



인터넷 거버넌스포럼은 인터넷과 관련한 공공정책 이슈를 토론하고 촉진하는 글로벌 멀티스테이크 홀더 (multistakeholder)의 플랫폼입니다.

2017 KrIGF

한국인터넷거버넌스포럼

The 6th Korea Internet Governance Forum(KrIGF)

2017.9.15(금), 09:00~18:30

세종대학교 광개토관 컨벤션센터

Kr-IGF 한국 인터넷거버넌스포럼

SOUTH KOREA INTERNET GOVERNANCE FORUM

[워크숍 5]

**블록체인 패러다임 :
정보 보안 &
제도적 거버넌스**



최은창 패널 소개

프리인터넷 프로젝트 펠로우

- 예일대 로스쿨 정보사회 프로젝트(ISP) 펠로우
- 옥스퍼드대 비교 미디어법 프로그램(PCMLP) 방문학자
- 고려대 국제대학원 강사, 이화여대 경영학과 강사
- 하버드 로스쿨 Internet Law Program
- 제네바 대학교-듀크 로스쿨 Transnational Law 연구소
- Yale-MIT- Harvard Cyberscholar Working Group
- 예일대 로스쿨 석사(LLM) 졸, 서울대 법대 박사 수료
- [저서] <네트워크의 부(Wealth of Networks)> 번역서
- <레이어 모델(Layered Model) 저서
- <사물인터넷이 바꾸는 세상> 번역서



김종승 패널 소개

SK텔레콤 Blockchain TF팀장

- 전 KT 미래융합사업추진실 IoT전략팀장
- 전 KT 온라인사업팀 스마트인터넷기획팀장
- 전 삼일PriceWaterhouseCoopers 컨설턴트

[저서]

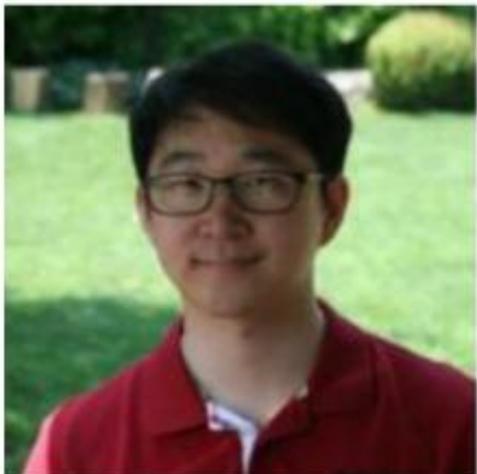
- <온디맨드 IoT>, 동아비즈니스리뷰 기고 (2015.9월)
- <3DPrintonomics>, "동아비즈니스리뷰 기고 (2015.3월)
- "3DPrintonomics, 중앙집권적 생산에서 '장인의 부활'로"
- <앱경영 시대가 온다(공저)>, 한국경제신문 (2010.12월)



민경식 패널 소개

한국인터넷진흥원
블록체인확산팀, 팀장

- 한국인터넷진흥원 (KISA) 연구위원 (비금융권 산업군의 블록체인 확산 로드맵 수립, 블록체인 기술 표준화 작업)
- 한국인터넷진흥원 (KISA) 정책기획팀, 전략개발팀, 국제회의지원팀장 등 역임
- 일본 메이지(明治)대 경제학 박사
- 성균관대학교 경제학부 박사 후 연구원
- 일본 Hyper Network 사회연구소, 연구원
- [저서]
“스마트 위험사회가 온다” (2012)



김경곤 패널 소개

고려대 정보보호융합학과
산학협력 중점교수

- 차세대보안리더양성프로그램(BoB) 컨설팅트랙멘토
- 국회사무처소관사단법인K-BoB Security Forum
- 딜로이트(Deloitte) 안진회계법인Senior Manager
- 언더해커그룹Null@Root 前Chairman & Member
- 국방사이버안보최고전문가과정, 모의침투팀멘토
- 삼일회계법인(PwC) Manager
- SK인포섹, 전임컨설턴트
- A3 Security Consulting 보안컨설턴트

[저서]

- 사이버보안과국가안보전략,
- 데이터베이스해킹& 보안완벽가이드,
- 웹해킹& 보안완벽가이드, 정보보호개론과실습 등등



박성준 패널 소개

동국대 국제정보보호대학원
블록체인연구센터 센터장

- 동국대학교 산학협력단 연구초빙교수(암호학 및 블록체인)
- 한국정보통신기술협회(TTA) 블록체인 분야 국가표준 전문위원회
- 과기정통부 블록체인오픈포럼 기술개발/정보보호 분과 분과장
- 국가보안기술연구소(NSRI) 블록체인미래과제 전문자문단
- (주)비씨큐어 대표이사
- 전 한국인터넷진흥원(KISA) 기반기술팀장
- 전 국가보안기술연구소(NSRI) 선임연구원
- 행정자치부 지능형 정부 중기계획 수립 과제반 전문위원(블록체인)
- 2016년 미래창조과학부 블록체인 국가로드맵 실무위원
- 전자서명법(Digital Signature Act) 제정 기술책임자(KISA)
- 국내 / 국제 표준암호알고리즘 SEED 개발 총책임자(KISA)

ITU → WSIS (2005) → IGF (2006)



[home](#) | [français](#) | [español](#)

- general information
- first phase: Geneva
- second phase: Tunis
- WSIS implementation
- WSIS follow-up
- WSIS+10 Review Process
- newsroom

WSIS Implementation

WSIS+10 Statement on
Implementation of WSIS
Outcomes



WSIS IMPLEMENTATION MECHANISM

Internet Governance Forum

The Tunis Agenda for the Information Society invited the Secretary-General of United Nations to convene a **new forum** the **Internet Governance Forum (IGF)** (para 67).

- ▶ **IGF official website**
- ▶ **Seventh meeting** of the IGF **New!**, 6-9 November 2012, Baku, Azerbaijan
- ▶ **Sixth meeting** of the IGF, 27-30 September 2011, Nairobi, Kenya
- ▶ **Fifth meeting** of the IGF, 14-17 September 2010, Vilnius, Lithuania
- ▶ **Fourth meeting** of the IGF, 15-18 November 2009, Sharm El Sheikh, Egypt
- ▶ **Third meeting** of the IGF, 3-6 December 2008, Hyderabad, India
- ▶ **Second meeting** of the IGF, 12-15 November 2007, Rio de Janeiro, Brazil
- ▶ **First meeting** of the IGF, 30 October - 2 November 2006, Athens, Greece

IGF FOR PUBLIC POLICY

- 인터넷 거버넌스 포럼(IGF)은 정부, 기업, 시민 사회, 학계, 기술 커뮤니티, 이용자 등 다자간 (multi-stakeholder)의 정책 대화를 위해 만들어진 포럼
- 2005년 국제전기통신연합 (ITU)가 개최한 정보사회세계정상회의(WSSIS)의 결과
- 튀니스 어젠더(Tunis Agenda)의 72항에 따라 2006년 아테네에서 IGF가 처음 개최
- 이후 각 국가 및 지역별로 IGF가 해마다 개최

MULTI-STAKEHOLDERS

2013 에드워드 스노든이 미국 정부에 의한
광범위한 불법 정보수집을 폭로

- 인터넷 관리 권한의 중요성이 부각
- 미국 주도의 인터넷주소관리기구 (ICANN)의
관리 구조를 국제적인 거버넌스 구조로
바꾸자는 논의
- 멀티스테이크홀더 개념이 2014년 넷문디얼
이니셔티브((NMI)이후에 IGF 도입
- ICANN에서 2016년
IANA로 관리권한 이양

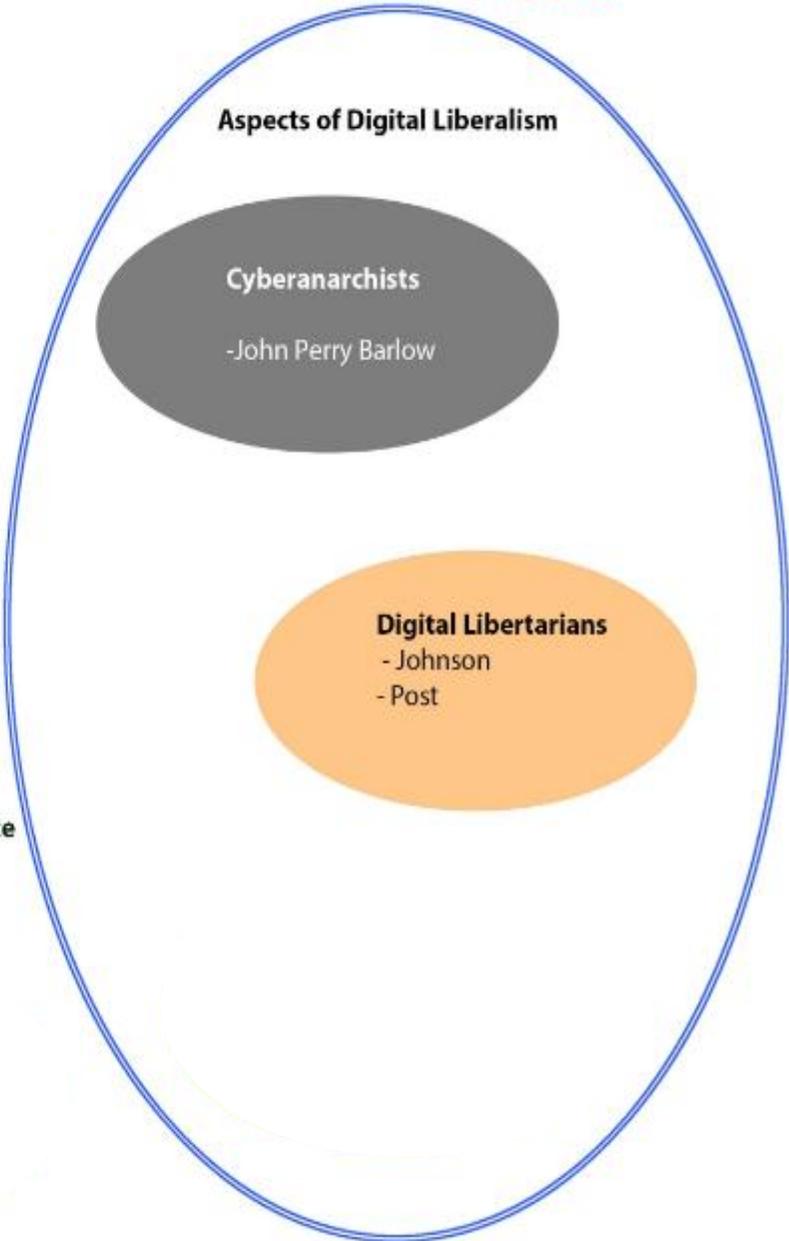
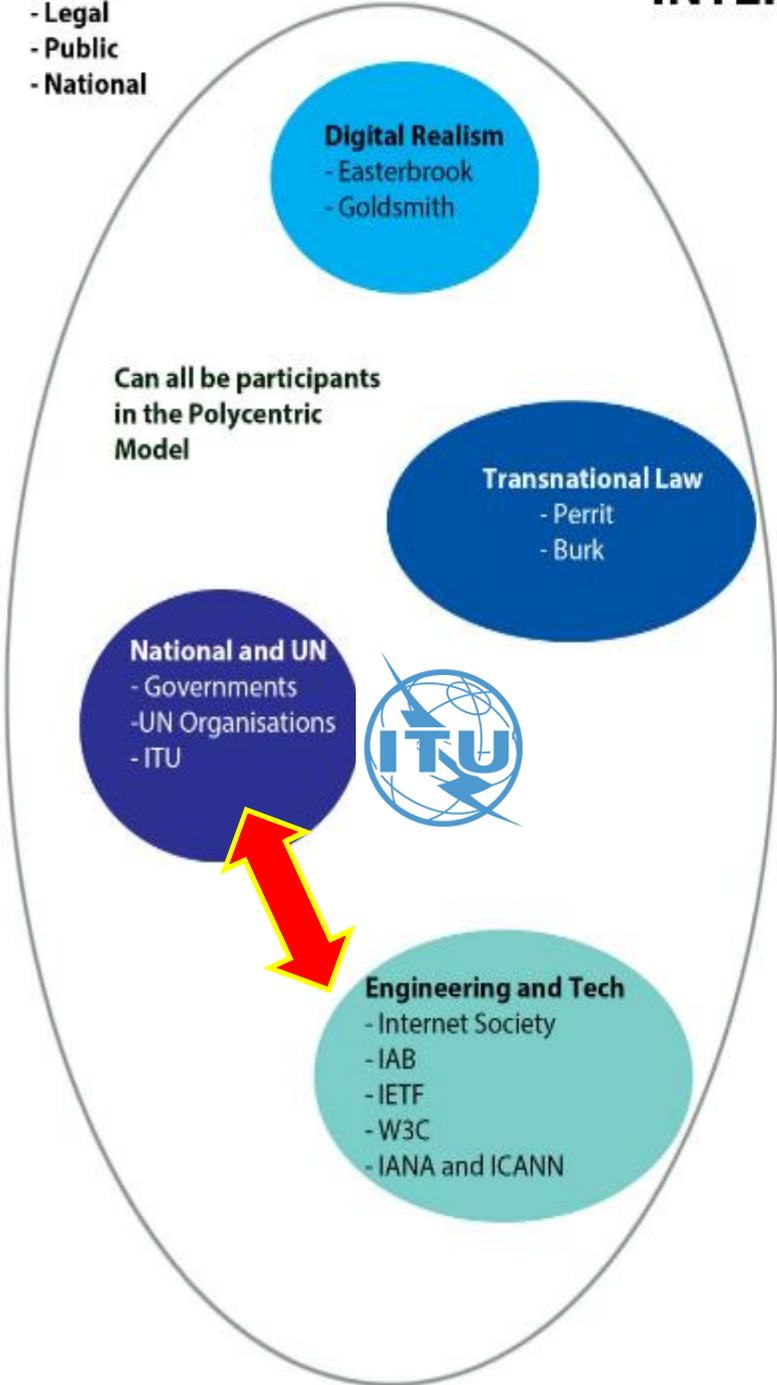




INTERNET GOVERNANCE MODELS

Formal
- Legal
- Public
- National

Informal
- Private
- Global
- Alternative structures
- Technical



Less Formal
- Structured
- Internal Governance
- Participatory
- Multi-stakeholder
- Technical

names of Privates Men of Capt. Jonathan Storons Company of Continental forces on Col. Richard King's Regiment of West Chester County now Stationed in S. Carolina of the United Colonies from the 20th Day of February 1776 to the 15th Day of April following both Days Included

Name	Company	Rank	Month	Day	Days	Days	Days	Days
Jonathan Storons Capt	176	2	6	11	3	4	4	
Joseph Young Lieut	1	1	13	7	1	7	11	8
James Howard Lieut	2	2	22	8	3	9	4	4
James Lowndge Surg	2	6	23	8	3	9	4	4
George James Lieut	2	6	15	7	1	17	24	
Oliver Kellack	2	9	13	6	5	2	14	2
James Karsen	2	3	13	6	6	2	13	3
Edmund Norton	2	1	13	6	2	2	11	2
Capt. William Campbell	1	1	15	6	3	2	12	3
James Wilson	2	1	13	3	4	1	18	1
William Davis	Apr	1	15	2		1	6	1
Robert Merritt	1	1	13	6	1	2	11	5
James M. Smith	March	11	13	5	1	2	1	1
James M. Smith	11	13	5	1	2	1	1	1
Stephen Kellack	6	13	5	5	2	14	2	
David Johnson	Feb	2	13	6	5	1	13	4
James Lowndge	March	18	13	4	1	0	9	4
Harvath Little	Apr	8	13	1	0	1	11	3
John M. Chan	March	14	13	4	1	2	13	10
Ezekiel Eaton	Feb	27	13	6	6	2	13	10
Joseph Williams	27	13	6	6	2	13	11	
Samuel Withers	27	13	6	6	0	7	11	
Nicholas Lewis	Apr	9	13	0		2	11	5
Thomas Brown	March	3	13	6	2	2	11	6
John Springs	2	13	4	1	1	13	4	
Richard White	18	13	4	1	1	13	4	
Hubert Cunningham	2	13	4	1	2	14	2	
Robert Mott	Feb	29	13	6	3	2	12	3
Seth Mott	March	1	13	6	3	2	9	4
James Welch	4	13	6	4	1	2	9	
Andrew Mott	29	13	3	1	1	6	5	
James Mott	24	13	3	1	1	6	5	

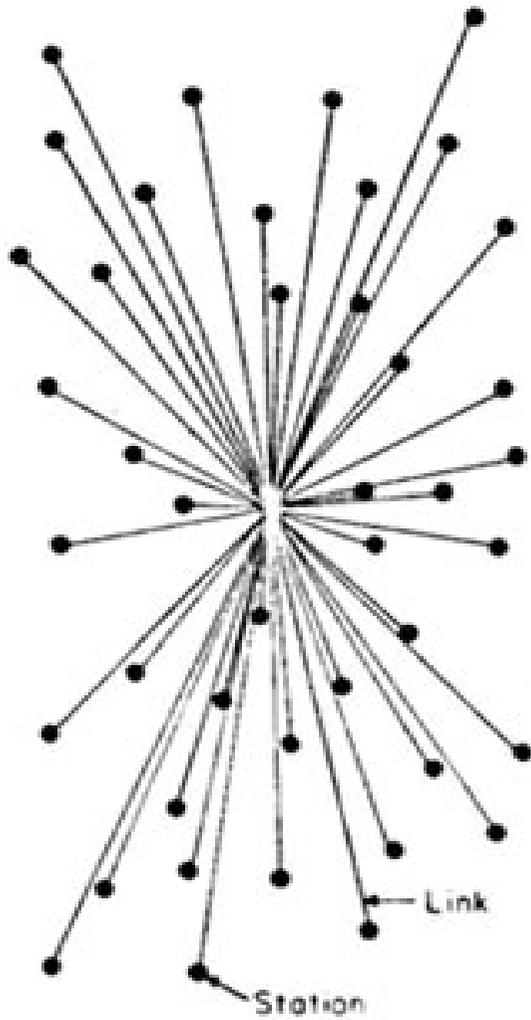
Name	Company	Rank	Month	Day	Days	Days	Days	Days
John Green	Apr	3	15	0	6	8	1	1
John Durrell	March	6	15	0	5	2	1	1
Jonathan Kraft	2	15	6	2				
James M. Smith	11	15	5	1	1	1	1	1
Stephen Lowndge	13	15	4	3				
John Pepper	Apr	8	15	1	1	1	1	1
John Davis	March	18	15	4	1	2	9	4
Stephen Bavel	18	15	6					
Joseph Withers	Apr	8	15	1	1	1	6	5
James M. Smith	March	24	15	3	1	2	6	5
Robert Cunningham	6	15	3	3	2	14	2	
George Young	Feb	25	15	6	3	2	14	2
John Withers	29	15	6	5	2	0	3	8
Nicholas M. Smith	Apr	14	15	0	4	2	3	8
John Withers	March	3	15	5	2	1	3	4
Samuel Scott	25	15	3	1	2	12	7	4
John Rogers	1	15	6	3	2	2	3	4
Matthew Withers	1	15	6	0	2	2	3	4
William Withers	Apr	1	15	1	4	2	1	1
Joseph Williams	March	6	13	5	3	2	1	1
James M. Smith	Feb	28	13	6	6	1	1	1
James M. Smith	Apr	8	13	1	1	1	1	1
Stephen Mott	8	13	1	1	1	1	1	1
James M. Smith	8	13	1	1	1	1	1	1
John Kellack	March	13	10	4	3	1	1	1
James Mott	Apr	6	15	1	2	13	8	4
John Kellack	Apr	1	13	6	3	2	2	4
James Lowndge	March	8	13	4	0	2	2	4
John Johnson	8	13	4	1	2	2	2	4
James Jones	March	6	13	5	3	2	2	4
John M. Smith	Apr	6	13	5	5	1	13	4
William Simpson	18	13	4	0	1	18	4	
William Withers	Apr	1	13	2	1	1	3	6
James Withers	March	3	13	5	3	2	2	4
Stephen Mott	Feb	23	13	5	3	2	2	4
John Mott	March	7	13	5	4	1	1	1
Michael Brown	Apr	1	13	1	3	2	2	4
John Brown	Apr	1	13	1	3	2	2	4
William Withers	Feb	23	13	6	5	1	1	1
James Withers	Apr	1	13	2	1	1	1	1
Jonathan Mott	March	27	13	1	1	1	1	1

92 12 11

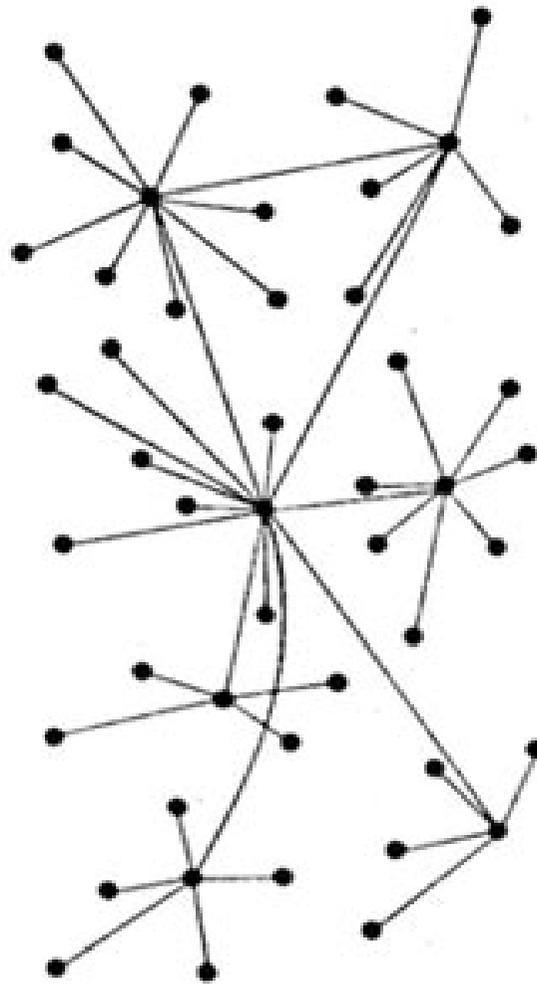
그림 1 블록체인에 기반한 거래과정



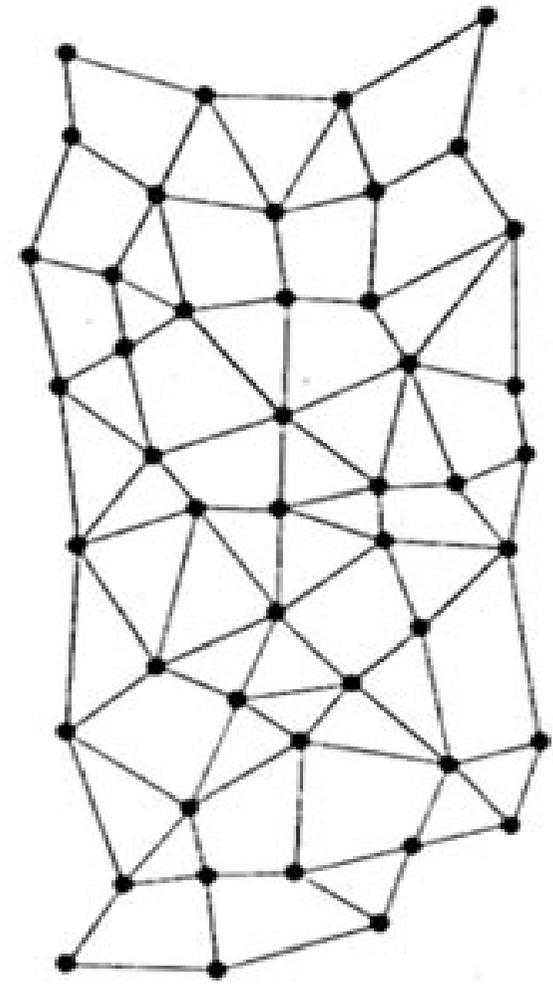
자료: Thomson Reuters(2016.1.16.), 「Blockchain technology: Is 2016 the year of the blockchain?」



CENTRALIZED
(A)



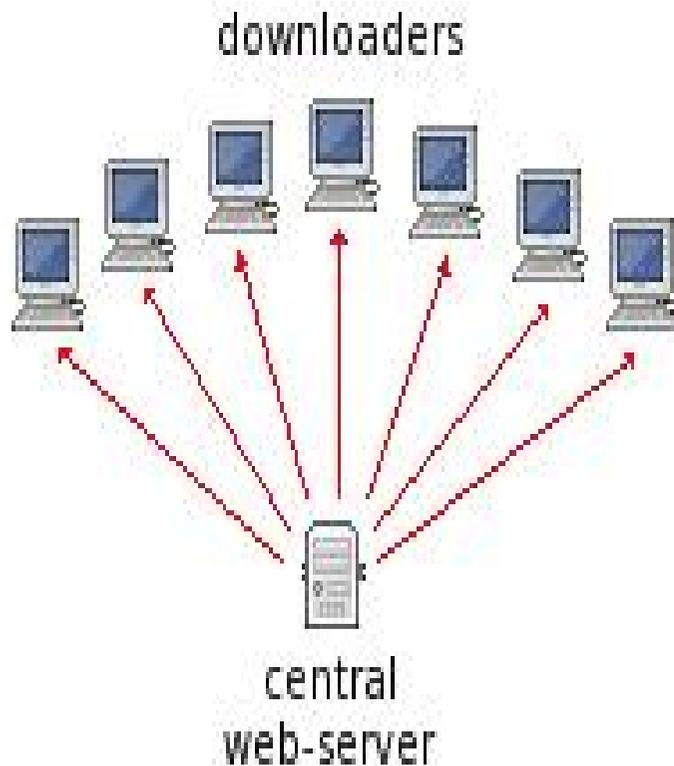
DECENTRALIZED
(B)



DISTRIBUTED
(C)

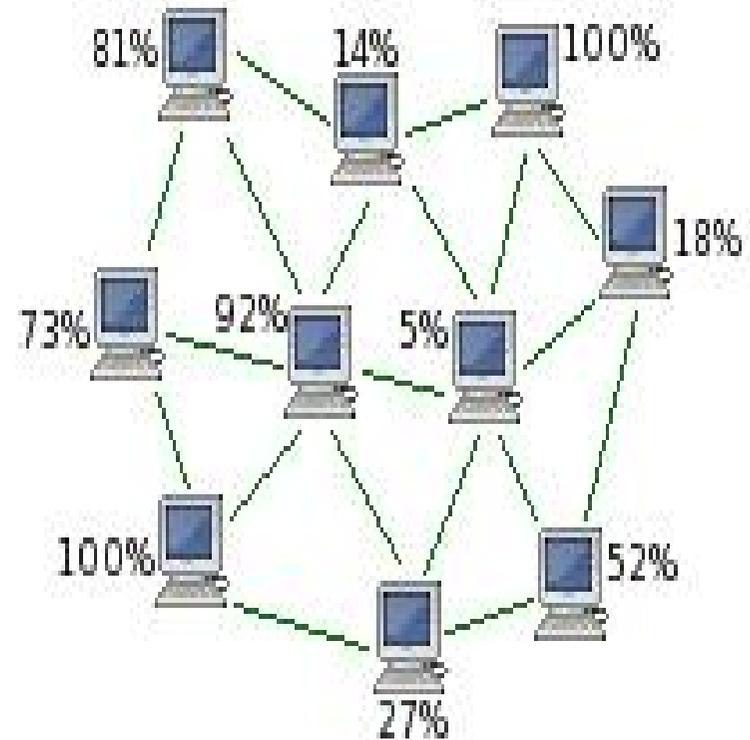
Paul_Baran_1962

Traditional Centralized Downloading



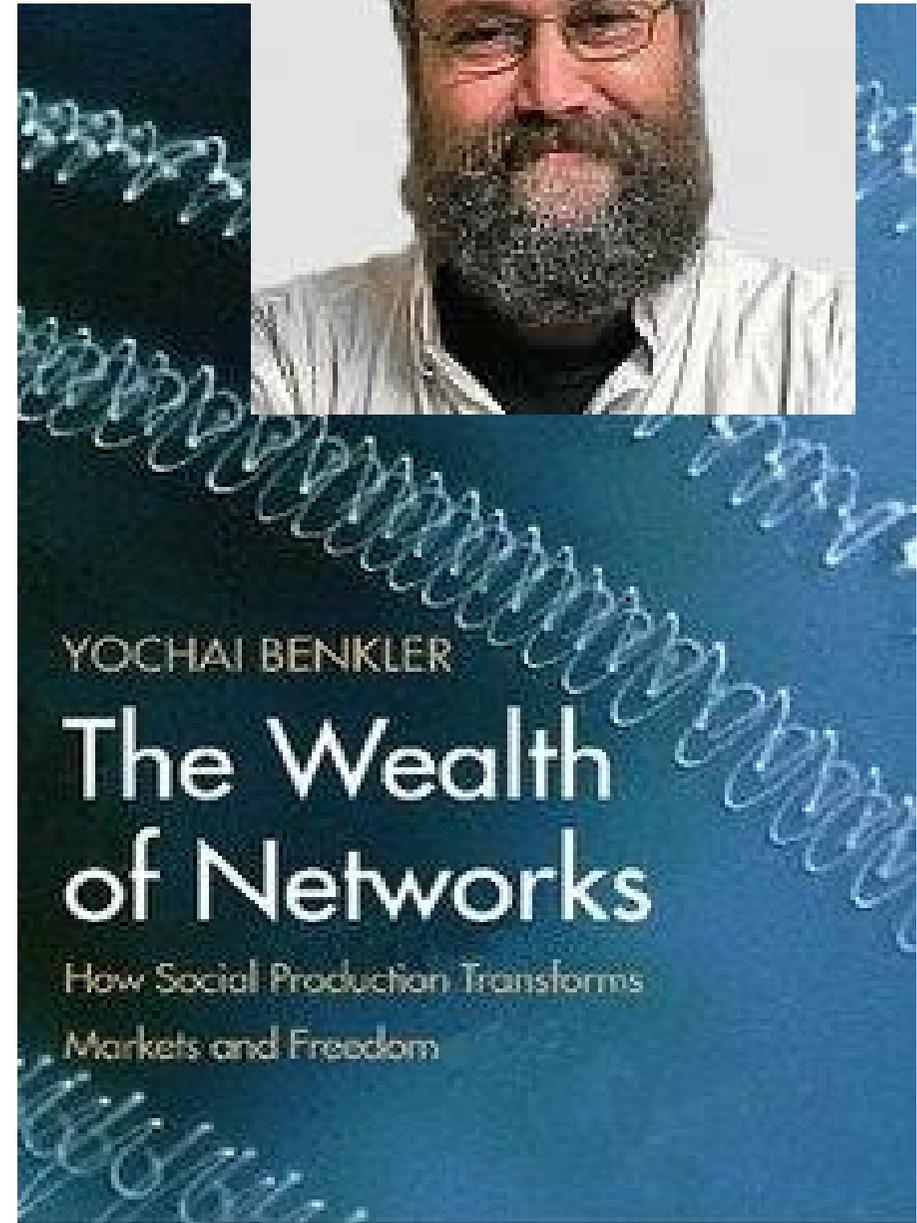
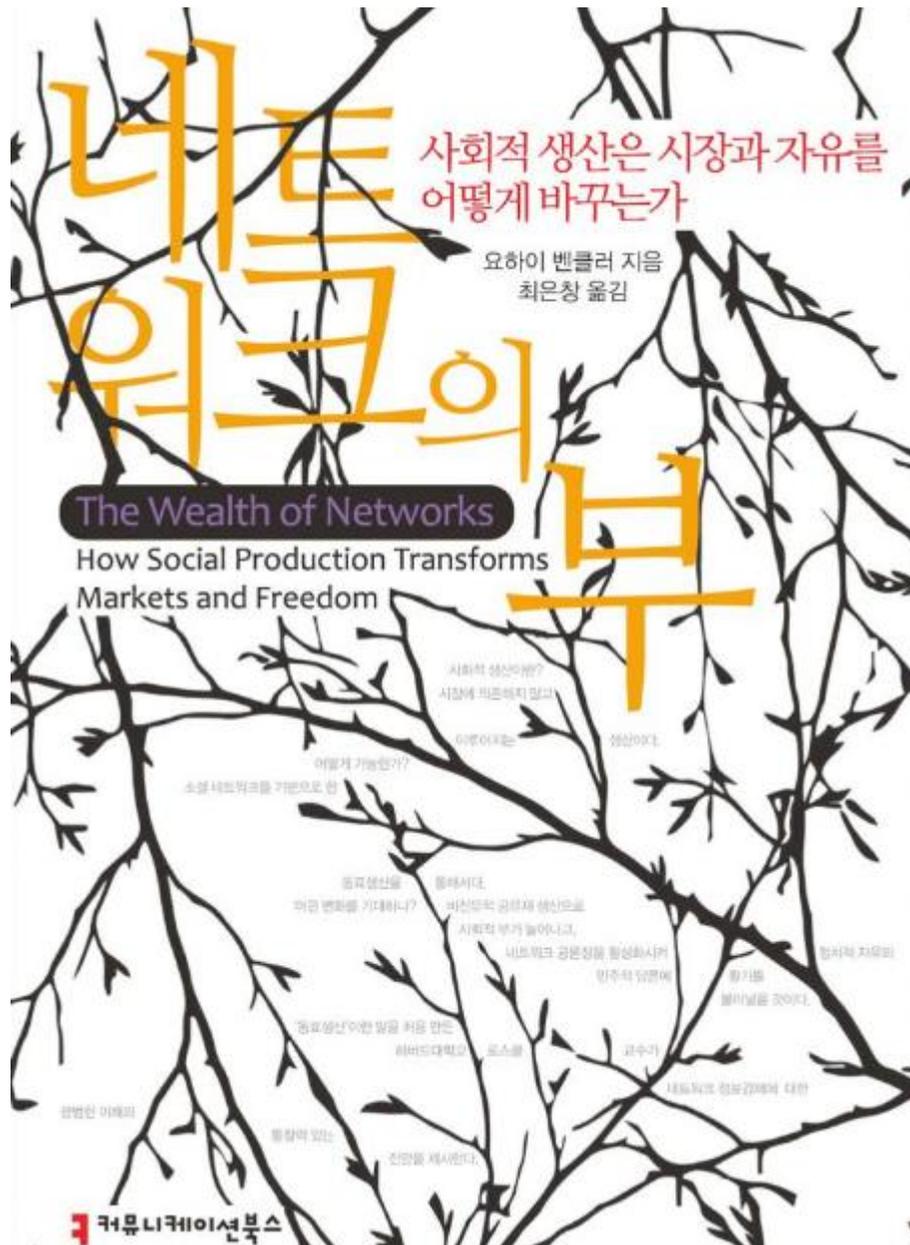
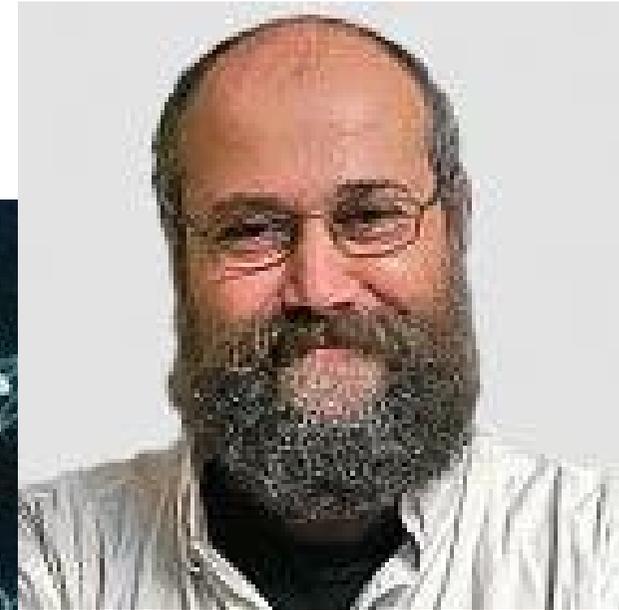
- Slow
- Single point of failure
- High bandwidth usage for server

Decentralized Peer-to-Peer Downloading



- Fast
- No single point of failure
- All downloaders are also uploaders

THE VALUE OF P2P



BLOCKCHAIN PARADIM

- 금융 서비스 분야(거래 수수료 시간 비용 절감 + 감독, 규제 비용 절감)
- 비금융분야 (디지털 정보의 보관, 디지털 인증, 스마트 계약, 물류 추적 관리)
- 4차 산업 혁명의 주요 동력
- Smart Contract의 실현: 거래 비용의 급감
 - 시스템 실패의 경우 누가 나서는가?
 - 책임의 소재는 어디에 있는가?
- 전자정부, 정부공공, 행정 서비스에도 적용
 - 그러나 블록체인의 활성화위한 기술 표준화 및 법제도적 준비가 필요. (블록체인법)

Much more than bitcoin: how blockchain can help the world's poorest people



Connectivity

How Blockchain Can Bring Financial Services to the Poor

A project from the Bill & Melinda Gates Foundation aims to use distributed ledger technology to help the two billion people worldwide who lack bank accounts.

by Elizabeth Woyke April 18, 2017



Two billion people worldwide don't have bank accounts and must conduct their transactions in cash—which can be difficult to manage and presents safety issues. Could blockchain, the technology underlying the digital currency Bitcoin, give them access to financial services? The Bill & Melinda Gates Foundation thinks so, and it is modifying blockchain.

KEY QUESTIONS

- 블록체인의 활용은 금융영역 + 비금융영역 존재
- 블록체인의 활용 사례 : 사물인터넷, 빅데이터, 물류, 인증, 스마트 계약과의 관계?
- 현재의 인터넷 보안, 인증 시스템에 블록체인이 미치는 변화와 영향력 전망?
- 블록체인은 해킹되지 않고 안전한가? (엔드포인트 보안, DDoS, 제로데이 취약점, DAO 사건)
- 블록체인 기술 표준화의 방향?
- 블록체인 패러다임이란 무엇인가?
- 블록체인에 적합한 제도적 거버넌스, 법제도의 변화 방향은?

BLOCKCHAIN

SECURITY

(정보보안, 사이버 보안)

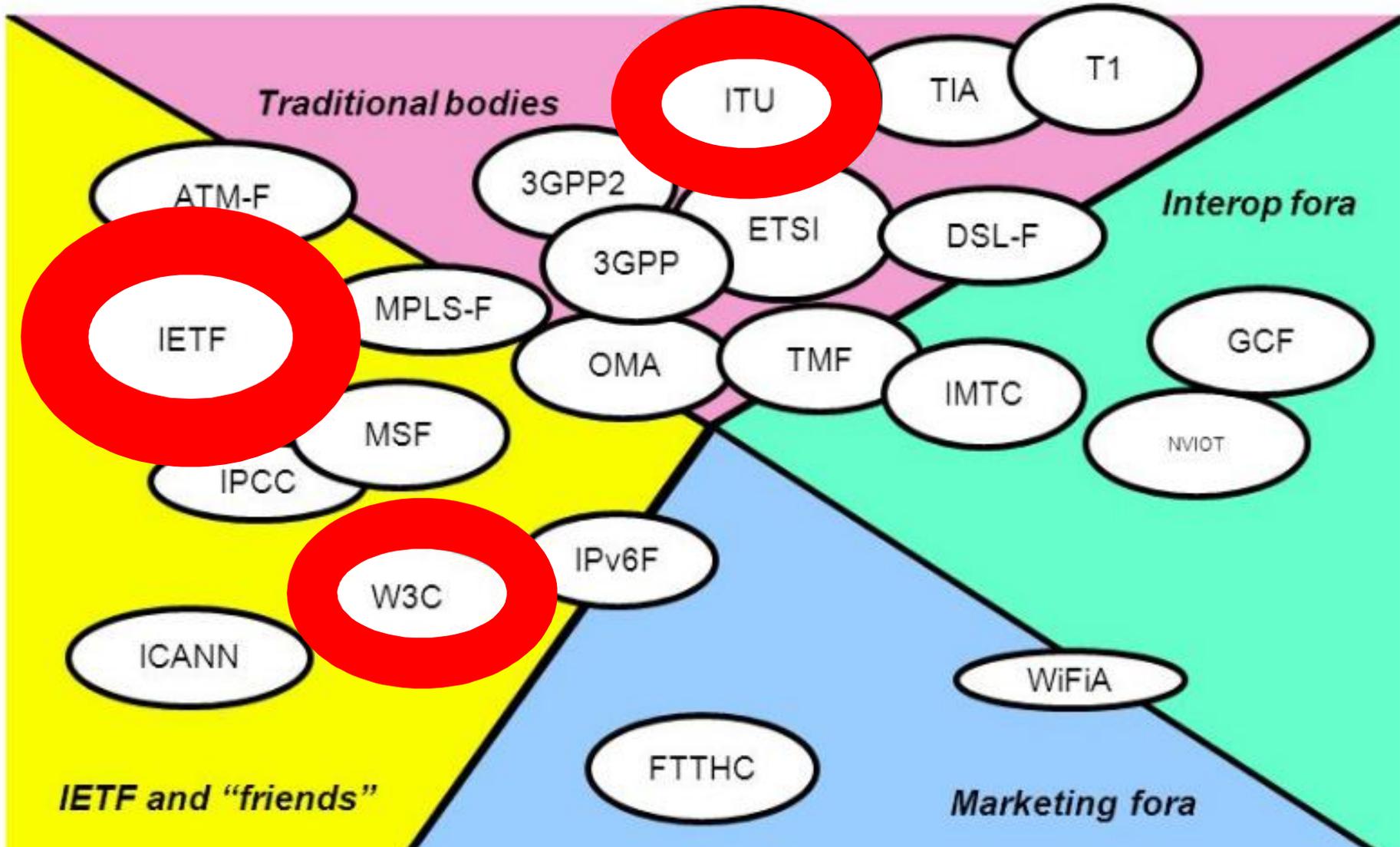
STANDARDIZATION

(블록체인 기술표준)

GOVERNANCE

(새로운 법제도,
신뢰기관의 불필요?)

STANDARDIZATION



SECURITY CONCERN

Harvard
Business
Review

TECHNOLOGY

How Safe Are Blockchains? It Depends.

by Allison Berke

MARCH 07, 2017

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Resources

Regional Presence



ITU workshop on "Security Aspects of Blockchain"

Workshop on Security Aspects of Blockchain

Hosted at ITU
Geneva, 21 March 2017





Blockchains and the Web

A W3C Workshop on Distributed Ledgers on the Web

29–30 June 2016, MIT Media Lab, Cambridge, Massachusetts

Report	Intro	How to Participate	Logistics	Program Committee
------------------------	-----------------------	------------------------------------	---------------------------	-----------------------------------

Many projects and companies are looking at ways to use the Bitcoin blockchain or other public or private distributed ledgers, to record an immutable timestamped public record that can be independently verified by any stakeholder.

What does this mean for Web technologies, beyond payments? What emerging capabilities could blockchains enable for the Web, such as distributed identity management? Conversely, should features be added to the Web Platform and to browsers to enable blockchain use cases, such as a JavaScript blockchain API to write to blockchain nodes? With the proliferation of different approaches and technology stacks (like Bitcoin, Ethereum, and Hyperledger), is there a need for interchange formats, protocols, or APIs to share transaction data across services and stacks or between public and private networks? What will help Web developers to take advantage of blockchains?

When we talk about blockchains as “part of the Web”, we face some specific questions: How does this fit into the [same origin](#) security model of the Web? What are the privacy implications, especially when talking about identity management? What part of the Web stack would be involved: client-side, server-side, protocols, interchange formats? What is the relationship to payments, including W3C's [Web Payments](#)

INTERNET GOVERNANCE

인터넷 거버넌스의 대상

콘텐츠층 Content Layer	<ul style="list-style-type: none">• Cybercrime• Intellectual Property Rights
논리층 Logical Layer	<ul style="list-style-type: none">• Standards• Domain Name System• IP Allocation and Numbering
인프라층 Infrastructure Layer	<ul style="list-style-type: none">• 상호접속• Universal Access• Next Generation Pathways

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[Instructions](#)

[List](#)

[Resource Persons](#)

The Internet Governance Forum

Dynamic Coalition on Blockchain Technologies

[Introduction](#)

[Action Plan](#)

[Stakeholders](#)

[Mailing List](#)

[Reports](#)

[Contacts](#)

Action Plan

The goal of the Dynamic Coalition will be to educate, inform and disseminate information on current trends and policy developments with blockchain development and regulation. Ultimately, the Dynamic Coalition will attempt to elaborate a "model framework" on blockchain technologies, including: (1) application of existing legal and oversight regimes to financial applications of blockchain; (2) smart contracts self-executing transactions and interactions between humans and machines or between multiple entities which are automatically enforce underlying code of the technology; and (3) decentralized autonomous organizations that offer new forms of participatory governance and activity. Critically, the Dynamic Coalition seeks to create model rules consistent with international law standards and that could potential different jurisdictions worldwide.

The purpose of this Dynamic Coalition is, therefore, to provide a global discussion arena aimed at scrutinising the various nuanced blockchain technologies so as to ultimately contribute to the elaboration of best practices, policies and regulations.

To do so, the Dynamic Coalition on Blockchain will provide a common platform involving a large variety of stakeholders in a joint blockchain debate. Beyond the website (<http://www.coala.global>) which will provide the basic information on the work done by the Dynamic Coalition (e.g., content from workshops and conference, articles, publications or blog posts drafted by individual members of the coalition, output from working groups), a mailing list will allow all members of the Dynamic Coalition to discuss these issues in an interactive fashion.

Dynamic Coalition on Blockchain Technologies

= **model framework on blockchain technologies**

- (1) application of existing legal and oversight regimes to financial applications of blockchain;
- (2) smart contracts or selfexecuting transactions and interactions between humans and machines
- (3) decentralized autonomous organizations

INTERNET GOVERNANCE

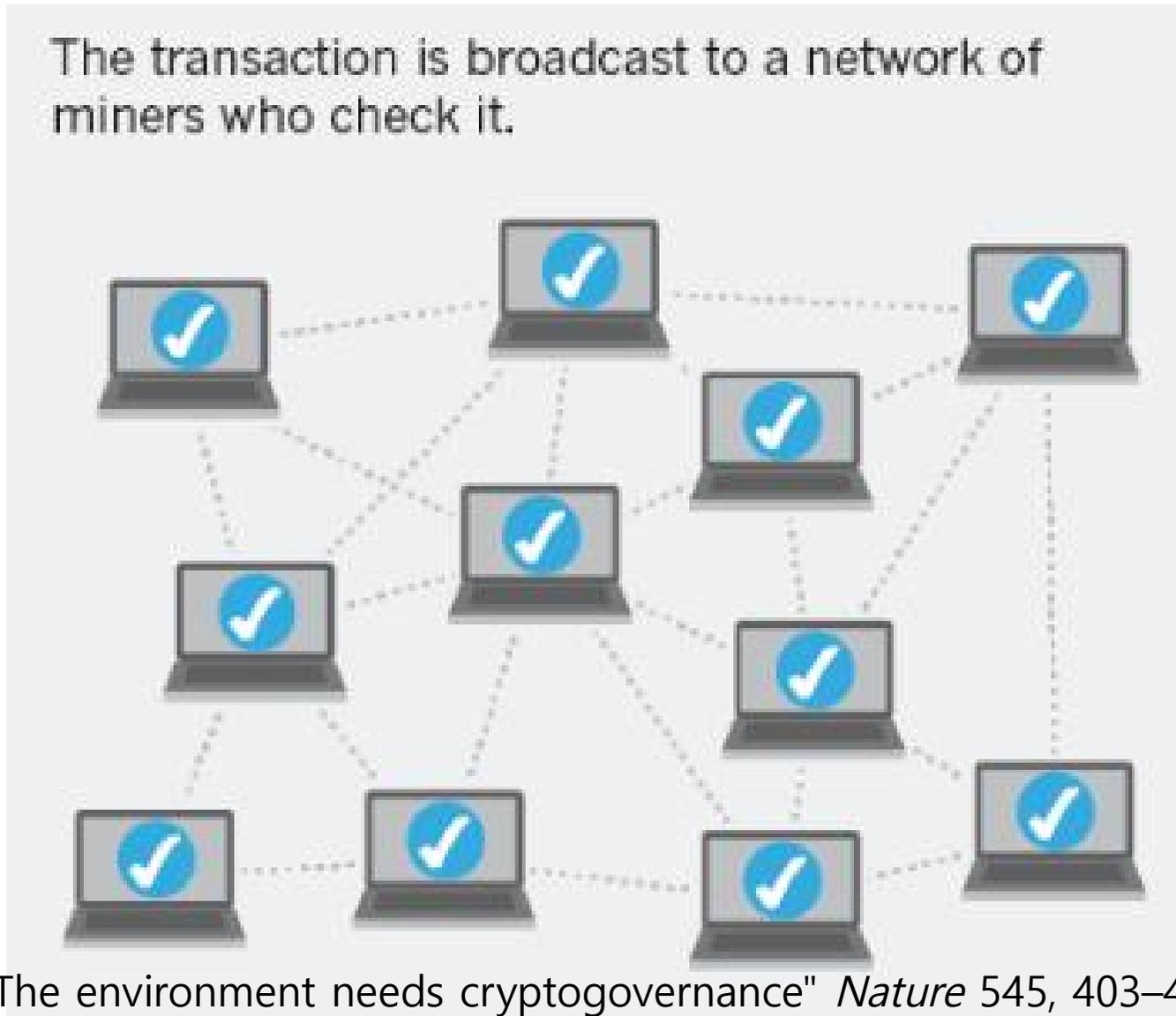
TCP/IP 프로토콜 슈트	제공자	규범적 분류와 영역	지배원리
	콘텐츠 제작자	콘텐츠 레이어 (상표권, 저작권, 데이터베이스 보호, 전자상거래 사기)	<ul style="list-style-type: none"> · 저작권법, 상표법, · 공정이용(fair use) · 온라인 서비스의 제공자(OSP) 법적 책임
응용 레이어(FTP, SMTP, HTTP, Telnet, DNS, RIP, SNMP 등)	애플리케이션 제작자	논리적 레이어 (웹 표준, 웹브라우저, HTML5, 운영체제, 프리·오픈 소프트웨어, 소프트웨어 특허, P2P, 저작권 관리 기술 DRM, 도메인 네임)	<ul style="list-style-type: none"> · 표준화(W3C, IETF) · 단대단(end-to-end) 원칙 · 망 중립성(유선, 무선) · 플랫폼 중립성
전송 레이어(UDP, TCP)	인터넷 서비스 제공자 (ISP)		
인터넷 레이어 (인터넷 프로토콜, IPv6, VoIP, ICMP 등)			
네트워크 액세스 레이어(주파수, DSL, 광랜, 케이블, FTTH, HFC, DOCSIS 등)	물리적 인프라 소유자	물리적 레이어 (트래픽에 대한 통제, 정책 라우터, 미들마일, 라스트마일)	<ul style="list-style-type: none"> · 재산권 보장 · 기술 표준화, · 커먼 캐리어 규제 · 망 개방, 상호 접속

BLOCKCHAIN GOVERNANCE

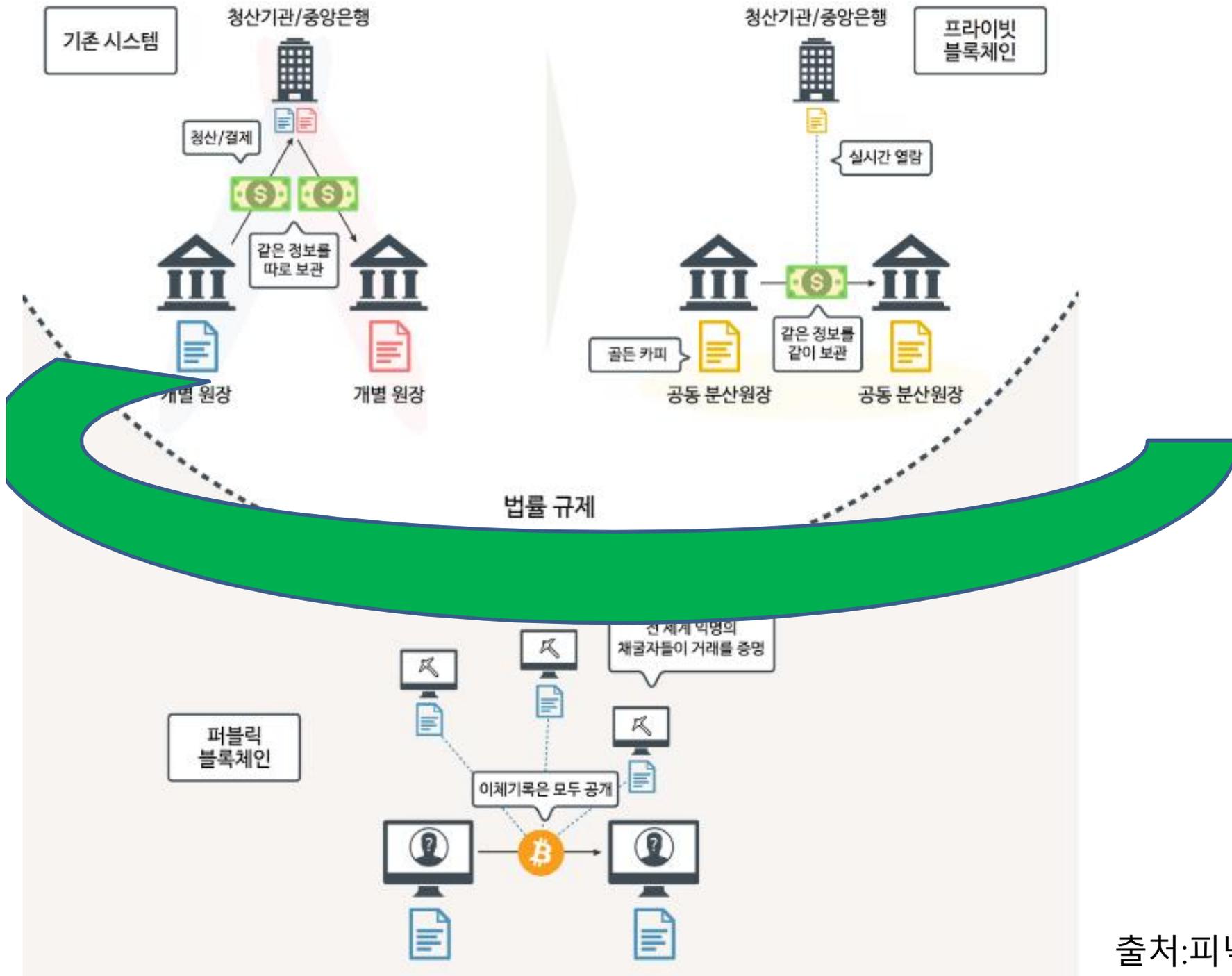


출처: "The environment needs cryptogovernance" *Nature* 545, 403–405 (25 May 2017)

BLOCKCHAIN GOVERNANCE



출처: "The environment needs cryptogovernance" *Nature* 545, 403–405 (25 May 2017)



출처: 피넥터

SMART CONTRACTS

- DAO= Decentralized Autonomous Organization

Smart contracts – simple to complex

