

Blockchain Trilemma: Choosing your Platform

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Business in the Metaverse

Choosing Your Blockchain

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When it comes to blockchain technology, businesses have a lot of choices to make. Not only do they need to decide which blockchain to use for their project, but they also have to weigh the options between speed and efficiency, centralization, and cost.

With over 1,000 blockchains to choose from, it's tough to decide which one is right for you.

The background features a dark blue field with a grid of binary code (0s and 1s) and faint, glowing wireframe cubes. Some cubes are connected by small link icons, representing a blockchain structure. A large, central cube is highlighted with a purple-to-yellow gradient glow. The text 'The Blockchain Scalability Trilemma' is centered in a large, bold, white font.

The Blockchain Scalability Trilemma



Scalability

Decentralization

Security

Blockchain Scalability Trilemma



The blockchain scalability trilemma is one of the greatest hurdles for cryptocurrencies. It states that you can only achieve two out of three features: **decentralization**, **scalability**, or **security** simultaneously - but never all three.

The term was originally coined by Vitalik Buterin, the founder of Ethereum (ETH).



Blockchain Scalability Trilemma

When deciding which blockchain platform to use, projects should consider some of the following criteria:

- Scalability and throughput of the platform
- Security and Privacy
- Blockchain functionality
- Private vs. Public Blockchains
- Adoption rate: evaluate the strength of the community
- Required development, experience, and costs
- Decentralization level: Concentration of power within the node network
- Power players in a Decentralized system

Blockchain Scalability

Trilemma



These next three factors aren't as important as the previous ones, but they can help you make a decision if you're having trouble choosing the right blockchain for you and your company:

- Availability of supporting developer tools to increase the developer experience
- Structure of information: quality of documentation, structure, and availability of external tutorials or guides
- Availability of bug bounties or incentivization programs



Scalability and throughput of the blockchain platform

- Layer 1 blockchain platforms, such as Bitcoin and Ethereum, are less scalable and have lower throughput than Layer 2 blockchain platforms
- Layer 2 blockchain platforms, such as the Polygon blockchain, are more scalable and have higher throughput than Layer 1 blockchain platforms
- There are also newer Layer 1 solutions that are trying to fix this problem, Solana is an example of a Layer 1 blockchain platform with high throughput and high-cost efficiency



Scalability and throughput of the blockchain platform

Key Takeaways:

- If blockchain technology is used for things such as gaming or metaverse, then the blockchain platform should be able to handle a large number of transactions without any downtime
- Financial transactions might not require high TPS but rather require higher security, thus far choosing a slower but safer blockchain might be an option for you
- The average size of transactions is also important, if your project requires high volume transactions and high security, then TPS and cost-effectiveness are not the main focus, but if you are in for a microtransactions requirement, choosing a fast and cost-effective chain is a must

Security & Privacy



Blockchains are created to be a very secure way of storing and sharing data, but that doesn't mean you shouldn't worry about how the platform keeps the data.

Different consensus algorithms provide different levels of security and privacy, here are some of the most popular consensuses:

- Proof-of-Work (PoW) - most famous is Bitcoin and Ethereum (pre-merge)
- Proof-of-Stake (PoS) - currently most famous is Ethereum (post-merge)
- Proof-of-History (PoH) - Solana's own take on PoS algorithm
- Proof-of-Importance (PoI)
- and others

Security & Privacy



If sustainability and carbon footprint are requirements for you, newer algorithms tend to be greener than for example original Bitcoin's PoW, which requires a massive amount of energy for confirming a single block!

Note: Some blockchain platforms offer better privacy than others, and this may be an important factor for companies that don't want to share their data with anyone.

Blockchain Functionality



Although all blockchains utilize the same technology, their features can vary greatly.

The rule of thumb is to go for a blockchain that matches your industry and your project goals.



Blockchain Functionality



Some examples of blockchains and their main focus:

- Ethereum: Mainly built for dApps or decentralized apps, as the first chain of this type, we can say that Ethereum is general in nature, but it definitely sees a lot of DeFi and Fintech usage, although NFTs are also one of the main use cases to date.
- Solana: Built for gaming, Solana's main focuses are currently Metaverse, NFTs, Gaming and other microtransaction required use cases.
- Ripple: Originally built as blockchain's take on SWIFT, Ripple is one of the best solutions for fast and cheap money transfers to date.

Private vs. Public Blockchains



Generally, blockchain comes in two forms: private (or enterprise) blockchain and public blockchain. Our main focus is public blockchains, but we will cover a few differences between these two types.

Private blockchains are more manageable for big companies because they can pick and choose who joins the network, what data is accessible to them, and which transactions they're able to carry out.

Public blockchains focus on participation and transparency. Unlike private networks, anyone can join a public blockchain and have the same rights as other users.

Private vs. Public Blockchains



Key Differences:

- Owners of private blockchains can edit, censor or delete blockchain entries
- Private blockchains are usually faster but they have less nodes and thus far they can be less safe
- Public blockchains are generally slower but they promote transparency, censor proofing and inclusion
- Public chains are generally more known to general public due to their nature of being widely used and transparent
- Private blockchains require invitation or approval for joining, while Public ones, as their name suggests, are open for everyone



Adoption rate: evaluate the strength of the community.

The success or failure of the blockchain industry will be determined by how well it is adopted by businesses and consumers.

Some of the most adopted blockchains to date include Bitcoin, Ethereum, and Litecoin, followed by Solana, Cardano, Polygon, Ripple, and others.

The blockchain community is made up of developers, entrepreneurs, investors, and others who are passionate about blockchain technology and its potential to change the world.



Required developer's experience and costs

There are a number of blockchain programming languages that developers can use to create applications on blockchain platforms.

Some of the widely used programming languages are:

- Solidity
- Java
- Python
- C++
- Ruby



Required developer's experience and costs

Language	Blockchain	Average Developer Costs	Developer Scarcity Level
Solidity	Ethereum, EMV-based-chains (like Polygon)	100k USD yearly	medium scarcity
Java	Ethereum, Hyperledger Fabric, IOTA, NEO, etc.	70k USD yearly	plenty
C++	Stellar, Ripple, Bitcoin, Solana (cross-compiled)	106k USD yearly	medium scarcity
Python	Ethereum, Hyperledger Fabric, NEO	105k USD yearly	plenty but competitive market
Ruby	Ethereum, Polkadot, etc.	126k USD yearly	medium scarcity
Rust	Solana	175k USD yearly	high scarcity



Decentralization level: Concentration of power within the node network

Although, decentralization through nodes is a key feature of blockchain technology, moving away from PoW consensus and implementing PoS technology opened the way for the concentration of power.

Many of the companies behind staking pools are registered somewhere and adhere to a particular country or jurisdiction, forcing them to act in their government's name is not impossible scenario.



Power Players in a Decentralized system

Since the Ethereum blockchain merge and PoS consensus implementation, there have been allegations of possible centralization. Some say that because large staking pools are necessary for transaction verification, this puts too much power into the hands of a few.

Others allege that because exchanges and DAOs are often behind these staking pools, they have too much control over the blockchain. What is clear is that blockchain technology is still evolving and there are many unanswered questions about its future.



Power Players in a Decentralized system

Key Takeaways:

- PoS consensus is faster and cheaper but it sacrifices security and decentralization
- Individual companies or organizations that provide staking pool infrastructure in networks such as Ethereum are registered in some jurisdictions and thus far they must comply to the governments
- Many of the power players in the Ethereum network are based in the USA at this very moment, and most of them announced they will comply with the regulatory bodies of their jurisdiction (USA)
- Beaware of particular blockchain power players and research how it affects you and your business in a long run

Defining project goals & needs

Before making your final decision you should define your project, try to find all possible use cases of the blockchain in your solution and then try to match your needs with a blockchain that perfectly suits your goals and serves all of your needs.

A good starting point is as already mentioned, trying to find a blockchain that is mainly focused on your industry or niche.



Best Chains



ethereum



Predating many of its competitors, Ethereum has cemented itself as a premier choice for software developers looking to create blockchain applications.

While Ethereum coins can technically be used as an alternative currency, they are more often utilized as a platform to create smart contracts and build decentralized applications.

Use Cases: General Use, DeFi, NFTs, dApps



Polygon is a set of protocols designed to address Ethereum's scalability issues. This alleviates congestion and improves transaction speed, while maintaining low cost fees.

Polygon makes it easy for blockchain projects to build on Ethereum without worrying about scalability issues. Polygon allows users to quickly and easily interact with any decentralized application without stress or anxiety about network traffic.

Use Cases: General Use, DeFi, dApps



Hundreds of financial institutions rely on Ripple's blockchain platform for its transparency, fast response time, and low transaction costs. Its main purpose is to enable global, cross-border payments with minimal charges.

Ripple is working on adding smart contract features to their platform, but this is still not supported and up to date.

Use Cases: DeFi, Money transfer



Solana is a purpose-built blockchain platform designed to host decentralized applications, similar to other popular dApp blockchains such as Ethereum and Cardano. It is mainly focused on NFTs, Gaming and Metaverse, but that is not its full functionality.

Not only is Solana one of the fastest blockchain platforms in the industry, with an average of 3000 TPS, but the Solana team claims it can reach even 65000 TPS, which would bring Solana to the speed of Visa cards.

Use Cases: Metaverse, Gaming, NFTs, Microtransactions



The Linux-based Hyperledger Fabric blockchain development framework is perfect for enterprises that want to develop permissioned solutions and applications. Its modular architecture lets various complex systems work together as plug-and-play components, making it possible to create very large and sophisticated blockchain solutions.

Use Cases: Scalable Enterprise solutions (private blockchain)

Conclusion



- Blockchain Trilemma teaches us about our own needs and how to balance between scalability, decentralization and security (plus costs and effectiveness)
- There are numerous blockchain platforms available, but it's generally good to choose one that is built for the task
- General blockchains are good, but they lack some features or we sacrifice some part of the equation
- A good way to find your blockchain is by checking top rated blockchains on Crypto.com, Binance, CoinMarketCap or similar (there are categories as well)
- Taking time while choosing your perfect match is recommended as changing platform mid-project can be stressful, expensive and sometimes not even possible



THANK YOU
QUESTIONS?



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