
# THE NEW WAY FOR SECURE **INTERNET OF THINGS**

# AT THE CUTTING EDGE OF
# **INTERNET OF THINGS & BLOCKCHAIN**

## WHAT IS NXXTECH?

Nxxtech is a full-stack blockchain architecture, aimed at enterprises, ready to extract business value from decentralized technologies. It was designed as a means to empower companies across industries and sectors with a modular, flexible and powerful toolkit so they will be able to exchange data, trade, pay and deliver value among stakeholders, peer to peer.

### UNBEATABLE SECURITY FOR ALL THINGS CONNECTED.

30 years into mass adoption of Internet, virtually every device we own has an access to Internet. Gadgets, wearables and systems are becoming smarter, more connected and autonomous. But, the bigger the system of connected things gets, the more traffic it generates, bringing bottleneck in its security, efficiency and overall performance. However, security has not been a high priority for these devices – until now.

### SAFER DATA VENUES, MULTIPLIED OPPORTUNITIES.

We communicate more, more often and more complex. In today`s ecosystem, organizations are continuously challenged to maintain relationships with their stakeholders across multiple devices and platforms. Such data venues and value transfer exchanges represent demanding financial and structural challenges, and generate a redundancy of data shared internally and to third parties alike.

### DECENTRALIZED ACCESS CONTROL, ELIMINATED ONE POINT OF FAILURE.

Today, connected things interact on the application layer of the Internet, where passwords, two factor authentications and other implementations are used to achieve trust and security. Corporations and users exchange information via open ports, relying heavily on the server infrastructure and outdated security systems, leading to a worrying combination of commercial dependency on enormous volumes of data being centralized.

**ONE-FITS-ALL SOLUTION ON BLOCKCHAIN, HEADING TOWARDS IOT MASS ADOPTION.**

In a current system, internet of things devices` are deployed in different ways and no single networking technology fits them all. There is an obvious reason: the providers whish as many users possible in their system and therefore lack the motivation for a unified standard. However, heading towards internet of things mass adoption, a need for alternative approach is paving the way.

**SIMPLE AND SECURE EDGE-TO-EDGE INTERACTIONS, NO MATTER THE DEVICE AND ITS MANUFACTURER.**

Is there a one-fits-all solution to enable the devices from different manufacturers will be able to securely communicate on different levels and among themselves? Nxxtech believes there is. Using blockchain technology, we moved the communication from application to protocol layer, where each device needs to present itself in order to communicate and execute orders within the network. If one wants to control the device, they can only control it over the security layer of blockchain on a smart contract.

**STANDARDIZED PROCESSES, ENDLESS NETWORKS OF IDENTIFIED THINGS.**

Nxxtech is speeding up the transformation of internet of things network into a network of interconnected devices which can interact without human intervention. By creating a two-way communications layer, things can now exchange messages on the blockchain, directly machine-to-machine. As a technological equivalent for your transactional processes, Nxxtech helps organizations to standardize their processes and simplify the way they communicate.

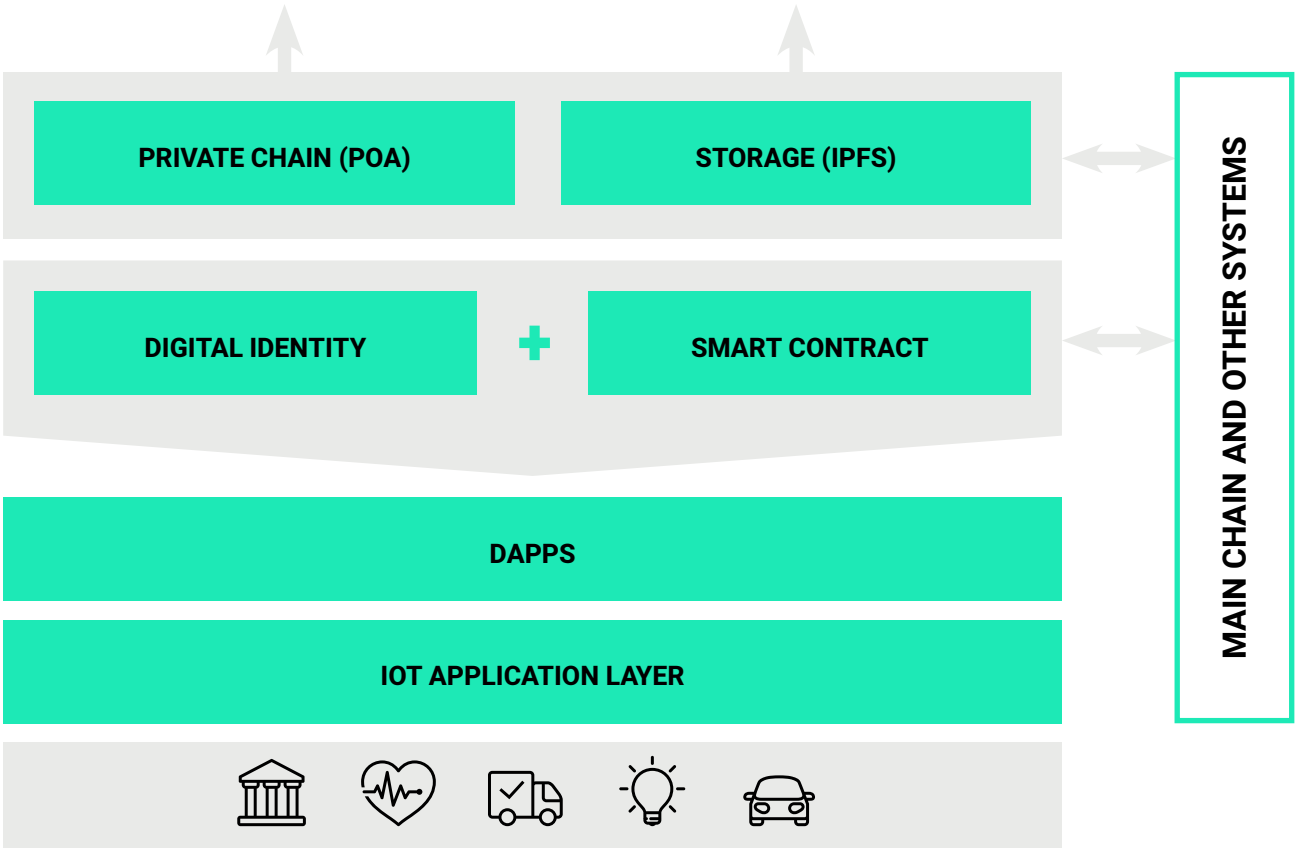
## HOW CAN YOUR COMPANY BENEFIT FROM NXXTECH?

- Create a technical equivalent for all of your transactional processes
- Improve security of business transactions
- Provide a ledger that is immutable to changes
- Standardize and manage aggregated data
- Maintain relationships with all of your stakeholders
- Enable cross-platform operability
- Create value networks across verticals and industry sectors

# HOW IS NXXTECH ARCHITECTURE BUILT?

Nxxtech network is a hard fork of Ethereum. It operates as an invitation-only ledger, meaning it doesn't need a token to run. Using Nxxtech means that all communication and transactions occur off main chain, making them faster, safer and far more appealing to businesses.

Nxxtech data storage functions as a standalone solution or it can be integrated with your private chain. It is IPFS based, meaning we only store the hash which we then use to retrieve data. We`ve also expanded it with additional functionalities, such as data encryption and access management to provide data resilience, eliminate redundancy and one point of failure.



# MODULES

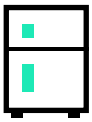
To ensure you immediately benefit from Nxxtech, we have taken into an account all aspects and prepared various modules that facilitate its easy integration and allow you to choose the stack that best reflects your needs.

**IOT**

IoT is a network of interrelated devices accessed through the internet, allowing their data collection, remote monitoring and control. By using Nxxtech to authenticate, authorize and gather data generated by devices, this technology enables the transformation of IoT into a network of interconnected devices which can interact without human intervention. By creating a two-way communications layer, devices can exchange messages directly on blockchain, meaning all communication happens in real time, directly machine-to-machine, with no intermediary. The risk of internet devices, applications and platforms being compromised is significantly reduced.

**DIGITAL IDENTITY**

Blockchain solves the issue of digital identity management by giving users more control over their personal information and businesses less worry about managing it. At its core, the solution allows people to have control over their personal data management when identifying anywhere online. Nxxtech combines decentralized blockchain principle and distributed storage with identity verification (KYC), allowing users to assign permissions for who and when can access their digital identity data.

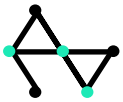


## DATA STORAGE

Across business lines, all connected devices require management, storage and retrieval of enormous amount of data. Today, corporations rely on the dedicated server infrastructure and cloud solutions, which leads to a worrying combination of commercial dependency on enormous volumes of data being centralized. Decentralized storage works by distributing and encrypting data across a network of nodes, making it safer, immutable and protected, promising a fundamental change in how businesses can protect their most valuable data and optimize their running costs.information via open ports, relying heavily on the server infrastructure and outdated security systems, leading to a worrying combination of commercial dependency on enormous volumes of data being centralized.

## SMART CONTRACTS

Smart contract is a term describing software on blockchain that stores contract terms in digital format between two or more parties. By containing a set of predefined rules, smart contract is a self-executing immutable code that can automatically enforce when certain conditions are met. It has the ability to “cut off” the middlemen and replace standardized processes that burden the administration costs of organizations. We provide the framework for developing custom smart contracts, their integration with existing software and an audit service for your proprietary codes.



## DECENTRALIZED APPLICATIONS (DAPPS)

dApps are a form of application framework, helping end-users to easily interact with smart contracts. They operate autonomously, with data cryptographically stored in blockchain and can remodel the backend structure of various digital products, services and platforms. The majority of dApps run on Ethereum, meaning they`re directly competing with other dApps and financial transactions for resources. In contrast, running dApps on Nxxtech brings many advantages to business logic, as the code and data on permissioned ledger are completely independent and the parameters customizable, opening enterprises new opportunities for highly-scalable non-fee market operations.

## TOKENOMICS & PAYMENT GATEWAY

Tokenomics is a new skill, required to create the token ecosystem in which the token usage, together with your token supply and demand are defined. We help you design, generate and manage a custom-build token that will drive your business endeavors and allow to easy share and exchange value. Residing on top of Nxxtech blockchain architecture, your custom enterprise token can represent basically any assets that are fungible and tradeable. Optional integration of existing payment gateways is also possible.

# IS BLOCKCHAIN “THE” SOLUTION **FOR YOUR BUSINESS?**

**BLOCKCHAIN IS A DIGITAL LEDGER WHERE TRANSACTIONS ARE PUBLICLY AND CHRONOLOGICALLY RECORDED THROUGH A SYSTEM OF CONSENSUS BUILDING AND SECURED BY STRONG CRYPTOGRAPHY.**

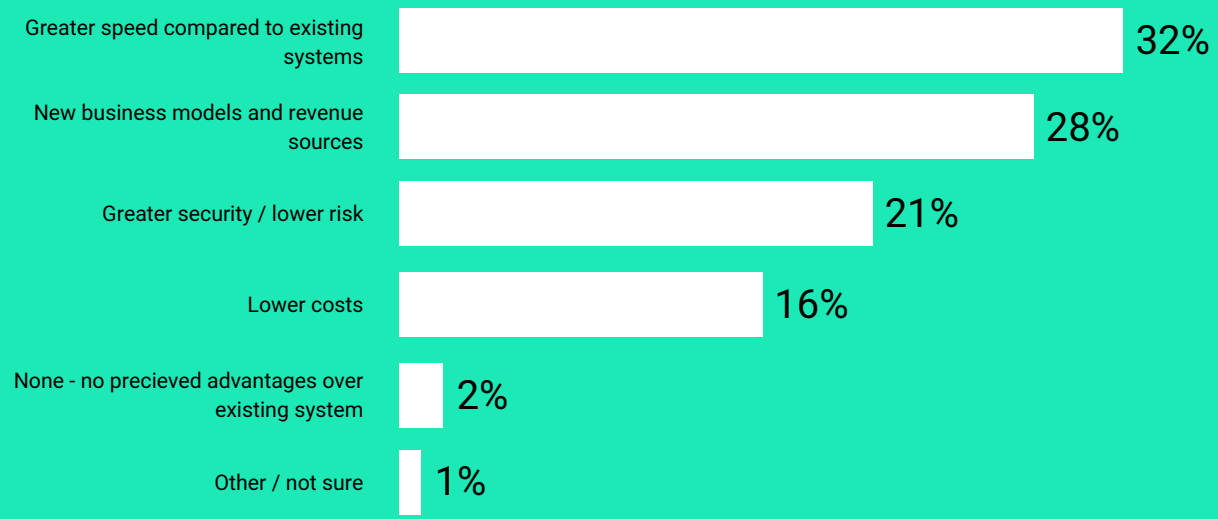
The buzzword of the year, blockchain is becoming an exciting technology for businesses to explore. But, its implementation requires solid knowledge, technical background and a serious consideration which may pose as a challenging task between all the hype. Choosing a framework to start of a blockchain project can be tricky and there are a number of aspects that need to be taken into consideration. To help you with the decision, answer the questions below.

Does your business require standardization?

Do you all agree upon the relevant rules and roles of business processes?

What aspects of data communication does your protocol cover?

# INDUSTRY EXPERTS ACROSS THE GLOBE INCREASINGLY RECOGNIZE IMPORTANT ADVANTAGES OF BLOCKCHAIN OVER EXISTING SYSTEMS.

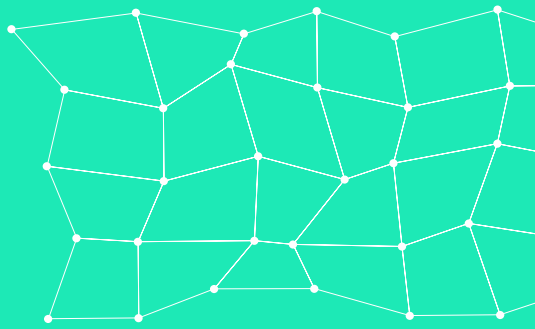



Most significant advanages of blockchain over exsisting sxstems

Research by Delloite

# WHY SHOULD YOU CONSIDER TAKING THE DECENTRALIZED APPROACH?

Compared to traditional ledgers where all of your company`s information sits in one place, blockchain represents a network of trusted computers, called nodes, that maintain collective, consensus-based system to manage, transact, verify and validate data blocks.

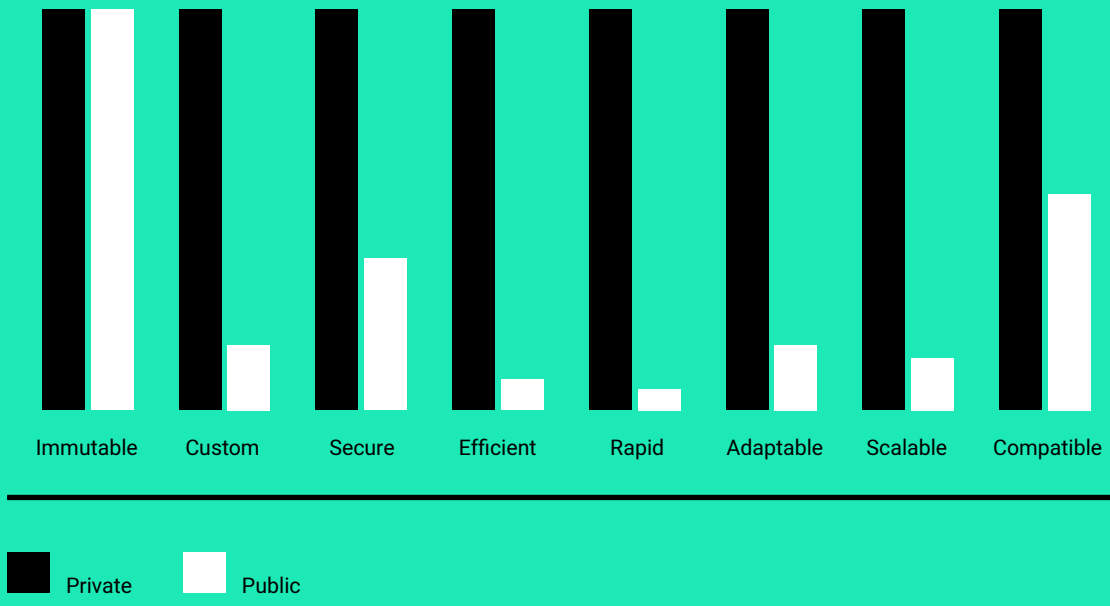


| | CENTRALIZED | DECENTRALIZED | DISTRIBUTED |
|---|---|---|---|
| Point of failure/Maintenance | Single point of failure. Easy to maintain. | No single point of failure. | No single point of failure. |
| Stability | Highly unstable. | Very stable, single failure doesn't do much harm. | Very stable, single failure doesn't do much harm. |
| Scalability | Low scalability. | Moderate. | Infinite. |
| Creation / Diversity | Fast creation, quick applicability. Less diversity, slow evolution. | First work out lower levers (trade, transport). Once the basic infrastructure is in place, evolution is tremendous. | First work out lower levers (trade, transport). Once the basic infrastructure is in place, evolution is tremendous. |

# DOES BLOCKCHAIN FIT YOUR TECHNOLOGY STACK?

If Internet is the foundational technology layer, blockchain is perceived as a driving force for the new generation of Internet. Its technical backbone has the ability to form and reach consensus among different parties via algorithmic software, bringing trust in peer-to-peer transactions. From a technical point of view, its innovation relies on three concepts: peer-to-peer cryptography, distributed consensus and random mathematical challenge.

To make further sense for blockchain in your business, it is necessary to understand the difference between public and private (or permissioned) ledgers. By its very nature, blockchain protects the integrity and availability of your data, making such a system almost impossible to hack. However, the openness of public ledger may present an obstacle for highly-regulated industries which need to consider the privacy and compliance implications beforehand. This is when private and permissioned protocols come in handy.



## PRIVATE / PERMISSIONED

- Accessible to trusted participants only
- Regulated by a trusted authority
- ach participant receives its own digital identity
- Tokenization is not required: no gas, no fees
- Native currency can be implemented
- Unlimited distributed storage
- Different consensus mechanisms, including Proof of Authority

### CONSENSUS MECHANISM

Proof of Authority (PoA) achieves consensus by referring to a list of validators (or authorities when they are linked to physical entities). For that, PoA is more secure and energy efficient, ensuring high speed and network scalability.

## PUBLIC

- Completely open
- Anyone can read/write data
- Require a substantial amount of energy
- Proof of work or Proof of Stake consensus
- Tokenization as an incentive for miners
- Each transaction on chain requires gas
- Very limited storage

### CONSENSUS MECHANISM

Proof of Work (PoW) records and verifies information through solving a mathematical problem. First computer to solve it is rewarded with cryptocurrency.

Proof of Stake (PoS) states that a person can mine or validate blocks according to how many coins he or she holds.  So, the more coins the miner owns, the more mining power he or she has.

# WHERE DOES NXXTECH STAND OUT?

There are already several blockchain frameworks for your company to choose from, which differ by who is allowed to participate in the network, which consensus protocol they use and how the shared ledger is maintained. Picking the right blockchain architecture heavily depends on what the main goal of your blockchain project is and what kind of assistance you need with its implementation. Below you can compare the crucial components, to make sure going with Nxxtech is your best fit.

| | ETHEREUM | HYPER LEDGER | IROHA | INDY | CORDA | IOTA | NXXTECH |
|---|---|---|---|---|---|---|---|
| ABOUT | The most popular public platform for writing dApps in form of smart contracts. | A collection of open source projects led by The Linux Foundation. It includes different frameworks (Fabric, Sawtooth, Burrow, Iroha, Indy). Also contains modules, a suite of software for developing and maintaining blockchains. | | | Created by R3 consortium of banks to automate legal agreements between businesses. | Goal of becoming the backbone for IoT and enable micro-transactions for connected devices. | Private chain operability and data storage system, focusing heavily on internet of things. |
| TYPE | Public | Permissioned / private. | Open-source. Permissioned. Based on Ethereum. | Public | Open source. Permissioned/ private. | Tangle as an alternative to existing blockchain. | Private / Permissioned. Based on Ethereum (sidechain). |
| BEST FOR | Public dApps. | Can represent anything of digital value. | Creation, transactions & management of complex digital assets, smart contracts, identities, and data content. | Shuffling derivates and payments. Purpose-built for decentralized identity. | Legally binding smart contracts for the financial industry. | Cryptocurrency for IoT. | Creation, transactions & management of complex digital assets, smart contracts, identities, and data content. |
| CONSENSUS MECHANISM | Proof of work (PoW) + Proof of stake (PoS). | Proof of elapsed time (PBFT). | Proof-of-stake (PoS) Tendermint consensus engine. | QuorumChain Consensus / Redundant Byzantine Fault Tolerance. | Notary nodes. | Proof of Work (PoW). | Proof of Authority (PoA). |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DATA STORAGE | Ethereum provides all functions for true decentralized applications. On the ledger. | Data is distributed and stored by all members of the private hyperledger consortium. | Data is distributed and stored by all members of the private hyperledger consortium. | | Immediately quarriable, in a relational database and moves data using message queues. | Neither decentralized nor trusting, as it uses a number of central components. | Can store and handle data externally, on IPFS and on the ledger. |
| DATA SECURITY / PRIVACY | Less extensive range of enterprise and data privacy. Frameworks like evan. network or Quorum close this gap. | Private transactions are possible - the trust in the system itself is limited to the trust in the owner of the blockchain. | Restricted | Yes | Multiple different business networks and transaction types can co-exist and interoperate. | "Masked Authenticated Messaging" not available yet. | Private-encrypted or public. |
| TOKENIZATION | An integral part of the Ethereum. | No support to classical tokenization - you can build a token-like construct but it's limited to the specific use case. | Does not have a native cryptocurrency, but it can be created by an eligible participant as required for their own enterprise use. | No. | No. | Tokenization of values is not a part of the platform. | Possible, not required. |
| SMART CONTRACTS | Integral part of Ethereum. | Chaincode. | Yes. | Yes. | Yes. | Currently not supported. | Yes. |

# HOW CAN YOU KICK OFF A BLOCKCHAIN PROJECT WITH NXXTECH?

In many aspects, the blockchain technology is extremely new and many businesses still find it challenging to identify a good use case that would motivate them to commence the initiative within their organization. Nxxtech assists your organization with several questions that rise from developing a distributed network system, helping you to remove friction and barriers discovered during the process. Setting the vision, defining the actual issues in your current operational processes, understanding your target customer and putting the strategy in motion are the next logical steps, all leading to you building a successful and profitable blockchain project on Nxxtech infrastructure.

# NXXTECH

Modular. Flexible. Powerful.

## ABOUT NXXTECH

Our mission is to create real-world blockchain architecture that breaks the technical barriers and empowers enterprises to move forward with digital innovation. Nxxtech blockchain architecture enables extendibility by separating its features in customizable modules to best fit specific needs of each organization. As such, it gives enterprises the necessary architecture to create custom decentralized applications of their choice and preference. This way, the users or devices within their trusted network can communicate and transfer value and messages completely independently of the servers and centralized systems that prevail today.

WANT TO DISCUSS YOUR UNIQUE NEEDS? REACH US AT INFO@NXXTECH.COM