Blockchain and Distributed Ledger

Sheila Warren

The Center for the Fourth Industrial Revolution

Market cap for Bitcoin: $186B
One Bitcoin = 12,100 USD =
36493842 Colombian Pesos

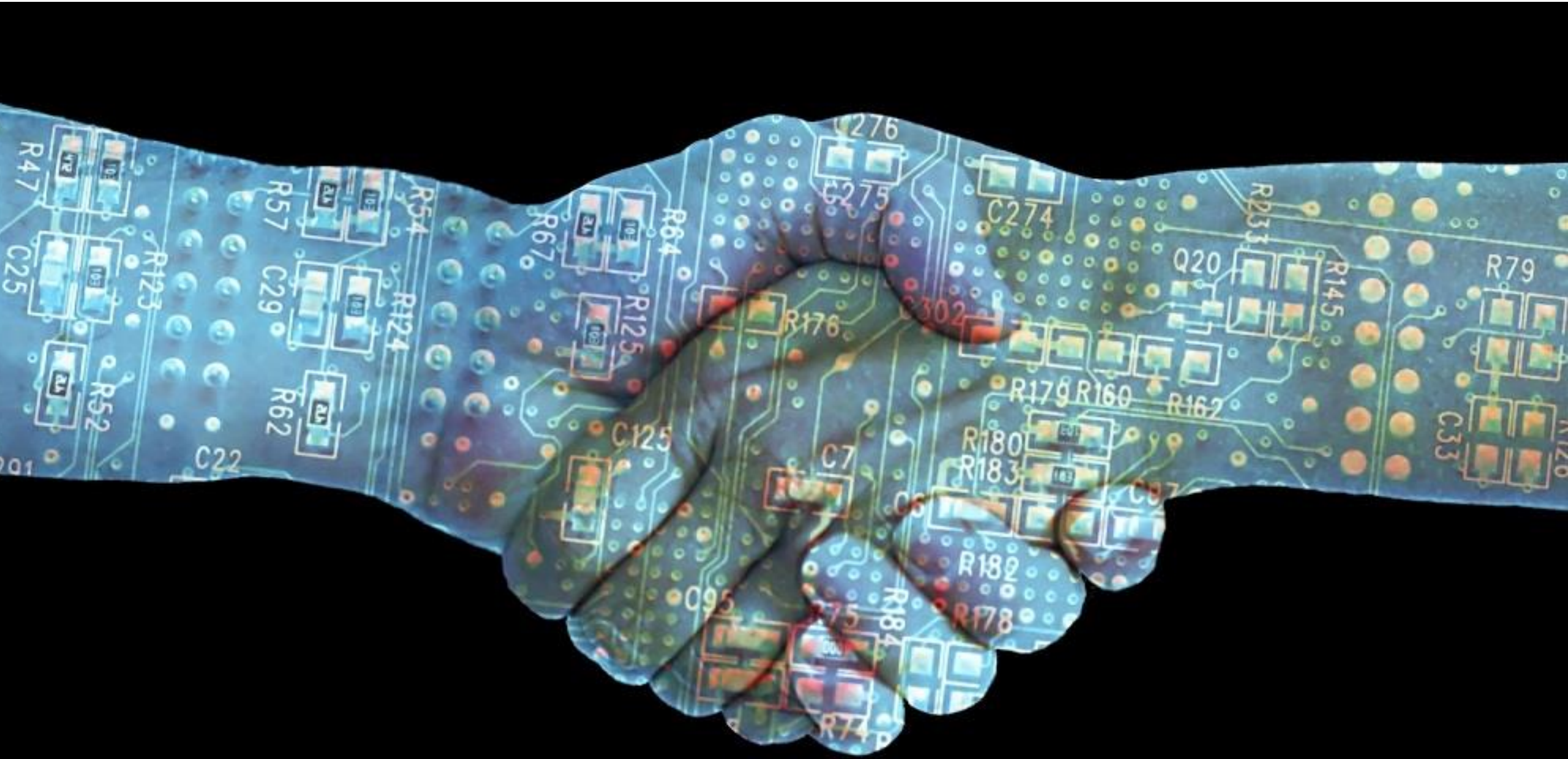
Market cap for Ethereum: $44B

ICOs: crossed $2.5B already in 2017

By 2025, >$1 trillion of digital coins

Digital currency exchanges

What is Blockchain?



Characteristics of high-potential use cases		Example
Shared repository	**A shared repository** of information is used by multiple parties	*Ledger that stores financial assets in which an owner and owned assets are tracked and shared with other internal/external parties (e.g. regulators and other geographical units)*
Multiple writers	**More than one entity** generates transactions that require modifications to the shared repository	*Payments system collectively managed and maintained by a small group of banks, but each bank has millions of end users transacting with their bank*
Minimal trust	A level of **mistrust exists between entities** that generate transactions	*Multiple parties within a trade finance arrangement (e.g. importer, exporter, issuing bank, receiving bank, correspondent banks and customs) that do not "trust" each other and, therefore, institute layers of verification and impose collateral requirements*
Intermediaries	**One (or multiple) intermediary** or a central gatekeeper is present to enforce trust	*Removing and/or reducing the importance of a central intermediary, whose primary role is to provide "trust" to the post-trade ecosystem*
Transaction dependencies	Interaction **or dependency between transactions** is created by different entities	*A situation in which Alice needs to send funds to Bob, then Bob needs to send funds to Charlie. Bob's transaction is dependent on Alice's transaction, and one cannot verify Bob's transaction without checking Alice's first*

Value Drivers

1. **Operational simplification**
   DLT reduces / eliminates manual efforts required to perform reconciliation and resolve disputes
2. **Regulatory efficiency improvement**
   DLT enables real-time monitoring of financial activity between regulators and regulated entities
3. **Counterparty risk reduction**
   DLT challenges the need to trust counterparties to fulfil obligations as agreements are codified and executed in a shared, immutable environment
4. **Clearing and settlement time reduction**
   DLT disintermediates third parties that support transaction verification / validation and accelerates settlement
5. **Liquidity and capital improvement**
   DLT reduces locked-in capital and provides transparency into sourcing liquidity for assets
6. **Fraud minimization**
   DLT enables asset provenance and full transaction history to be established within a single source of truth

Key findings: World Economic Forum

- DLT has great potential to drive simplicity and efficiency
- DLT is not a panacea
- Applications of DLT will differ by use case
- Digital Identity is a critical enabler
- The most impactful DLT applications will require deep collaboration between incumbents, innovators and regulators
- New financial services infrastructure built on DLT will redraw processes and call into question foundational orthodoxies

Current-state assumptions	Transformative characteristics of distributed infrastructure	Implications for market participants within financial services	
Information silos drive the need for detailed reconciliation activities **Lack of a single version of the truth and audit trails creates arbitrage concerns**	**a) immutability**	 Eliminates need for reconciliation	 Provides historical single version of the truth
Asymmetric information between market participants drives the proliferation of central authorities **Lack of transparency increases regulations on FIs**	**b) transparency**	 Eliminates imbalance of information among market participants	 Increases cooperation between regulators and regulated entities
Lack of trust between counterparties creates the need for central authority oversight in contract execution	**c) autonomy**	 Ensures agreements are executed to agreed upon business outcomes	 Disintermediates supporting entities established to resolve disputes

Distributed ledger technology will:

- question the need for individual books of record through immutable and distributed record-keeping
- significantly increase transparency between market participants
- have implications for the cost of leverage by reducing information asymmetry between borrowers and lenders
- transform the relationship between regulators and regulated entities, reducing frictions and improving outcomes
- reduce the need for intermediaries by providing autonomous execution capabilities

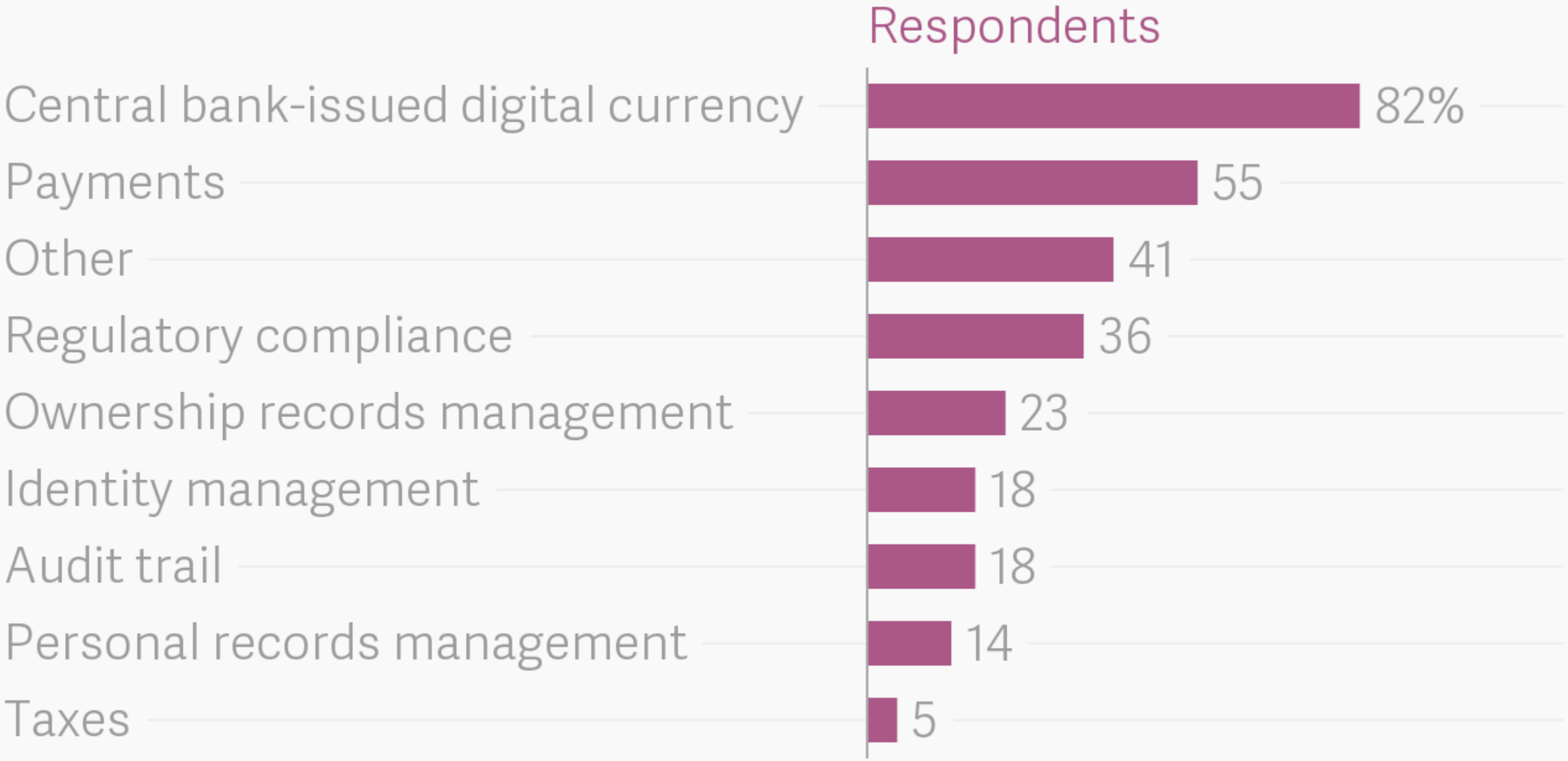
Use case	Value driver	Benefits
Trade finance	Operational simplication	Enables real-time multi-party tracking and management of letters of credit, and enables faster automated settlement
Automated compliance	Regulatory efficiency improvement	Provides faster and more accurate reporting by automating compliance processes that draw on immutable data sources
Global payments	Settlement time reduction	Enables the near real-time point-to-point transfer of funds between financial institutions (FIs), removing friction and accelerating settlement
Asset rehypothecation	Liquidity and capital improvement	Provides market participants with an improved line of sight into assets, enabling improved risk evaluation and decision-making

Bank of Japan
European Central Bank
Monetary Authority of Singapore
Bank of Canada
US Federal Reserve

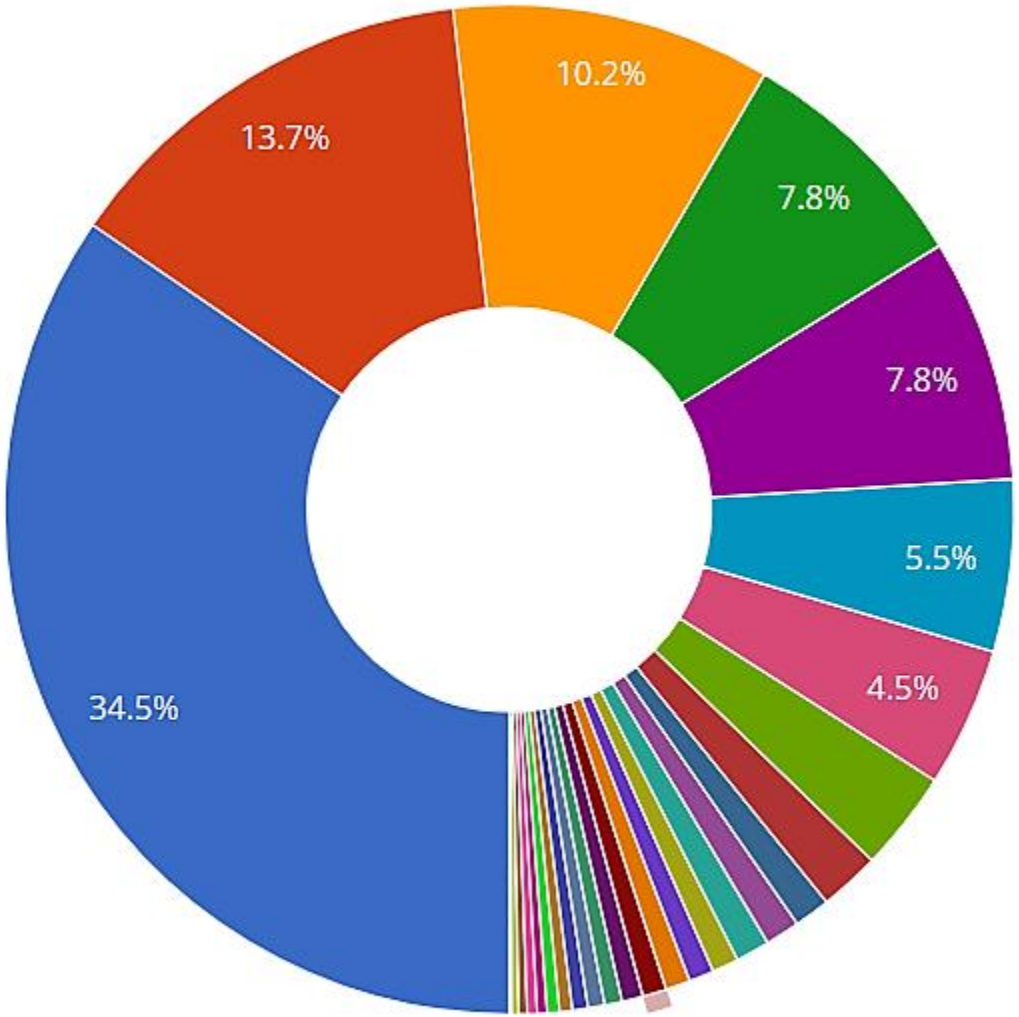
Banco de la República Colombia + R3

20% within two years
40% within a decade

What central banks want to use blockchain tech for



ICOs by Category 2017



- Infrastructure 34.5% ($1,269,016,979.8)
- Trading & Investing 13.7% ($503,017,590.32)
- Finance 10.2% ($375,729,821.3)
- Payments 7.8% ($286,809,236.36)
- Data Storage 7.8% ($286,222,856)
- Drugs & Healthcare 5.5% ($202,526,054.4)
- Gaming & VR 4.5% ($164,506,063.9)
- Gambling & Betting 3.2% ($118,225,095.92)
- Commerce & Advertising 1.9% ($71,224,709)
- Identity & Reputation 1.2% ($42,359,520)
- Art & Music 1.1% ($40,691,545)
- Real Estate 1.1% ($40,132,362)
- Events & Entertainment 0.9% ($31,302,122.5)
- Legal 0.8% ($29,368,234)
- Energy & Utilities 0.8% ($28,866,928)
- Social Network 0.8% ($28,158,853.52)
- Communications 0.7% ($24,732,744)
- Mining 0.6% ($20,647,239)

▲ 1/2 ▼

Supply chain

Trade finance

Single windows

Traceability and provenance

Fair trade

Reduction in inefficiency

DLT can provide:

- Faster credit risk assessment from the transaction history;
- Minimized human error in document checks;
- Instant verification and reconciliation of records;
- Automatic execution of workflow steps through smart contracts; and
- Instant, secure, low-cost exchange of data

GENUINE

REPUBLIC OF KENYA

THE REGISTERED LAND ACT

(Chapter 300)

Title Deed

Title Number KAJIADO/LOODARIAK/579

Approximate Area 104.0 hectares

Registry Map Sheet No. .....

This is to certify that SELETA OLE SULULU

ID/4555787/64 of P. O. Box 119 Ngong Hills . . . . . .

. . . . . .

. . . . . .

is (~~are~~) now registered as the absolute proprietor(s)
comprised in the above-mentioned title, subject to th
the register relating to the land and to such of th
interests set out in section 30 of the Registered Land
for the time being subsist and affect the land.

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District La

day of Septem

Land Registrar


PRIVACY
INFORMATION
DATA
INDIVIDUALS
LAWS
PERSONAL
PRIVATE
PUBLIC
CONSIDERED
RIGHT
STAKEHOLDERS
INTERESTS
TIME
PERSON
CASES
PERSONS
PEOPLE
SOMETHING
SELF-SYNCHRONIZATION
COUNTRIES
INDIVIDUAL
GOVERNMENT
CONCERNS
REQUIRE
WAY
MODESTY
STORED
CIRCUMSTANCES
COLLECTED
NORMALLY
FORM
CULTURES
SHARING
EXECUTIVES
EARNINGS
DEPRIVED
CLOTHES
DANGERS
USUALLY
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STATES
SACRIFICED
CONTENT
HUMAN
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INVESTORS
ASPECT
RELATED
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TAKE
COMMON
LEGAL
FREEDOM
INCLUDE
VIEW
EXPOSURE
EXTREME
CONFLICT
CONSTITUTIONS
PART
COLLABORATIVELY
UNNOTICED
MANY
INCOME
WITHIN

Disintermediation

Financial inclusion

Smart contracts

Friction (Ripple)

Better property records

Mining

Identity/registries

Permissioned blockchains/DLs (Corda)

Public comfort/cultural adoption
Understanding
Integration/systems overhaul

Nascent technology
Security
Energy consumption
Uncertain regulatory status

Sheila Warren
Head, Blockchain and Distributed Ledger
Center for the Fourth Industrial Revolution
Sheila.Warren@weforum.org
+1 415 205-6105