Blockchain Breakout Session

Digital Money Symposium
26 January 2016

Imperial College London

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What is a Blockchain?

A blockchain is a distributed ledger database that uses a cryptographic network to provide a single source of truth.

What does it enable?

A blockchain allows untrusting parties with common interests to co-create a **permanent**, **unchangeable** and **transparent record** of exchange and processing without relying on a central authority.

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Why is it significant?

- If the **Internet** is a disruptive platform designed to facilitate the **dissemination of information…..**

- …then **Blockchain Technology** is a disruptive platform designed to facilitate the **exchange of value**

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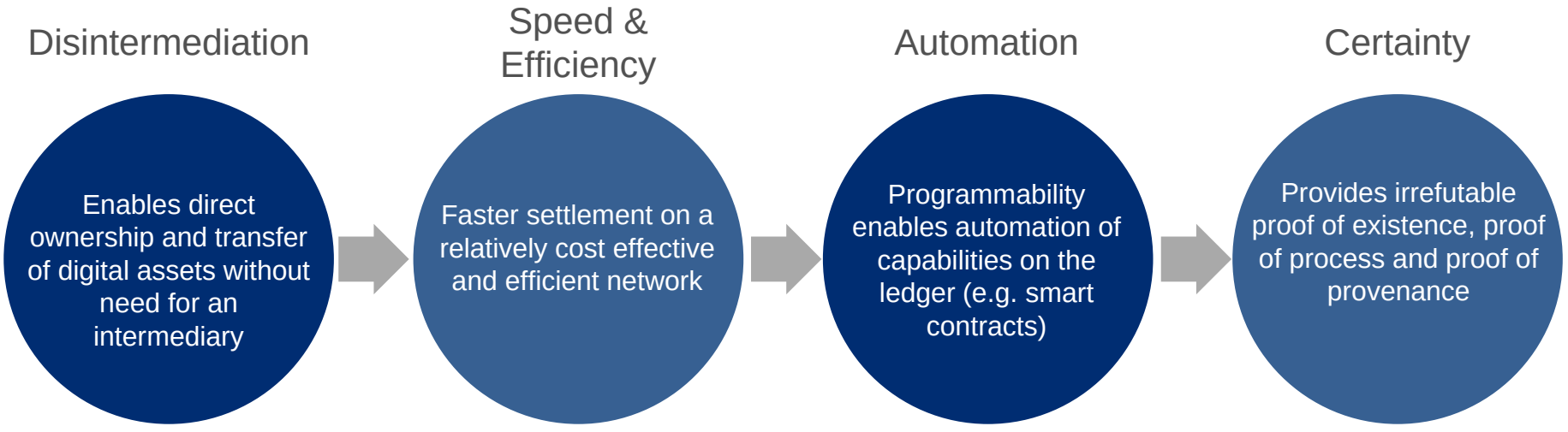
What are the implications?



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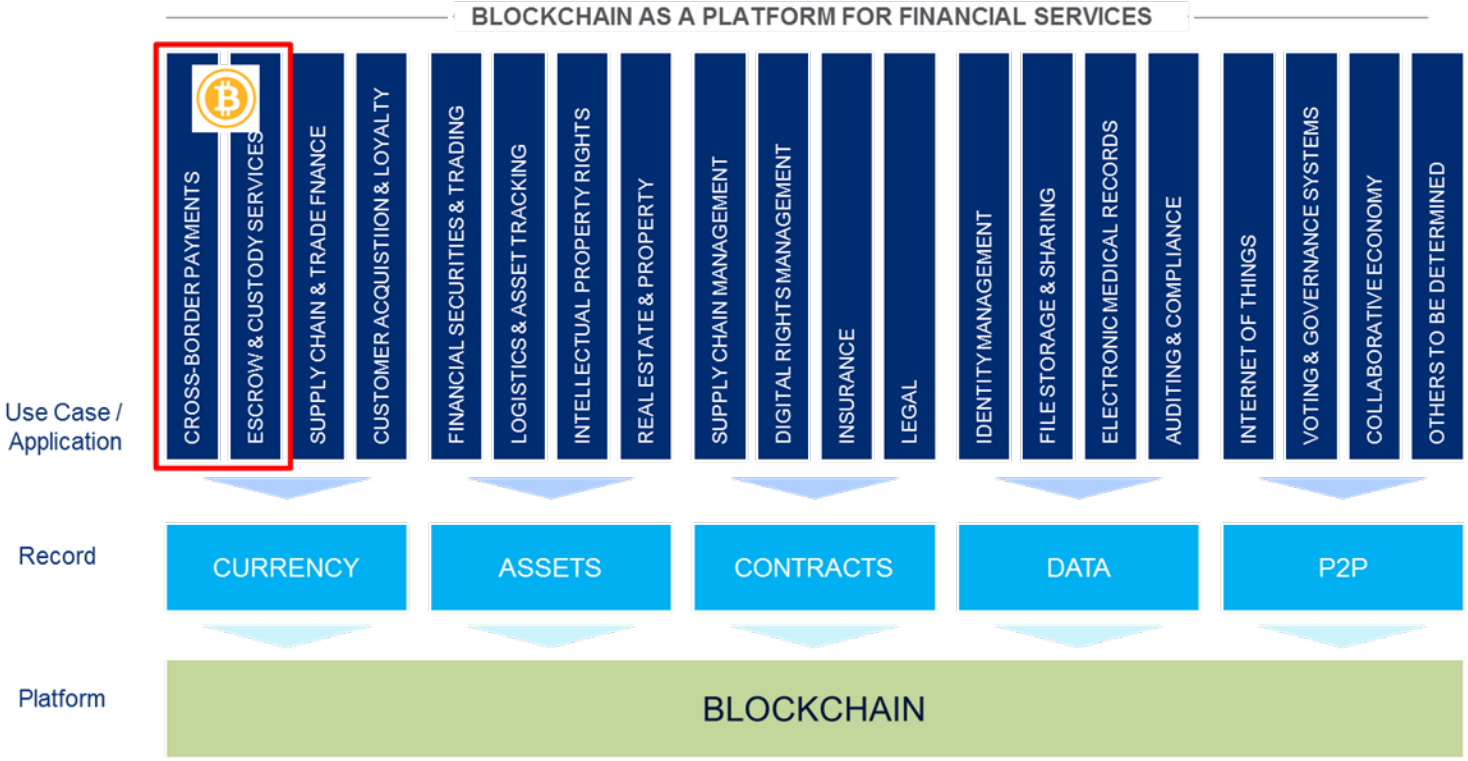
Blockchain is bigger than Bitcoin

Blockchains are platforms upon which various applications can be built, well beyond currencies.



Source: Citi Ventures

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Example of Relevance of Blockchain in Banking

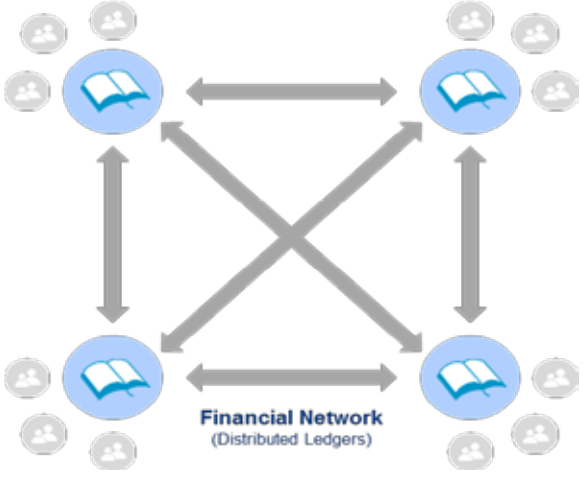
Blockchain's distributed ledger model has potential to take steps, time and cost out of financial flows

Financial Intermediaries (Today)

- Requires trusted, centralized intermediaries
- Batch clearing and settlement
- Higher fees and costly infrastructure

Financial Protocol (Emerging)

- No (or fewer) intermediaries required
- Near real-time processing and management
- Lower fees and reduced infrastructure cost



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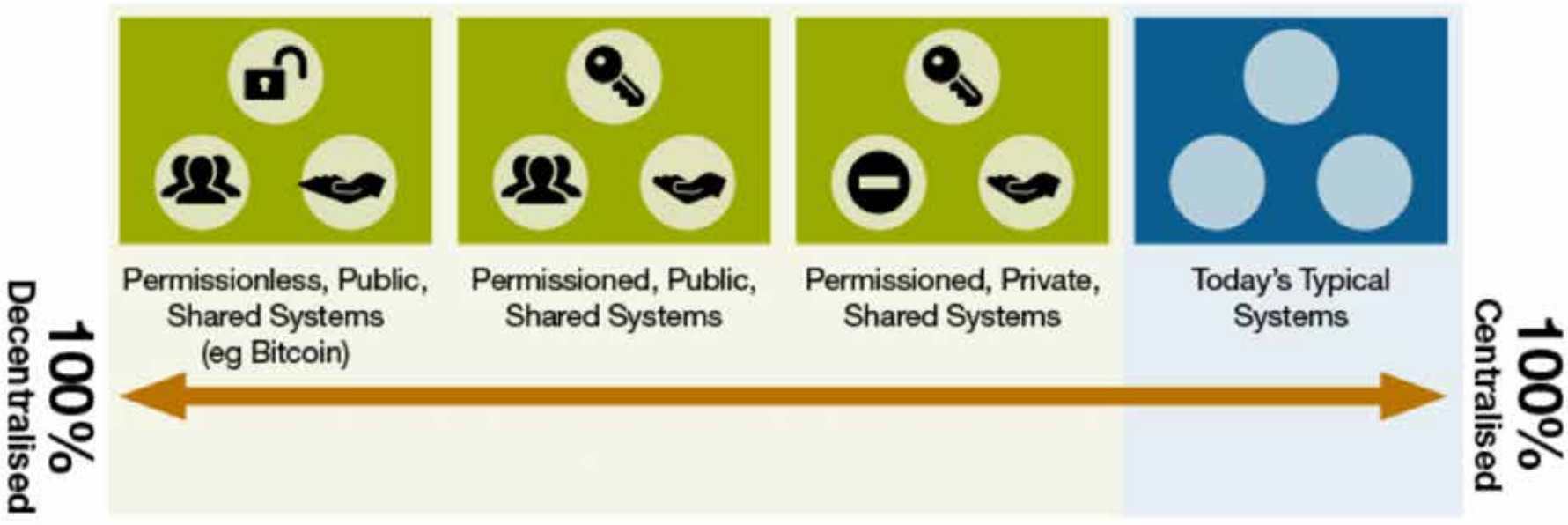
Wide range of contemporary blockchain technologies



Source: Richard Brown, R3

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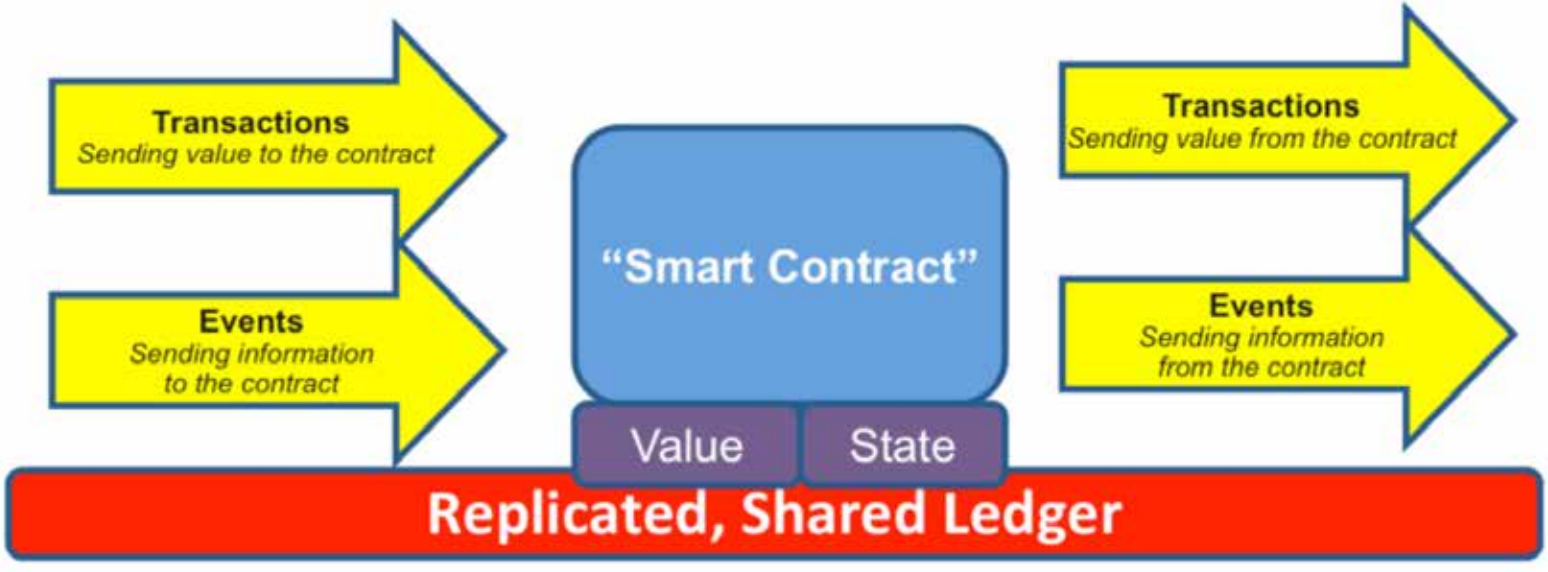
What are smart contracts?

Smart contracts are cryptographically-assured executable business logic that can move value.



Source: Richard Brown

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Evolution from cyber-libertarian hobby into the mainstream

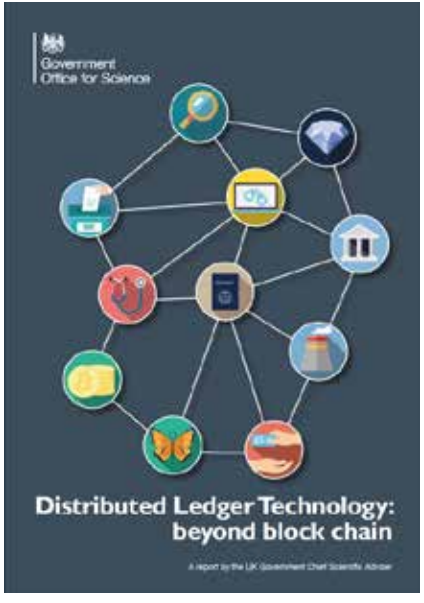
2008

Bitcoin: A Peer-to-Peer Electronic Cash System

Satoshi Nakamoto
satoshin@gmx.com
www.bitcoin.org

1. Introduction

2016



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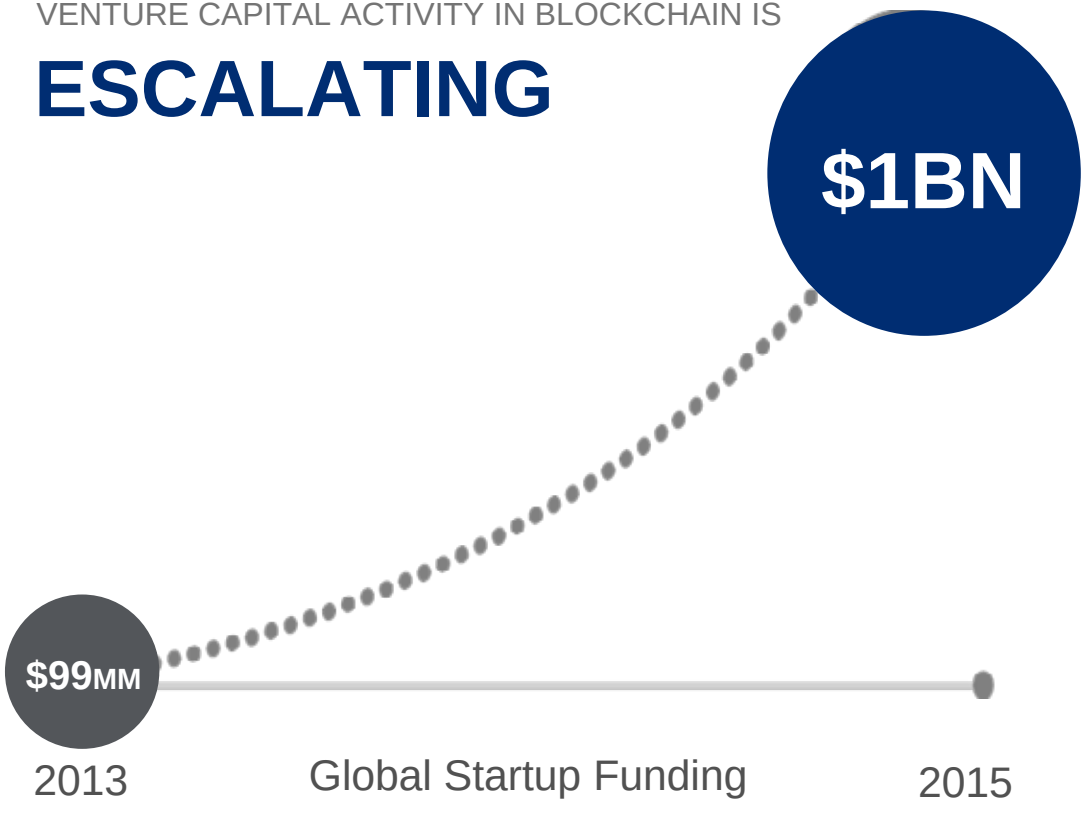
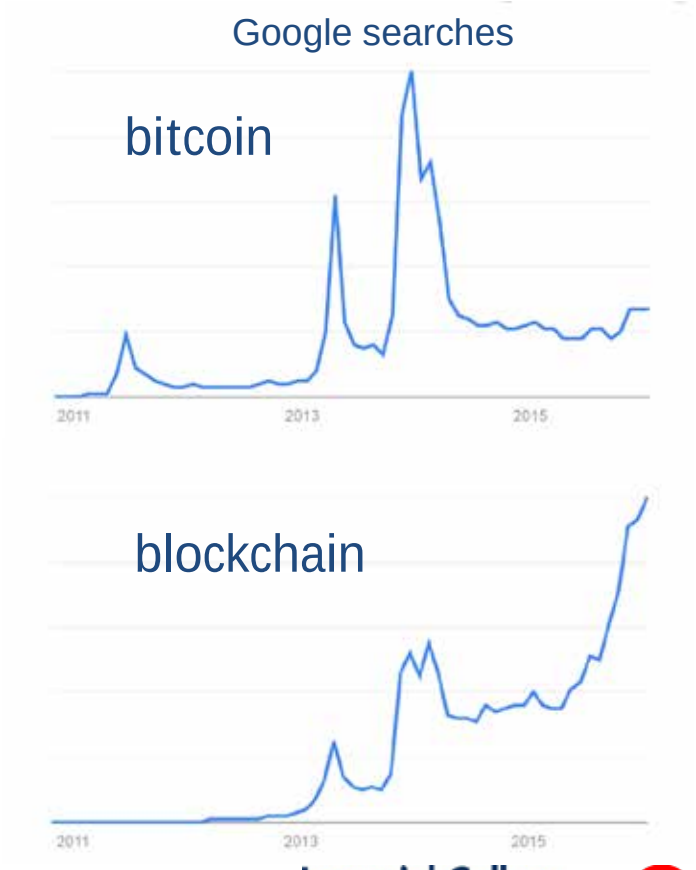
Growing interest in blockchain

VENTURE CAPITAL ACTIVITY IN BLOCKCHAIN IS

ESCALATING





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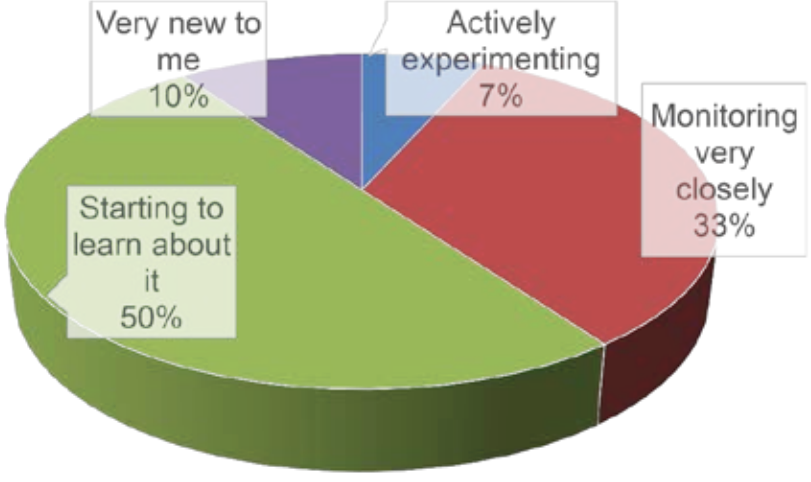
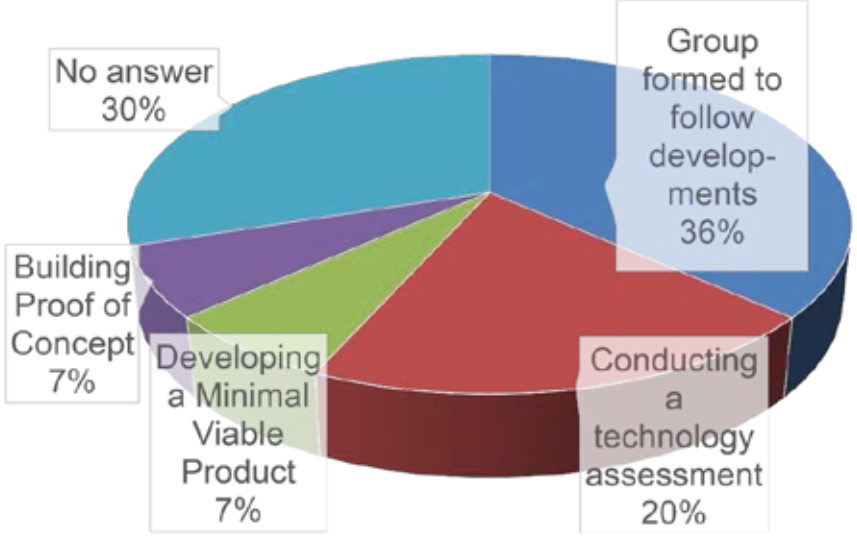
Poll Results

(30 Respondents)

Level of Knowledge of Blockchain



State of Blockchain Technology Adoption



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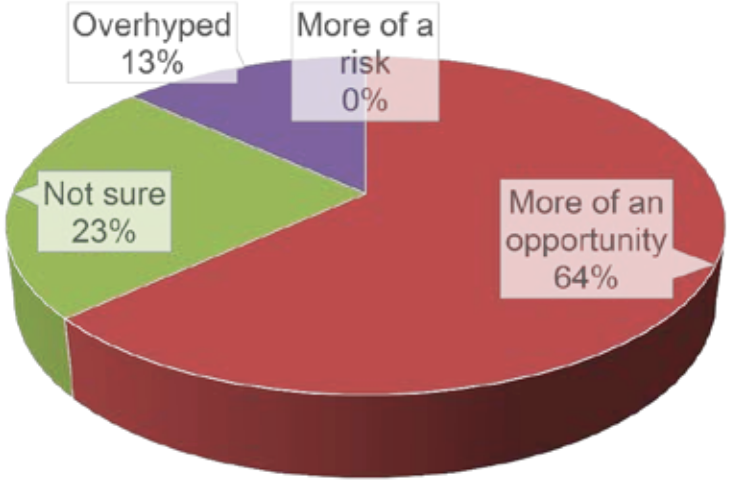
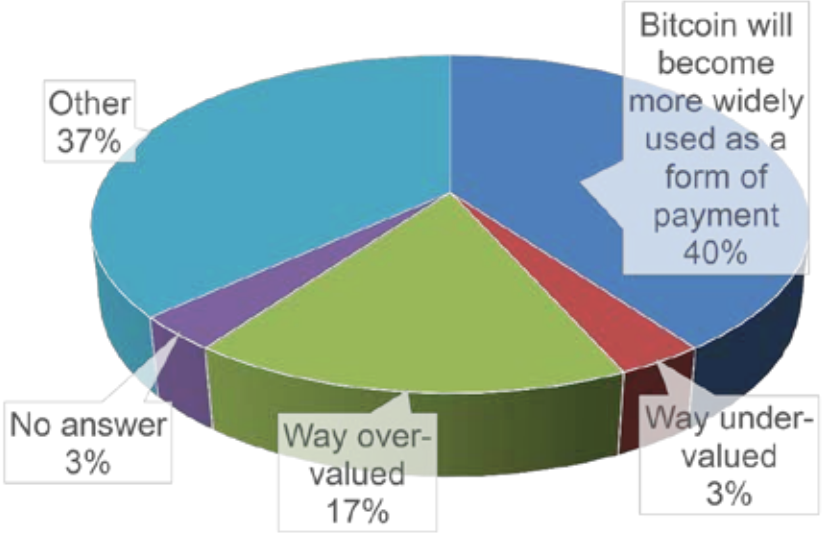
Attitude towards Blockchain



Attitude towards Bitcoin



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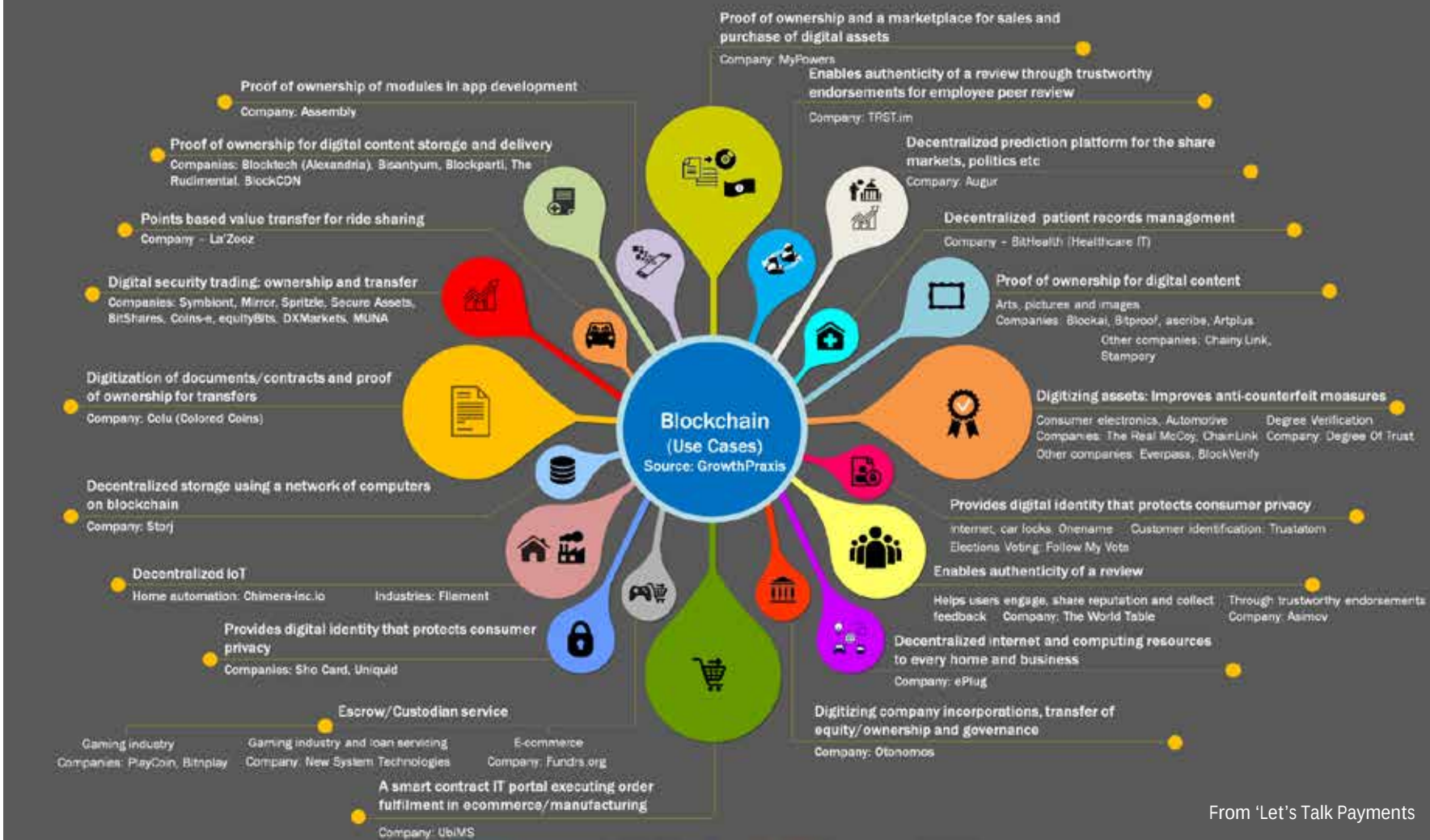
Blockchain Use Cases



From 'Let's Talk Payments

“Whilst it is true that virtually ANY application COULD store its data on a blockchain, it is not true that ANY application WOULD WANT to do this.”

Research grant reviewer, January 2016

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Poll Responses on Most Promising Use Cases

- Low-friction low-cost cross-border payments
- Digital legal tender
- Replacing traditional payment schemes
- Corporate action automation
- Exchange of assets with superfast settlement
- Know your customer (KYC)
- Sharing of personal data in innovative distributed and secure ways (e.g. health records)
- Ensuring integrity of code and systems
- Auditing services
- IoT (esp. with Smart Contracts)
- Provenance (e.g. of used cars)

Blockchain Financial Use Cases

Currency and Payments

P2P (including Merchant Wallets)

Remittances

Merchant Processing

B2B, B2C

Networks & Consortia

Other Areas of Interest

Trade

Markets and Securities

AML & Compliance

Digital Identity

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Blockchain Use Cases
Non-financial

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Gradbase

VERIFY DEGREE

SUCCESS

Qualification verified by Imperial College London

Transaction details

Confirmed by Bitcoin network.

Name:	Kacper Zyka
Date of birth:	08.10.1993
University:	Imperial College London
Qualification type:	Master of Engineering
Course name:	Computing
Year of graduation:	2018
Degree classification:	First-class Honours

EXPRESS AGREEMENT

Verify the Existence of NDA Contract : Widget Manufacturing Consultation

View independent proof that the contract has been signed and recorded in a trusted public ledger

Home / Choose Contract Type / Initialise Contract Outline / Negotiate Contract Clauses / Sign Agreed Version / View Proof of Contract

Step 1	Step 2	Step 3	Step 4	Step 5
Choose a Contract Type (One-Way NDA)	Name the parties to the contract, and agree upon the basic outline of the contract	Negotiate the detailed terms of your contract, with full version control	Sign the final agreed version of your contract	**Receive proof of signing and verify what has been signed**

View Proof of Contract Existence

See your contract hash and signatures recorded on a trusted public ledger

BACK TO PREVIOUS STAGE | VIEW CONTRACT CLAUSES AS PDF | VIEW FULL CONTRACT WITH CLAUSES AND SIGNATURES

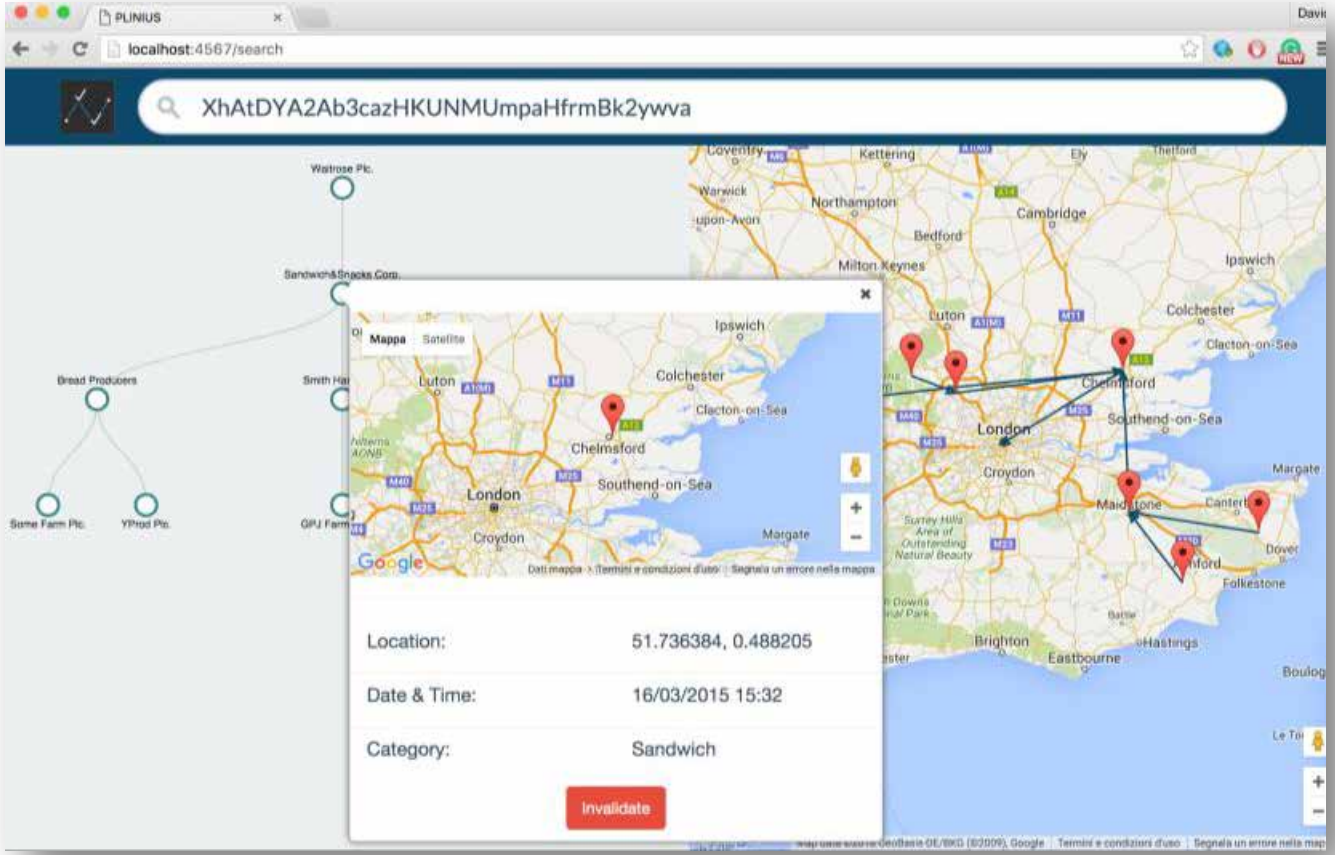
Your contract has been recorded the form of a transaction in the Bitcoin Blockchain. The Blockchain is an immutable public ledger, which means it is transparent and easily verifiable through multiple independent sources, and it is not possible to alter or change transaction records.

Therefore proof of existence of your contract is permanently stored on the Blockchain.

The transaction identification number of your contract is:

bdf1d84693a26040028a5ad618fd1012f9c8e751dec35eab2b9fe91e04c1ffc8

Imperial College Centre for Cryptocurrency Research and Engineering


PLINIUS
localhost:4567/search
XhAtDYA2Ab3cazHKUNMUmpaHfrmBk2ywva
Waitrose Plc.
Sandwich&Snacks Corp.
Bread Producers
Some Farm Plc.
YProd Plc.
GPJ Farm
Mappa
Satellite
Location:
51.736384, 0.488205
Date & Time:
16/03/2015 15:32
Category:
Sandwich
Invalidate


12:34
Viewing Product
Bread
Made by Waitrose on 25 Dec 2015
Wheat
Waitrose

Blockchain Implementation Considerations

Poll results: Biggest Challenges

Challenge	Number of Respondents	Percentage of Respondents
Finding the most appropriate use cases	16	53%
Developing an ecosystem	16	53%
Selecting and implementing an appropriate technology	7	23%
Security/privacy issues	6	20%
Scalability	3	10%

***Additional challenges identified**:*
Legal/Regulatory (2), Stability/resilience of platform/provider (2), Engagement (1)

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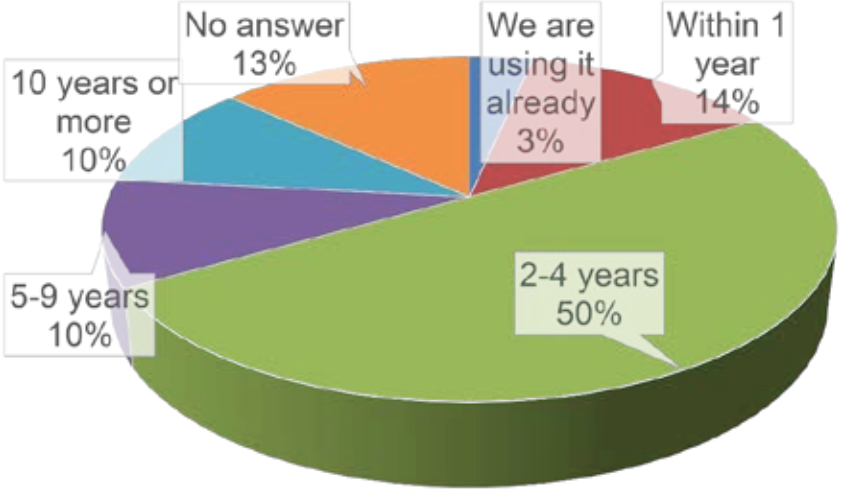
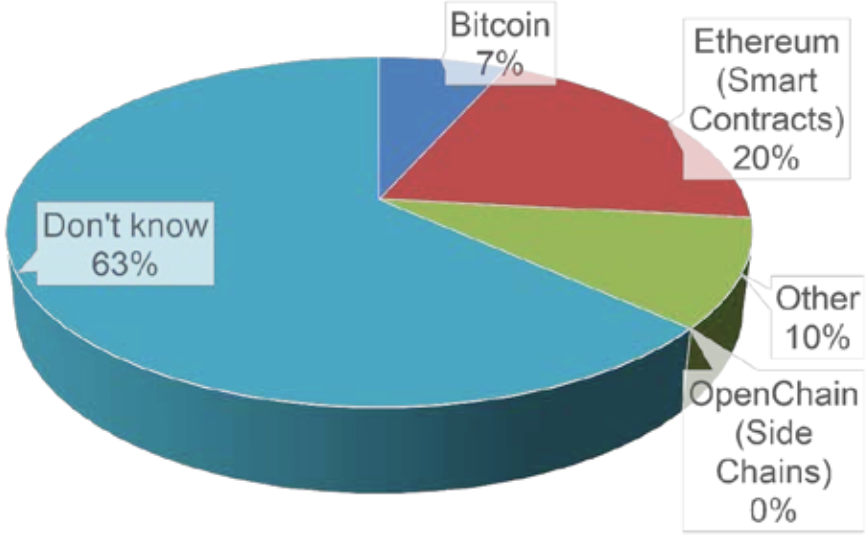
Timeframe to Production



Dominant Emerging Platform



Other: Credits (10%), Hyperledger R3 (3%)

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Challenges to blockchain adoption

- Determining optimal blockchain use cases
- Requires building an ecosystem/network of participants
- Technology is not yet industrial grade
- Requires integration into legacy systems or migration of current tech
- Requires fundamental business process redesign
- Will require adaptation of some regulatory and legal frameworks
- Unless asset remains digital, full benefit of blockchain cannot be fully realized

Comments
Your experiences
Q&A

Contacts: morgan.mckenney@citi.com and wjk@imperial.ac.uk

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