18th International SPICE Conference

Permissioned Blockchains and Smart Contracts into Agile Software Processes

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Presenter: Sofia Terzi

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Contents

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Software Development Methodologies

Section I

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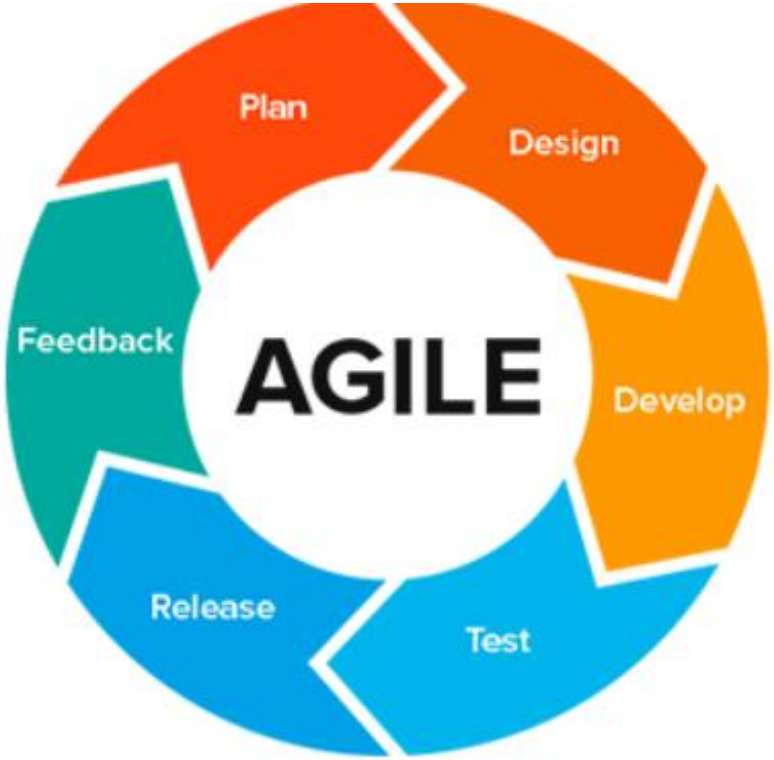
Agile Methodology

Iteration Development

Delivery of product ASAP

Customer feedback

Incorporate information



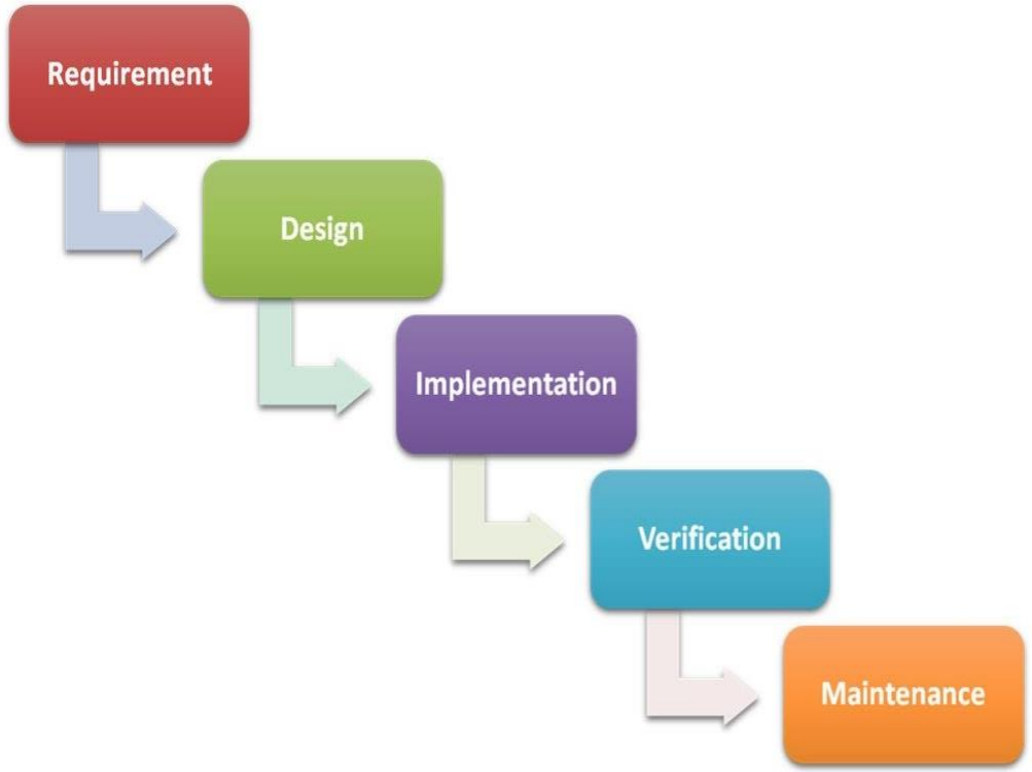
Overlook key features at early stages

Traditional Methodologies

Analysis ➡ Design

Coding ➡ Testing

Deployment ➡ Maintenance



Difficult to adopt new technologies

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Blockchain Technology

Section II

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Blockchain Technology

Transactions between trustless networks – No intermediary

Utilize smart contracts – Digital promises and actions

No single entity to control who enters or leaves the network

Blockchain Technology Features

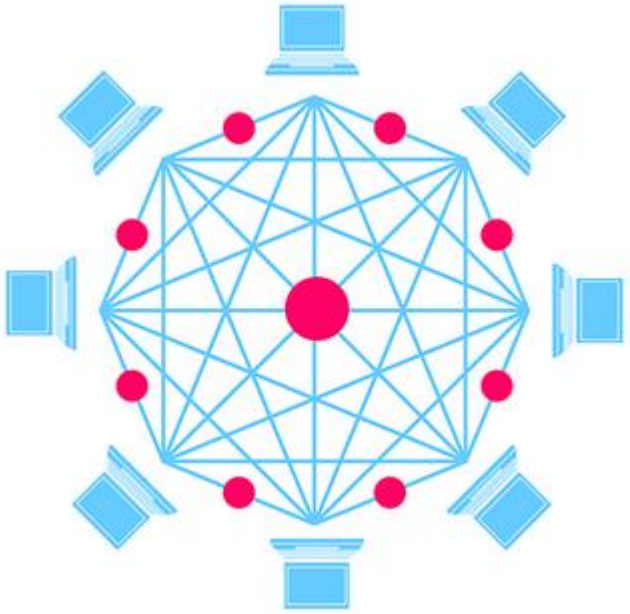
Immutability:

All blocks connected - merkle tree

Blocks are only appended at the end

Distributed among all participants

Participants verify each transaction



Transactions are completely transparent

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Software Processes

Section III

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Blockchain and Agile - I

Early and continuous delivery

- Spot smart contracts' misconfigurations
- Collaborate with customer and experts

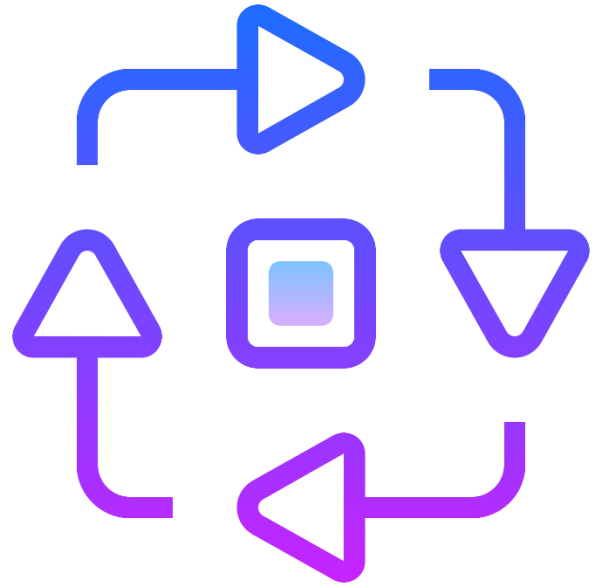
Expect changes at all stages

- Customer Demands
- Bugs and new features
- Frequent team meetings

Blockchain and Agile - II

Produce working software

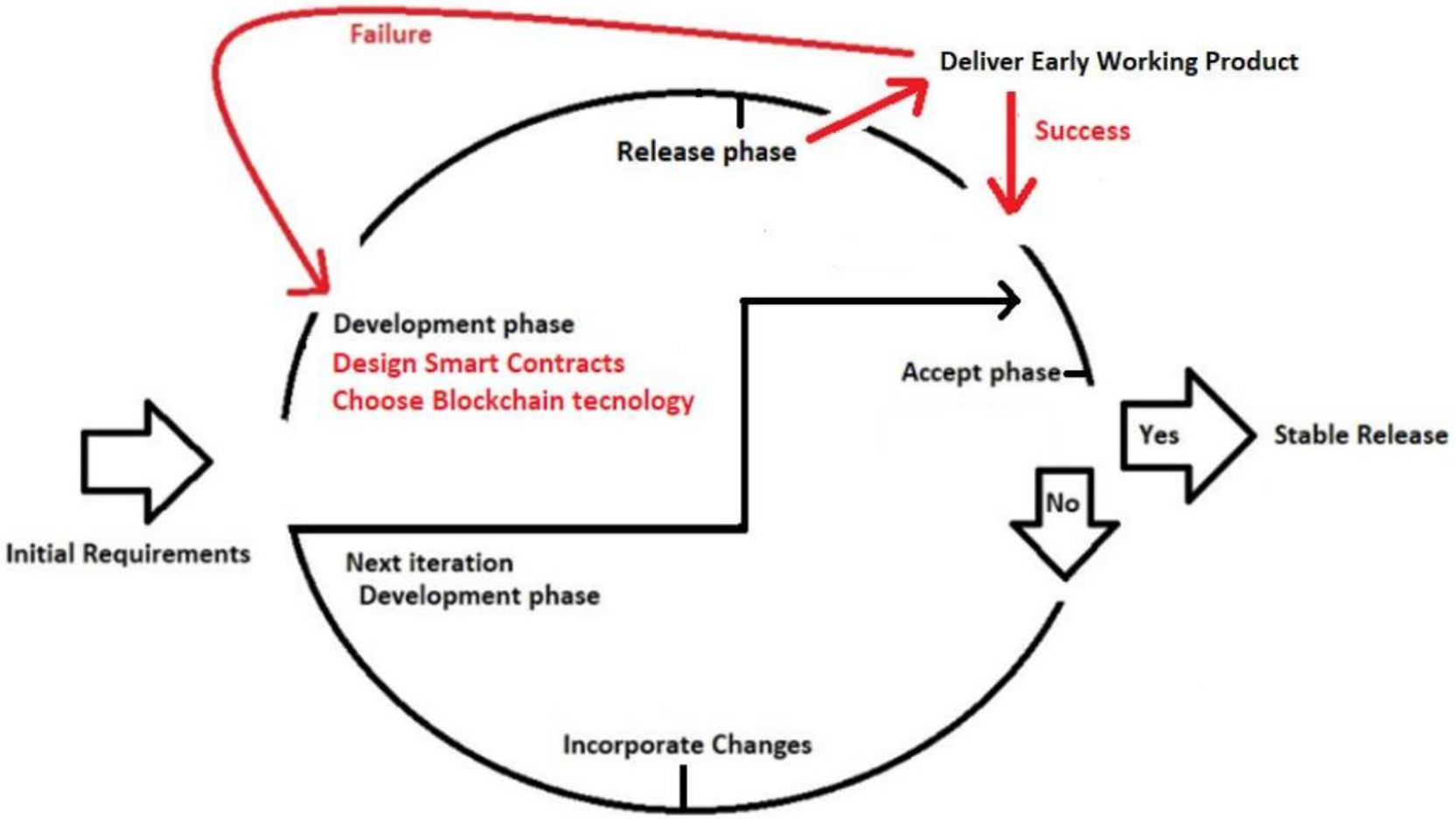
- Research available blockchain technologies
- No standards
- Support all needed functionality



Promote sustainable development

- Choose blockchain technology that supports well-known computer languages
- Better architecture

Blockchain and Agile Combined



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Processes Improvement

Section IV

SPI guidelines for Permissioned Blockchains - I

Verifiability

Privacy

Integrity

Redundancy

Trust anchor

Permissioned Blockchain is a Candidate

SPI guidelines for Permissioned Blockchains - II

Need to Store Data

Multiple Writers

Known Users

Trusted Users

Online Processing

Permissioned Blockchain is the choice

SPI guidelines for Blockchain projects - I

Use open source technologies

Requirements Management

Do not accept changes that cannot be fulfilled

Measurement and Analysis

Measurements will not be clear

Measurements will change during development

Metrics only for what is meaningful

Smart contracts - Services

SPI guidelines for Blockchain projects - II

Design security along with other tools and hardware

High risks for effort and cost

- Assess dangers from customer requirements changes
- Development team's inexperience
- Incorrect smart contracts
- Technology rapid changes

SPI guidelines for Blockchain projects - III

Develop software as initially planned, minimize late additions

Monitor the project plan at all times

Make corrections to the development process according to risk plan

Align smart contracts with defined requirements

Choose technology after evaluation of alternative solutions

SPI guidelines for Blockchain projects - IV

Close collaboration with stakeholders for

- Smart Contracts Design
- Smart Contracts Terms
- Smart Contracts Actions

SPI guidelines for Blockchain projects - V

Organizational Process Definitions must

- Define an agile lifecycle model
- Consider strengths and weaknesses of development team
- Action plan including training the team before and during the development process

Product Integration must include thorough tests to

- Certify smart contracts act as expected
- Make a blockchain system responsive and automatic

SPI guidelines for Blockchain projects - VI

Causal Analysis should focus to the outcomes

- Keep detailed documentation at any stage
- Keep track of applied practices
- Practices outcome reveals the causes of success and failure

Performance Management will rely on developers estimations

- Time needed to complete the project
- Project difficulty level

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