

# D'LIGHT



법무법인 디라이트

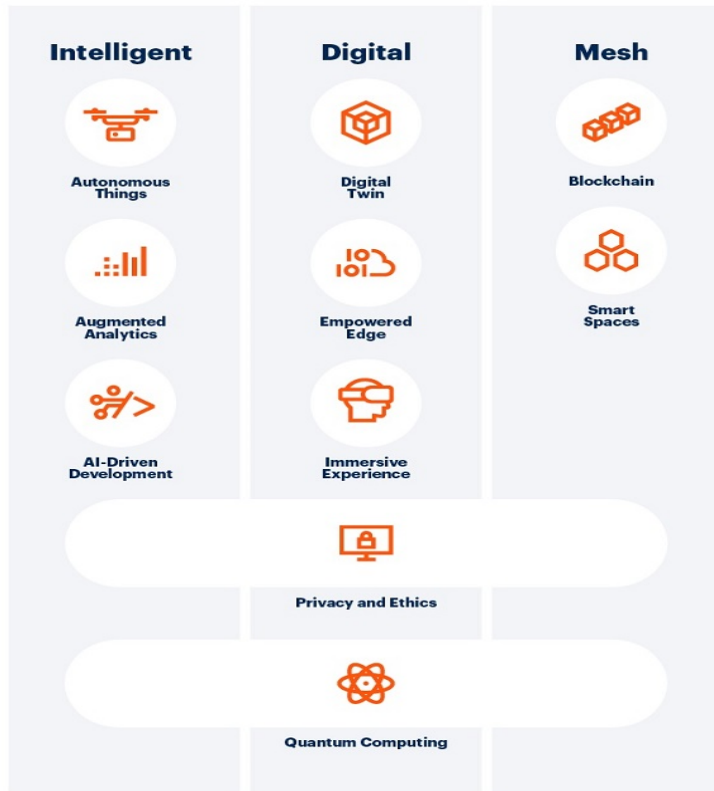
# 블록체인 미래 가치와 기술동향

수석컨설턴트/오픈 블록체인 포럼 윤석빈

# 2019 블록체인 5대 Trend

- STO(증권형 토큰 발행)의 확산
- 기관 투자자 유입
- 확장 솔루션(Scaling) 확보
- 기업의 블록체인 적용 및 활용 확산
- 스테이블 코인

## Top 10 Strategic Technology Trends for 2019



[gartner.com/SmarterWithGartner](https://gartner.com/SmarterWithGartner)

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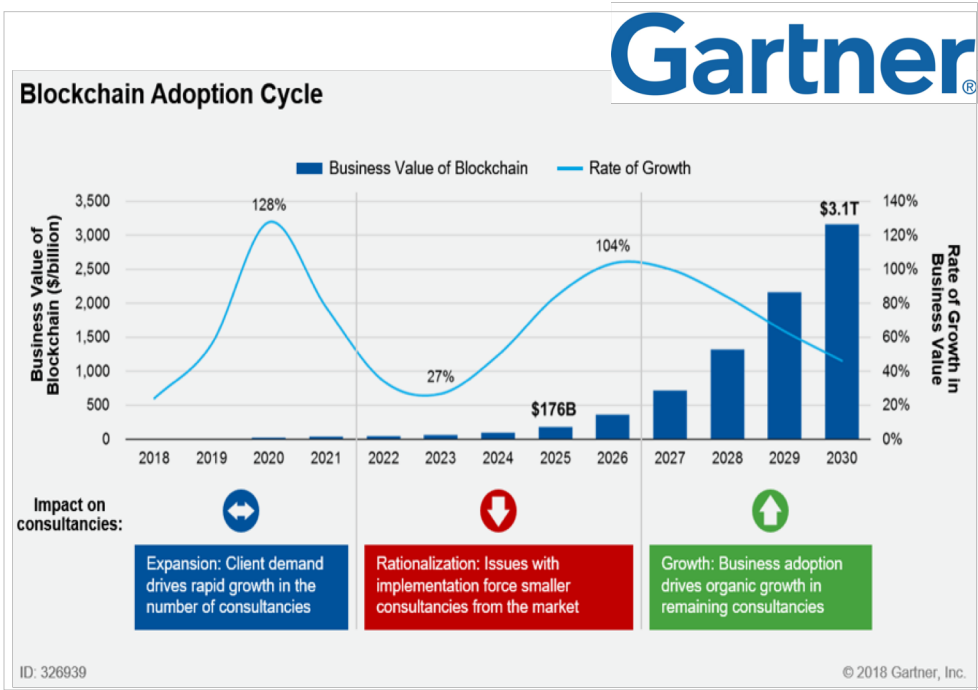
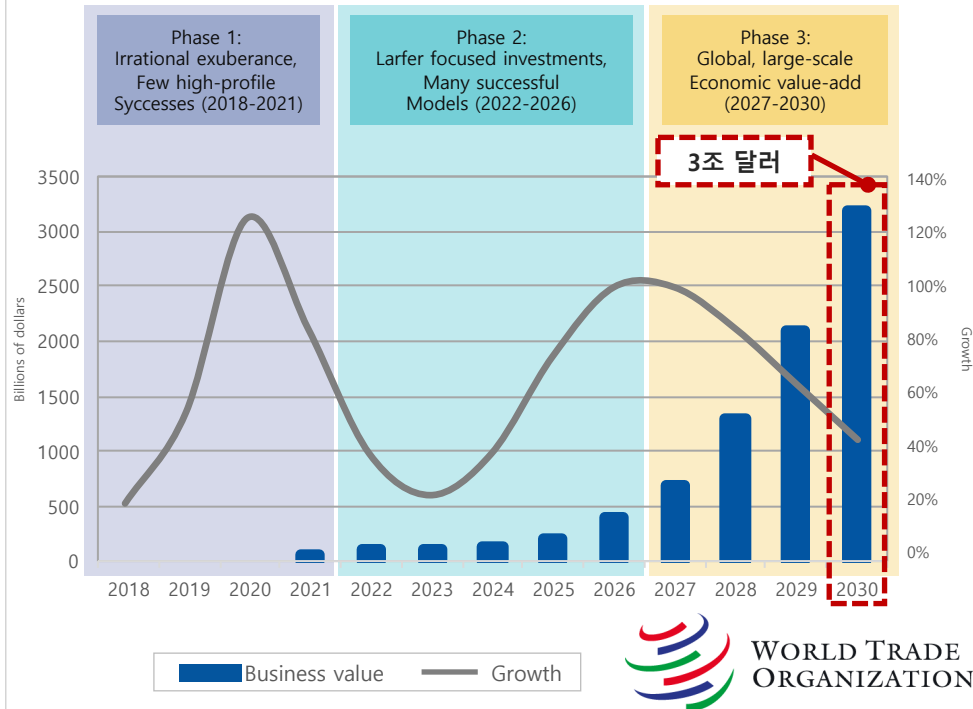
**Gartner.**

지능(Intelligent), 디지털(Digital), 메시(Mesh)

- ▲ 자율 사물(Autonomous Things)
- ▲ 증강 분석(Augmented Analytics)
- ▲ 인공지능 주도 개발(AI-Driven Development)
- ▲ 디지털 트윈(Digital Twins)
- ▲ 자율권을 가진 에지(Empowered Edge)
- ▲ 몰입 경험(Immersive Experience)
- ▲ 블록체인(Blockchain)
- ▲ 스마트 공간(Smart Spaces)
- ▲ 디지털 윤리와 개인정보보호(Digital Ethics and Privacy)
- ▲ 양자 컴퓨팅(Quantum Computing)

# 블록체인 부가가치 2030년 3300조

“2030년 블록체인으로 인한 부가가치 3조 달러” WTO



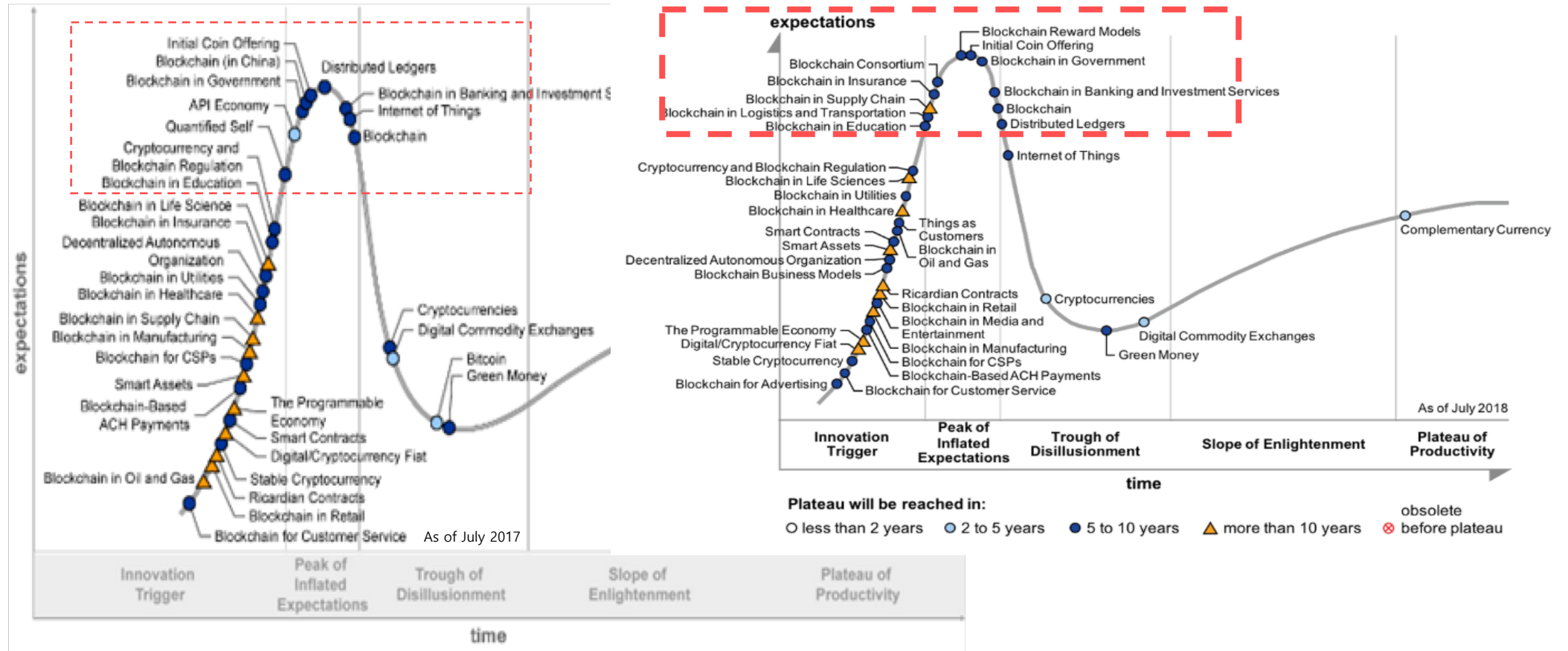
글로벌 기업 84% "블록체인, 앞으로 주류될 것"

최종수정 2018.08.29 10:12 기사입력 2018.08.29 10:12

Gartner®	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Business VALU e (조 원 ₩) (Billions of dollars)	4조	5조	6조	21조	37조	50조	64조	96조	176조	360조	720조	1332조	2162조	3300조
Growth(%)		24%	56%	128%	78%	34%	27%	50%	84%	104%	100%	84%	64%	46%

# Gartner 블록체인 비즈니스 전망 (2017,2018년)

## Hype Cycle for Blockchain Business



Plateau will be reached:

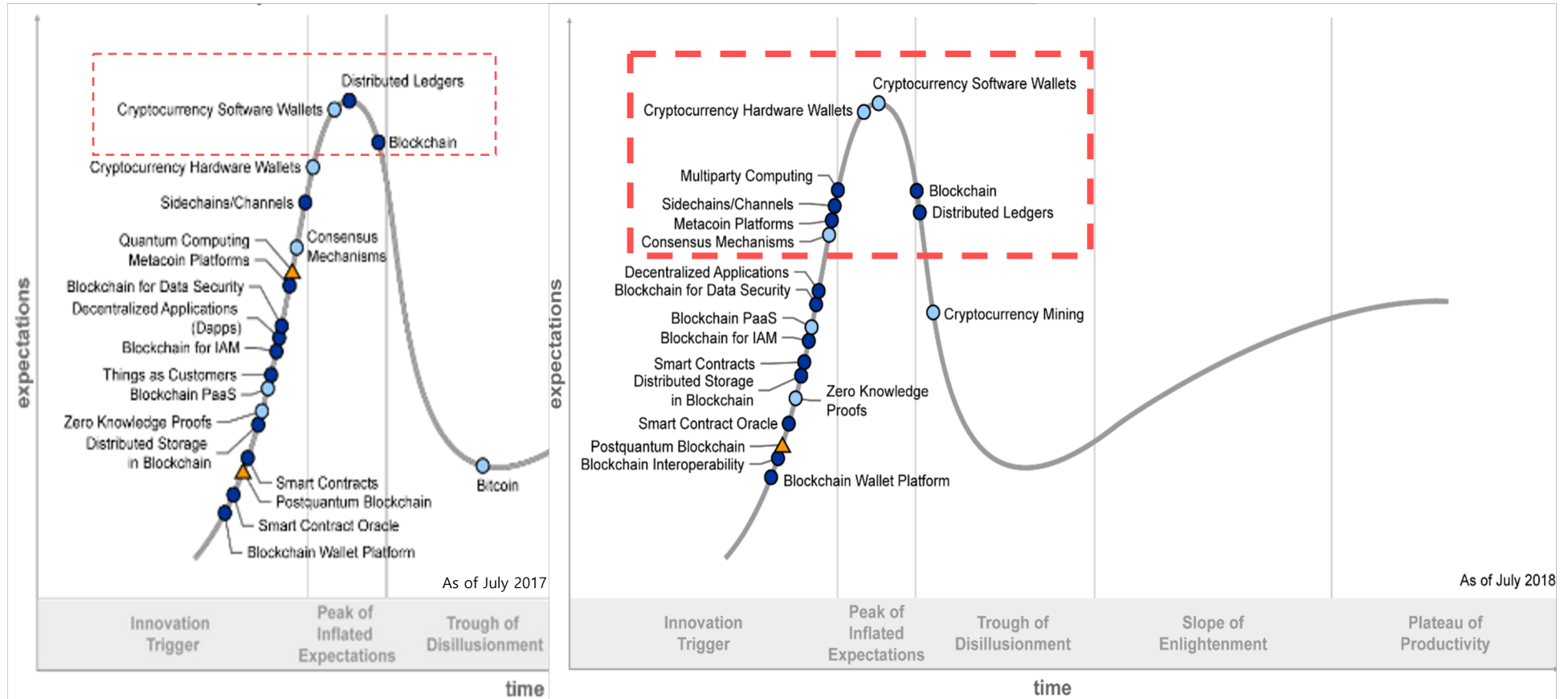
- less than 2 years
- 2 to 5 years
- 5 to 10 years
- ▲ more than 10 years
- ⊗ obsolete before plateau

**Gartner**

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# Gartner 블록체인 기술 전망 (2017,2018년)

## Hype Cycle for Blockchain Technology



Plateau will be reached:

- less than 2 years
- 2 to 5 years
- 5 to 10 years
- ▲ more than 10 years
- ⊗ obsolete before plateau



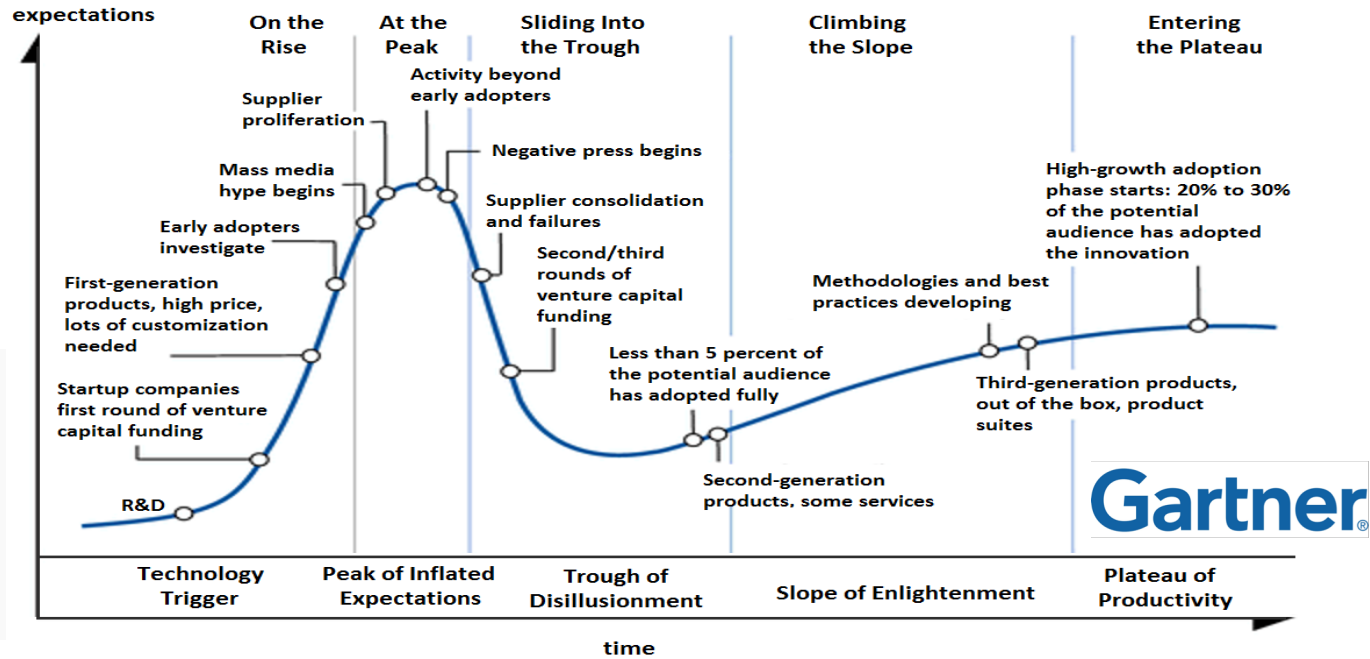
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# 하이프 사이클(Hype Cycle)

위키백과, 우리 모두의 백과사전.

기술의 성숙도를 표현하기 위한 시각적 도구이다. *과대광고 주기*라고도 한다. 미국의 정보 기술 연구 및 자문 회사인 [가트너](http://www.gartner.com)에서 개발하였다.

**핵심 인물**   진 홀 (Gene Hall) CEO  
**매출액**     ▲ 10억 6000만 미국 달러 (2006년)  
**순이익**     ▲ 1억 5600만 미국 달러 (2006년)  
**종업원**     5,700명(2013년)  
**웹사이트**   [www.gartner.com](http://www.gartner.com)



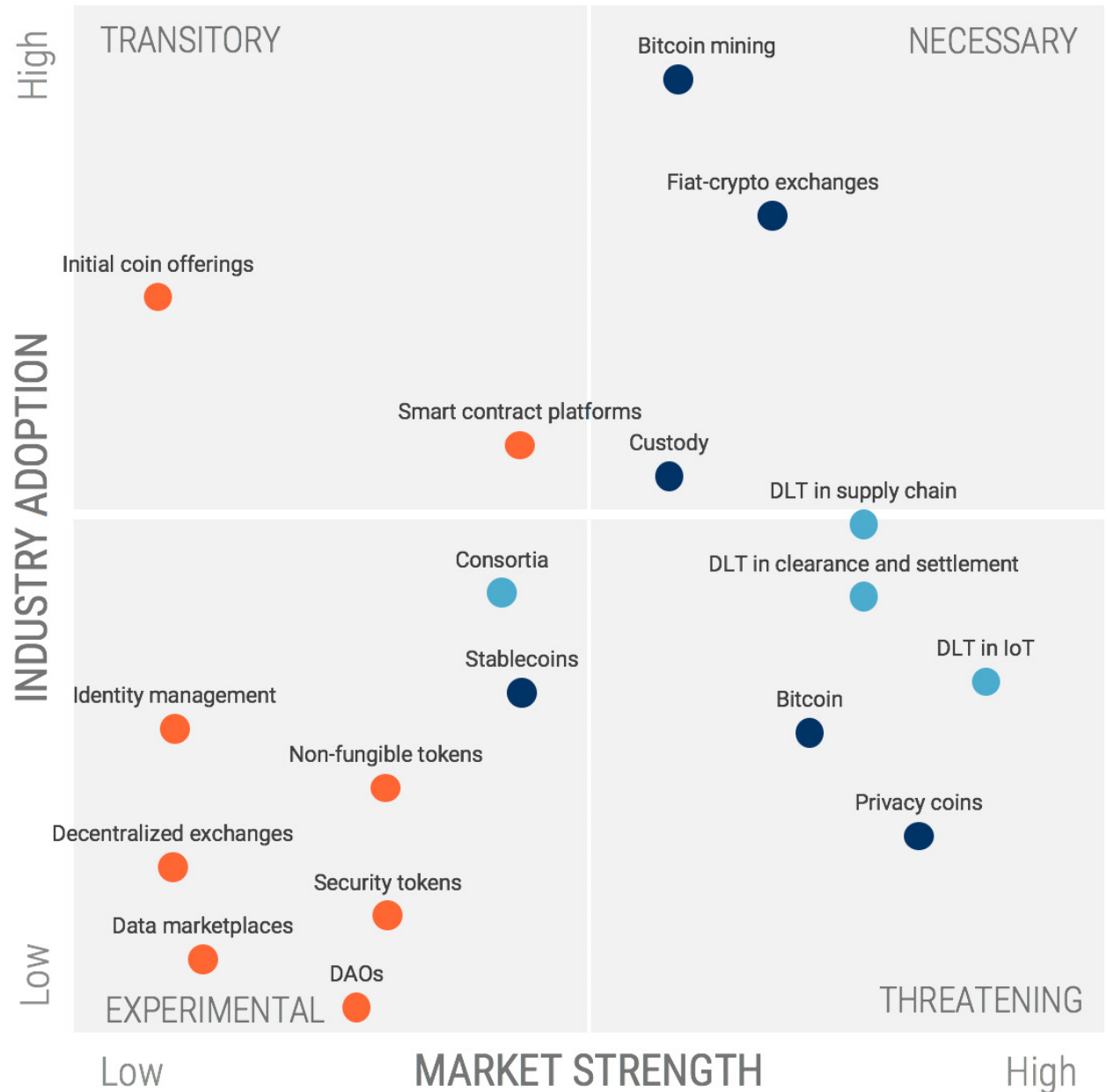
단계	명칭	2030
1	기술 촉발 (Technology Trigger)	잠재적 기술이 관심을 받기 시작하는 시기. 초기단계의 개념적 모델과 미디어 관심이 대중의 관심을 불러 일으킨다. 상용화된 제품은 없고 상업적 가치도 아직 증명되지 않은 상태이다.
2	부풀려진 기대의 정점 (Peak of Inflated Expectations)	초기의 대중성이 일부의 성공적 사례와 다수의 실패 사례를 양산해 낸다. 일부 기업이 실제 사업에 착수하지만, 대부분의 기업들은 관망한다.
3	환멸 단계 (Trough of Disillusionment)	실험 및 구현이 결과물을 내놓는 데 실패함에 따라 관심이 시들해진다. 제품화를 시도한 주체들은 포기하거나 실패한다. 살아 남은 사업 주체들이 소비자들을 만족시킬만한 제품의 향상에 성공한 경우에만 투자가 지속된다.
4	계몽 단계 (Slope of Enlightenment)	기술의 수익 모델을 보여 주는 좋은 사례들이 늘어나고 더 잘 이해되기 시작한다. 2-3세대 제품들이 출시된다. 더 많은 기업들이 사업에 투자하기 시작한다. 보수적인 기업들은 여전히 유보적인 입장을 취한다.
5	생산성 안정 단계 (Plateau of Productivity)	기술이 시장의 주류로 자리잡기 시작한다. 사업자의 생존 가능성을 평가하기 위한 기준이 명확해진다. 시장에서 성과를 거두기 시작한다.



# NExTT Framework Emerging Trends in Blockchain Technology

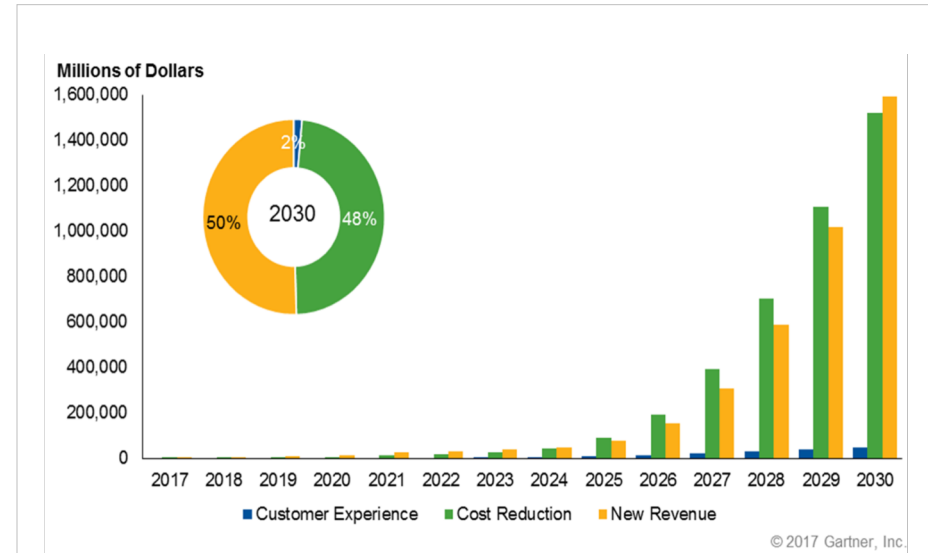
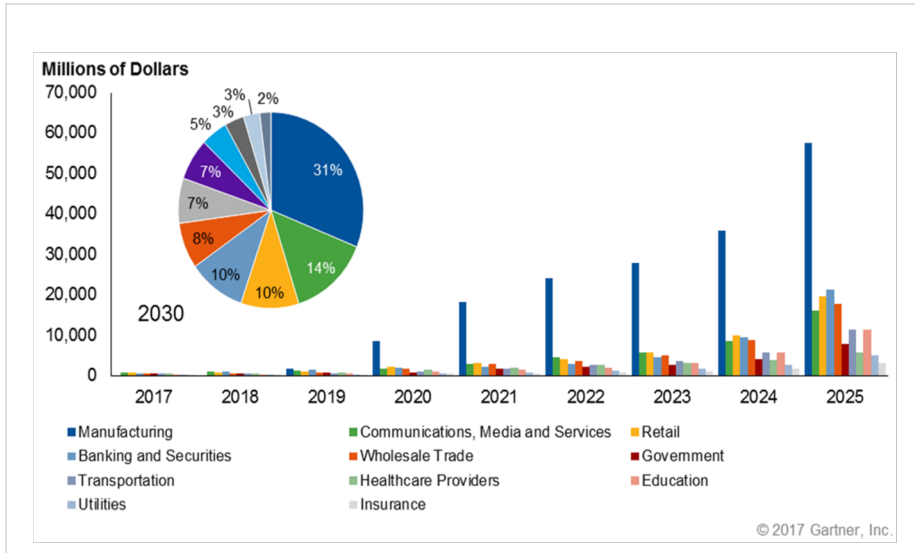
- 실험적 단계 (Experimental)**  
 개념적이거나, 초기 트렌드이나, 아직 널리 쓰이지는 않는 단계  
 Consortia, Stablecoins, Identity management, Non-fungible tokens, Decentralized exchanges, Security tokens, Data marketplaces, DAOs
- 가변적단계 (Transitory)**  
 실제로 사용되기 시작하였으나, 여전히 불확실성이 존재하는 단계  
 Initial coin offerings, Smart contract platforms
- 위협적단계 (Threatening)**  
 의미 있는 투자가 이루어져서 시장에 확산되기 직전인 단계  
 DLT in clearance and settlement, DLT in IoT, Bitcoin, Privacy coins
- 필수단계 (Necessary)**  
 널리 쓰이기 시작하는 단계  
 Bitcoin mining, Fiat-crypto exchanges, Custody

- Bitcoin and cryptocurrencies
 ● Enterprise distributed ledger (DLT) use cases
- Decentralized applications



Source: CB insight

# 블록체인 사업가능 분야



## 블록체인 사용예시



### Citizen / Business Solutions

#### Digital - Physical

Physical "Wallets"

Proof of Identity

Asset Tags

#### Software/Applications

Automated Acquisition

Cross-Entity Transaction Efficiencies

Voting

Complex Data (Records)

Cross-Entity Reconciliation

Asset Markets

Connected Identities

Self-Sovereign "Wallets" (Identity, Medical)

Social/Humanitarian Assistance

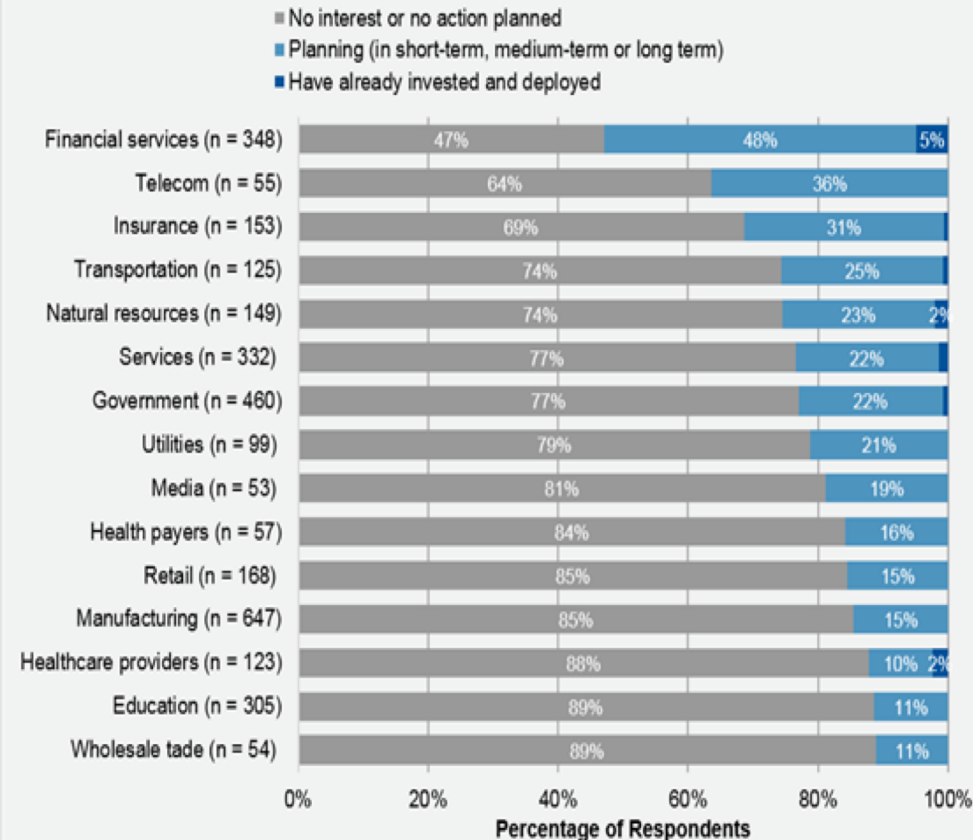
### Blockchain Platform / Protocol

# 블록체인 사업가능 분야



Industry	Potential	Years to Maturity
Banking and Investment Services	Transformational	5 to 10 years
Communications Service Providers	High	5 to 10 years
Education	High	5 to 10 years
Government	Transformational	5 to 10 years
Healthcare	Transformational	More than 10 years
Insurance	Transformational	5 to 10 years
Life Science	Transformational	5 to 10 years
Manufacturing	High	More than 10 years
Oil and Gas	Transformational	More than 10 years
Retail	Transformational	More than 10 years
Utilities	High	5 to 10 years

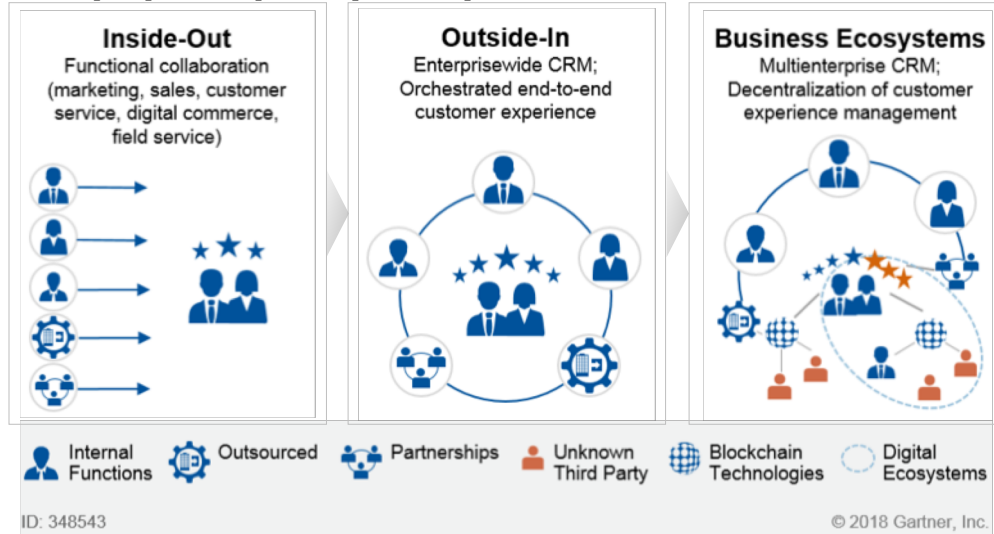
## Adoption Plans for Blockchain by Vertical



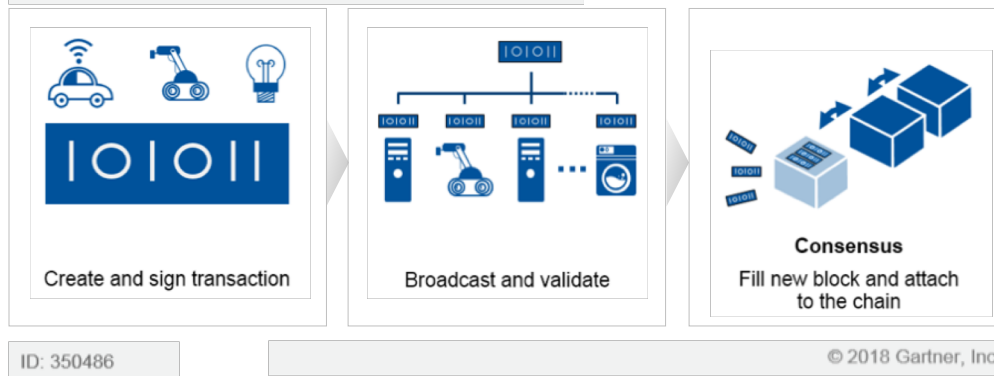
Base: All answering, excludes don't know, n varies by segment  
 What are your organization's plans in terms of blockchain/distributed ledger?  
 ID: 347846

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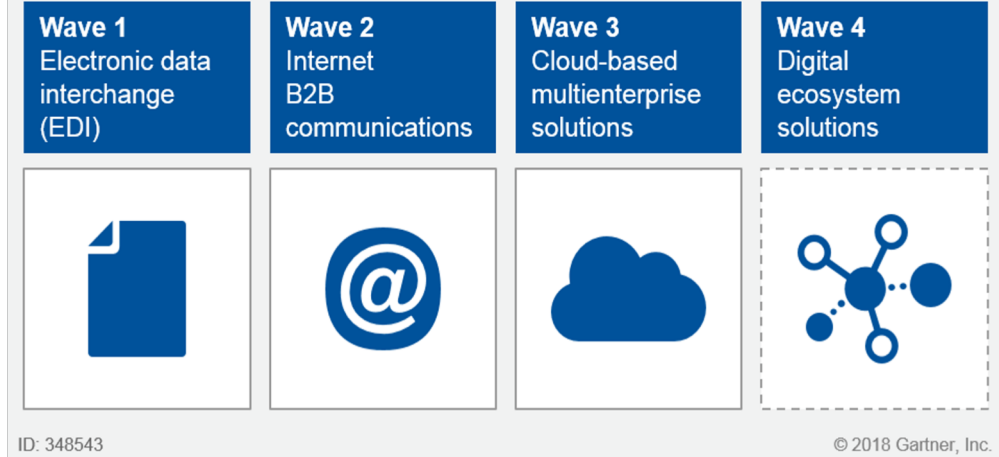
## 블록체인 사업화 절차



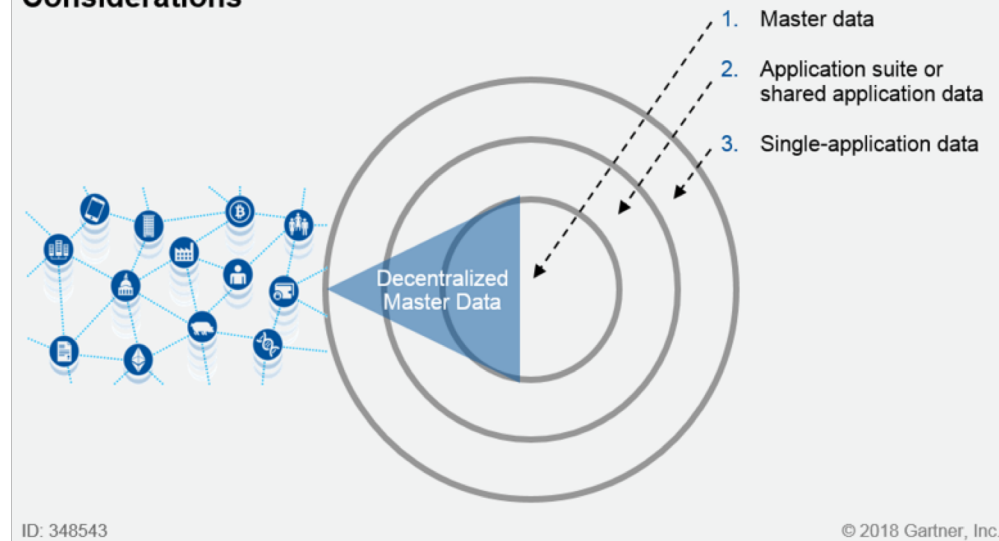
## Blockchain for IoT



## Preparing for a Fourth Wave of Multienterprise Solutions

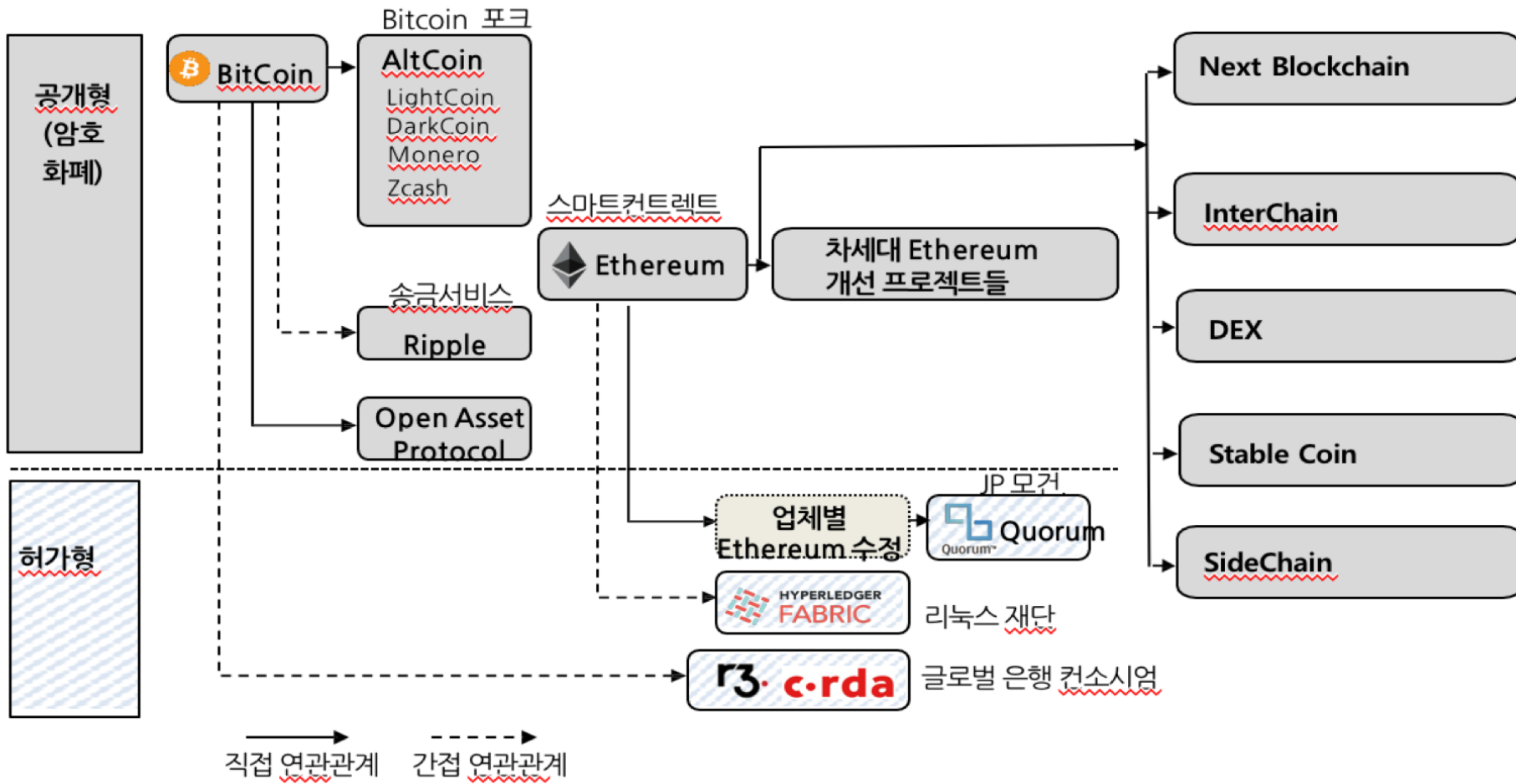


## Three Rings of Information Governance and Decentralized Data Considerations



# 블록체인 분류와 역사

BlockChain1.0(2009)    BlockChain2.0(2015.07)    →    BlockChain3.0



Qtum, Cardano, Tezos, EOS, Zilliqa, Rchain, Genaro, Dfinity, Ontology, Aelf, Seele, Holo, Thunder, Achain, IOST, Metadium, HashGraph

Cosmos, AION, ARK, ICON, Wanchain, Polkadot

Kyber N/W, 0x, Airstwap

Maker DAO, Variabl, Basecoin, Terra

Loom, PoA networks, Plasma, Lightnig network, RSK(2way peg to Bitcoin), Alpha(Centralized Peg), Liquid (by Blockstream), Bitcoin extended, Bitcoin codex(redesign of Namecoin as a sidechain), MimbleWimble

# Ethereum - 해결하고자 하는 핵심문제

- 특정한 어플리케이션에 한정된 블록체인이 아니라 다양한 종류의 dapp을 실행할 수 있는 범용 플랫폼
- PoW의 에너지 낭비와 중앙화 되어가는 채굴풀 문제
- Trilemma 문제 - Decentralization, Scalability, Security 3가지를 하나의 체인에서 모두 해결할 수는 없음

Source: Atoms Atomrigs Consulting Inc.

# Ethereum - 1.x 솔루션

- Transaction based state machine - UTXO vs Account (rich statefulness), world computer
- Merkle patricia tree
- Turing completeness smart contract
- Execution model - EVM (stack based) & Gas system
- Memory hard PoW Ethash, modified GHOST protocol

Source: Atoms Atomrigs Consulting Inc.

# Ethereum 1.x 문제들

- Scalability issue - single threaded world computer
- Every node processes every transaction and stores the entire states
- Solidity language & formal verification
- Transaction finality
- Inflexible gassystem
- PoW's energyconsumption

Source: Atoms Atomrigs Consulting Inc.



# Ethereum 2.0

- Sharding +CasperFFG
- Multi layered scalability solutions
- Libp2p - transport layer
- Efficient signature scheme & accumulator
- eWASM
- Formal verification

Source: Atoms Atomrigs Consulting Inc.

# 블록 producers/validators 선정방법 및 합의 방식

PoW	Casper FFG
Hash power competition	Staking ether
Longest or heaviest chain	Pre-defined producer order
Penalty: Waste hash power	Slash conditions
Probable or no finality	Finality
Liveness over safeness	Safeness over liveness

Source: Atoms Atomrigs Consulting Inc.

## PoW Main Chain

“Anchor Layer”

## Beacon Chain

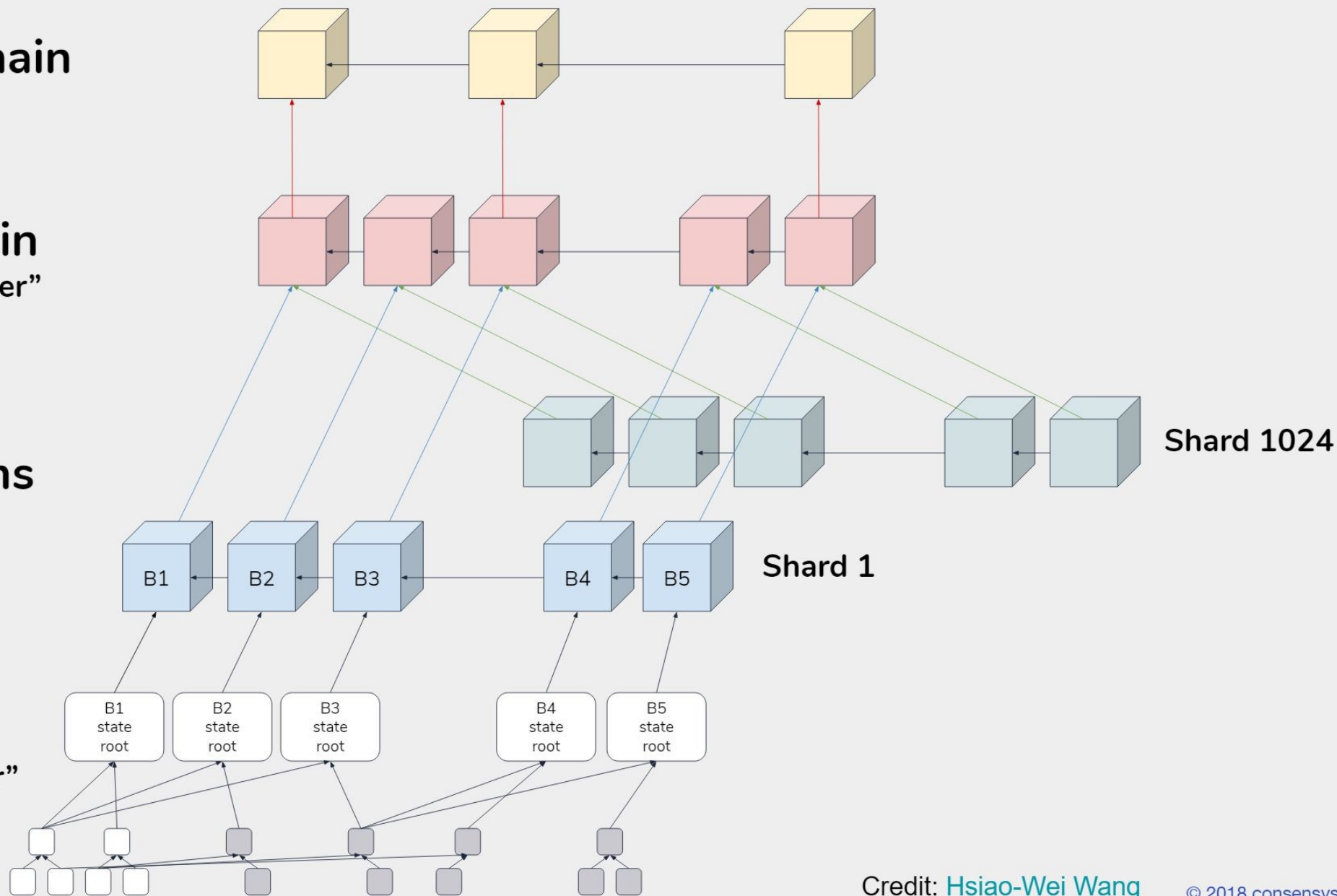
“Coordination Layer”

## Shard Chains

“Data Layer”

## VM(s)

“Execution Layer”



# ETHEREUM CASPER

## 3 TYPES OF CHAINS



### CURRENT CHAIN

PROOF  
OF WORK

We will be transitioning to the beacon chain from here

### BEACON CHAIN

PROOF  
OF STAKE

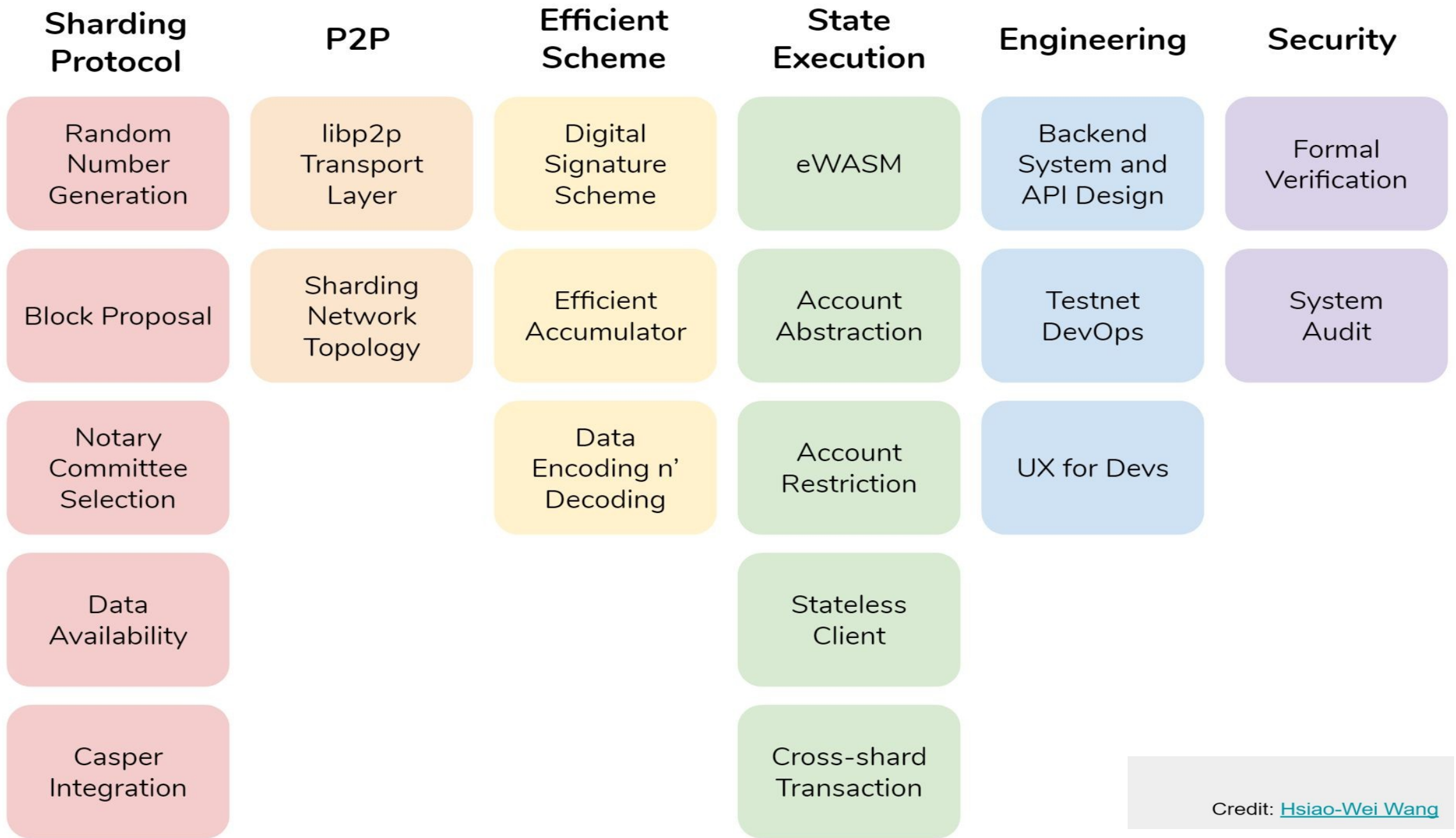
Validators will reside here and link to the Shard Chains

### SHARD CHAIN

TX &  
DATA

Multiple shard chains - each holding a portion of transactions

Credit: [\\_Shawn Dexter](#)



Credit: [Hsiao-Wei Wang](#)

# Ethereum 2.0 Scope of Work

Re-engineering Consensus

<b>Proof of Work</b>	→	<b>Proof of Stake</b>
Burning CPU/GPU/ASIC cycles	→	Staking Ether
All nodes validate everything	→	Committee-based validation
Random blocktimes	→	Regular block times
No finality	→	Transaction finality
Environmentally damaging	→	Environmentally lightweight
Inherently centralising	→	Enhanced decentralisation

Credit: [Ben Edgington](#)

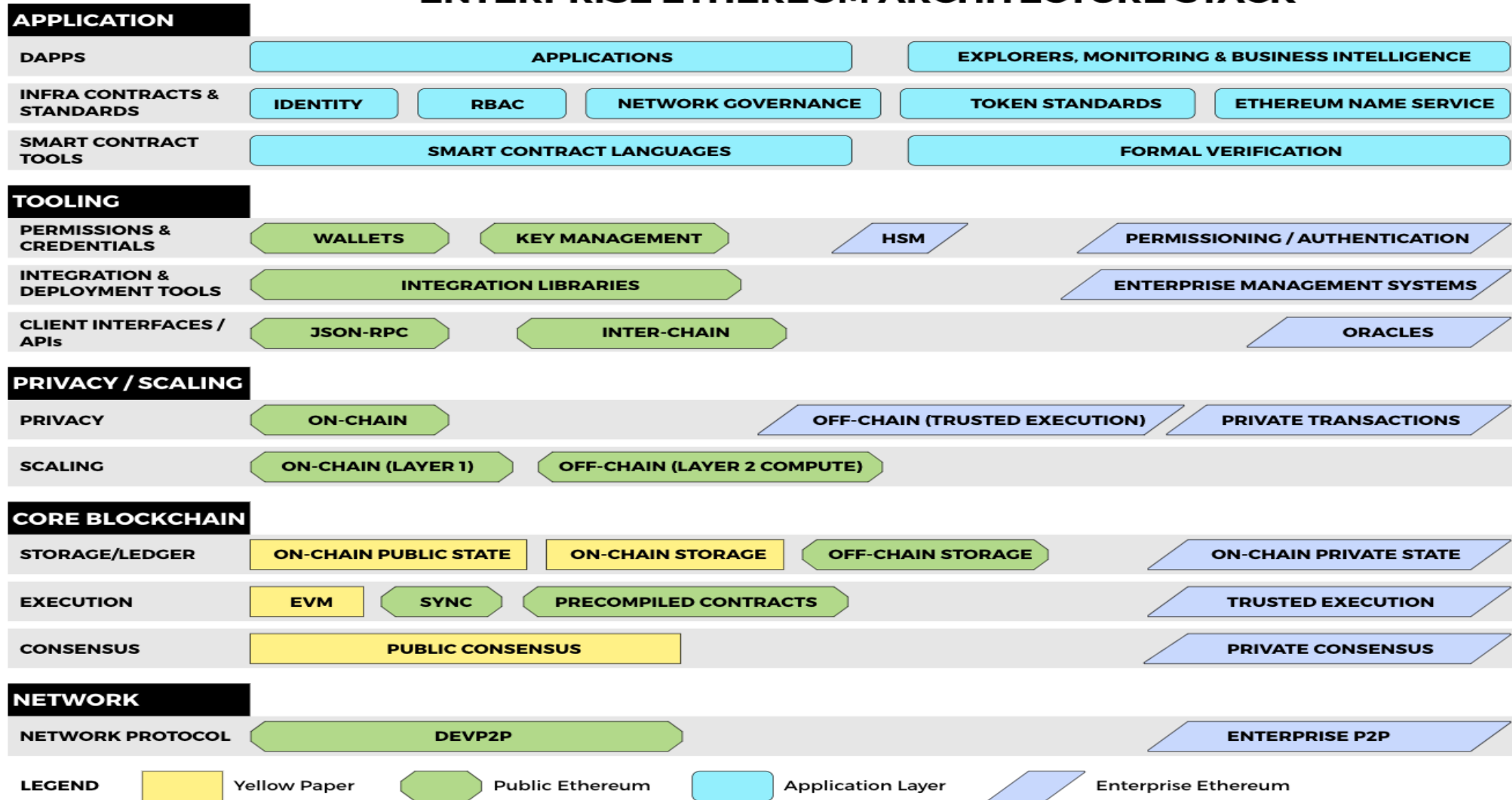
# Ethereum 2.0 Scope of Work

Re-engineering State Transition



Credit: [Ben Edgington](#)

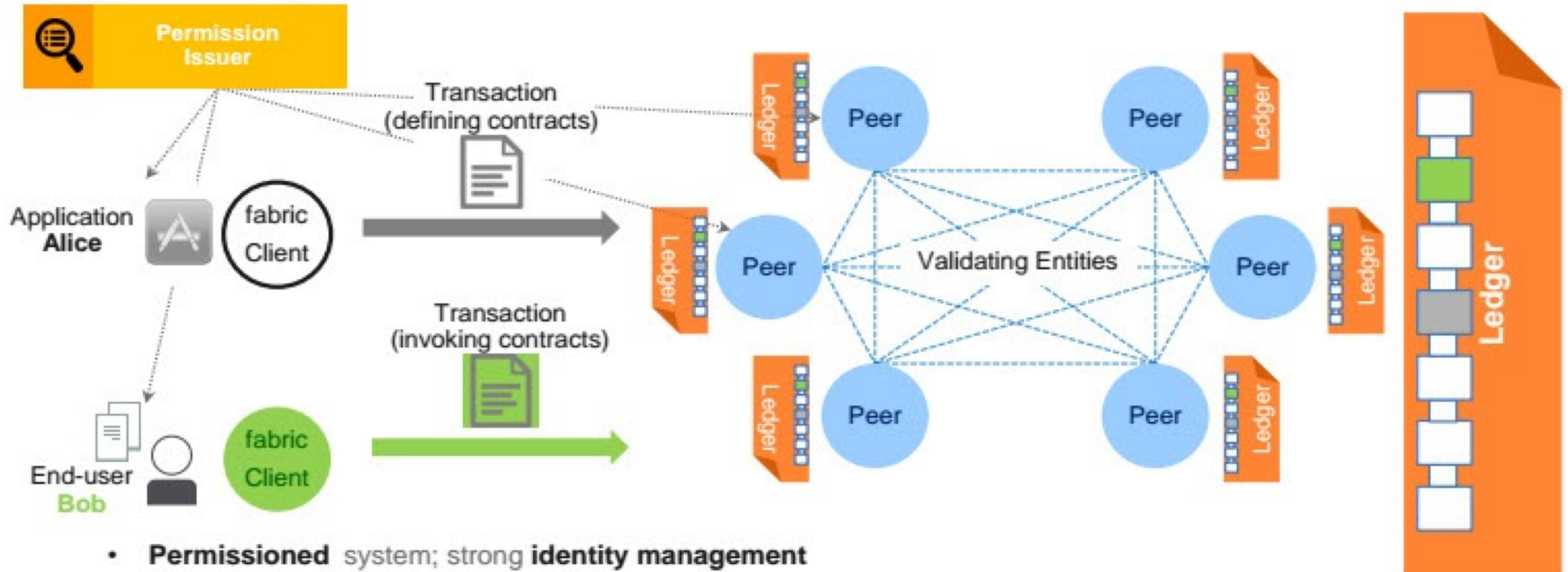
# ENTERPRISE ETHEREUM ARCHITECTURE STACK



All Yellow Paper, Public Ethereum, and Application Layer components may be extended for Enterprise Ethereum as required.



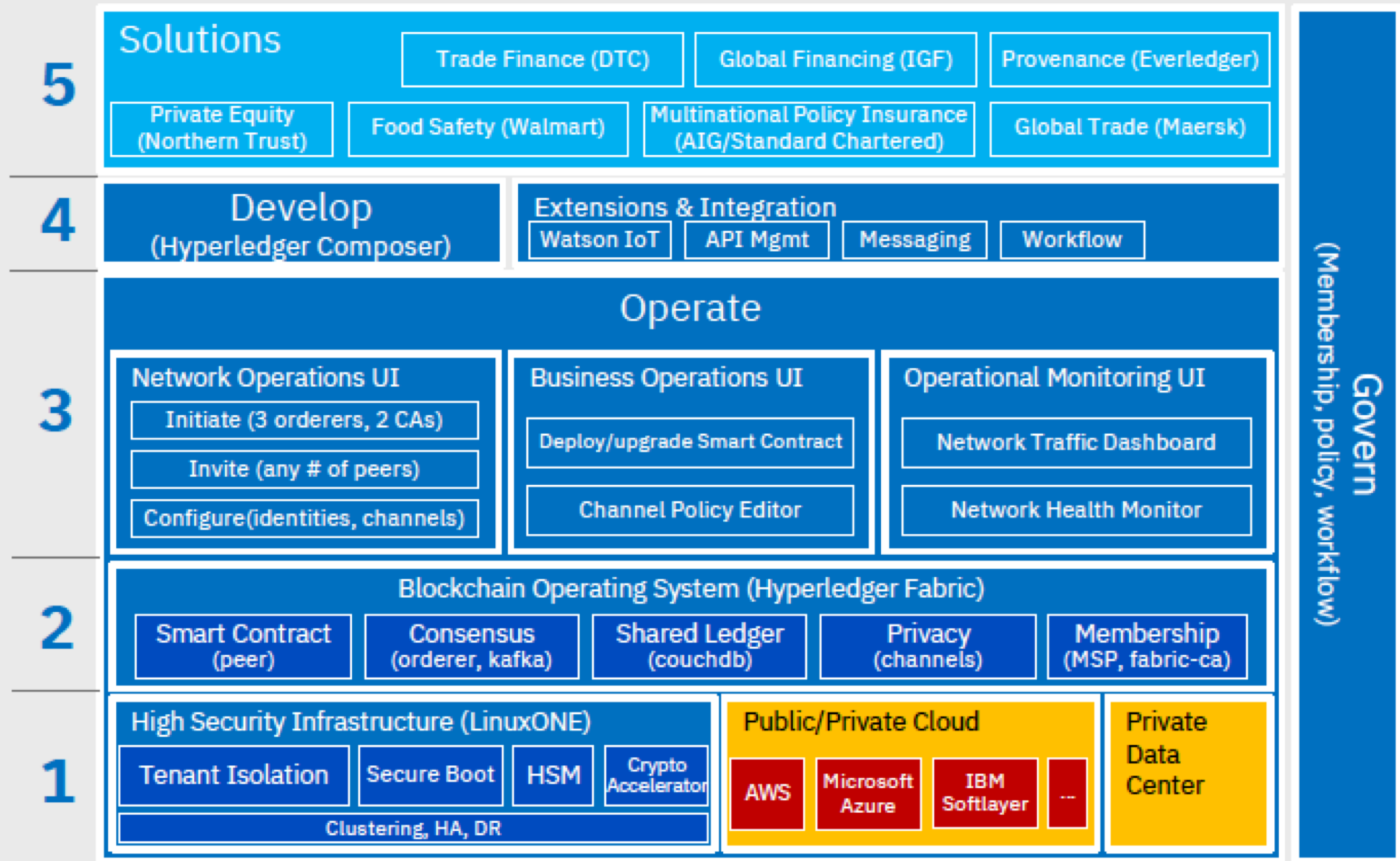
# Hyperledger-fabric model



- **Permissioned** system; strong **identity management**
- Distinct roles of **users**, and **validators**
- Users **deploy** new pieces of code (chaincodes) and **invoke** them through **deploy & invoke** transactions
- Validators evaluate the effect of a transaction and reach consensus over the new version of the **ledger**
- **Ledger** = total order of transactions + hash (global state)
- **Pluggable consensus** protocol, currently PBFT & Sieve

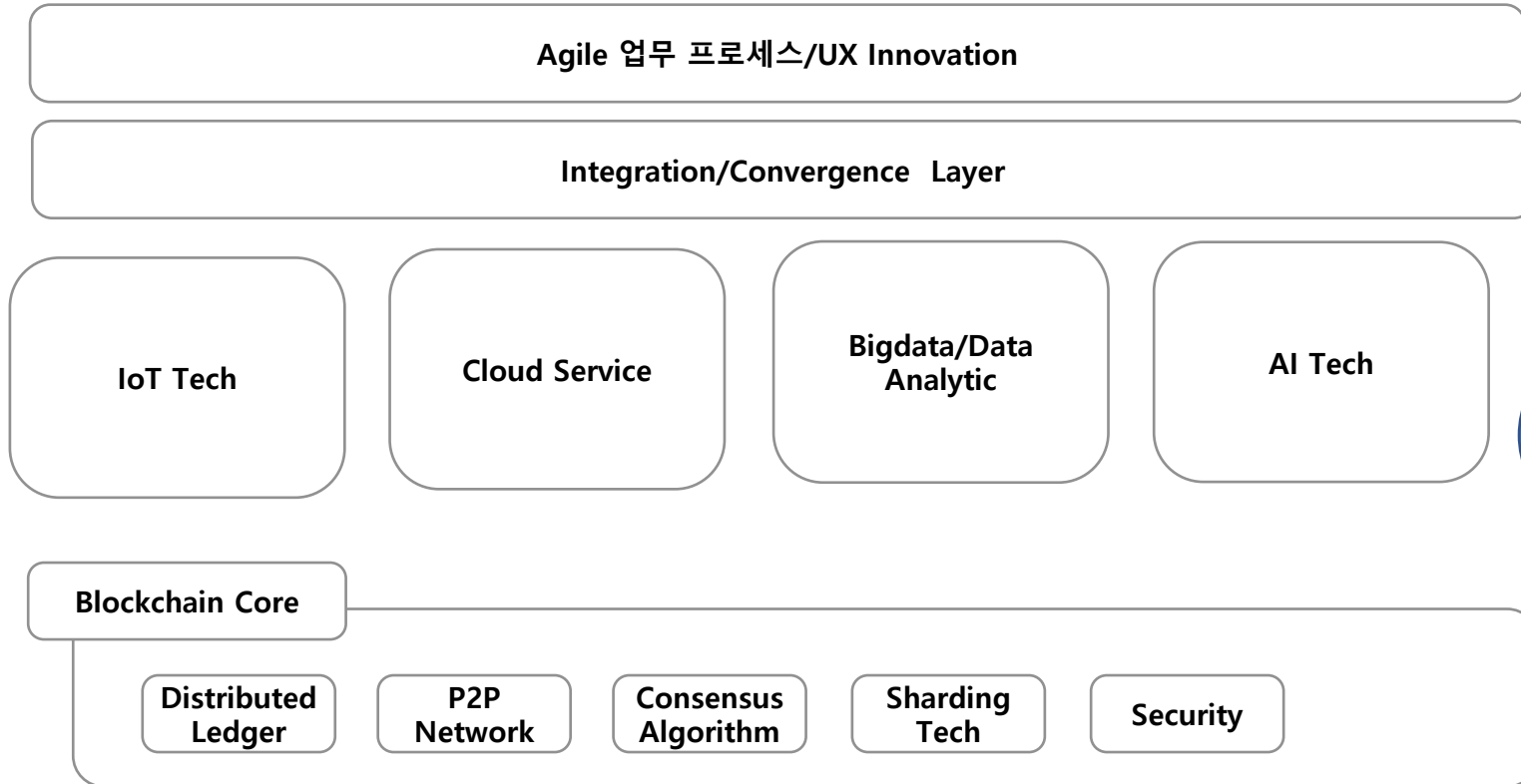


# IBM Blockchain Platform Architecture



- Included in IBM Blockchain Platform
- Supported via IBM Certified Docker Images

# 4차 산업혁명 융합 모델 예시



감사 합니다.

수석 컨설턴트/오픈 블럭체인 포럼  
윤석빈

카카오톡 ID: seokbin7

