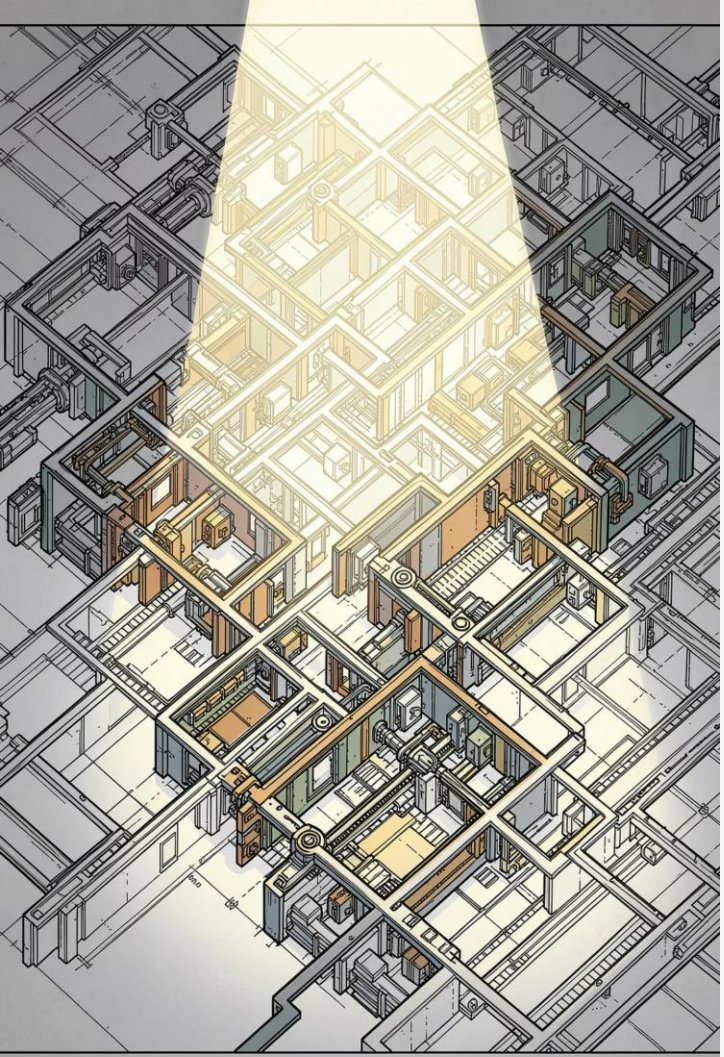


BLOCKCHAIN FOUNDATIONS

The Architecture of Trust: Decoding Blockchain Types

Blockchain technology has evolved far beyond its cryptocurrency origins, branching into distinct architectural models that serve radically different purposes. Understanding these variations is essential for organisations evaluating where distributed ledgers can deliver genuine value.

Each blockchain type represents a deliberate trade-off between decentralisation, scalability, privacy, and control. From fully public networks open to anyone, to tightly governed private systems built for enterprise efficiency, the spectrum is broad and consequential. This presentation decodes four core blockchain architectures and the strategic considerations that should guide their adoption.

OVERVIEW

The Spectrum of Control

Blockchain networks are not monolithic. They span a continuum from fully open, permissionless systems to tightly controlled, permissioned environments — each engineered to balance transparency, efficiency, and governance differently.

1

Public Blockchains

Fully decentralised, permissionless, and open to all participants. No single entity controls the network, and anyone can join, transact, or validate.

2

Private Blockchains

Controlled, permissioned, and restricted to a single organisation. Access is tightly managed, prioritising efficiency and data privacy over openness.

3

Consortium Blockchains

Collaborative networks governed by a pre-selected group of organisations. Shared authority enables trust across institutional boundaries.

4

Hybrid Blockchains

Blended systems that combine private security controls with public chain accessibility, offering the best of both architectural worlds.

PUBLIC NETWORKS

Public Blockchains: The Open Frontier

Public blockchains represent the original vision of decentralised trust — networks where anyone can participate without seeking permission from a central authority. These systems rely on cryptoeconomic incentives to align the behaviour of unrelated participants around a shared, tamper-resistant ledger.

Security Model

Public networks employ **Proof of Work** or **Proof of Stake** consensus mechanisms, requiring participants to commit computational or financial resources. This makes attacks economically irrational and ensures network integrity at a global scale.

Iconic Example

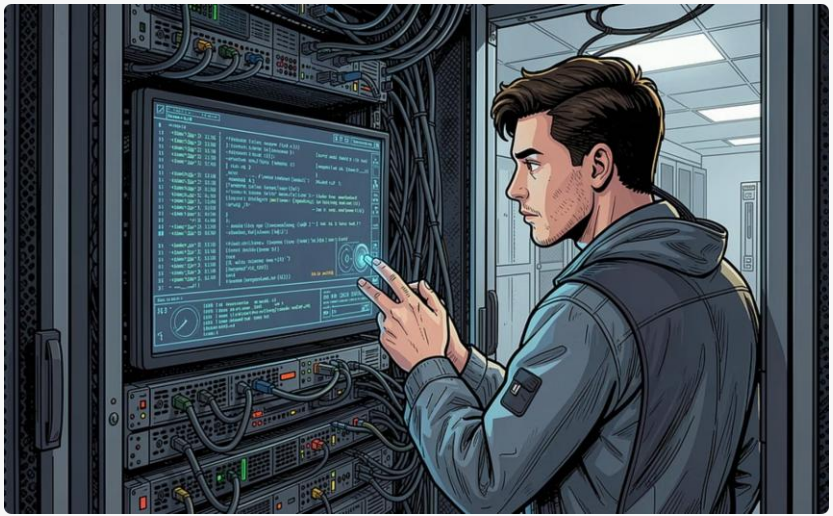
The **Bitcoin** network remains the paradigmatic public blockchain, enabling peer-to-peer value transfer across borders without intermediaries. Its decade-long resilience has demonstrated the viability of decentralised trust.

Anyone can read the ledger, broadcast transactions, or operate a node — true permissionless participation.

ENTERPRISE NETWORKS

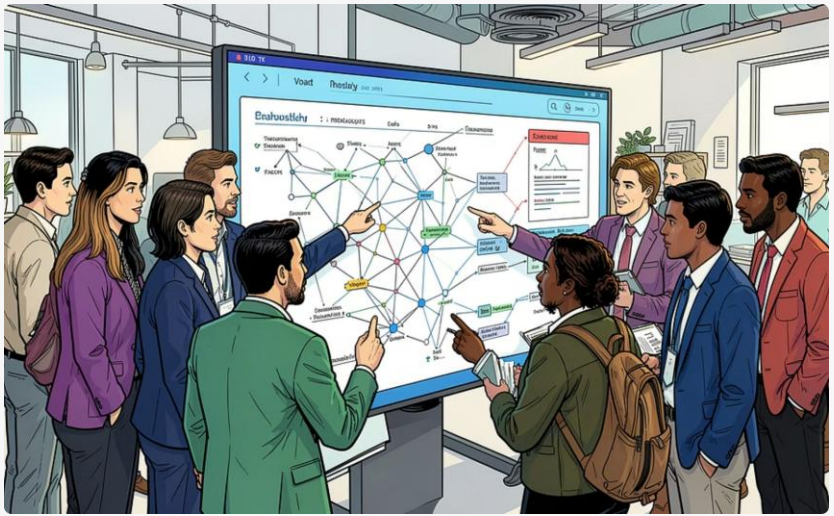
Enterprise Foundations: Private & Consortium

When blockchain moves inside organisations, the priorities shift. Decentralisation gives way to efficiency, accountability, and governance. Two models dominate the enterprise landscape, each addressing different collaboration needs.



Private Blockchains

Single-organisation control optimised for internal efficiency and data privacy. Ideal for streamlining internal processes, auditing, and record-keeping where external participation is unnecessary.



Consortium Blockchains

Multi-organisation collaboration with shared governance and pre-defined roles. Each member operates a node, creating a trust framework for alliances in banking, logistics, and healthcare.

Consortium models reduce operational friction in complex supply chains and interbank settlement networks by providing a shared, immutable source of truth.

HYBRID SYSTEMS

The Hybrid Advantage

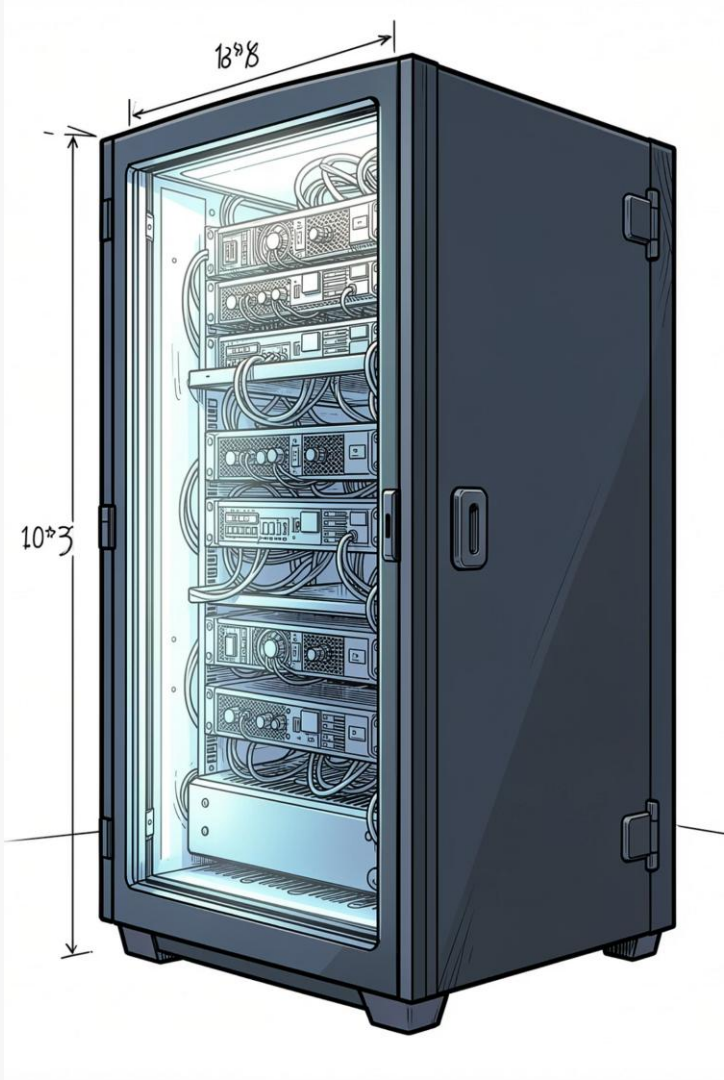
Hybrid blockchains offer a pragmatic middle path — combining the security and transparency of public chains with the privacy and control of permissioned networks. This architectural flexibility makes them increasingly attractive to organisations navigating complex regulatory and operational landscapes.

Flexibility

Orchestrate private data flows internally while anchoring critical security proofs on a public chain. This dual-layer approach lets organisations keep sensitive data confidential whilst leveraging the immutability of a public network for verification.

Adaptability

Tailor transparency levels to meet regulatory compliance requirements and specific business needs. Different stakeholders can be granted varying degrees of access, ensuring that auditors, partners, and the public each see precisely what is appropriate.



STRATEGIC OUTLOOK

Choosing Your Path: The Path Forward

Selecting a blockchain architecture is fundamentally a question of priorities. No single model is universally superior — each represents a considered trade-off that must align with specific organisational objectives and constraints.

Decentralisation

Open, trustless networks

Scalability

High throughput, enterprise speed

Control

Governance, privacy, compliance

The future of trust lies not in hype but in thoughtful infrastructure. Organisations that carefully match blockchain architecture to their operational reality will be best positioned to power the next generation of global digital economies — where transparency, efficiency, and governance converge.