



SRI VENKATESWARAA
COLLEGE OF TECHNOLOGY

Approved by AICTE, New Delhi
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ETHEREUM BLOCKCHAIN AND SMART CONTRACTS

CREATED BY:
KONDURU GREESHMA
B.TECH AI&DS

TOPICS INCLUDED:

1. Introduction
2. Understanding Blockchain
3. The Ethereum Ecosystem
4. Smart Contracts
5. Ethereum Virtual Machine(EVM)
6. Decentralized Applications(dApps)
7. Ethereum Gas and Transactions
8. Challenges and Scalability
9. Use cases of Ethereum
10. Security and Auditing
11. Future of Ethereum
12. Conclusion



INTRODUCTION:

Ethereum is a decentralized blockchain and development platform. It allows developers to build and deploy applications and smart contracts

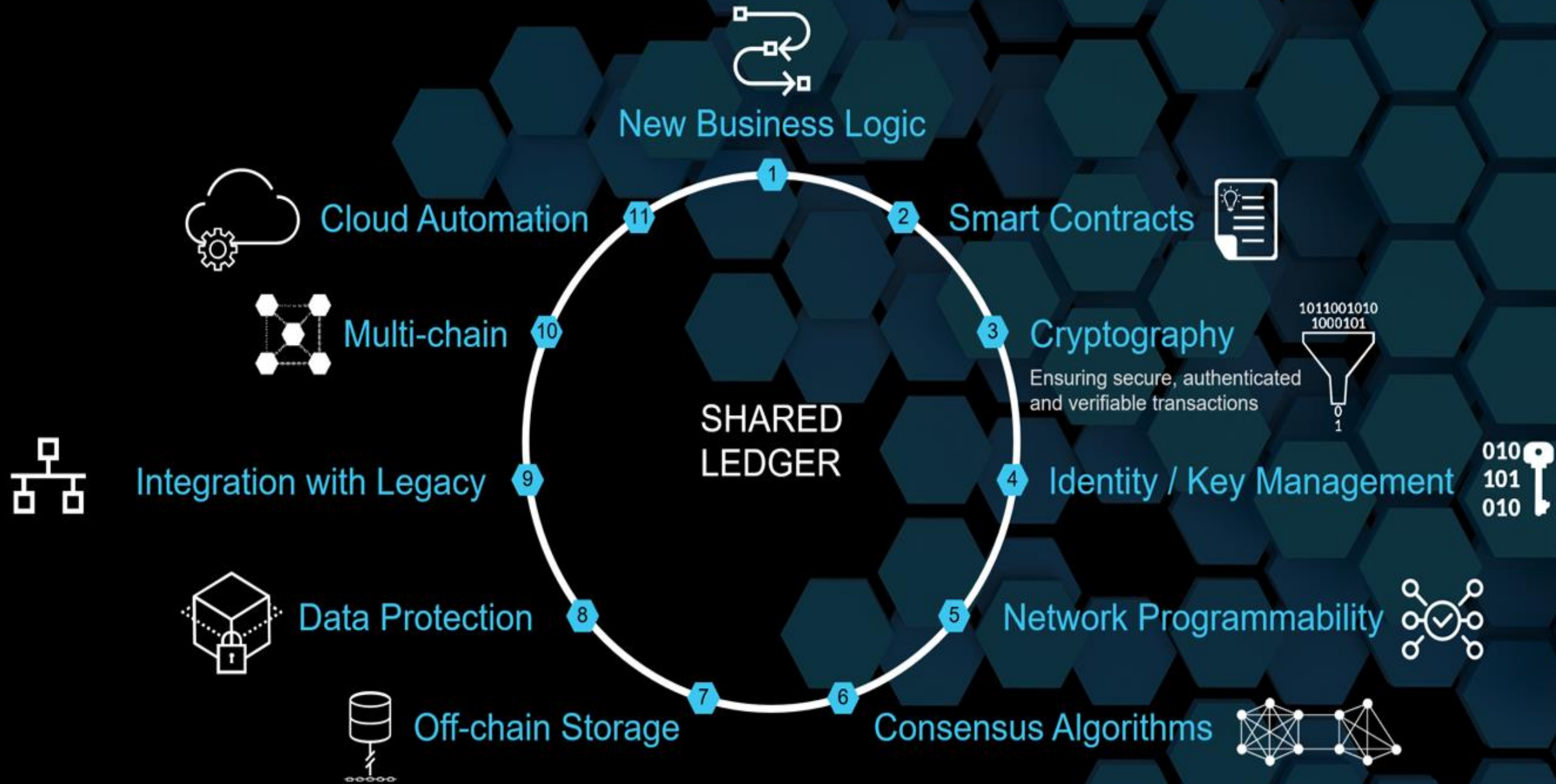
Ethereum enables building and deploying smart contracts and decentralized applications (dApps) without downtime, fraud, control or interference from a third party

Understanding Blockchain:



- Blockchain is a decentralized, immutable ledger that records transactions across a network of computers. It ensures security and transparency by utilizing cryptographic techniques
- Blockchain Technology is an advanced database mechanism that allows transparent information sharing within a business network..

The elements of Blockchain



Advancing the Web 3.0 Ecosystem

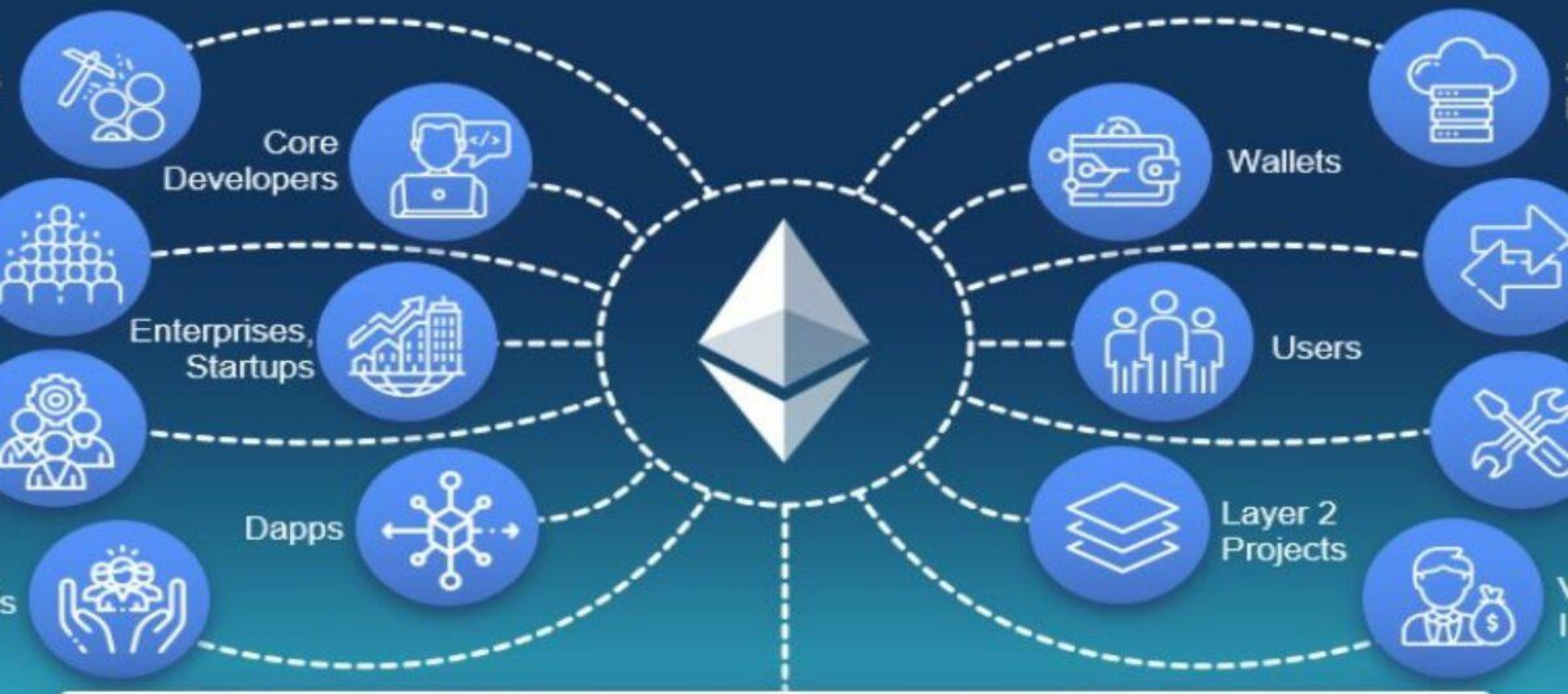
Specialized Ecosystem

Maturing Technology

Research

Specifications

Open-source Code and



The Ethereum Ecosystem:

Ethereum is a decentralized platform that enables the creation of smart contracts and decentralized applications (dApps). Its native cryptocurrency is called Ether.



SMART CONTRACTS:

Smart contracts are self-executing contracts with the terms of the agreement directly written into code. They automatically enforce and execute the terms of an agreement

Smart Contracts Benefits



Smart Contracts are Awesome!

Autonomy

You're the one making the agreement; there's no need to rely on a broker or lawyer

1



2

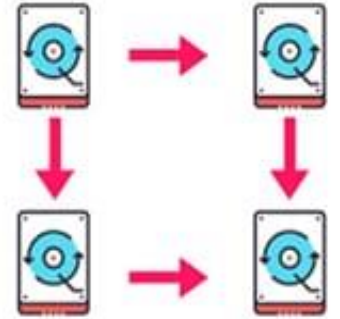
Trust

Your documents are encrypted on a shared ledger

Backup

On the blockchain, Your documents are duplicated many times over

3



4

Savings

Smart contracts save you money since they knock out the presence of an intermediary

Accuracy

Smart contracts are not only faster and cheaper but also avoid the errors that come from manually filling out heaps of forms.

5



ETHEREUM VIRTUAL MACHINE (EVM):

The Ethereum Virtual Machine is the runtime environment for smart contracts in Ethereum . It enables the execution of smart contract code in a secure and deterministic manner.

Ethereum Virtual Machine (EVM)

Machine state (volatile)

Program Counter
(PC)

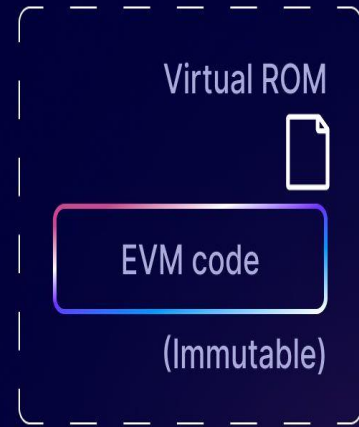
Stack

Memory

Gas available

(Account)
Storage

World state
(persistent)

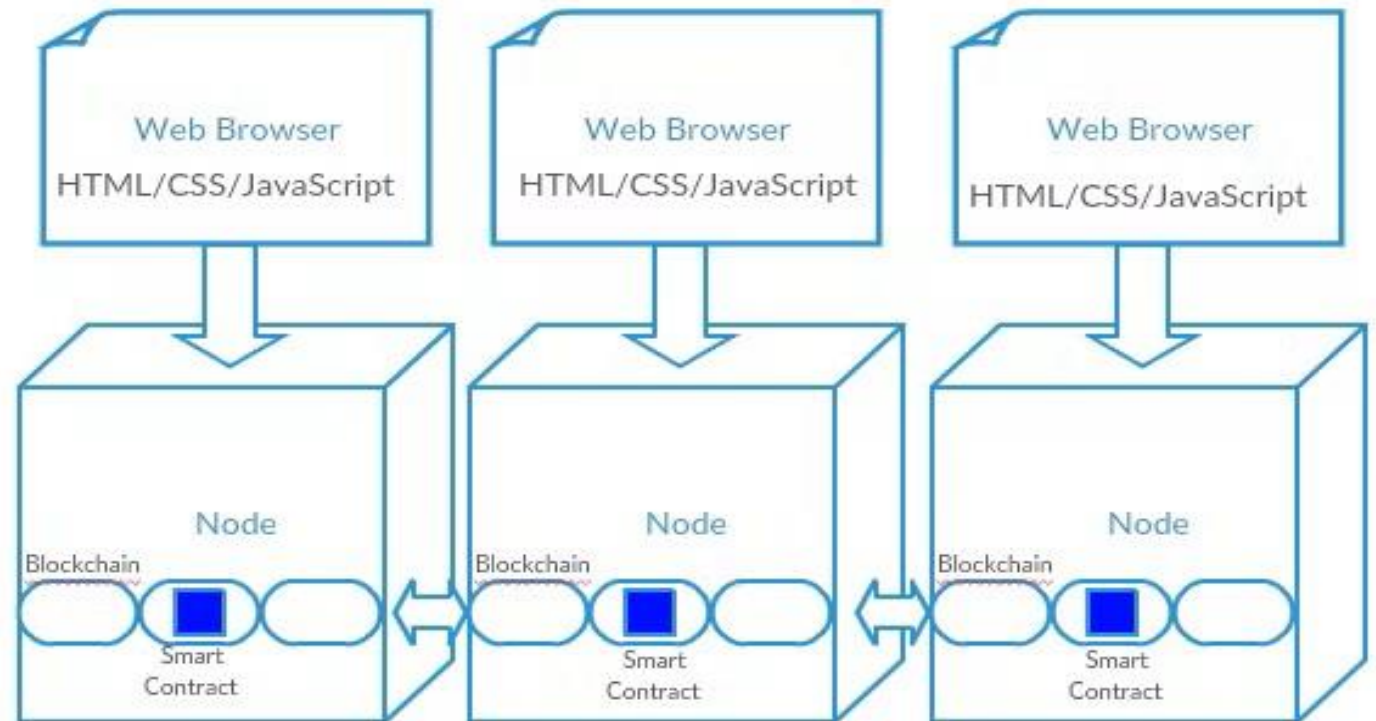


ETHEREUM VIRTUAL MACHINE ARCHITECTURE:

ASP .NET Application Architecture



Decentralized Application Architecture



Decentralized Apps(dApps):

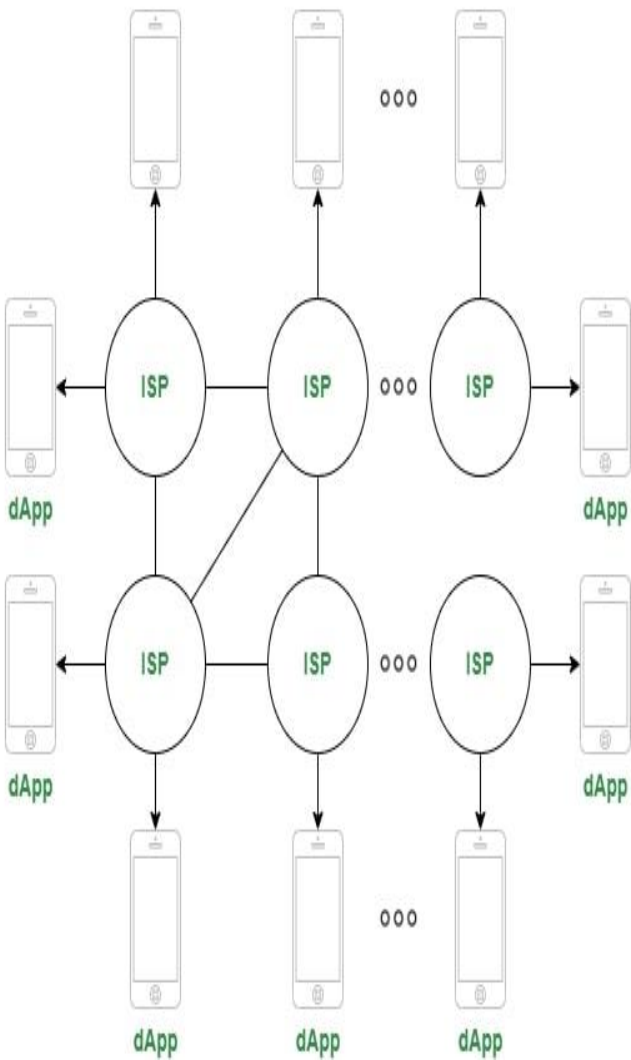
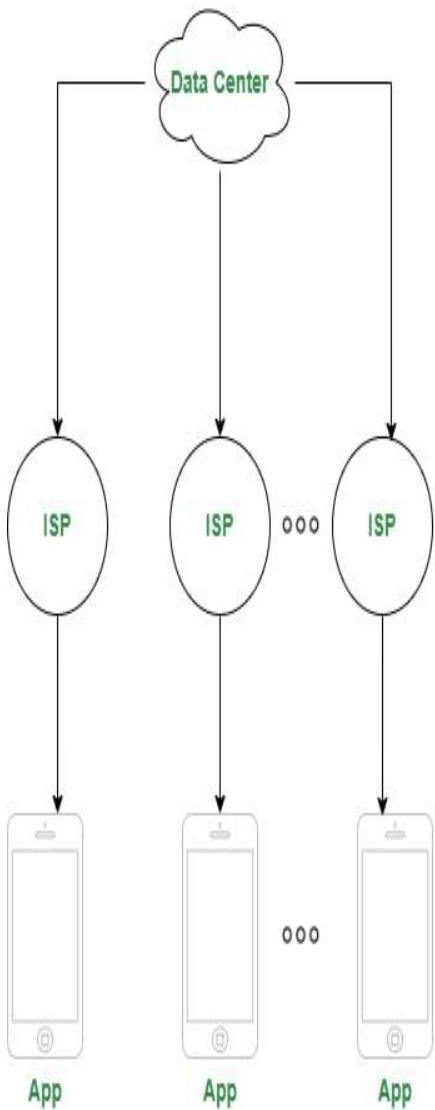
WHAT ARE
DAPPS



Normal Apps

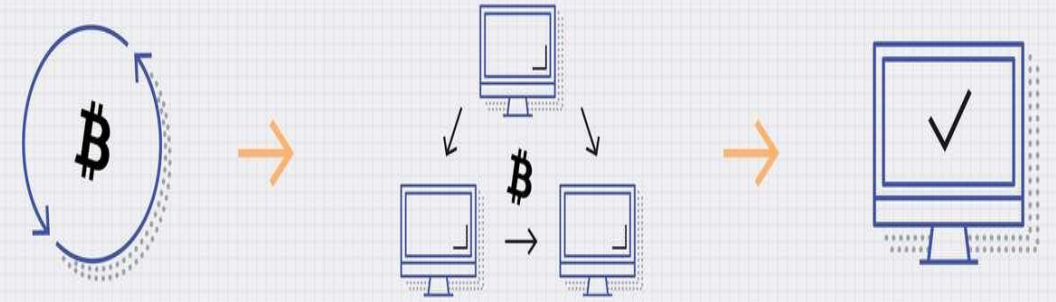
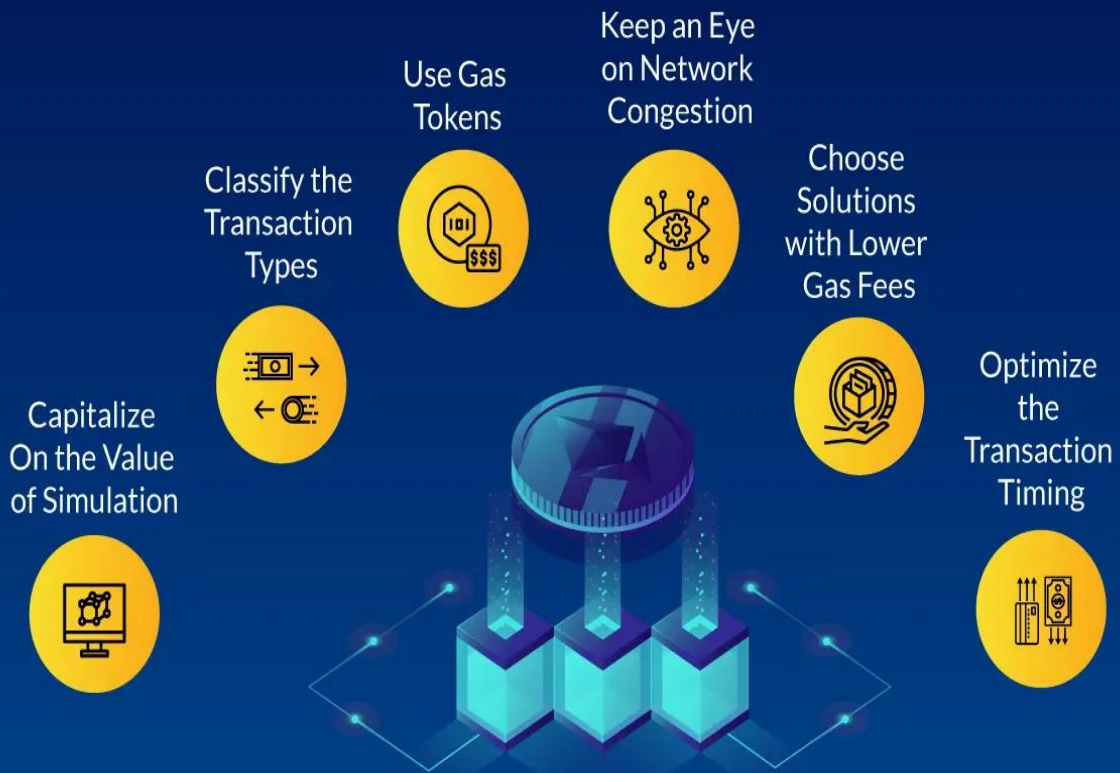
VS

dApps



ETHEREUM GAS AND TRANSACTIONS:

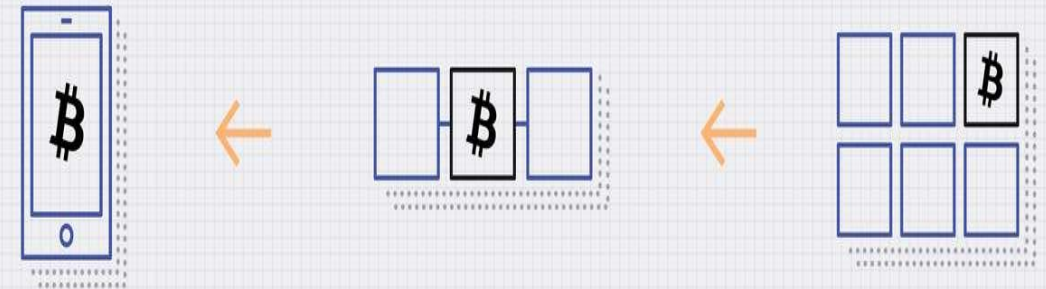
METHODS FOR REDUCING ETHEREUM GAS FEES



A new transaction is entered.

The transaction is then transmitted to a network of peer-to-peer computers scattered across the world.

This network of computers then solves equations to confirm the validity of the transaction.

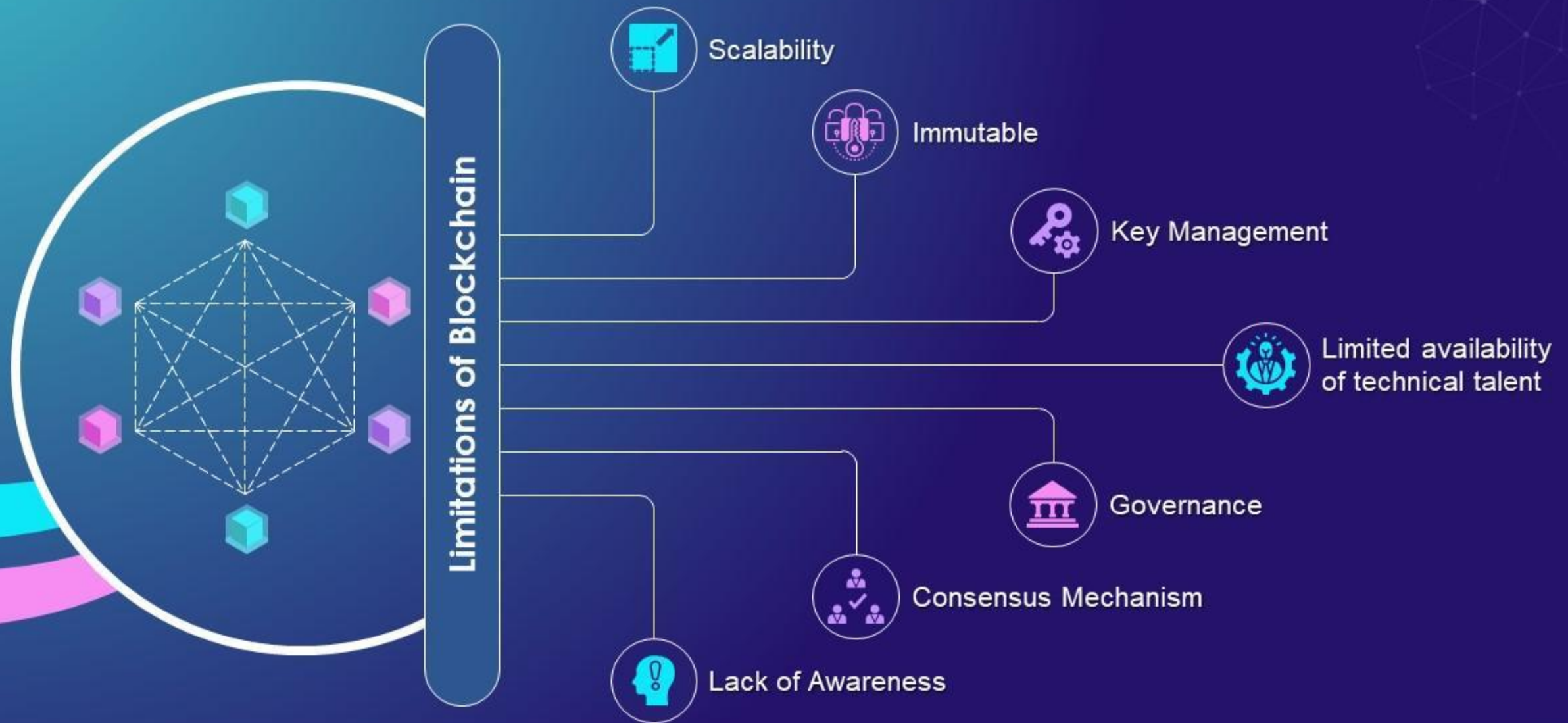


The transaction is complete.

These blocks are then chained together creating a long history of all transactions that are permanent.

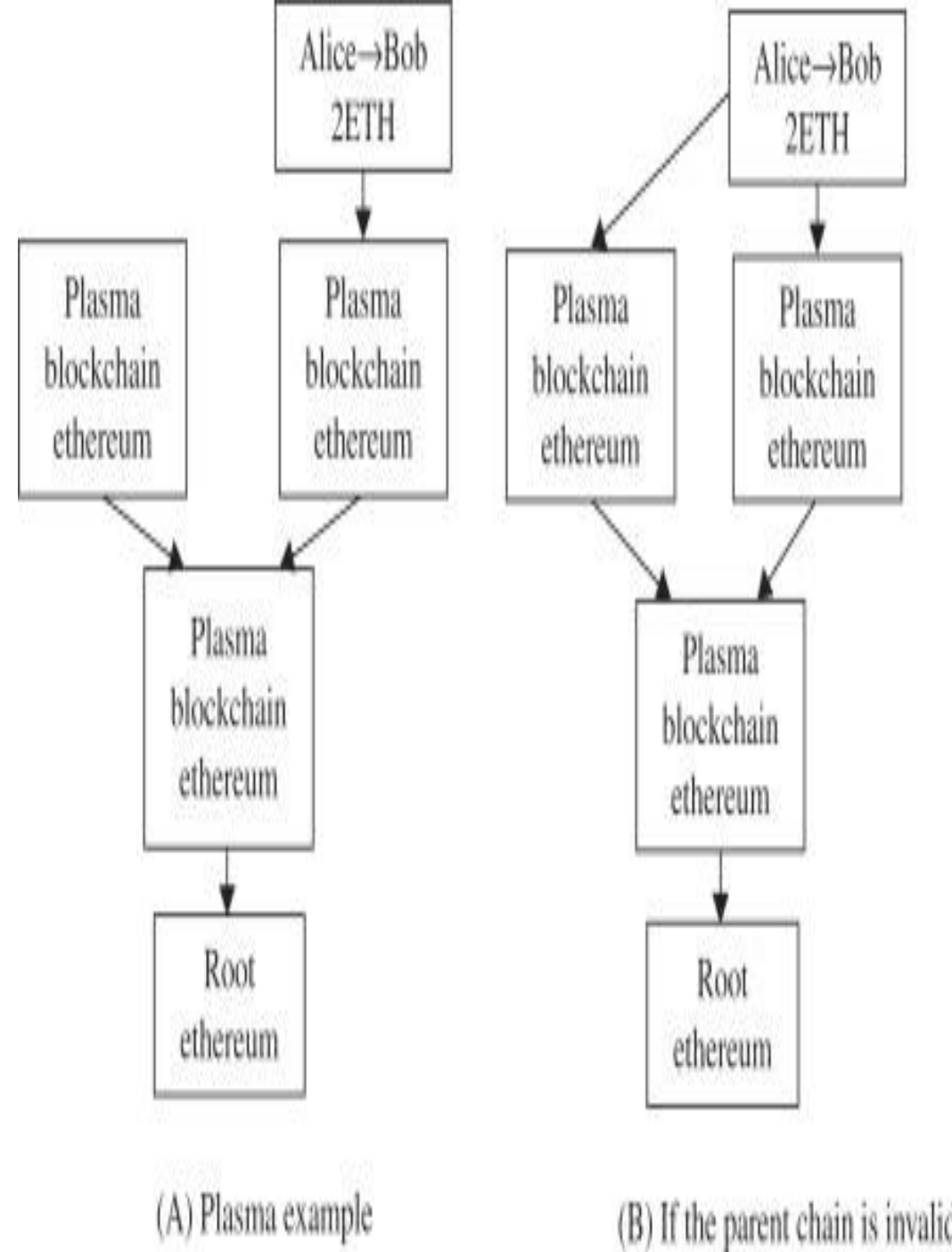
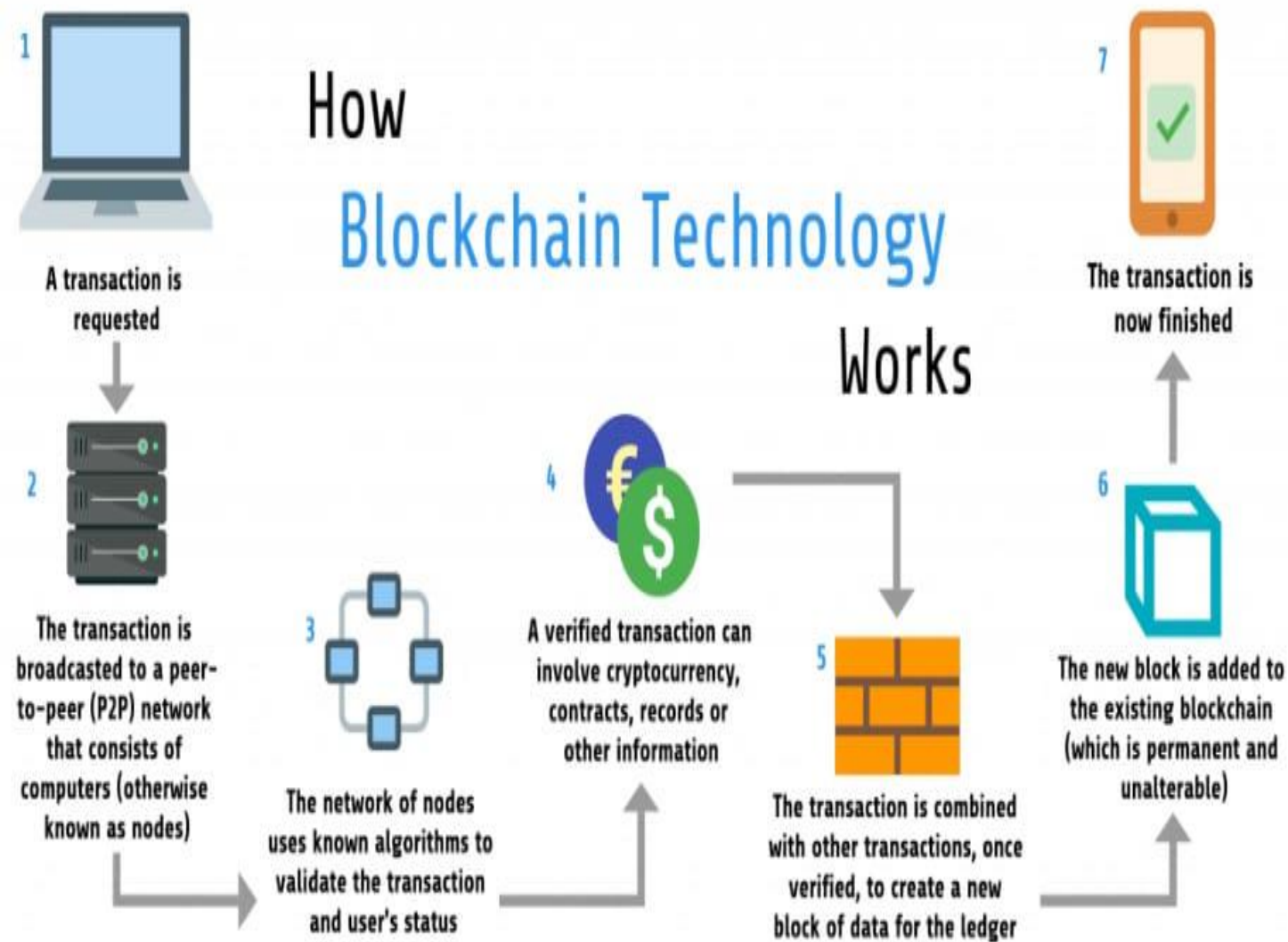
Once confirmed to be legitimate transactions, they are clustered together into blocks.

Different Challenges of Blockchain Technology



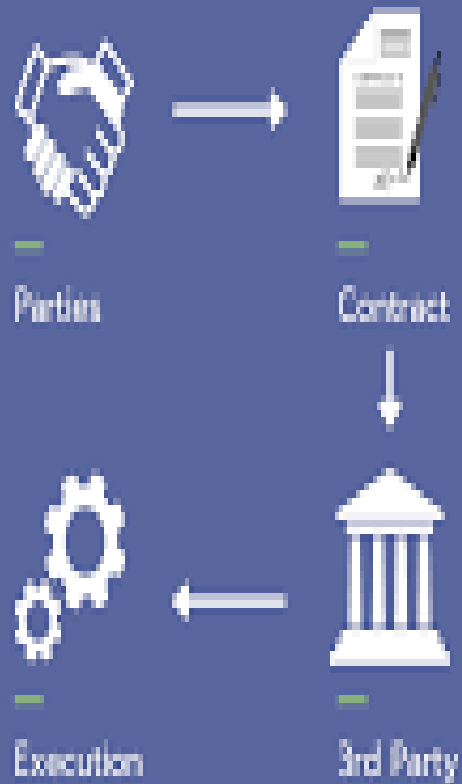
CHALLENGES AND SCALABILITY

How Blockchain Technology Works

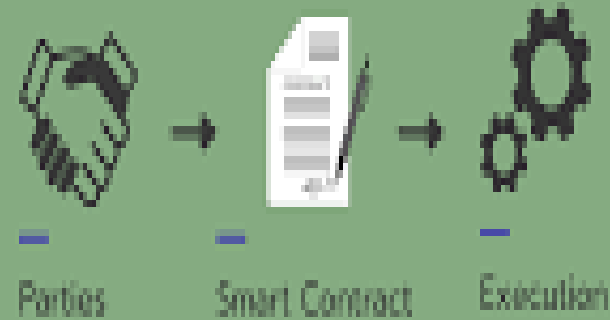


USE CASES IN ETHEREUM:

Traditional Contracts



Smart Contracts



ETHEREUM USE CASES

- Payment Gateways
- ICO Platforms
- Tokenizing Assets
- Health Applications
- Digital Identity Management





1 Introduction

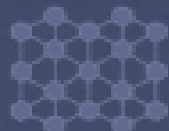
Over the last few years, developers have begun using Bitcoin's underlying technology - the Blockchain - for creative new applications. Ethereum is a next-generation platform that allows anyone - both developers and consumers - to easily take advantage of decentralized networks and realize the benefits of blockchain technology.

2 What are Decentralized Networks?

Decentralized networks redistribute functions and powers away from a central server, enabling peer-to-peer communication.

Advantages:

- ✓ No central point of failure
- ✓ Highly reliable
- ✓ Cost-effective



BitTorrent, used for file sharing, is an example of a decentralized network.



6 Mist

Mist will be Ethereum's end user interface to bring blockchain technologies to non-technical users.

It will include a catalog for decentralized applications and an assortment of other tools.



Mist will work similar to app stores and browsers that consumers are already familiar with.

3 The Blockchain

Most networks function using a central authority to make final decisions. The blockchain, a type of decentralized network, is able to make agreements across the whole network, without any central authority.



Bitcoin uses Blockchain technology to record and verify transactions without the need for a central bank.



5 Ether

Ether is the native token of Ethereum, and serves two key purposes. First, by requiring applications to pay ether for every operation they perform, broken or malicious programs are kept from running out of control. Second, ether is given as a reward to those who contribute their resources to the decentralized network.

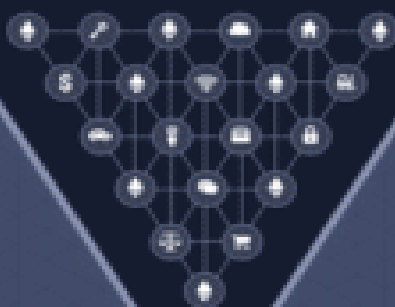


Ether: The "fuel" that runs the Ethereum network

ENTER ETHEREUM

Ethereum's vision is to decentralize the internet by creating a platform where applications can be built and run on a decentralized network. Ethereum is fast and flexible without the inherent limitations of the Bitcoin protocol.

What Bitcoin does for payments, Ethereum does for anything that can be programmed



7 What will Ethereum be used for?

Decentralizing Existing Services



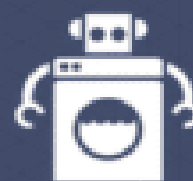
Services that are traditionally centralized can be decentralized using Ethereum. This will lead to reduced costs and fees by connecting individuals directly and removing 3rd parties.

Imagine a service like Uber or eBay without a company in the middle collecting fees!

Bringing Science Fiction to Life

Using Ethereum, IBM and Samsung worked on a proof of concept where a washing machine could:

- ✓ order its own detergent when it runs out
- ✓ call its own repairman when it breaks down
- ✓ do the laundry when electricity is cheapest?



Unimagined Possibilities



The creators of the internet didn't anticipate social media or cloud computing. We have no way of predicting which breakthrough technologies will be born on the Ethereum blockchain!

8 What is being built on Ethereum?

- WeirFund: Decentralized crowdfunding platform.
- airlock: Access protocol for smart property and the Internet of Things.
- PROVENANCE: Project to increase the transparency and accountability of supply chains.
- augur: Decentralized prediction market platform.

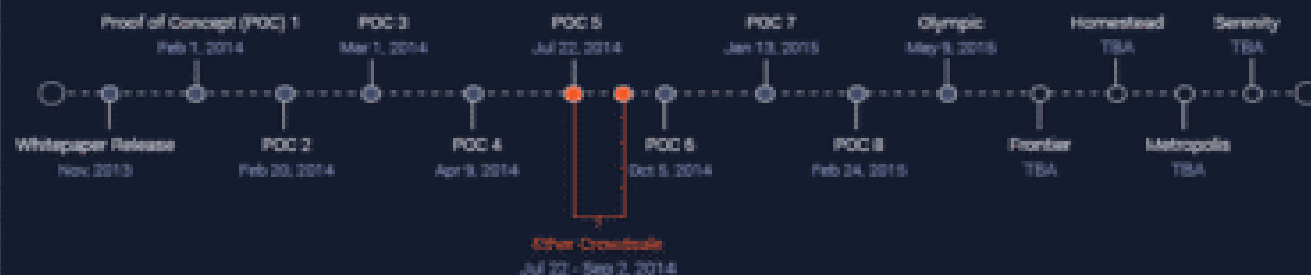
9 Funding the Vision

On July 22, 2014, the non-profit Ethereum foundation launched a public crowdsale of Ether. The funds collected have helped carry out the development of the project. The sale lasted for 42 days and raised 31,691 BTC, or \$18,439,096, making it (at the time) the largest completed crowdsale of all time.

Crowdsale Numbers

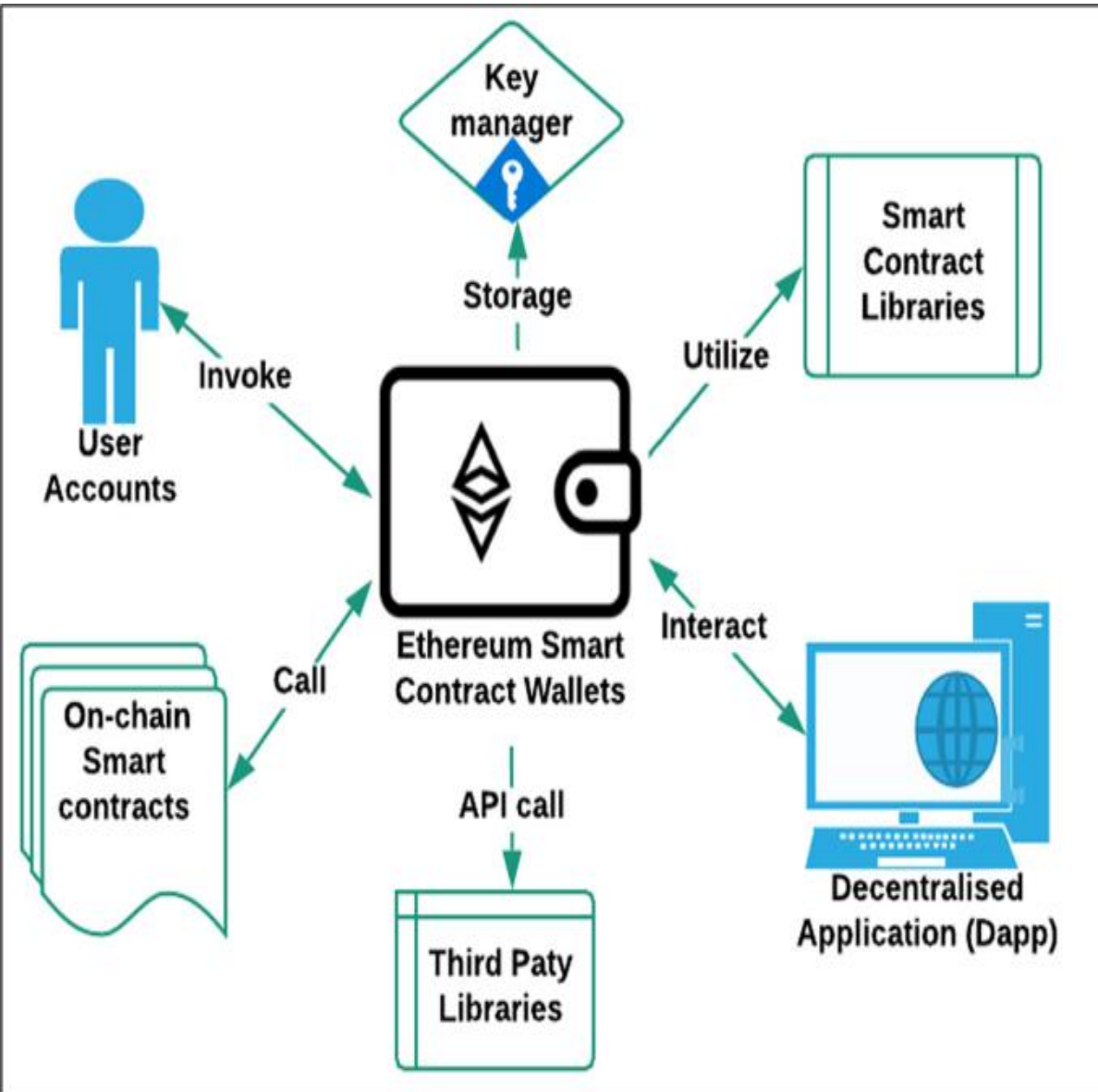
42 Days | 31 Thousand BTC Collected | \$18 Million Equivalent
3rd Largest Crowdfunded Project in History (current) | 9 Thousand Participants

Ethereum Software Release Dates

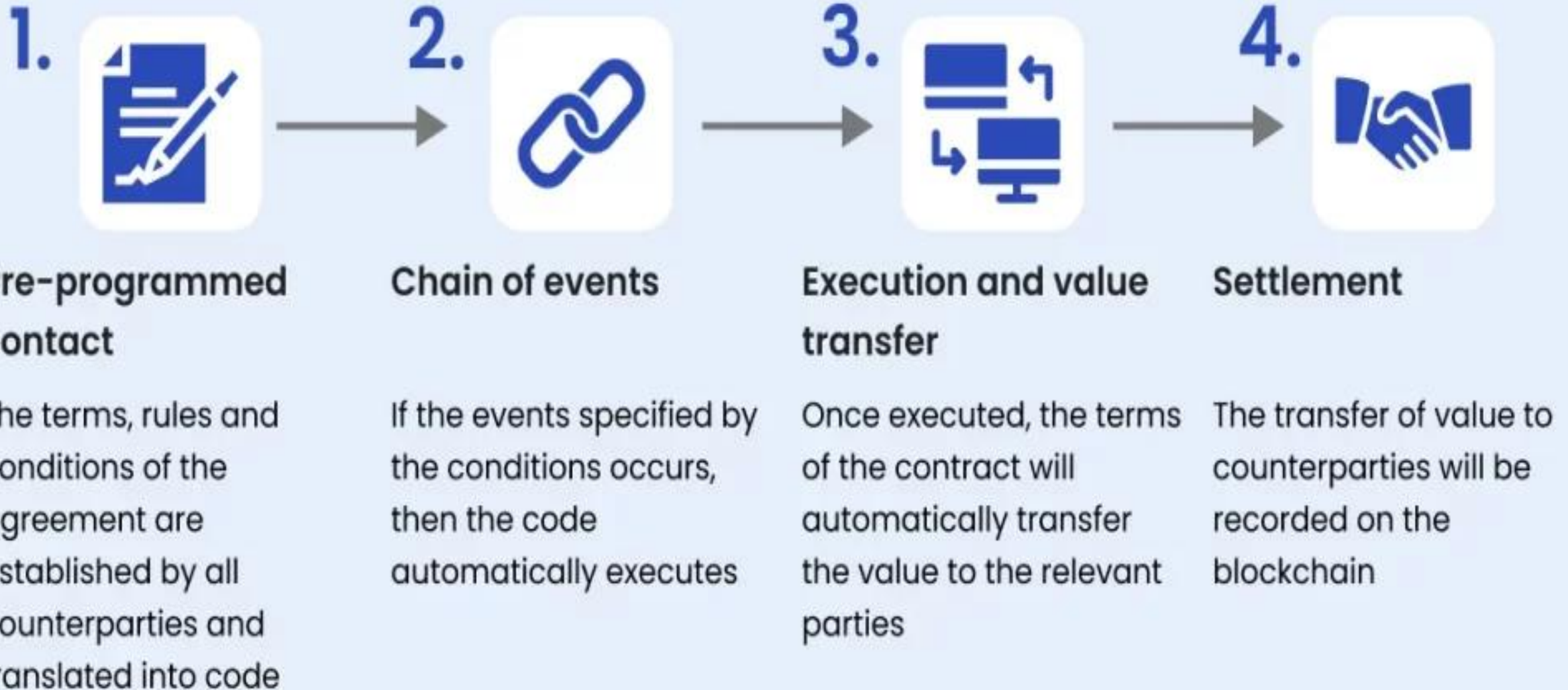


SECURITY AND AUDITING

What is a Smart Contract Audit?



How do Smart Contracts Work?



Potential Use Cases of Ethereum

Decentralized
Finance (DeFi)

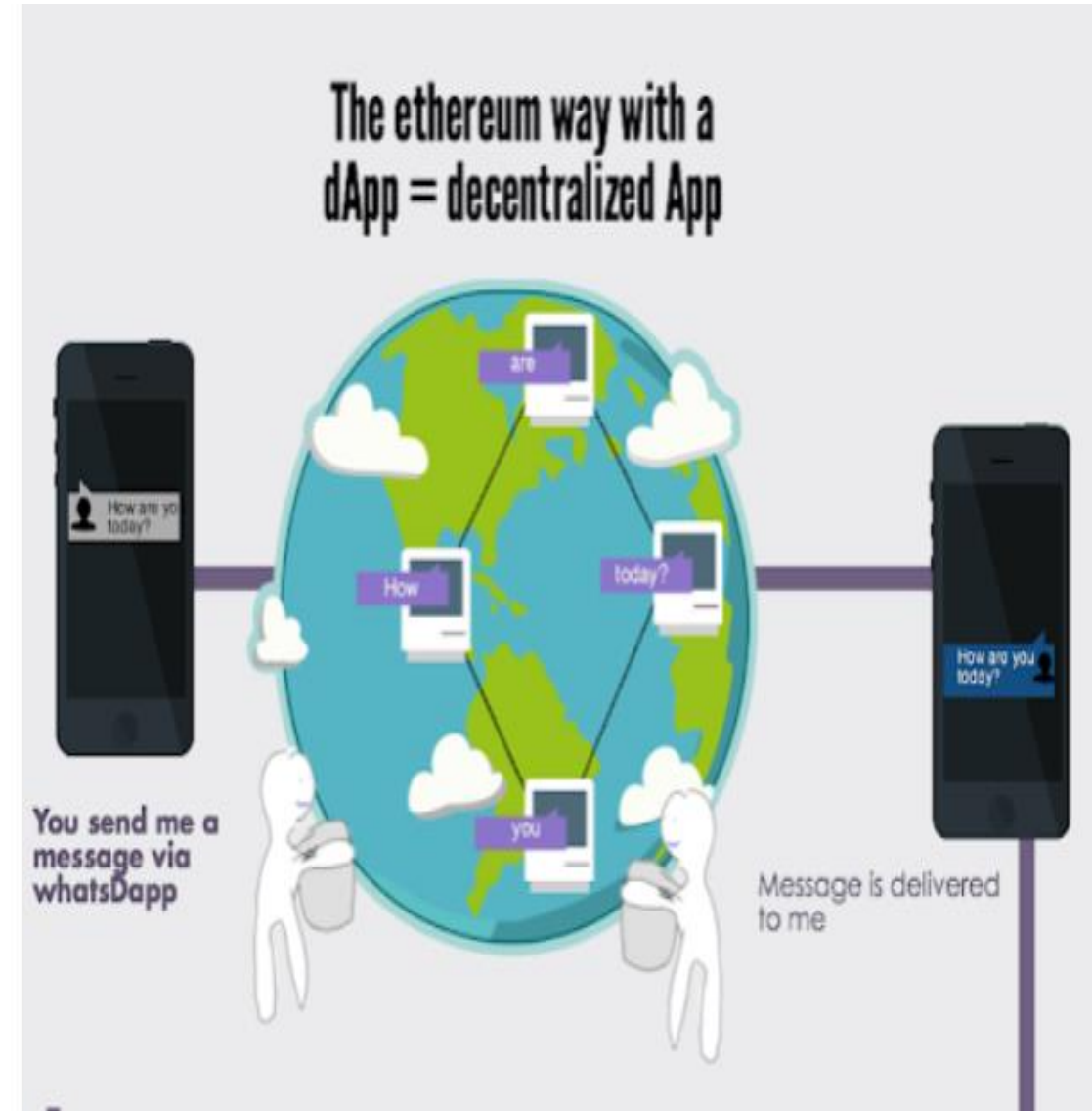
Gaming



Ethereum Smart Contract

FUTURE OF ETHEREUM

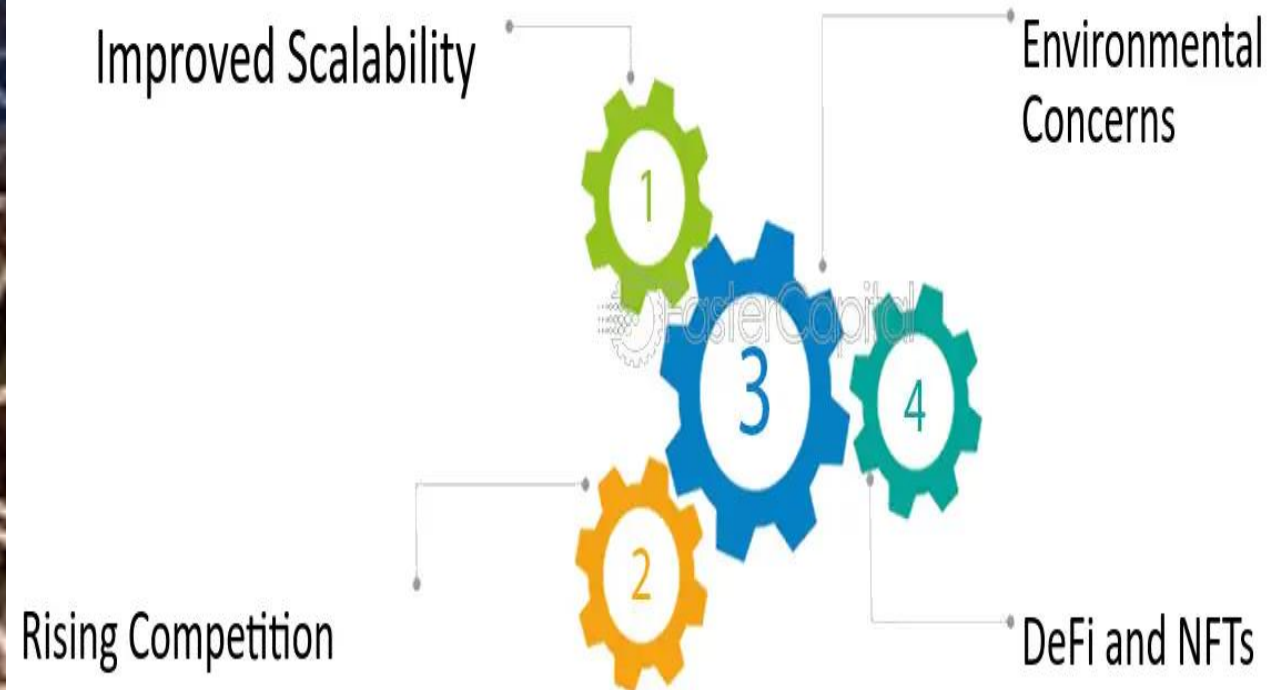
IN THE
FUTURE,
WHAT WILL
ETHEREUM
BE USED
FOR?



CONCLUSION:

In conclusion, Ethereum has redefined the landscape of blockchain technology with its innovative approach to smart contracts and decentralized applications. Its impact will continue to shape the future of various industries...

Conclusion and Future Outlook for Ethereum



THANK YOU ALL!!!!!!!

FOR YOUR PATIENCE TO REACH THIS SLIDE



DESIGNED BY:
KONDURU GREESHMA
B.TECH AI &DS