BLOCKCHAIN:
Opportunities and Challenges in Healthcare

Jody Ranck, DrPH
Consulting Analyst

CHILMARK RESEARCH

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#ChilmarkBlockchain

CORE BELIEFS AT CHILMARK

Our team is united by a core belief that effective deployment and use of IT is essential to modernizing care delivery and ultimately improving the patient journey. We monitor trends and developments in the industry with a focus on those technologies that will be transformational to healthcare delivery.

We provide comprehensive, objective, high quality research for busy executives. It's our way to help create a more informed, future-ready market of products and customers.

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TODAY'S PRESENTERS

JODY RANCK, DRPH

Consulting Analyst, Chilmark Research
Co-chair, Healthcare Blockchain Summit

JOHN HALAMKA, MD

International Healthcare Innovation Professor
Harvard University, School of Medicine

VINCE KURAITIS, JD

Principal, Better Health Technologies, LLC

30 years healthcare experience across 150+ organizations

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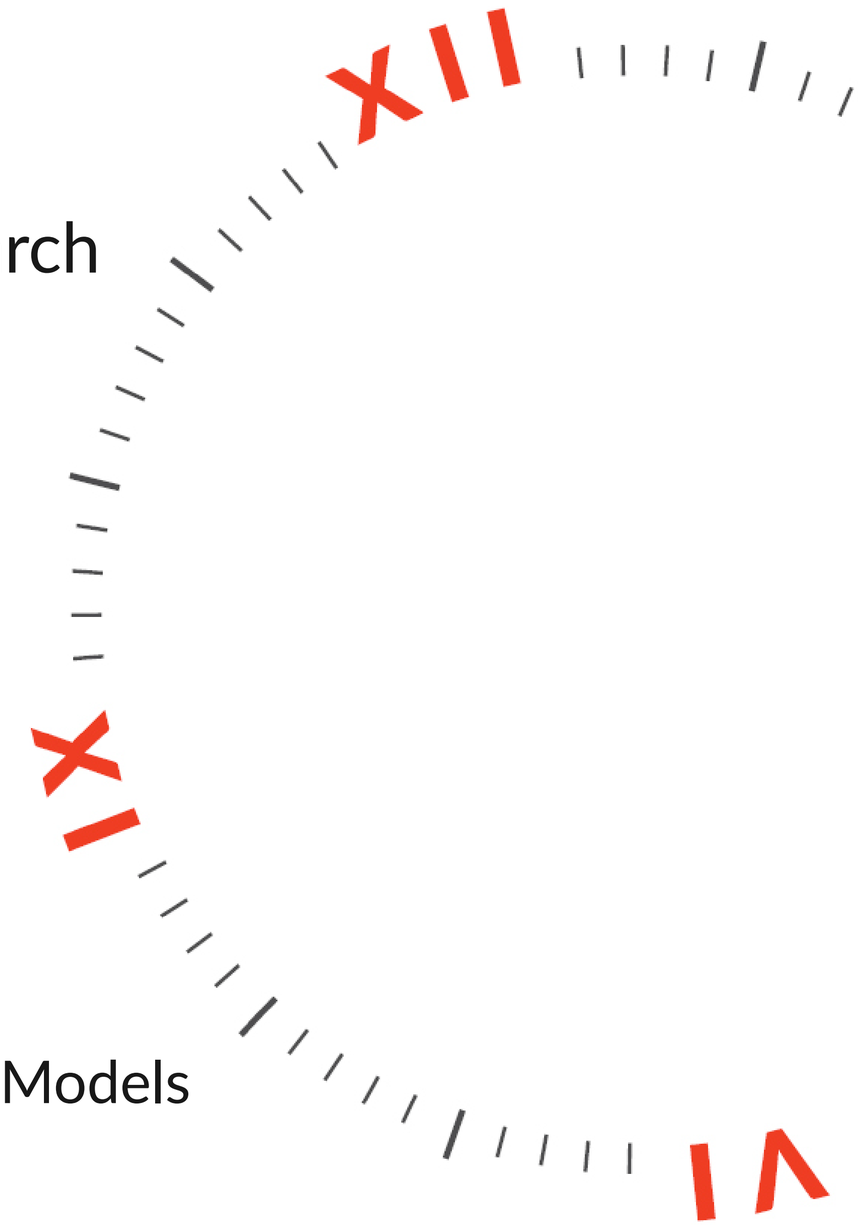
AGENDA

- Blockchain Healthcare Report from Chilmark Research
- Why Blockchain Now?
- Healthcare use cases for Payers/Providers
- Overview of Vendors
- What does the Future Hold?
- Panelist Presentations:
  - John Halamka: A Blockchain Primer with Use Cases
  - Vince Kuraitis: Lay-of-the-Land for 21st Century Business Models



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CHILMARK REPORT

BLOCKCHAIN

OPPORTUNITIES AND CHALLENGES IN HEALTHCARE

LEARN MORE

WHY BLOCKCHAIN NOW?

- Fintech and beyond
- Cryptocurrency speculation and ICOs
- Rapid growth in startup activity
- Payer and Government interest is growing
- ONC White Paper Challenge (2016), Trust Framework
- 2017-18 growth in ICOs
- Major platforms are investing

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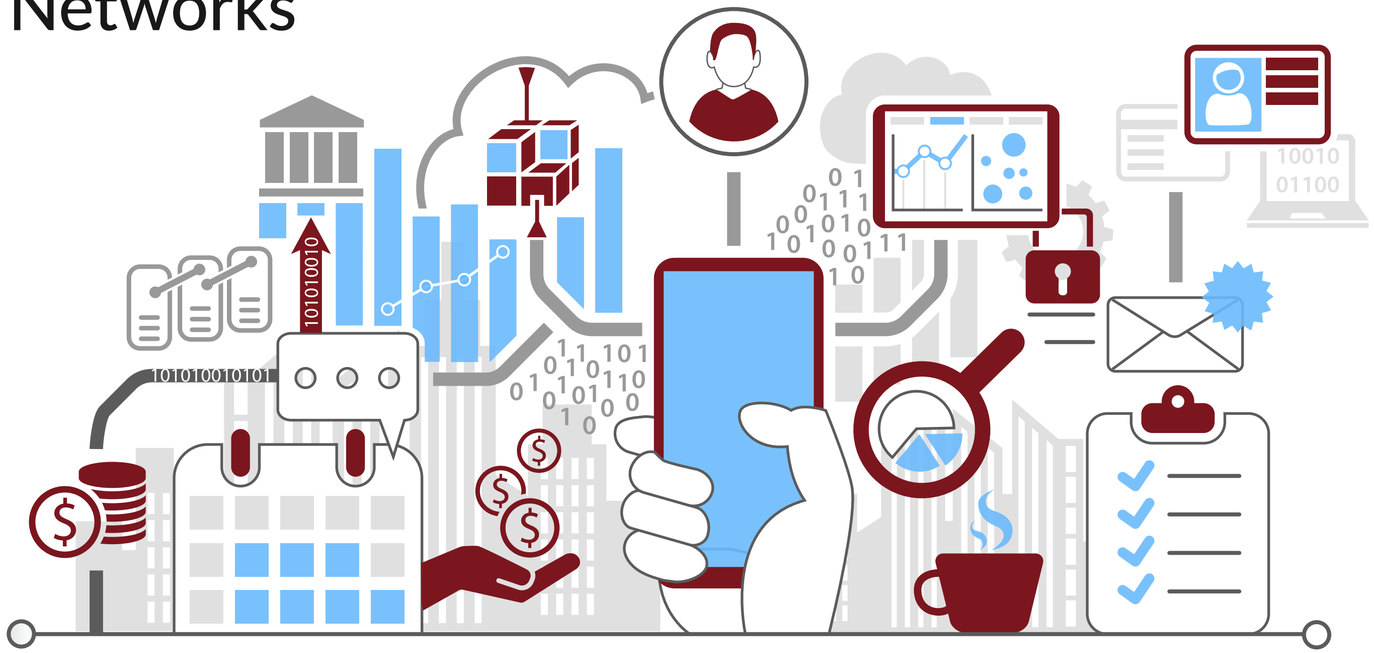
USE CASES (PAYERS/PROVIDERS)

- Master Patient Indices/Provider Networks
- Revenue Cycle Management
- Patient Data Management
- Supply Chains
- Decentralized HIEs
- Quality Measures Reporting
- Care Coordination/Document and Data sharing



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OVERVIEW OF VENDORS

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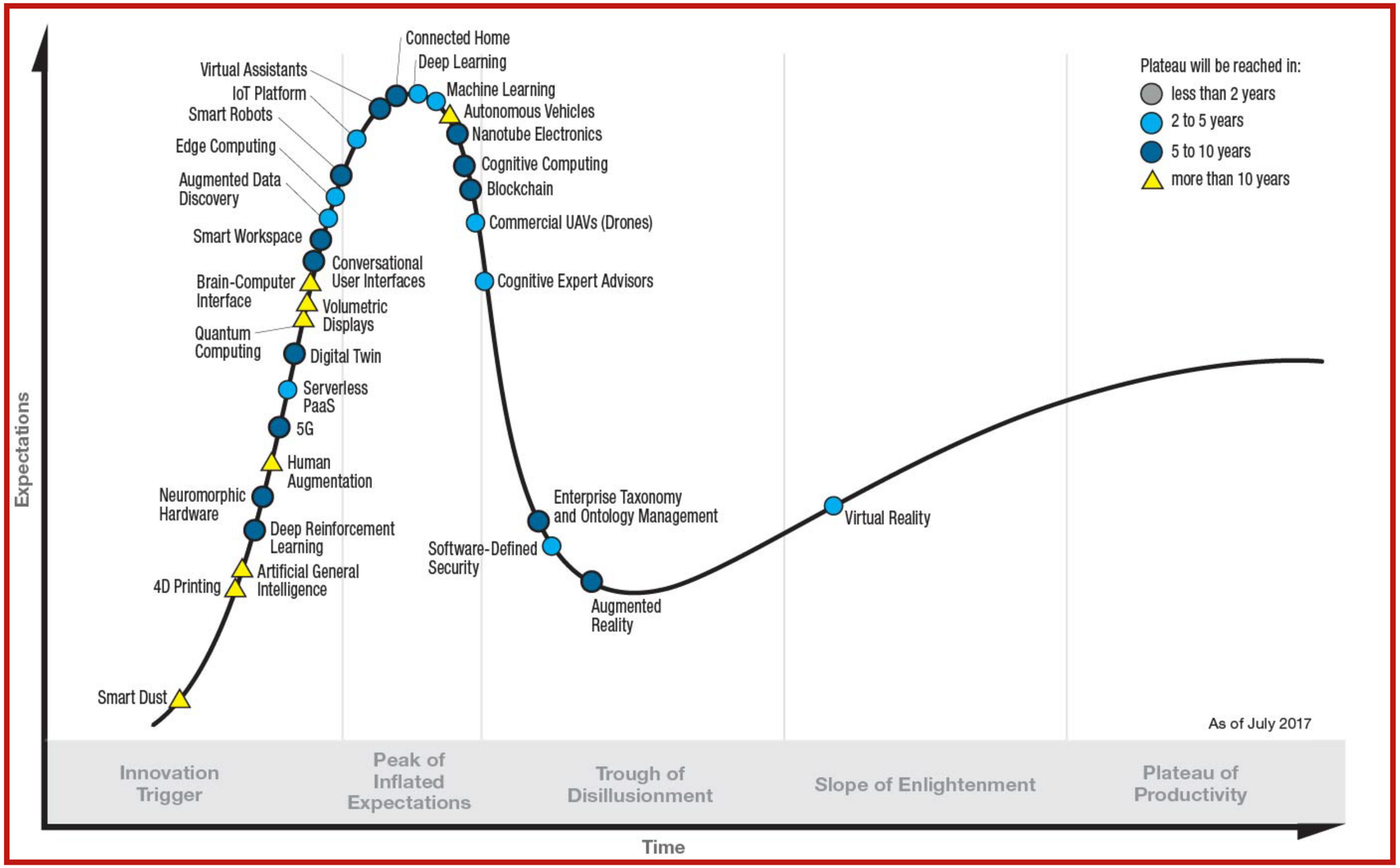
A Blockchain Primer with Use Cases

JOHN HALAMKA, MD
HARVARD UNIVERSITY, SCHOOL OF MEDICINE

GARTNER HYPE CYCLE FOR EMERGING TECHNOLOGIES 2017



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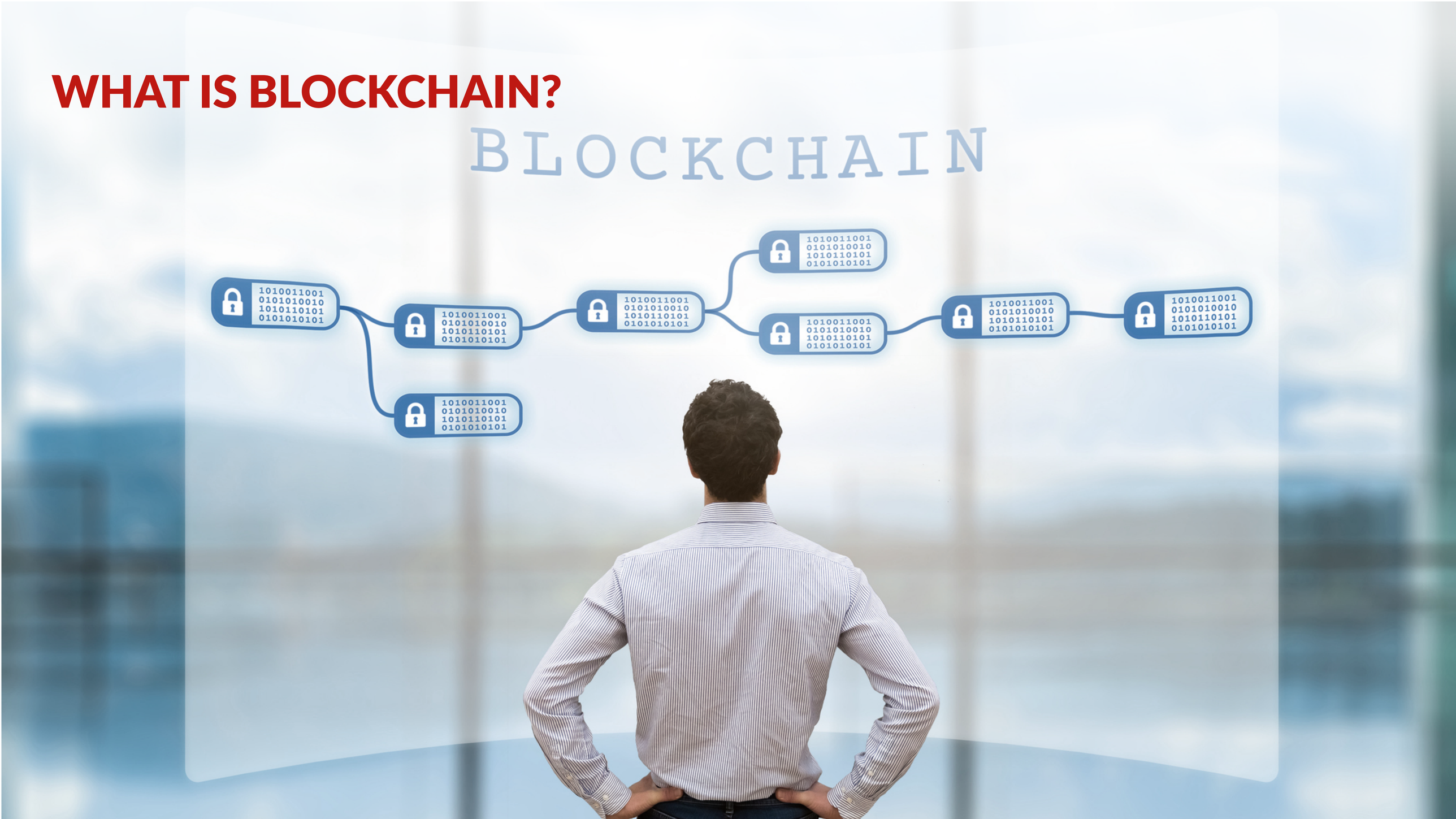
WHAT IS BLOCKCHAIN?



HASHING

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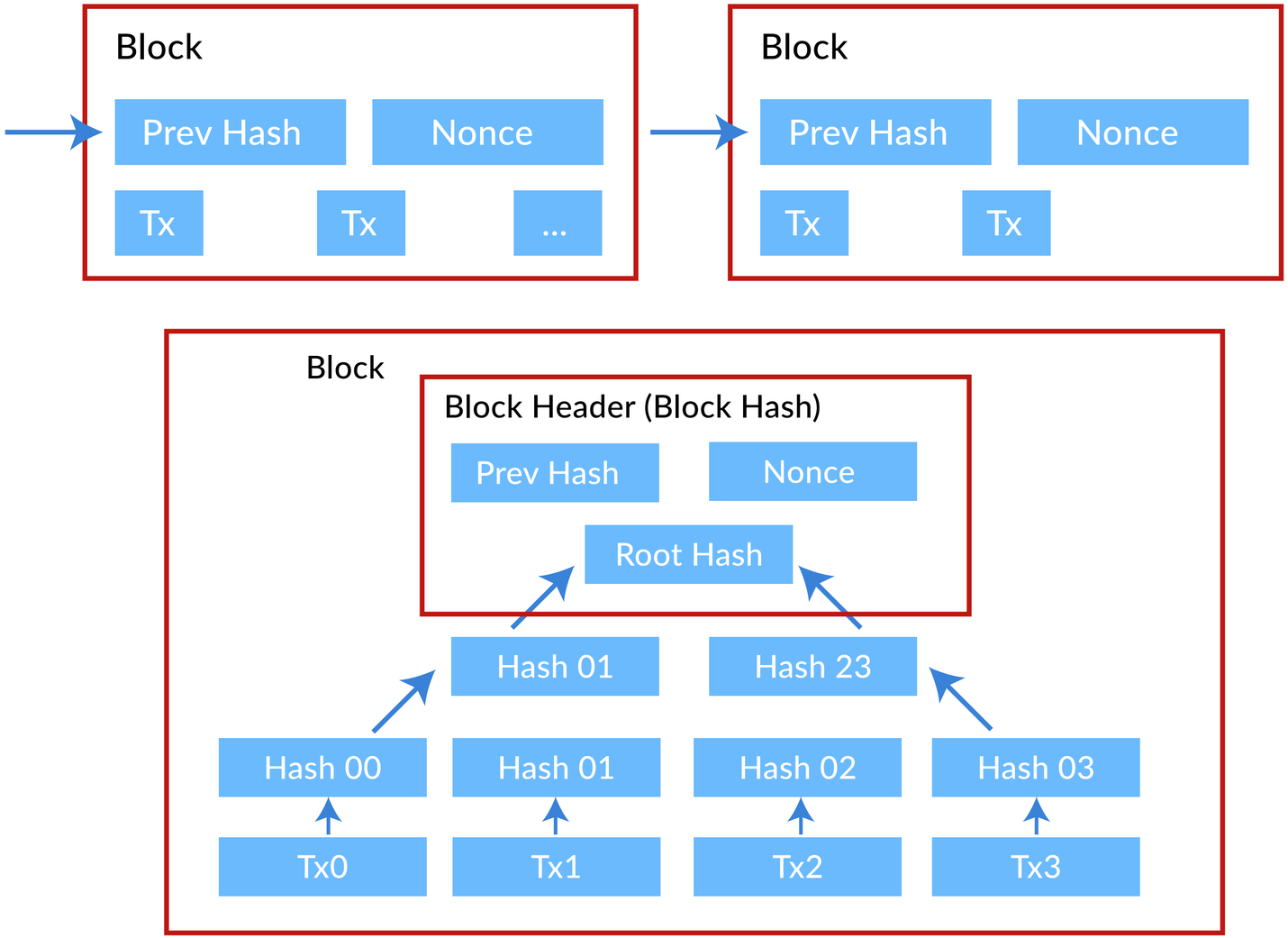
BLOCKCHAIN REFRESHER

- Immutability, provenance and time-stamping
- A “trustless” P2P architecture, maintained by “mining” via Proof of Work hashing algorithm



Nakamoto, Satoshi, 2008. Bitcoin: A Peer-to-Peer Electronic Cash System

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HARVARD/MIT BLOCKCHAIN PILOT

Unify the medication lists of the community by writing medication data to a public ledger

Evaluating the reliability of a decentralized architecture

Controlling privacy and access

Understanding costs and scalability

Enabling novel uses of data

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WORK IN PROGRESS

BILL & MELINDA GATES *foundation*

QUESTIONS?

- jhalamka@bidmc.harvard.edu
- http://geekdoctor.blogspot.com

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Lay-of-the-Land for 21st Century Business Models

HIERARCHIES, PLATFORMS, CRYPTO NETWORKS

VINCE KURAITIS
BETTER HEALTH TECHNOLOGIES LLC

I. THE DECENTRALIZATION MEGATREND

II. THE DE/CENTRALIZATION CONTINUUM: Business Model & Network Design Options

III. 5 IMPLICATIONS FOR PROVIDERS & PAYERS

I. THE DECENTRALIZATION MEGATREND, E.G.,

- Addressing concentration of wealth (1% vs. 99%)
- “Techlash” against platform giants, e.g., Facebook
- Cryptocurrencies without government backing
- Banking w/o banks
- Energy w/o utility companies

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HEALTHCARE IS HIGHLY CENTRALIZED

EXAMPLES

- Fee-for-service payments drive activity
- Patient data not shared; viewed as proprietary asset
- Increasing consolidation
- Increasing % of employed physicians
- Price/quality opaqueness
- Culture, professional societies
- Local providers as customary default choice

WHAT WOULD A MORE DECENTRALIZED HEALTHCARE SYSTEM LOOK LIKE?

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“DECENTRALIZATION” HAS MANY DEFINITIONS & MEANINGS

AS APPLIED TO BIZ MODELS

- Distribution of power, influence, value capture
- A means, not an end in and of itself

WHAT IT’S NOT

- Not just virtual care or geographic decentralization
- Doesn’t imply “one” source of centralization

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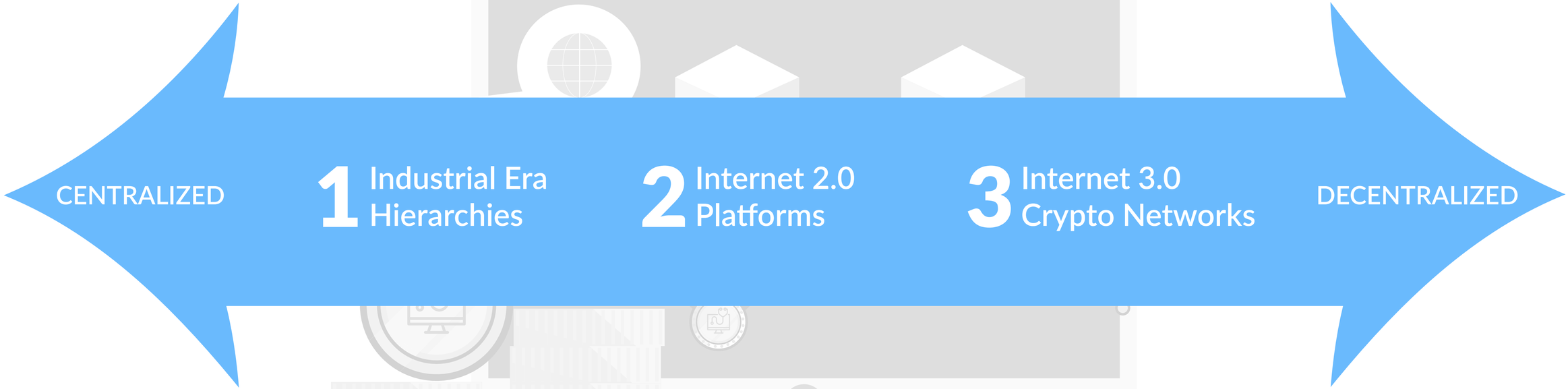
II. “THE DE/CENTRALIZATION CONTINUUM”

BUSINESS MODEL & NETWORK DESIGN OPTIONS



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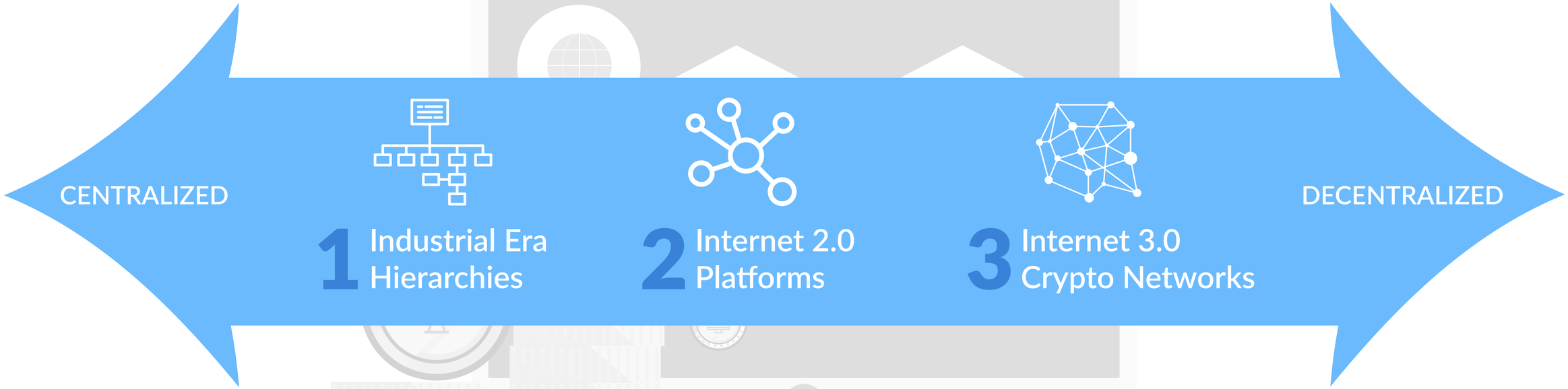
GRAPHICAL DEPICTIONS

“THE DE/CENTRALIZATION CONTINUUM”



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RIDESHARING REIMAGINED

CENTRALIZED ⟷ DECENTRALIZED

Own, control & operate everything	A software platform to connect drivers & riders + a “take no prisoners company culture”	A kinder, gentler version of Uber – governance respects a community focus	Local driver cooperatives enabled by a software platform	“A P2P mobility service enabling trustless collaboration powered by blockchain”

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DEFINING CHARACTERISTICS

HIERARCHIES, PLATFORMS, CRYPTO NETWORKS

CENTRALIZED ⟷ DECENTRALIZED

	Industrial Era Hierarchies	Internet 2.0 Platforms	Internet 3.0 Crypto Networks
Mindset	Command and control	Orchestration	Collaboration; empower individuals & communities
Core Assets	Ownership of financial & physical capital, employees, IP, brand…	User networks, proprietary platform software	Data
Strategic Focus	Products/services	Ecosystems	New economies
Value creation	by co.	P2P and through platform capabilities	P2P
Value capture	by co.	by platform	P2P
Business Strategy Knowledge & Empiricism	Well established--100+ years of evolution	Moderately-well established--20 years of evolutoin	Nascent
Use of blockchain tech?	Technically possible but advantage over other tech is unclear	Yes. Focus on tactical advantages, cost, efficieny	Yes. Strategic, disruptive.
Governance	by co.	platform rules	P2P, communities; emerging
Reputation	Brand	curation, rating systems, data	P2P
Security	vulnerable central point of control	vulnerable central point of control	blockchain, consensus
Privacy			
Regulatory Frameworks	Well established	"Techlash" just beginning in U.S.; EU enacted GDPR regs effective 5/18	Largely non-existant
User data	Proprietary to co.s	Proprietary to platforms	Controlled by users
TRADEOFFS			
Control	Highest		Lowest/none
Network effects	Lowest		Highest
Coordination/Orchestration		Highest	

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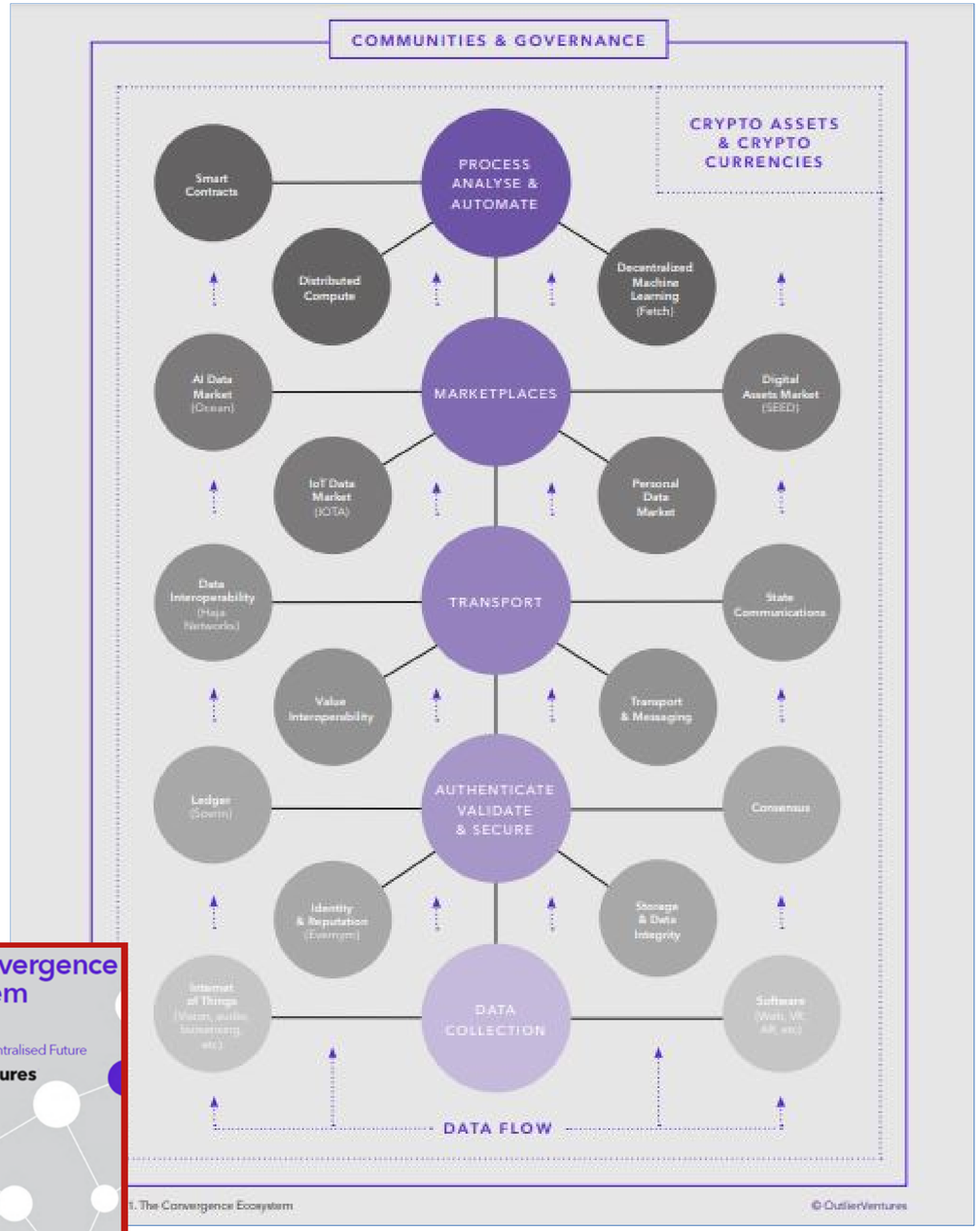
CHARACTERIZING CRYPTO NETWORKS

KEY COMPONENTS

- Open source
- Distributed
- Decentralized
- Automated
- Tokenized

ENABLING TECHNOLOGIES

- Blockchain
- AI
- 3D printing
- Cloud
- IoT



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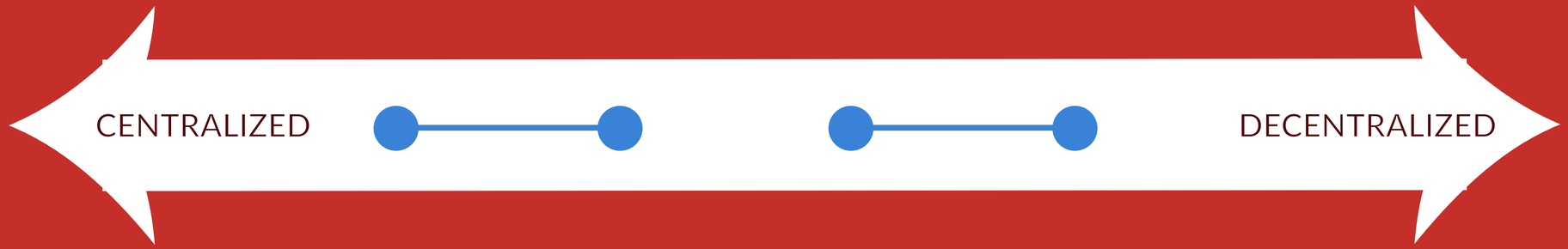
III. 5 IMPLICATIONS (PAYERS/PROVIDERS)

1) A NEW, COMPLEX WORLD OF BUSINESS MODELS AND STRATEGY

- All 3 categorizations will persist
- Crypto networks as uncharted design spaces
- Anticipate MANY **hybrids**



- Many new rules are counterintuitive

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MANY STRATEGIES CHANGE 180°

INDUSTRIAL ERA STRATEGY

- Dominate markets through supply-side economies of scale

DIGITAL STRATEGY

- Maximize demand-size economies of scale (network effects)
- Dominate markets by orchestrating networks & ecosystems
- Reduce transaction costs

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120+ HEALTHCARE ICOS IN THE WORKS

AIDOC	DentalFix	FarmaTrust	Linda Healthcare	minthealth	Simply Vital Health
Aimedis	Dentix Global	GeneBTC (scam)	Litra	mitio	SmartHealthcare
AIOM	Dermavir	Grapevine World	Longenesis	modum	Solve.Care
Ambrosus	dHealthNetwork	H+	Lumenus	MyMEDIS	SSOT Health
AMCHART	Digipharm	Hayver	Luven Diagnostic	NAM	Synthium Health
ARNA Panacea	Docademic	HealCoin	Lympo	Nano Vision	TeamMate
BlockMedx	Doc Coin	HealPoint	Mahra	Nebula Genomics	Tide
BlockRx	doc.ai	Health Monitor	MDCN	NurseToken	Timicoin
Blüpass	Earthmedz	Health Wizz	MD Tokens	NWP	trustedhealth
BowheadHealth	eCuris	HealthBase	MedCredits	OGSoft Solutions Ltd	TwinToken
BurstIQ	eHealth First	Healthcombix	MediBloc	Open Longevity	Universal Health Coin
Care4Me	ELCoin	HealthHeart	MediBond	Patientory	Veris Foundation
CareX Blockchain Platform	Elige.re	Healthureum	Medicalchain	PeerAtlas	VoxelX
Citizen Health	Embleema	Hearthy	MediChain	Potion Owl	VR MED
Clinicoin	Emrify Health Passport	Hi:Health	medicohealth	Proof.Work	WELL
CoinHealth	Encrypgen	HIT Foundation	Medicoin	Robomed Network	XMED Chain
Coral Health	Enome	Ingeniciel	Med Layer	SciCoins	Yoo-Mi PHA
Cryogen	Escobarcoin	Iryo	MedNetwork	ScriptDrop	Youthereum
CureCoin	Eterly	Kinect Hub	MedXchange	Shivom	Zealeum
DeepRadiology	Etheal	LenusChain	MEXC	Skychain	Zenome
Dentacoin					

> “Crypto networks will be the organizing mechanism and economic model of the next generation internet.
>
> **Ali Yahya, VC at @a16z**

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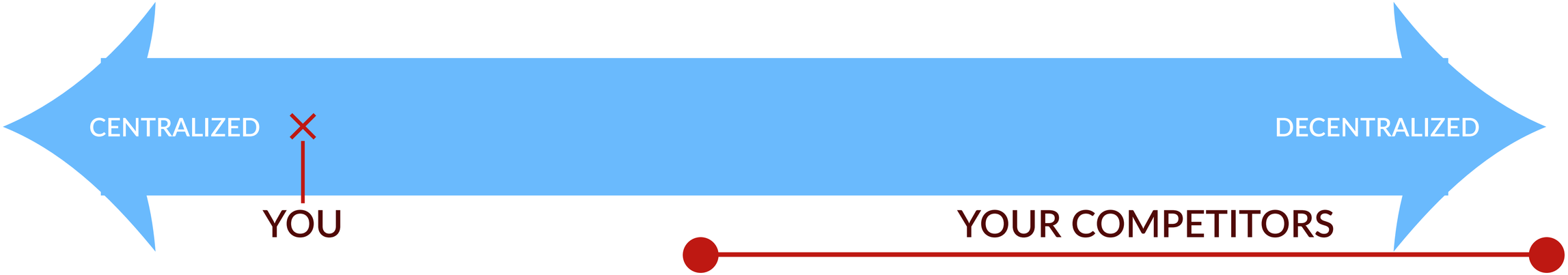
2) TO HEALTHCARE INCUMBENTS

"YOU MUST DECENTRALIZE YOUR BUSINESS MODEL"



IRRESISTIBLE FORCES DRIVE DECENTRALIZATION

1. From volume to value
2. Digitization and HIT interop
3. Democratization/consumerization of healthcare & data

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3) OPTIMIZE CENTRALIZATION VS. DECENTRALIZATION

- A few industries/use cases do require maximal decentralization
- Healthcare isn't one of them.
- Reframing the Debate About Decentralization
  - FROM: *Maximizing* decentralization
  - TO: *Optimizing* centralization vs. decentralization
- Tradeoffs--Centralization has advantages

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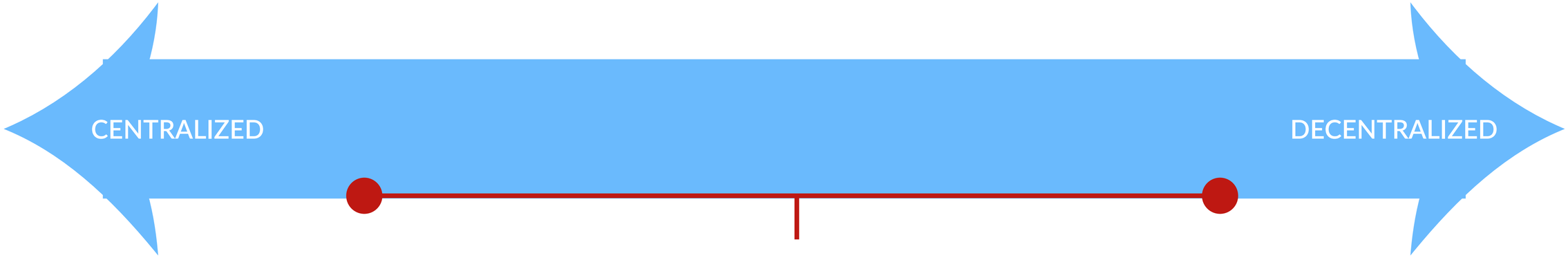
4) FOR MOST INCUMBENTS, DECENTRALIZATION VIA PLATFORMS WILL MAKE MORE SENSE



- Add platform components incrementally
- Doesn’t require abandoning existing (hierarchical) business model
- Less of a cultural leap
- Lower risk – 20 years of platform learning

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5) PUTTING HEALTHCARE BLOCKCHAINS INTO PERSPECTIVE

- Blockchain can be deployed across the De/Centralization Continuum
- A powerful (essential?) network building tool

A TL;DR SUMMARY

- Blockchains are the tail, not the dog.
- The dog is the effort to decentralize ALL industries – including healthcare – over the next decade.

THE 2ND ANNUAL
HEALTHCARE BLOCKCHAIN SUMMIT
BOSTON, JUNE 11-12, 2018
MORE INFO
discover
CODE-A-THON
THIRD PLACE
discover
CODE-A-THON
FIRST PLACE
discover
CODE-A-THON
SECOND PLACE

Thank You for Attending

Additional Questions?

Please feel free to email Jody directly with any additional questions or inquiries: **jody@chilmarkresearch.com**

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