

H2020 공동연구 활성화를 위한 유럽 ICT 전문가 3차 Forum
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Blockchain 정책 및 기술동향

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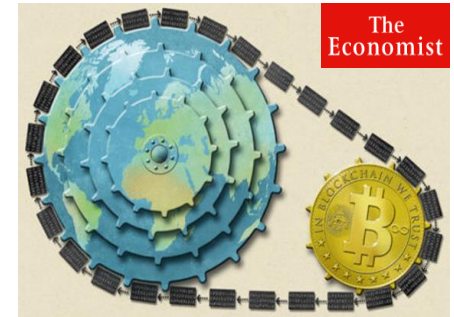
Contents

- Introduction
 - Features and characteristics of Blockchain
- Challenges and technical considerations
- Korea activities
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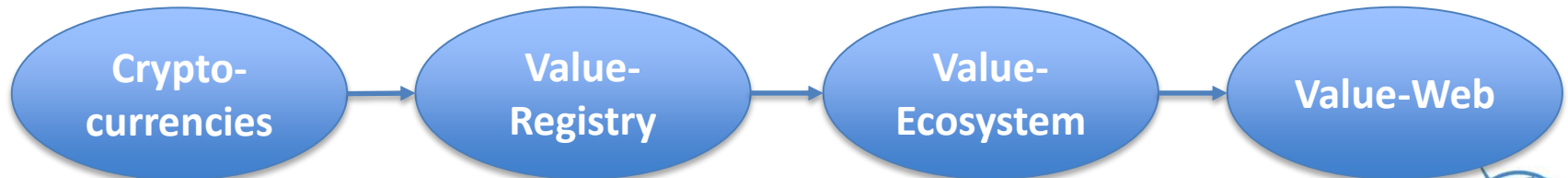
A New Paradigm – Blockchain

“It is a machine for creating trust.”

(Source: The Economist)



- The currency in the Internet is **data**.
- Revolutionizes how transactions are recorded
 - a **decentralized digital ledger** that records transactions
 - builds **trust** with **accountability** and **transparency**



Blockchain

- **Blockchain**

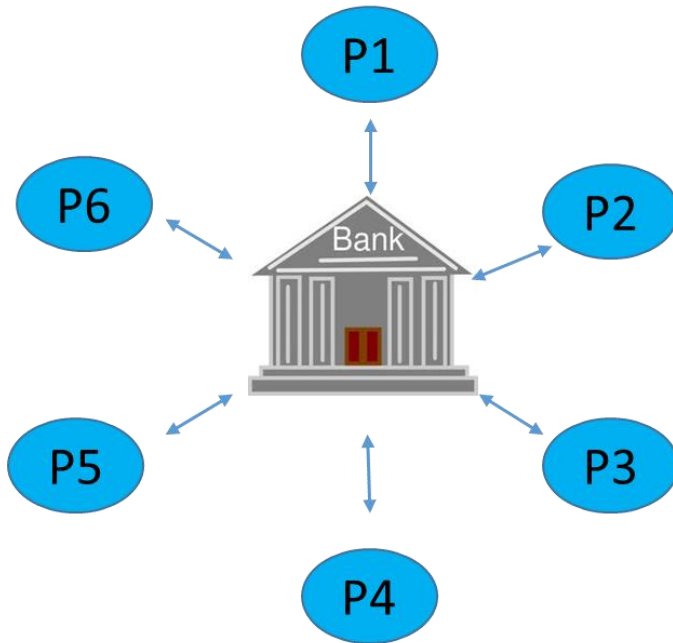
- a database that maintains a continuously growing set of data records.
- **Decentralized approach** - there is no master computer holding the entire chain.
 - Peer-to-peer messaging
 - Distributed file sharing
 - Autonomous device coordination

- **Two types of elements**

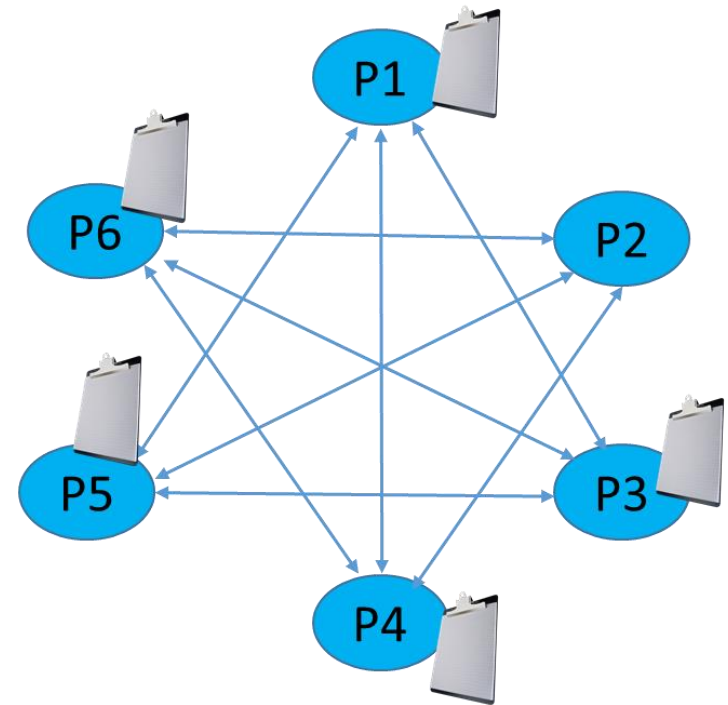
- **Transactions** are the actions created by the participants in the system.
- **Blocks** record these transactions and make sure they are in the correct sequence and have not been tampered with.
- Blocks also record a time stamp when the transactions were added.

Blockchain as a Decentralized Ledger

Centralized Operator



Decentralized Operators



New Challenges for Business

Emerging the Blockchain

A new idea of a Blockchain-based Value Exchange Platform:
Just like what the Internet does to information

INTERNET

Transfer information



TEXT



IMAGES



PROGRAMS



VIDEOS

BLOCKCHAIN

Transfer ownership



MONEY



CONTRACTS



PATENTS



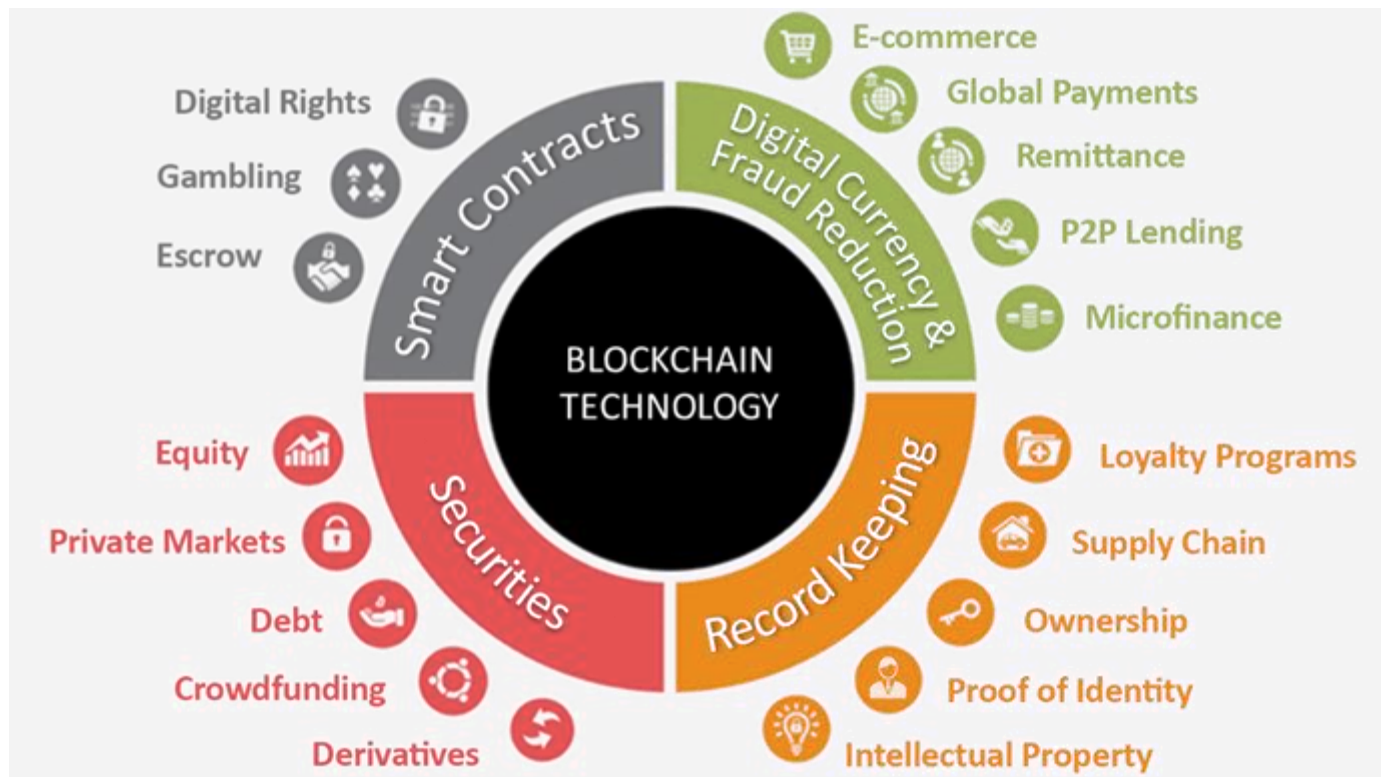
ASSETS

Key Benefits

- **Build trust**
 - enables devices to participate in transactions as a trusted party
- **Reduce costs**
 - remove the ‘middle man’ from the process.
- **Accelerate transactions**
 - reduce time needed for completing legal or contractual commitments.

Blockchain Applications

The Blockchain is radically changing the future of transaction based industries.



Challenges

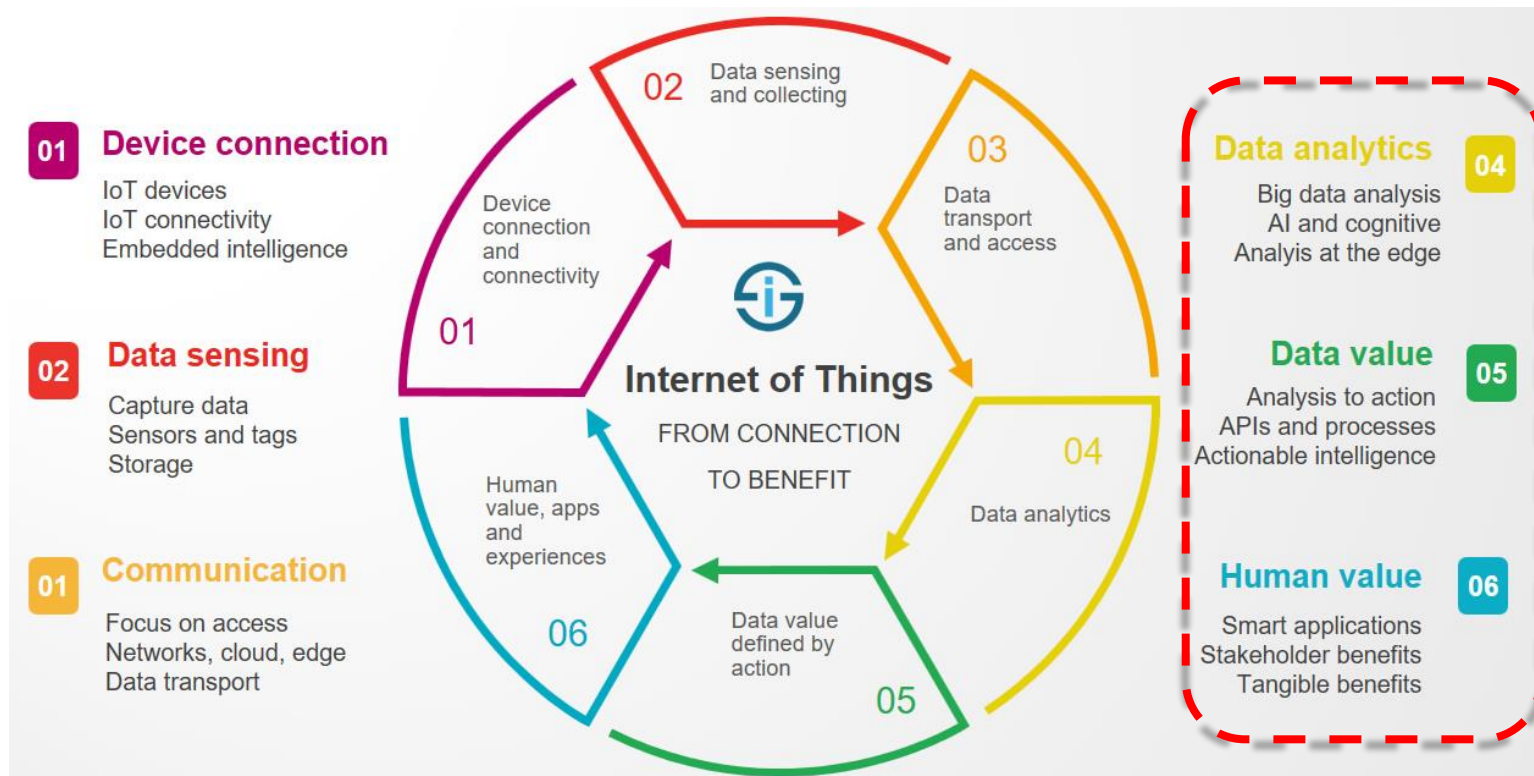
- Technical aspects
 - Scalability, Processing power and time, Storage
 - Security, Interoperability
- Legal & policy aspects
 - Privacy (GDPR), Smart contracts
- Market aspects
 - Sharing economy

Key Technical Considerations

- From networking and services perspectives
 - Identity management and related protocols
 - Secure network control plane
 - Networked collaboration with P2P
 - Network scalability
 - Decentralizing Trusted computing
 - Integrated approaches with multiple standards
 - Various applications using Blockchain (Finance, IoT, Security, Reputation System, Public service)

Towards Internet of Value

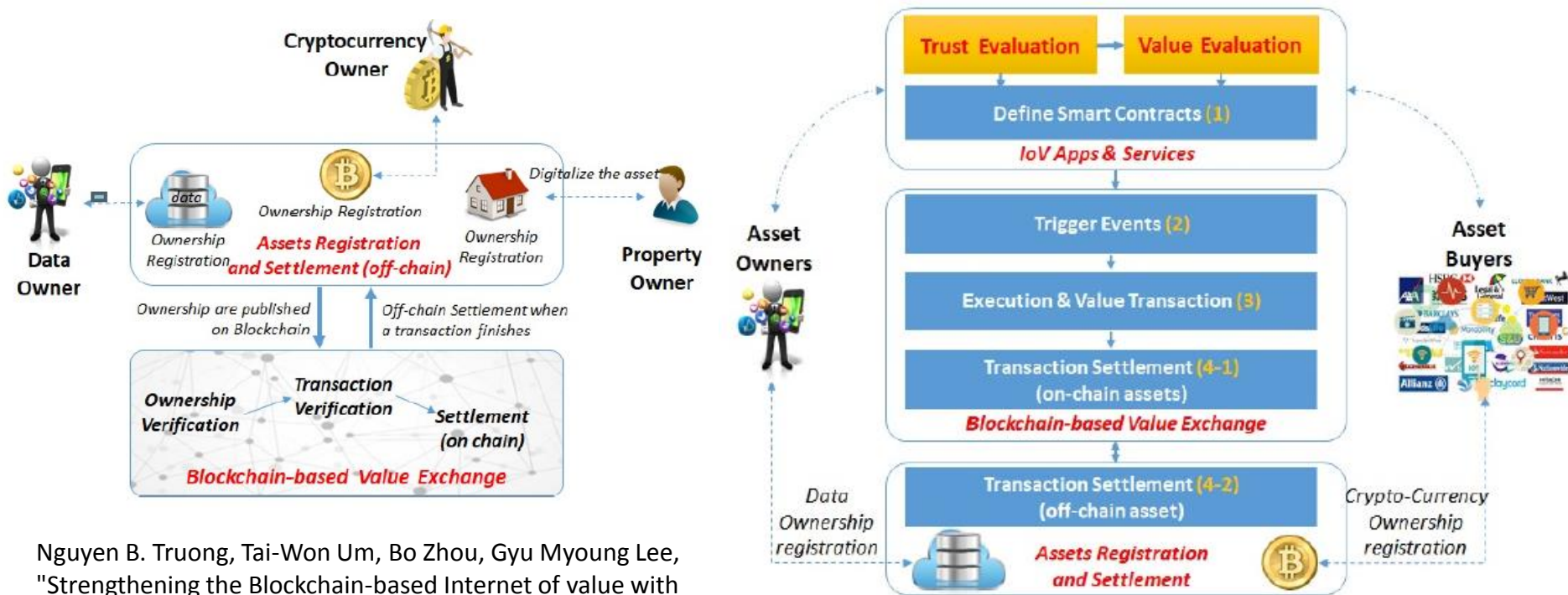
Data is Value – How to measure Value?



Source: i-SCOOP, <https://www.i-scoop.eu/internet-of-things-guide/internet-of-things/>

Blockchain-based Internet of Value

The **IoV** is as a platform of the next generation Internet that enables various types of assets to be digitalized and represented as digital value using **Blockchain**.



Nguyen B. Truong, Tai-Won Um, Bo Zhou, Gyu Myoung Lee,
"Strengthening the Blockchain-based Internet of value with trust," IEEE ICC 2018, May 2018 (Kansas City, USA)

Korea Activities (1)

- 초기 금융 분야 블록체인 적용
 - 국내 은행은 해외송금, 인증 같은 서비스에 적용
 - 금융위원회 주도의 공동 블록체인 컨소시엄 출범, 국내 16개 주요 은행과 블록체인 제도화 연구 진행
 - 가상화폐 법제도 정비 중, 가상화폐공개(ICO) 전면 금지
- 서비스 적용 분야 확대 중
 - 의료: 의료정보관리 유통, 블록체인기반 의료 제증명서비스
 - 물류, 유통: 해운물류 산업에 블록체인 적용
 - 에너지: 한전 블록체인 기반 전력거래 및 전기차 충전 서비스 구축
 - 공공부문: 지자체 공공 복지 서비스에 적용
- 정책 동향
 - 암호화폐 투기 근절을 위한 규제를 추진하되 블록체인 기술, 산업 발전은 지원
 - 암호화폐 투자 관련 정책 및 블록체인 도입, 산업육성에 대한 전략을 동시에 마련
- 국내 스타트업 기업 증가
 - 코인 플러그, 코빗, 스케일 체인, 코인 플러스 등

Korea Activities (2)



- 블록체인 → 4차산업혁명의 중요한 축
- 올해를 블록체인 산업 활성화의 원년
- 블록체인 시범사업
 - 2017년: 4건 14억
 - 2018년: 42억 예산 투입, 공공분야 우수사례 발굴

①투명한 전자투표 시스템 (선관위), ②블록체인 기반 전자문서 발급 인증 시스템 (외교부), ③믿을 수 있는 축산물 이력관리 시스템 (농식품부), ④종이 없는 스마트계약 기반 부동산 거래 플랫폼 (국토부), ⑤빠르고 효율적인 스마트 개인통관 서비스 (관세청)

- 블록체인 기술개발 및 인력 양성
 - 2017년 40억 → 2018년 100억원 규모
 - 산업계교육지원(KISA), 블록체인 연구센터 신규 선정
- “블록체인 산업발전 기본계획” 수립 추진 예정

Korea Activities (3)

- R&D Projects (2018)

- 블록체인 대용량 데이터 처리 기술 (ETRI)

- 2018년 정보통신방송 1차 신규지원 대상 과제

단위:백만원

기술분야	과제명	수행기간/예산
융합서비스	[사회문제] 부정 거래 방지를 위한 데이터 공유 서비스	2년/500
블록체인 융합기술	실시간 대용량 데이터 유통을 위한 온-오프 하이브리드 블록체인 기술 개발	3년/1,500
	블록체인간 상호연동 핵심기술 개발	3년/1,000
	임베디드 환경에서 블록체인을 이용한 기기들 간의 신뢰성 확보 기술	3년/800
	블록체인 트랜잭션 모니터링 및 분석 기술개발	3년/400
	블록체인 핵심 기술 개발	3년/300
정보보호	O2O 서비스를 위한 무자각 증강인증 및 프라이버시가 보장되는 블록체인 ID 관리 기술개발	3년/1,300

Korea Activities (4)

- Related communities



Seoul Ethereum Meetup



Blockchain Korea, Hashed Lounge

이더리움 연구회

Study groups in universities

Decipher
SNU BLOCKCHAIN ACADEMY

민간단체: 블록체인학회, 블록체인오픈포럼, 블록체인산업진흥협회, 블록체인협회 등

EU Activities

- Initial EU focus was on financial markets
 - But applications far beyond Financial sector
- Blockchain/DLT as a breakthrough technology
- EC launched the EU Blockchain Observatory and Forum (February 2018)
- EU Initiatives – feasibility study on Blockchain
 - Setting the right conditions for the advent of an open, innovative, trustworthy, transparent, and EU law compliant data and transactional environment
 - Assess the opportunity, benefits, and challenges of creating at EU level an enabling framework or infrastructure supporting Blockchain-based services

Related ITU-T Activities

- Focus Groups
 - FG-DPM (Data Processing & Management)
 - FG-DLT (Distributed Ledger Technology)
 - FG-DFC (Digital Currency)
- SG13 – Future Networks (& Cloud)
- SG17 – Security
- SG20 – IoT, Smart Cities & Communities

FG-DPM

- **Parent study group:** ITU-T SG20 (IoT and SC&C)
- **Established:** ITU-T SG20 meeting (Dubai, 22 March 2017) following the 1st Forum on Data Management: Transforming Data Into Value www.itu.int/en/ITU-T/Workshops-and-Seminars/iot/201703
- **Overall objectives:**
 - promote the establishment of trust-based data management frameworks for IoT and SC&C
 - investigate existing and emerging technologies
 - Identify and address standardization gaps and challenges
- **Meetings**
 - 1st meeting: 17-19 July 2017 (Geneva)
 - 2nd meeting: 20-25 October 2017 (Geneva)
 - 3rd meeting: 19-23 February 2018 (Brussels) - TBC

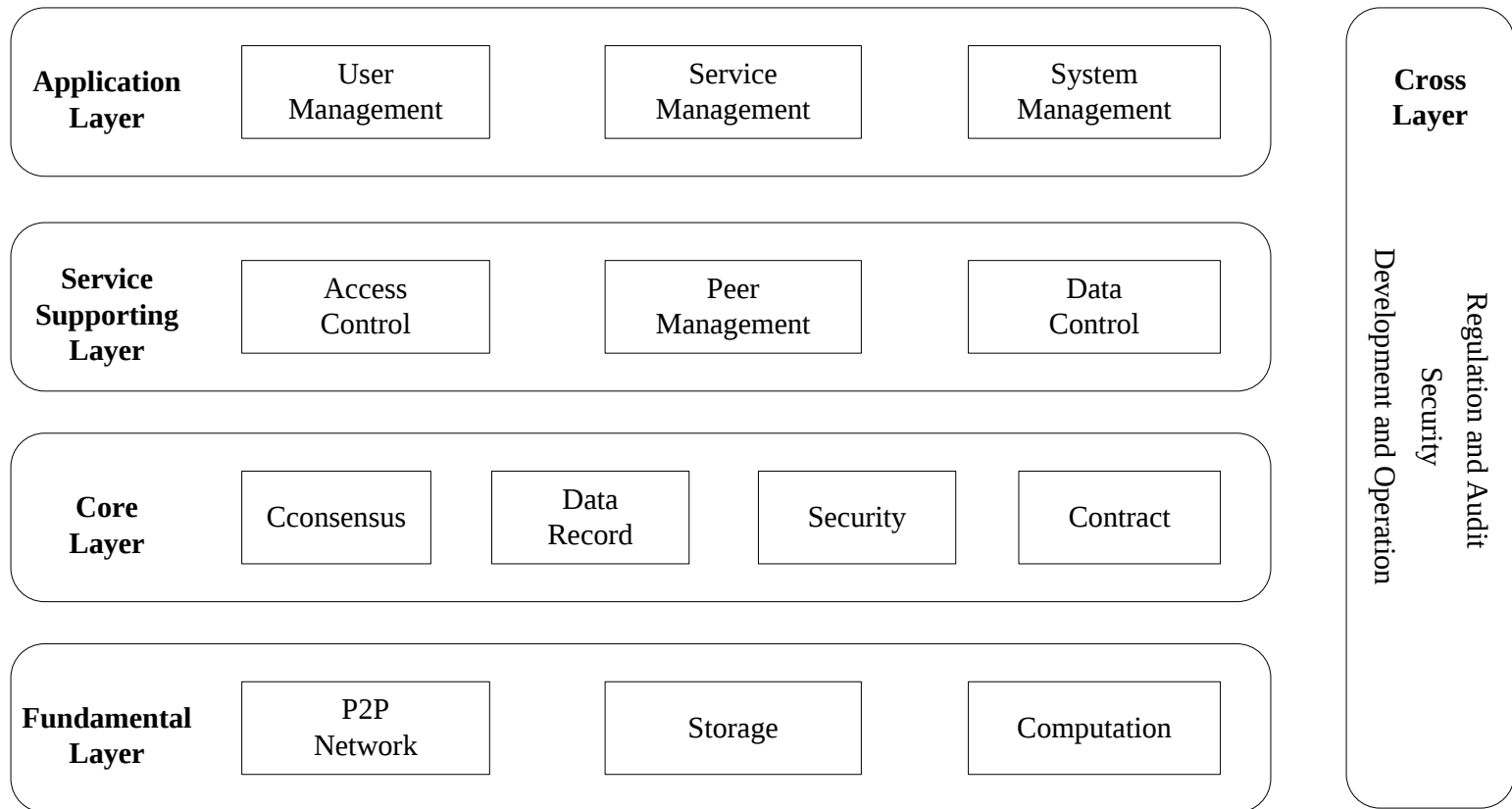
FG-DPM: <https://www.itu.int/en/ITU-T/focusgroups/dpm/Pages/default.aspx>

Deliverables on Blockchain in FG-DPM

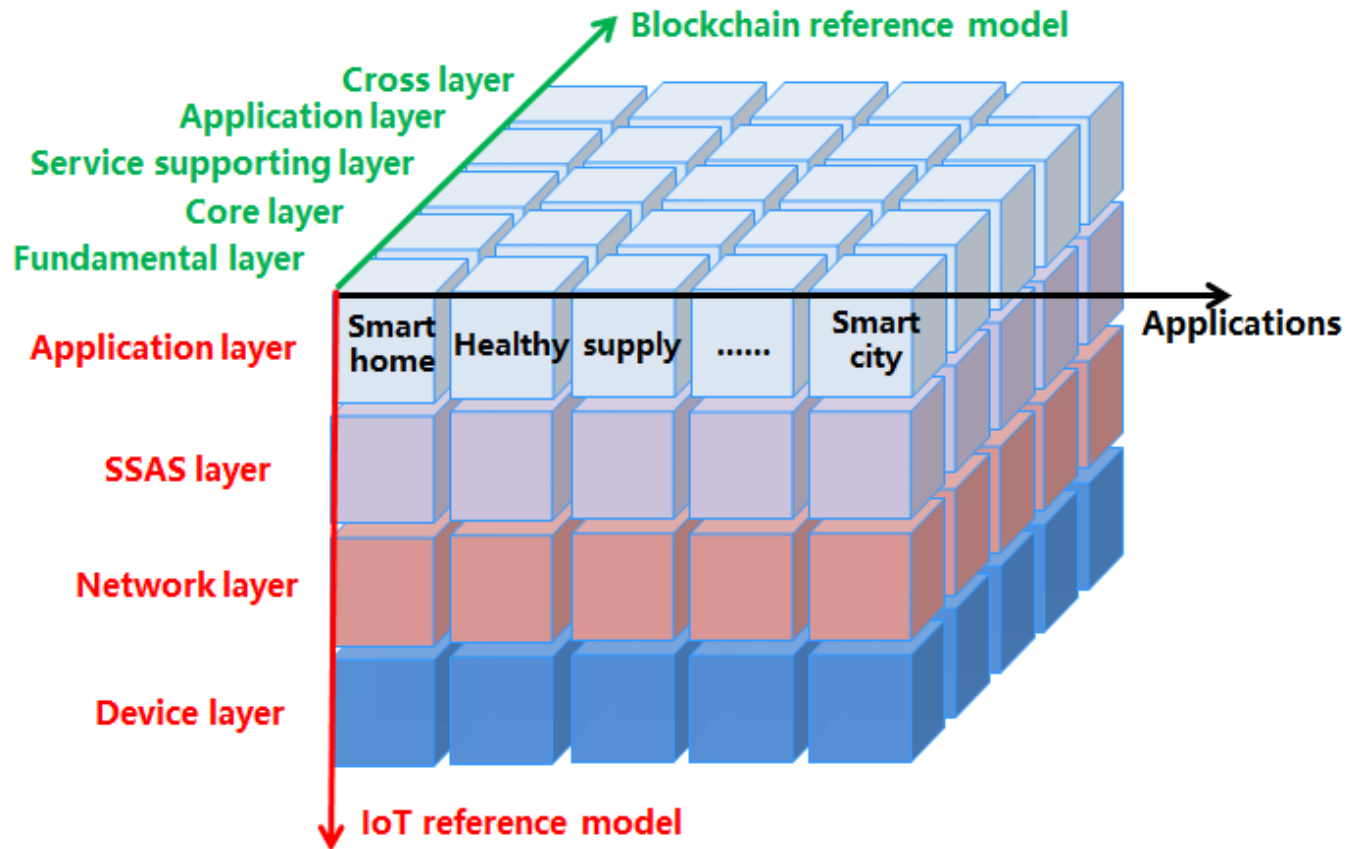
- **WG3: Data sharing, Interoperability and Blockchain**

D3.5 Overview of IoT and Blockchain	• Provide blockchain overview including basic concepts, key characteristics, various models • Analyze blockchain as a decentralized database solution • Analyze key benefits of using blockchain for IoT in terms of accelerating transaction, reducing costs and building trust • Specify roles of blockchain technique in DPM for IoT and SC&C applications
D3.6 Blockchain-based Data Exchange and Sharing Technology	• Identify roles and considerations of blockchain in data exchange and sharing • Identify challenges for blockchain-based data exchange and sharing • Present blockchain operations to support resilience, sharing, and auditable protection of IoT data • Demonstrate how blockchain can change the future of IoT in relation to device identity and data integrity
D3.7 Using blockchain to improve data management	• Identify roles and considerations of blockchain in data management • Identify challenges of blockchain technique to improve data management • Provide detailed operations of blockchain in data management perspectives • Analyze blockchain in the public sector's data management of data as a public good ✓ Case study – blockchain in smart cities • Analyze blockchain in the industry's data management of data as a source of competitive advantage ✓ Case study – blockchain in industrial applications

A common reference model of the Blockchain

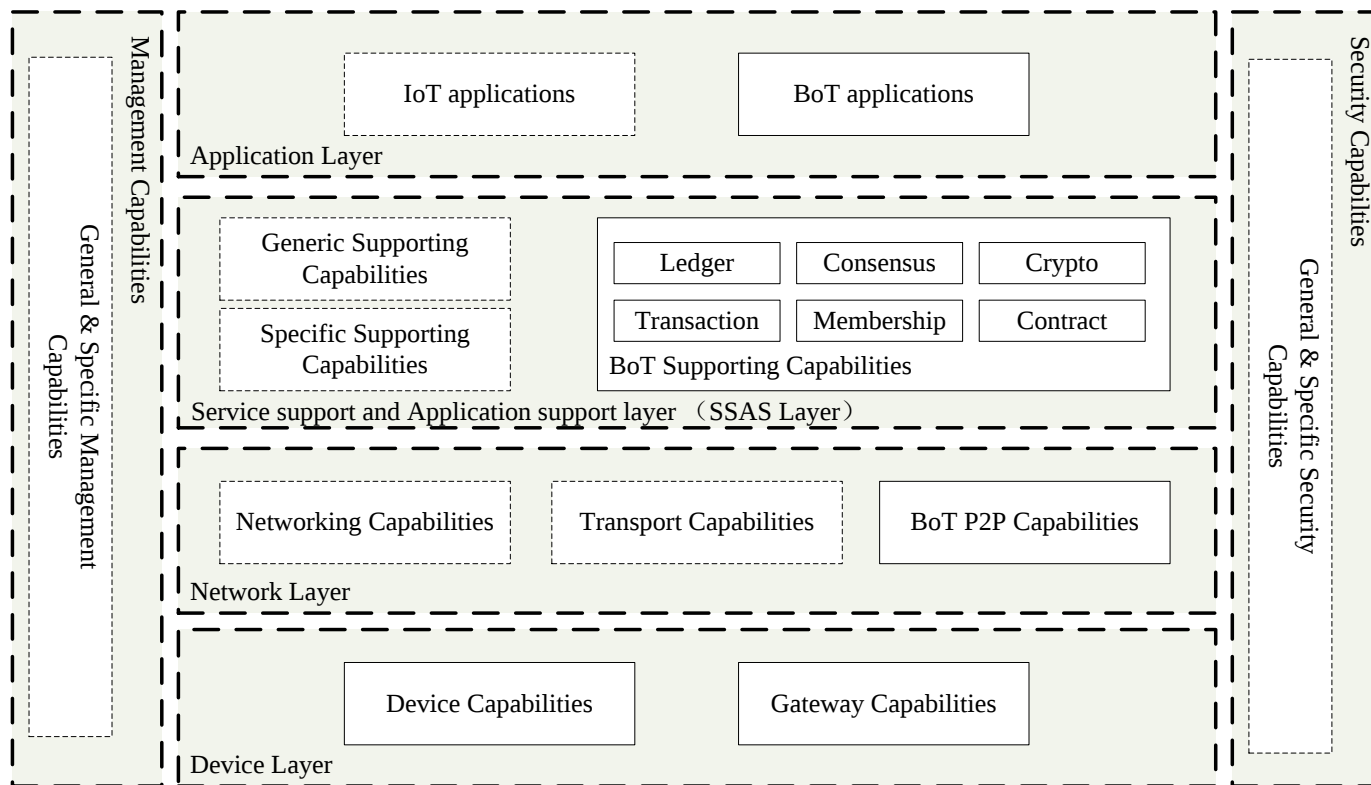


Convergence of the Blockchain and IoT/SC&C



SG20 – Y.IoT-BoT-fw

- Blockchain of Things as decentralized service platform

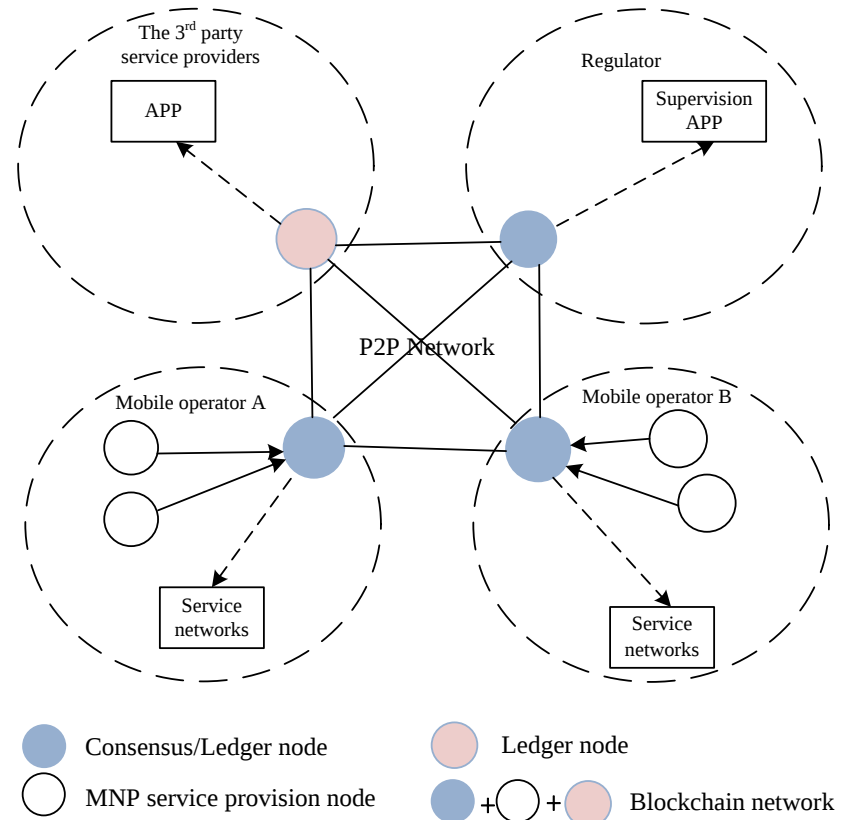


Legends:

SG13 – Y.NGNe-BC-reqts

- **Blockchain in NGNe**

- Scenarios and use cases of blockchain in the next generation network evolution
- Characteristics and high-level requirements of the blockchain in the next generation network evolution based on the scenarios and use cases
- General framework and capability requirements of the blockchain in the next generation network evolution



SG13-C361, November 2017

SG17 – Q14/17

- **A new Question Q14/17 – “Security aspects for Distributed Ledger Technologies”**
 - X.sradlt, Security architecture for Distributed Ledger Technology
 - X.strdlt, Security threats and requirements for digital payment services based on distributed ledger technology
 - X.sct-dlt, Security capabilities and threats of Distributed Ledger Technology
 - X.ss-dlt, Security Services based on Distributed Ledger Technology
 - X.dltsec, Privacy and security considerations for using DLT data in Identity Management
 - X.sadlt, Security assurance for Distributed Ledger Technology
 - X.stov, Security threats to online voting using distributed ledger technology

Conclusion

- **Trust** is the **oxygen**
- **data** is safe and it is properly treated



Internet of Value



The world's most valuable resource is no longer oil, but data

The data economy demands a new approach to antitrust rules



May 2017



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