

Source: *The Business Blockchain* by William Mougayar (Wiley, 2016)

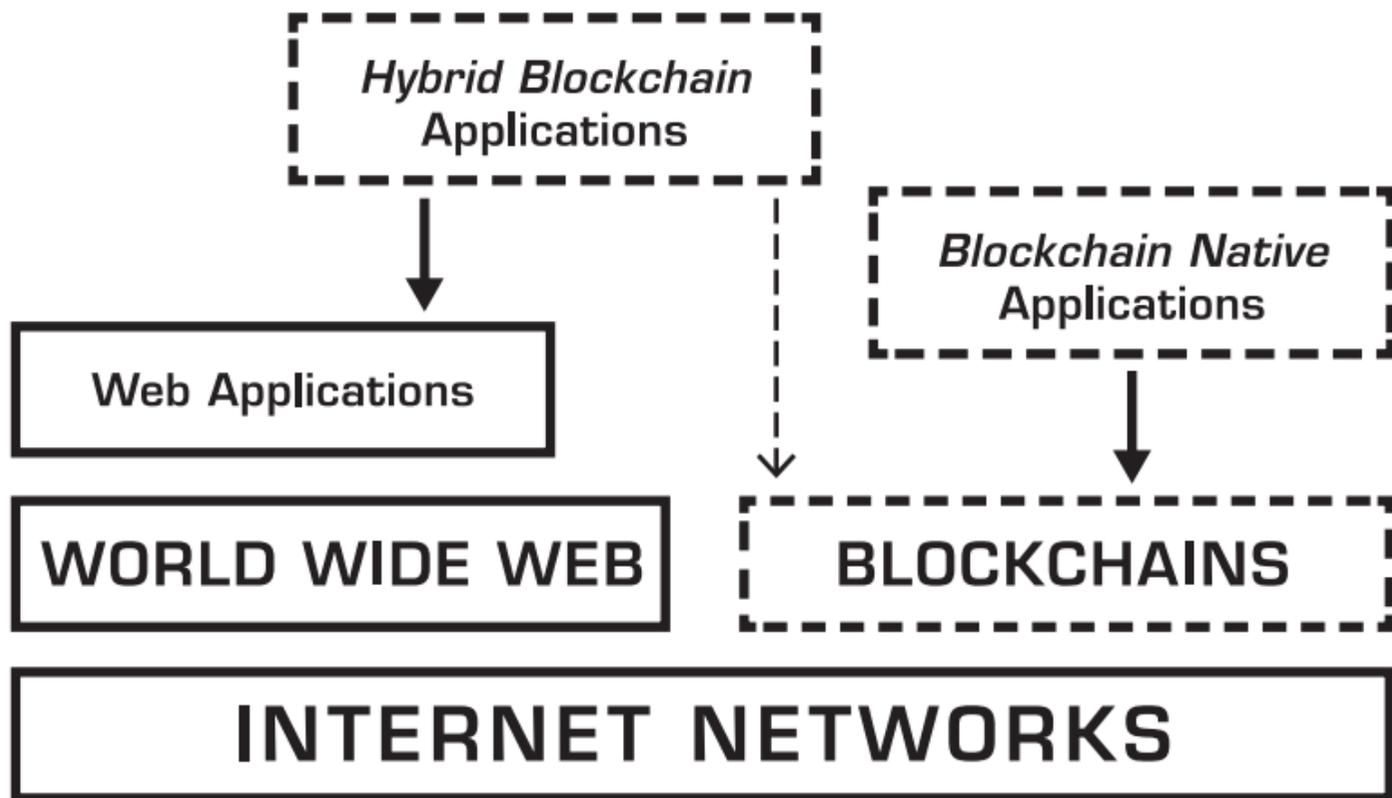
**BLOCKCHAINS, LIKE THE WEB,  
NEED THE INTERNET**

**WORLD WIDE WEB**

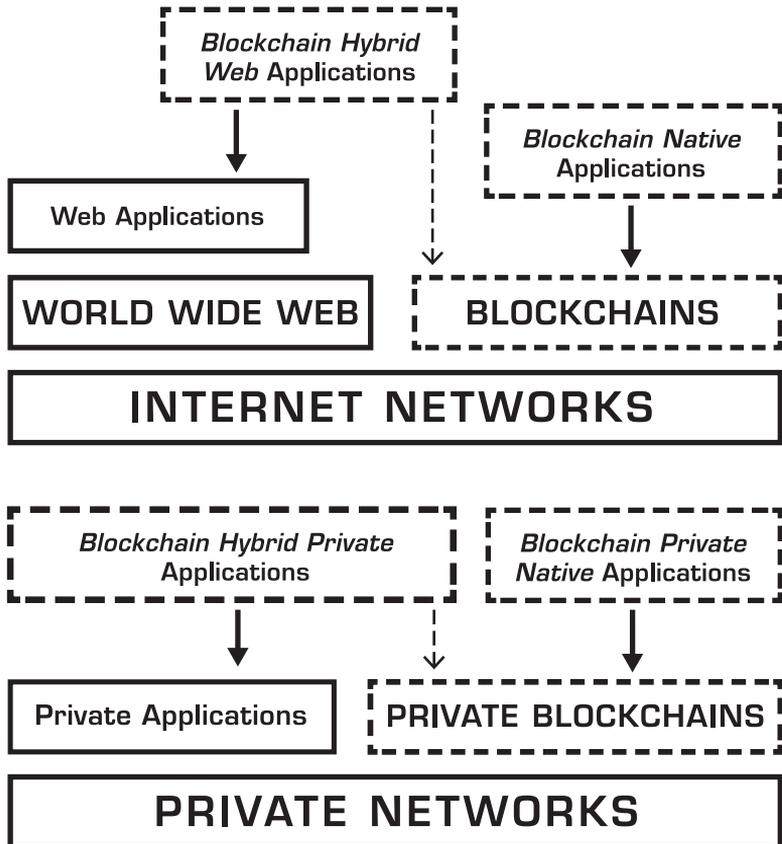
**BLOCKCHAINS**

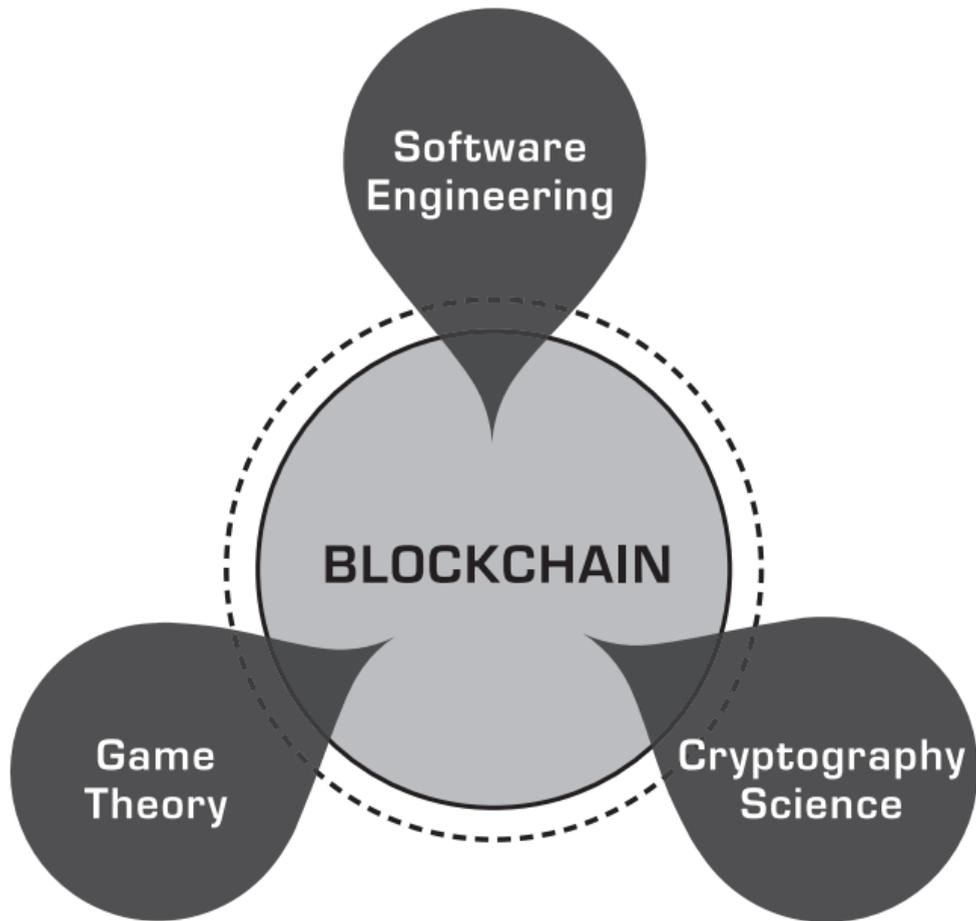
**INTERNET**

# FLAVORS OF BLOCKCHAIN APPLICATIONS



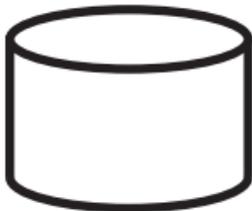
# FOUR TYPES OF BLOCKCHAIN APPLICATIONS





## BANK A

Owens database A  
Confirms AA has  
at least \$5



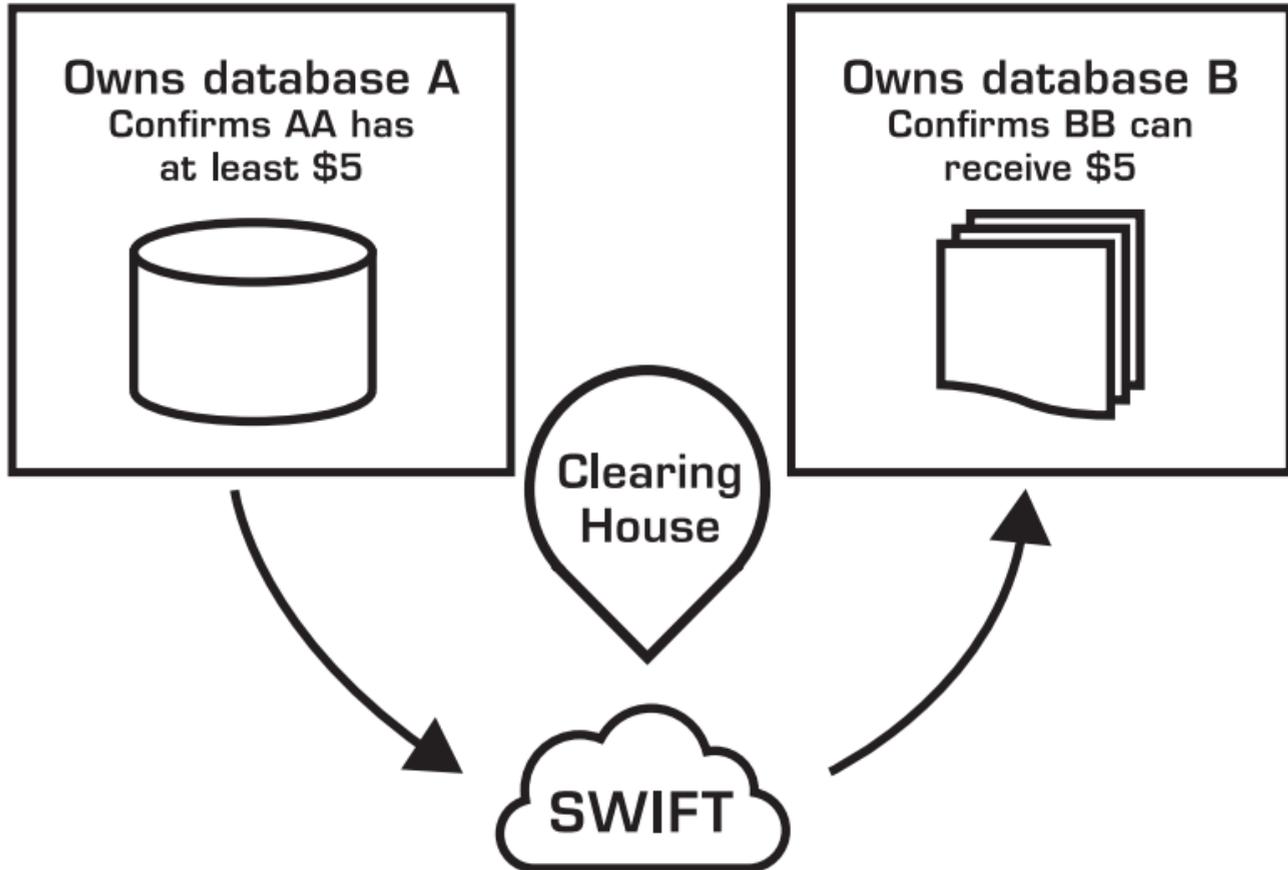
## BANK B

Owens database B  
Confirms BB can  
receive \$5



Clearing  
House

SWIFT



**USER**

Initiates transfer  
from their wallet

**USER**

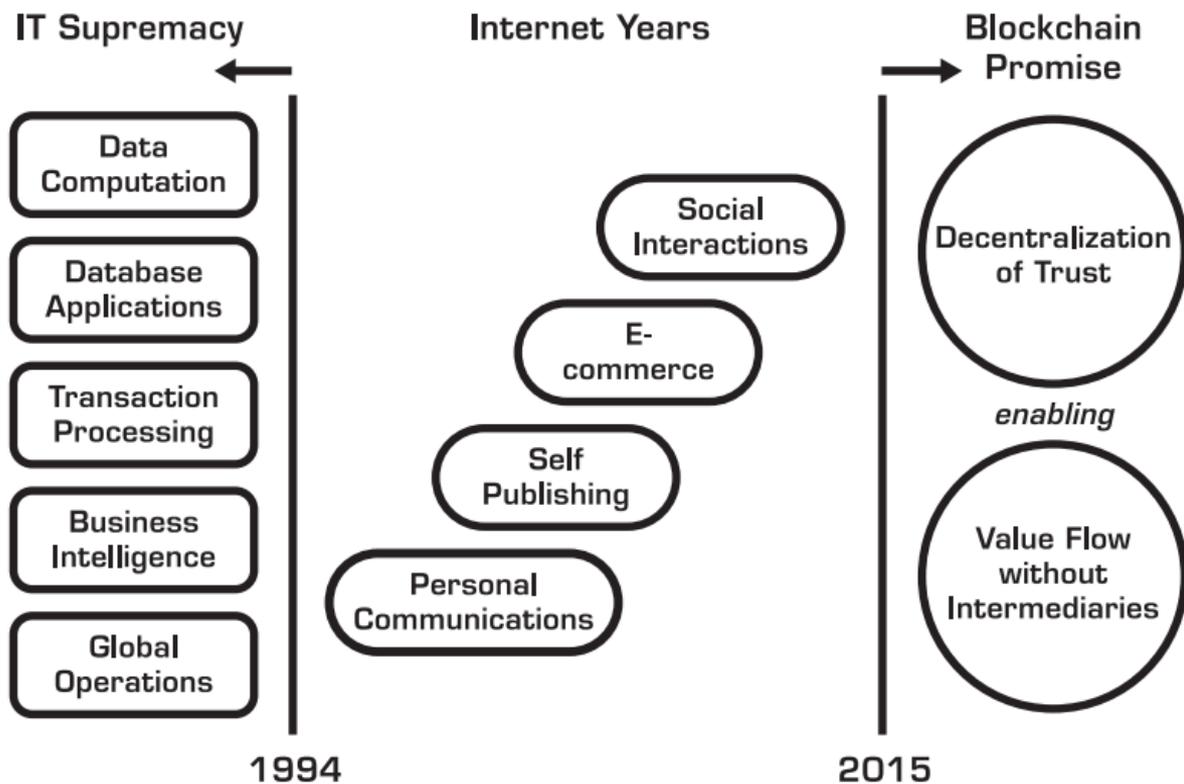
Receives funds  
in wallet

**BLOCKCHAIN**

```
graph TD; User1[USER: Initiates transfer from their wallet] --> Blockchain((BLOCKCHAIN)); Blockchain --> User2[USER: Receives funds in wallet];
```

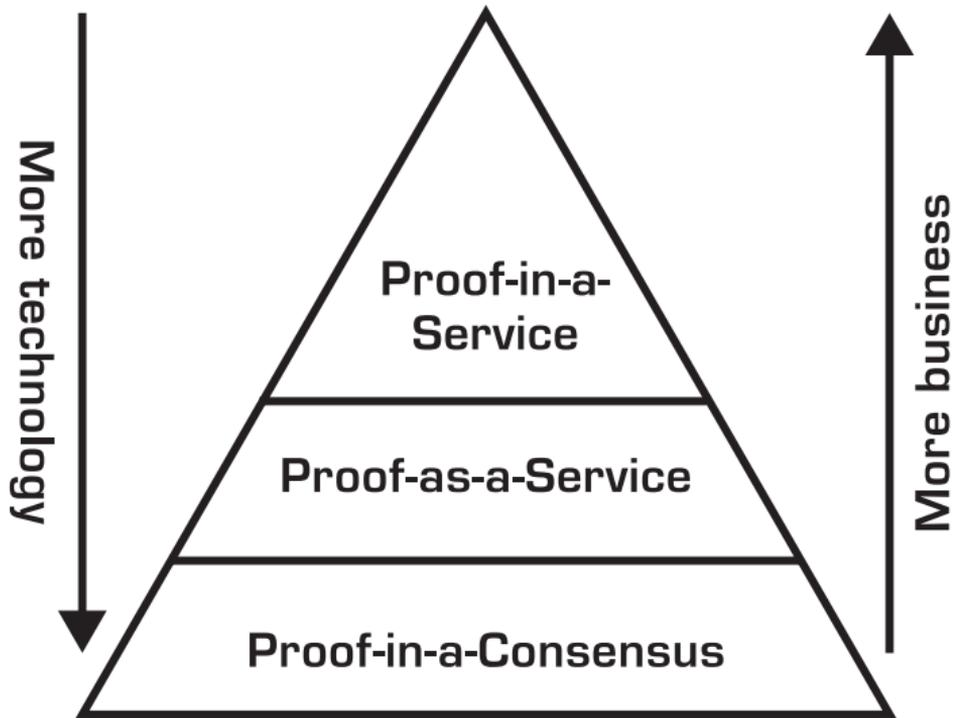
The diagram illustrates a transaction process. At the top left, a box labeled 'USER' contains the text 'Initiates transfer from their wallet'. A curved arrow points from this box to a cloud-shaped box at the bottom labeled 'BLOCKCHAIN'. Another curved arrow points from the 'BLOCKCHAIN' box to a second box at the top right, also labeled 'USER', which contains the text 'Receives funds in wallet'.

# DEFINING TECHNOLOGY ERAS



<b>PHASE</b>	<b>GOAL</b>	<b>DISRUPTING</b>	<b>OUTCOME</b>
<b>Communications</b>	Reach anyone in the world	Post office	Personal Communications
<b>Publishing</b>	Spread ideas	Print media	Self-publishing
<b>Commerce</b>	Trade	Supply chains and physical stores	E-Commerce
<b>Social Interactions</b>	Connect with friends	Real world	Social Web
<b>Asset Transactions</b>	Manage what you own	Existing custodians	Trust-based Services

# THE PROOFS PYRAMID



### **PROOF-IN-A-SERVICE**

- |  |  |
|--|--|
| <ul style="list-style-type: none"><li>• Wedding registry</li><li>• Land registry</li><li>• Supply chains</li><li>• Asset registrations</li></ul> | <ul style="list-style-type: none"><li>• Counterparty transactions</li><li>• Accounting audits</li><li>• Voting</li><li>• Deed transfer</li></ul> |
|--|--|

### **PROOF-AS-A-SERVICE**

- |   |   |
|---|---|
| <ul style="list-style-type: none"><li>• Proof of asset</li><li>• Proof of identity</li><li>• Proof of authenticity</li><li>• Proof of individuality</li></ul> | <ul style="list-style-type: none"><li>• Proof of ownership</li><li>• Proof of physical address</li><li>• Proof of provenance</li><li>• Proof of receipt</li></ul> |
|---|---|

### **PROOF-IN-A-CONSENSUS**

- |  |   |
|--|---|
| <ul style="list-style-type: none"><li>• Proof of work</li><li>• Proof of stake</li></ul> | <ul style="list-style-type: none"><li>• Proof of authority</li><li>• Proof of existence</li></ul> |
|--|---|

# A FRAMEWORK FOR FOCUSING BLOCKCHAIN'S SUCCESS

**BUSINESS  
DRIVERS**

**TECHNOLOGY  
ENABLERS**

**Technical  
Challenges**

**Behavioral/  
Educational  
Challenges**

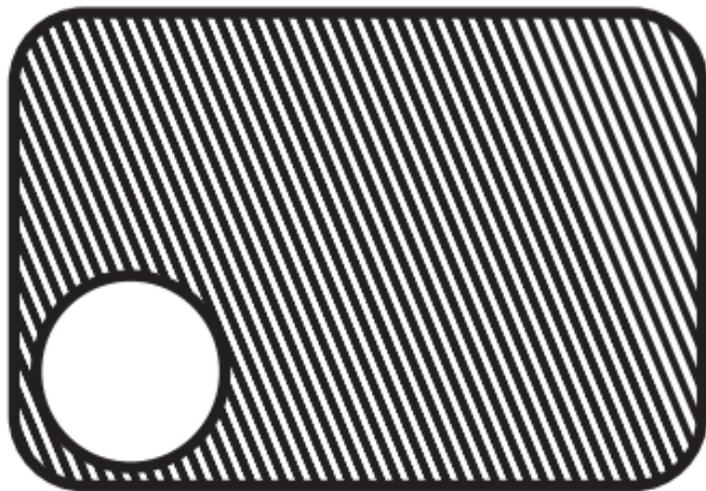
**Market/  
Business  
Challenges**

**Legal/  
Regulatory  
Challenges**

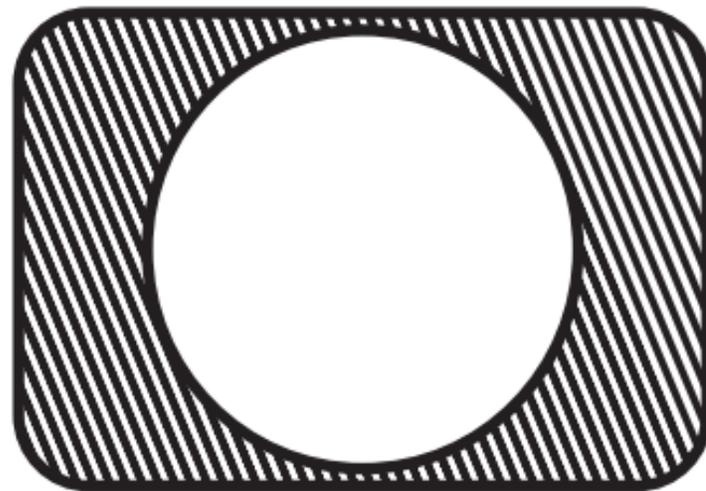
**SOLUTIONS (to Barriers)**

TECHNICAL	MARKET / BUSINESS
<ul style="list-style-type: none"> <li>• Underdeveloped ecosystem infrastructure</li> <li>• Lack of mature applications</li> <li>• Scarcity in developers</li> <li>• Immature middleware and tools</li> <li>• Scalability</li> <li>• Legacy systems</li> <li>• Tradeoffs with databases</li> <li>• Privacy</li> <li>• Security</li> <li>• Lack of standards</li> </ul>	<ul style="list-style-type: none"> <li>• Moving assets to the blockchain</li> <li>• Quality of project ideas</li> <li>• Critical mass of users</li> <li>• Quality of startups</li> <li>• Venture capital</li> <li>• Volatility of cryptocurrency</li> <li>• Onboarding new users</li> <li>• Few poster applications companies</li> <li>• Not enough qualified individuals</li> <li>• Costs issues</li> <li>• Innovators dilemma<sup>1</sup></li> </ul>
BEHAVIORAL / EDUCATIONAL	LEGAL / REGULATORY
<ul style="list-style-type: none"> <li>• Lack of understanding of potential value</li> <li>• Limited executive vision</li> <li>• Change management</li> <li>• Trusting a network</li> <li>• Few best practices</li> <li>• Low usability factor</li> </ul>	<ul style="list-style-type: none"> <li>• Unclear regulations</li> <li>• Government interferences</li> <li>• Compliance requirements</li> <li>• Hype</li> <li>• Taxation and reporting</li> </ul>

# INNOVATION POTENTIAL FOR THE BLOCKCHAIN



**REGULATED  
ENVIRONMENTS**



**UNREGULATED  
ENVIRONMENTS**

## APPLICATIONS AND SOLUTIONS

- |   |  |
|---|--|
| <ul style="list-style-type: none"><li>• Brokerage services</li><li>• Cryptocurrency exchanges</li><li>• Software wallets</li><li>• Hardware wallets</li><li>• Merchant and retail services</li><li>• Financial data providers</li><li>• Trade finance solutions</li><li>• Compliance and identity</li><li>• Payments integrations</li></ul> | <ul style="list-style-type: none"><li>• Trading platforms</li><li>• Brokerage services</li><li>• Payroll</li><li>• Insurance</li><li>• Investments</li><li>• Loans</li><li>• Global/Local money services</li><li>• Capital markets solutions</li><li>• Teller machines</li></ul> |
|---|--|

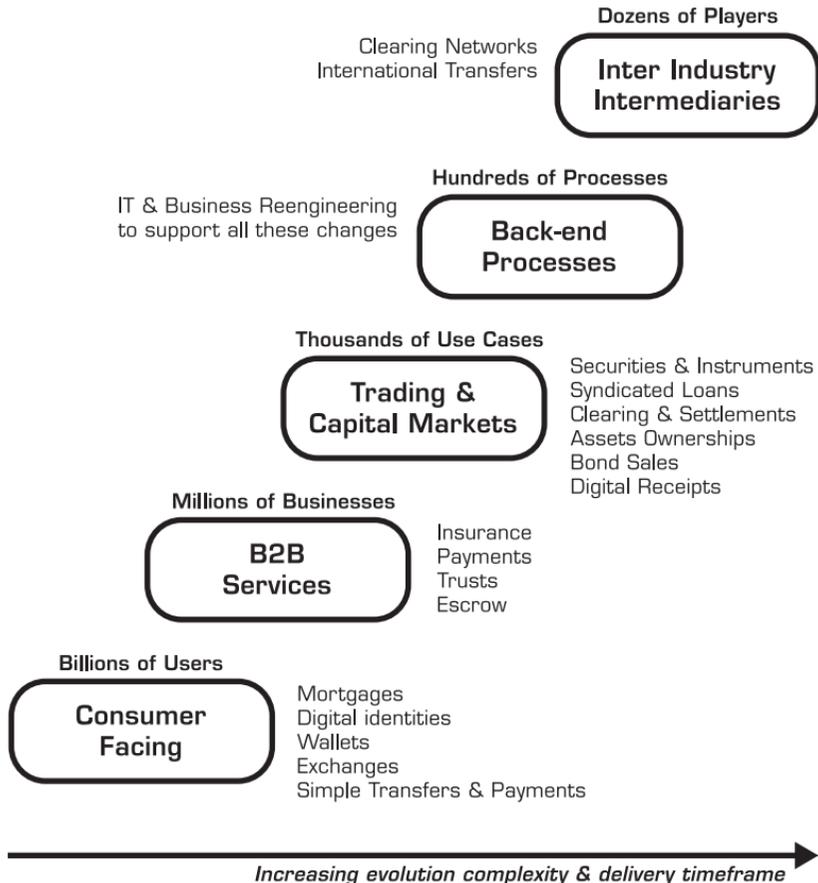
## MIDDLEWARE & SERVICES

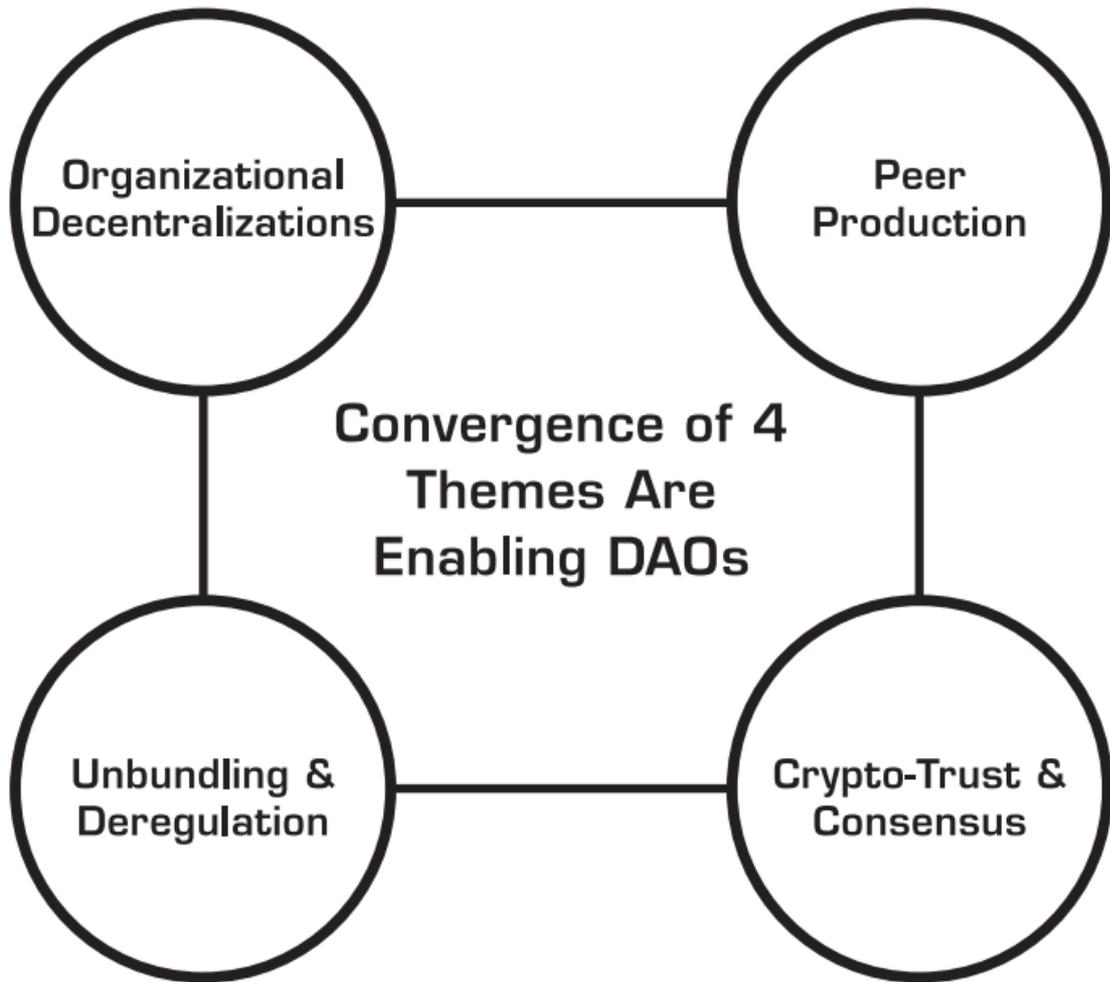
- |  |   |
|--|---|
| <ul style="list-style-type: none"><li>• Technology services providers</li><li>• Blockchain platforms</li><li>• Software development environments</li></ul> | <ul style="list-style-type: none"><li>• General purpose APIs</li><li>• Special purpose APIs</li><li>• Smart contracts tools</li></ul> |
|--|---|

## INFRASTRUCTURE & BASE PROTOCOLS

- |  |   |
|--|---|
| <ul style="list-style-type: none"><li>• Public consensus blockchains</li><li>• Private consensus blockchains</li></ul> | <ul style="list-style-type: none"><li>• Microtransactions infrastructure</li><li>• Miners</li></ul> |
|--|---|

# BLOCKCHAIN IN FINANCIAL SERVICES





## SOME BLOCKCHAIN-BASED SERVICES FOR TRADITIONAL GOVERNMENTS

- Marriage registration
- Procurement auctions
- Passport issuance
- Benefits collection
- Land registration
- Licenses
- Birth certificates

- Property ownership
- Motor vehicle registration
- Patents
- Taxes
- Voting
- Government bonds
- Filings and compliance

# A GENERIC APPROACH TO BLOCKCHAIN FUNCTIONALITY

**Off-Chain  
Services**

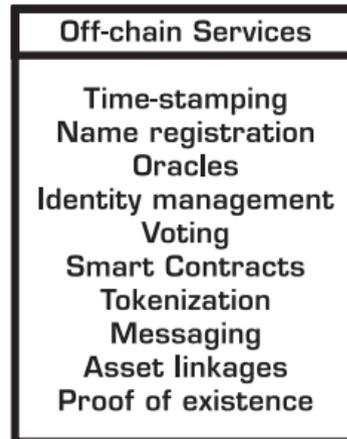
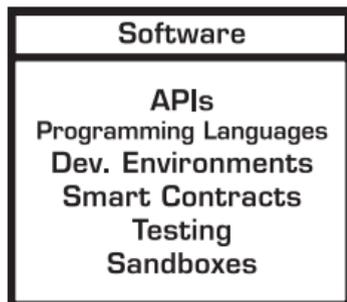
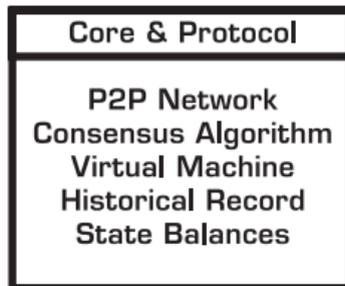
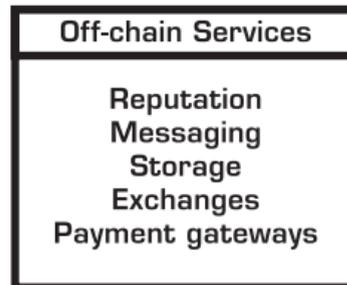
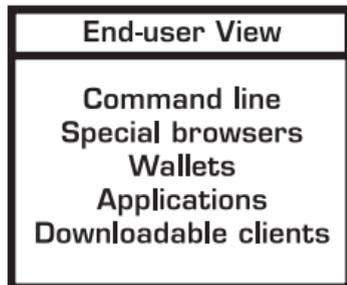
**Blockchain  
Services**

**End-user  
Products**

**CORE & PROTOCOL**

**Software Development Tools**

# A GENERIC APPROACH TO BLOCKCHAIN FUNCTIONALITY



# WHAT BLOCKCHAIN COMPETENCIES DO YOU HAVE?



APPROACH	HOW IT'S DONE	EXAMPLES
IT Services	We will build you anything	Big IT firms
Blockchain	You work directly with the blockchain's tools and services	Bitcoin, Ethereum
Development Platforms	Frameworks for IT professionals	Eris, BlockApps
Solutions	Industry-specific	Clearmatics, DAH, Chain
APIs & Overlays	DIY assembling pieces	Open Assets, Tierion

# HOW NEW TECHNOLOGY PERMEATES

