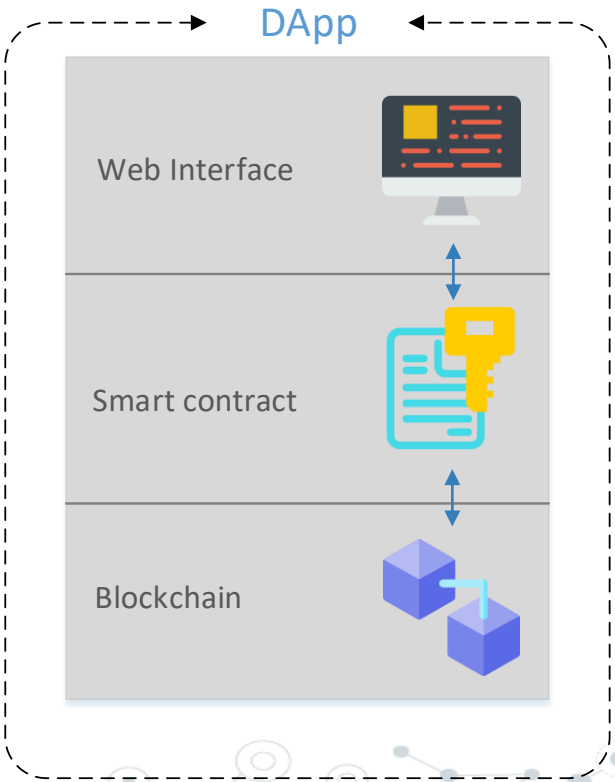

Blockchain
Private Key Cryptography
P2P Network
Program (the blockchain's protocol)
Cash vs. Plastic
Identity
Tree falls in a forest
System of Record
Tragedy of the commons
Platform

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

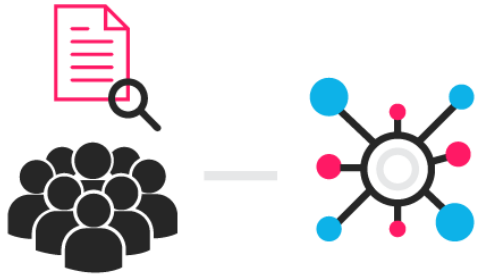
With no central point of failure and secured using cryptography, applications are well protected against hacking attacks and fraudulent activities.

Advantages:

- Immutability
- Corruption & tamper
- Secure

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:

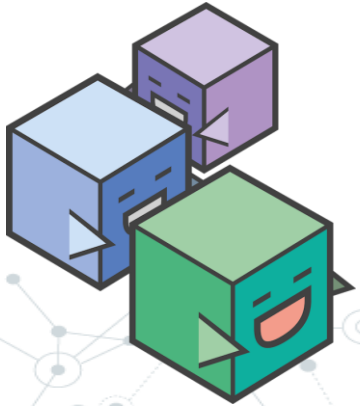


ENTER ETHEREUM

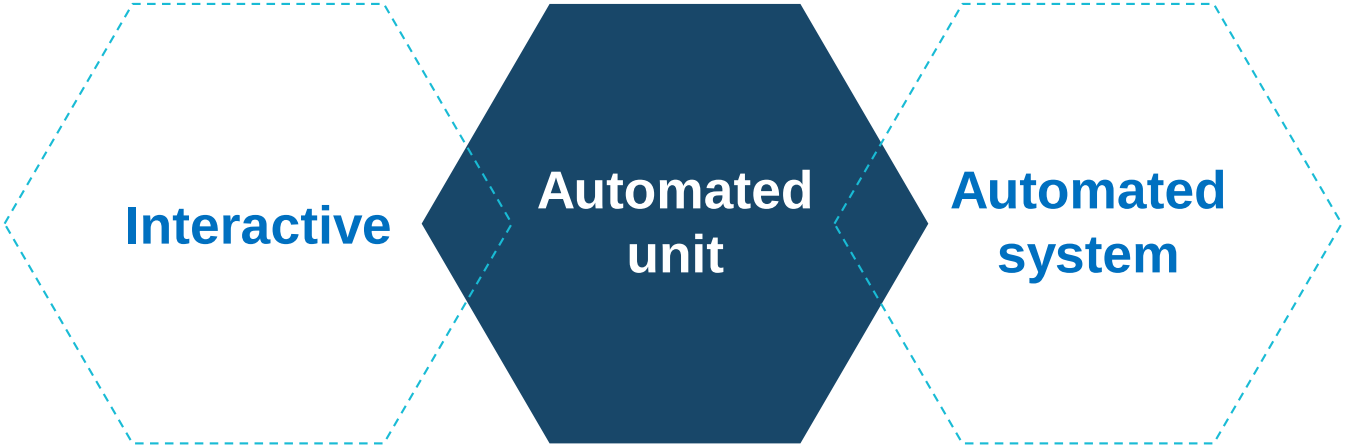
The Ethereum makes the process of creating blockchain applications much easier and efficient than ever before. Instead of having to build an entirely original blockchain for each new application, Ethereum enables the development of potentially thousands of different applications all on one platform.

Hyperledger composer

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



Types of testing with HC:

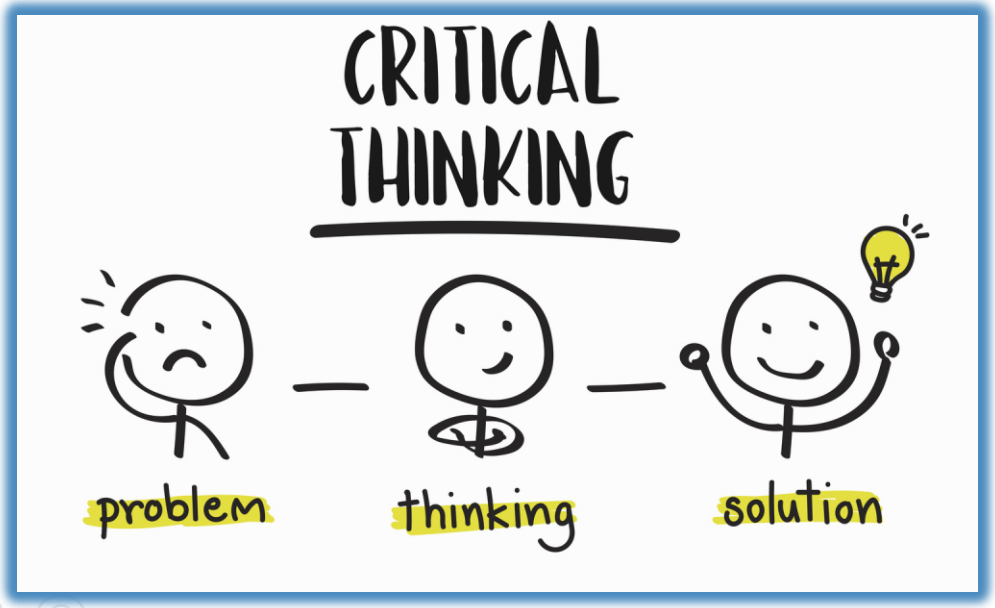


Tools checklist:

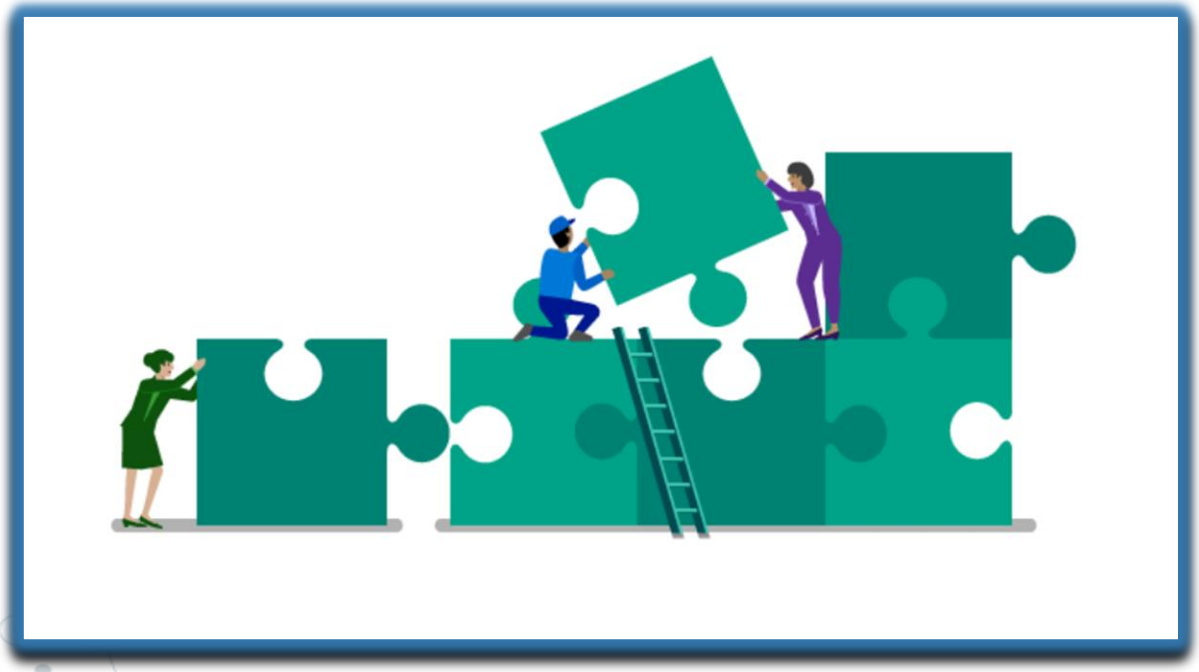
- ✓ Testnet indexing tool
- ✓ Bug and test tracking tools
- ✓ API testing tools (Postman, soapUI)
- ✓ Database testing tools
- ✓ Encoding and encryption software

Tester’s skills needed?

1. Critical thinking

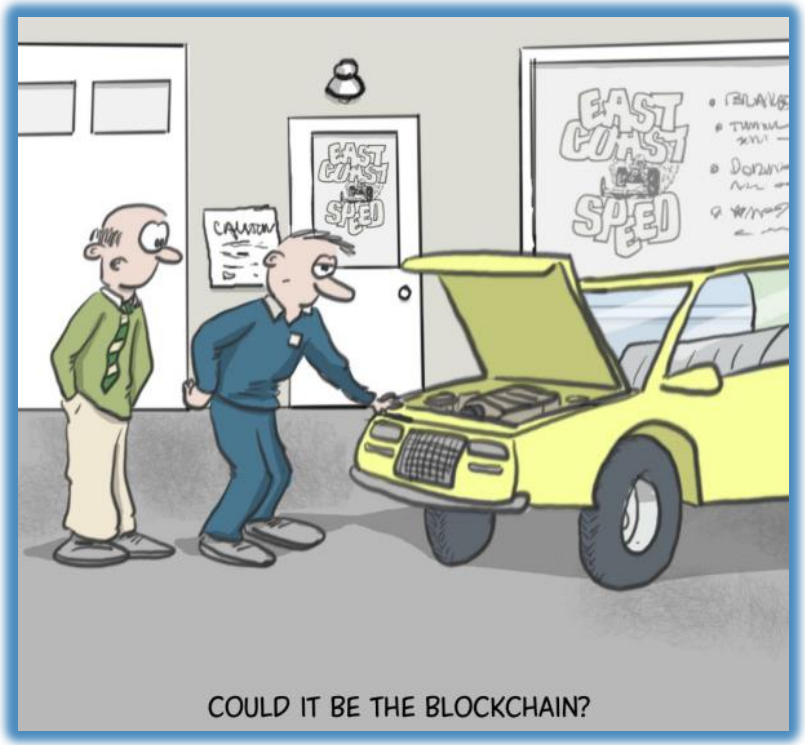


2. Test design techniques

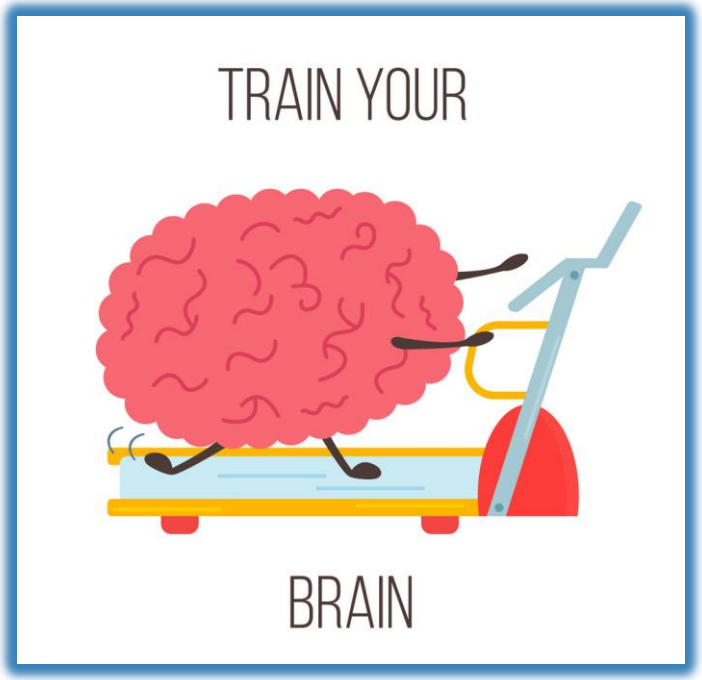


3. Automation

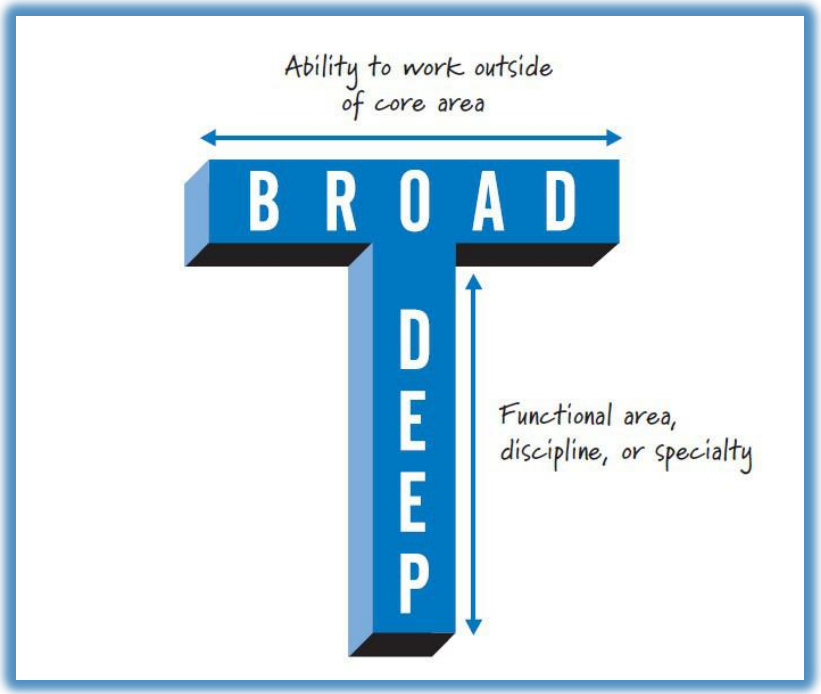
4. Manual testing



5. Learning to work with new tools quickly



6. Being a “T” shaped person



Types of tests?

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

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, tabler 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...

Chris de Rose 2015 / Dan Ariely 2013

Thank you!