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*"Zest for Enlightenment"*

# Distributed Futures & Smart Ledgers

## The Future Is Already Here, And It Might Be Boring

**Professor Michael Mainelli**  
*Executive Chairman, Z/Yen Group*



@mrmainelli

Tuesday, 4 June 2019  
London

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[www.zyen.com](http://www.zyen.com)

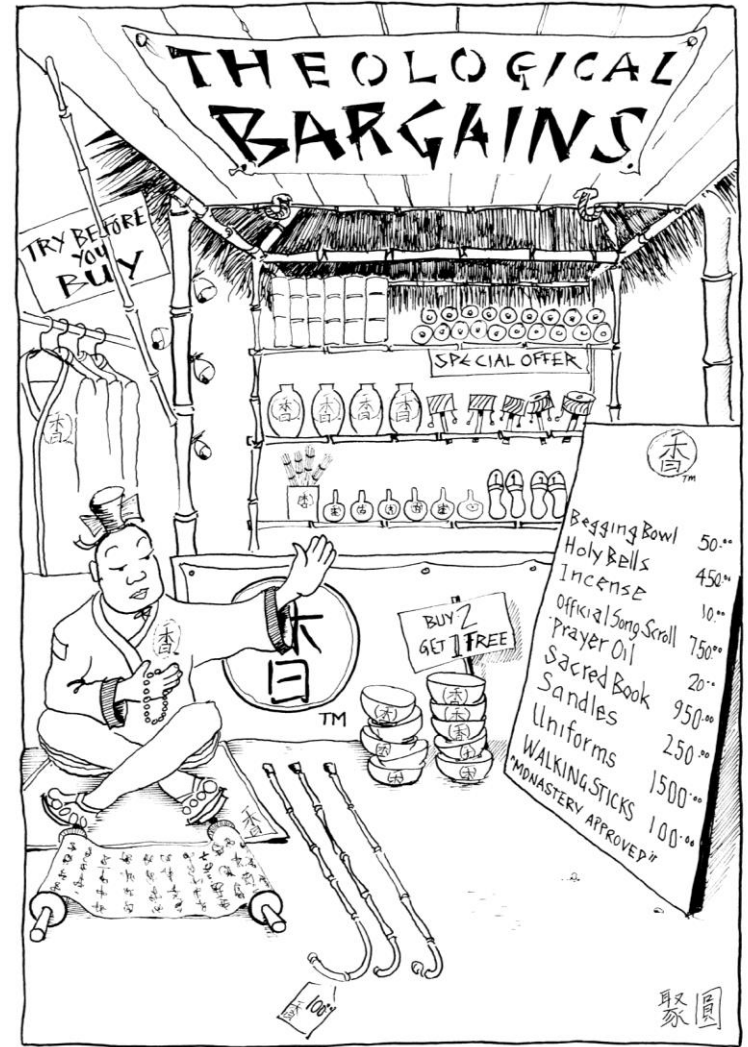




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# Outline

- ◆ Smart Ledger research
- ◆ Myths & legends
- ◆ The 'Internet-of-Record'
- ◆ Outlook after the 'pixie dust' settles



"Get a detailed grip on the big picture."  
*Chao Kli Ning*



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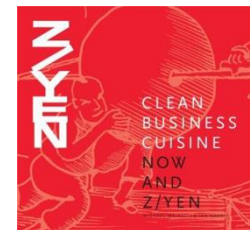
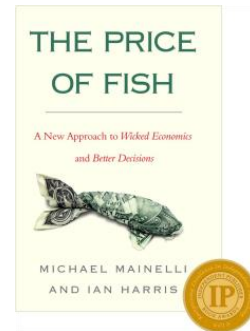
# Z/Yen



The Global  
Financial Centres  
Index



- ◆ Special – City of London’s leading commercial think-tank
- ◆ Services – projects, strategy, expertise on demand, coaching, research, analytics, modern systems
- ◆ Sectors – technology, finance, voluntary, professional services, outsourcing

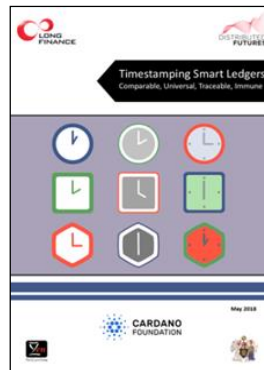
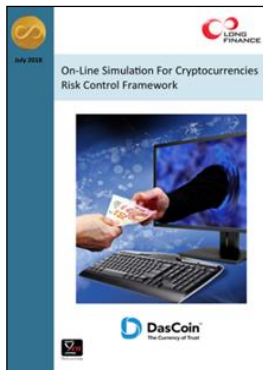
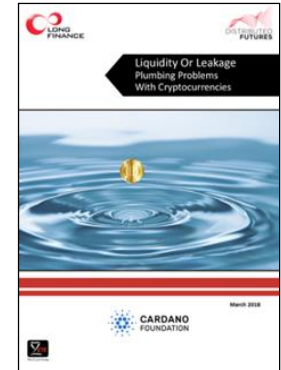
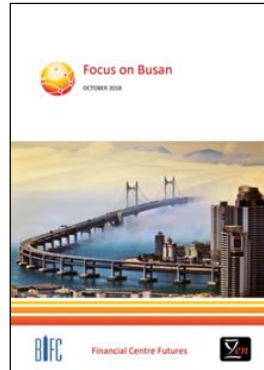
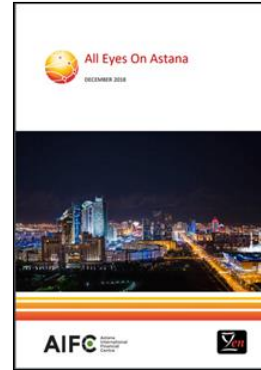
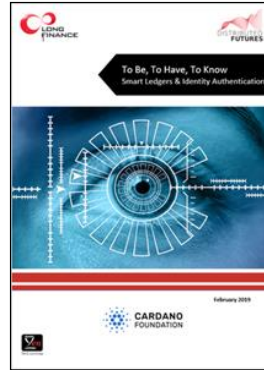


- Independent Publisher Book Awards Finance, Investment & Economics Gold Prize 2012 for ***The Price of Fish***
- British Computer Society **IT Director of the Year** 2004 for PropheZy and VizZy
- DTI **Smart Award** 2003 for PropheZy
- *Sunday Times* Book of the Week, ***Clean Business Cuisine***
- £1.9M **Foresight Challenge Award** for Financial Laboratory visualising financial risk 1997



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# Recent Research

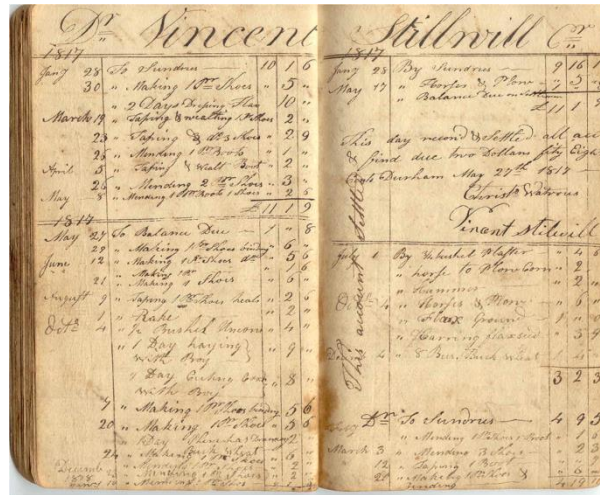




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# 'Internet-of-Record(s)'

“A ledger is a book, file, or other record of financial transactions.”



Christopher Watrous Ledger Book, Durham, 1817 (Vedder Library)

Accounts for Demo

CASH ACCOUNT From 01/03/2003 to 29/03/2004

Select current year Select previous year Refresh list

Date	Payee	Reference	Category	Actual (gross) Amount	Recon Balance (gross)	Admn. fund split OST net	Non OST	Sink. fund split OST net	Non OST	Balance (net)
25 MAY	Mr J Citizen	Lot 1 levy pa	Deposit	500.00	500.00	0.00	500.00	0.00	0.00	500.00
26 MAY	Local Insurance	Insurance	Ar Insurance Bu	-269.00	231.00	0.00	-269.00	0.00	0.00	231.00
31 MAY	(netbank)	Oovt Debit Tr	Oovt Debit Tr	-2.52	228.48	0.00	-2.52	0.00	0.00	228.48
31 MAY	(netbank)	Account Ser	Account Ser	-5.00	223.48	0.00	-5.00	0.00	0.00	223.48
31 MAY	(netbank)	Interest	Bank Interest	0.52	224.00	0.00	0.52	0.00	0.00	224.00
3 JUN 03	Clarks Grounds	Grounds Maint	Grounds Maint	-30.00	194.00	0.00	-30.00	0.00	0.00	194.00
10 JUN 03	Electrical Engineer	Replace light	Building Maint	-22.60	171.40	0.00	-22.60	0.00	0.00	171.40
11 JUL 03	Levy credit trans	Lot 1 credit	Levy credit tr	0.00	171.40	0.00	-250.00	0.00	250.00	171.40
10 OCT 03	Leahy	Terror Payou	Bank Transf	1000.00	1171.40	909.09	0.00	0.00	0.00	1080.49
10 OCT 03	Fencers Upstand	Broken Pain	Fencing	-120.00	1051.40	0.00	0.00	0.00	-120.00	960.49
16 OCT 03	Mr P D Jakeson	Lot 1 levy pa	Deposit	400.00	1451.40	0.00	0.00	363.64	0.00	1324.13
6 NOV 03	Mr P D Jakeson	Lot 1 levy pa	Deposit	25.00	1476.40	0.00	0.00	22.73	0.00	1346.86
11 NOV 03	Mr P D Jakeson	Lot 1 levy pa	Deposit	5.00	1481.40	0.00	0.00	4.55	0.00	1351.41

Edit row

Receive levy Bill pay Ledger Statement Bank deposit Strataware

Credit Debit Ledger group Reconciliation Term deposit Bank account

[SOURCE: [https://en.wikipedia.org/wiki/Tally\\_stick](https://en.wikipedia.org/wiki/Tally_stick)]

[SOURCE: <http://www.rootsweb.ancestry.com/~nygreen2/wpeF7.jpg>]

[SOURCE: <https://en.wikipedia.org/wiki/Ledger>]



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# Possibly Distributively Ledgerable

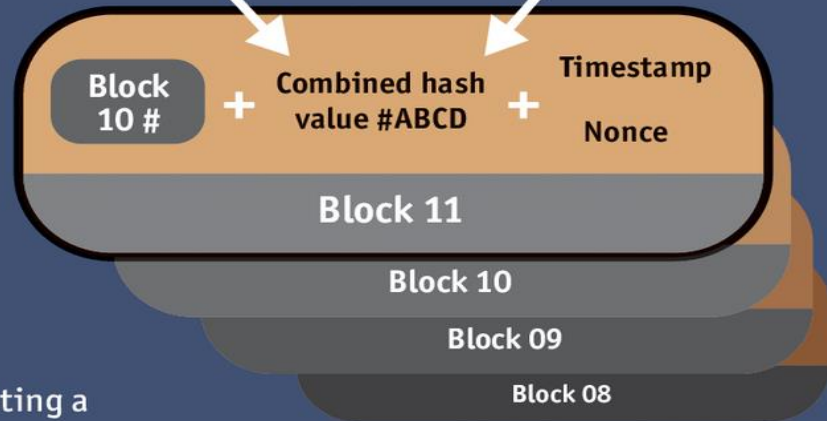
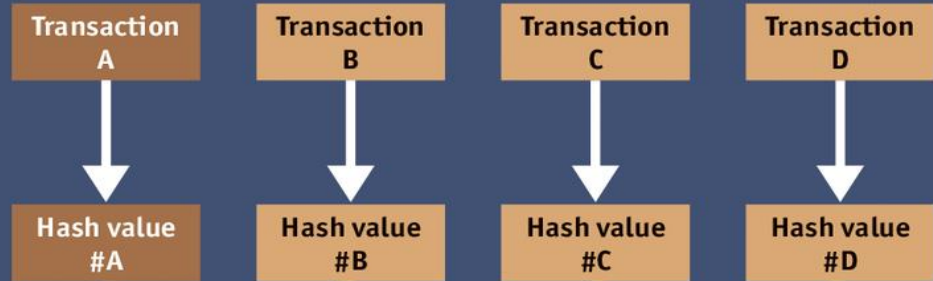
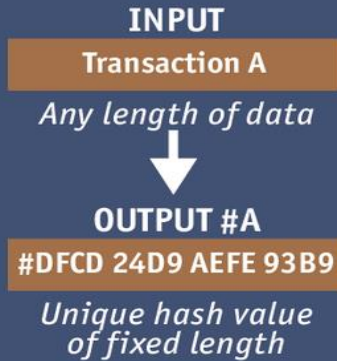
Financial Instruments, Records, Models		Public Records		Private, Semi-Private/Semi-Public		Physical Keys, Intellectual Property, Other Records	
Currencies	Derivatives	Land & Property Titles	Vehicle Registries	Contracts	ID	Home Key	Hotel Key
Commodities	Insurance Policies	Shipping Registries	Satellite Registries	Signature	Will	Office Key	Car Key
Trading Records	Private and Public Equities	Business License	Business Ownership Records	Trust	Escrow	Deposit Box Key	Mail Box Key
Certificates of Deposit	Bonds	Incorporation / Dissolution Records	Regulatory Records	Other Classifiable Data	High School / University Degrees	Internet Of Things	Copyrights & Patents
Voting Rights (Financial Services)	Credit Data	Criminal Records	Passport	Professional Qualifications	Certifications	Licenses	Digital Rights Management
Collateral Management	Client Monies Segregation	Birth / Death Certificates	Voting ID	Human Resources Records	Medical Records	Trademarks	Proof Of Authenticity / Authorship
Mortgage / Loan Records	Crowd-Funding	Health & Safety Inspections	Tax Returns	Accounting Records	Business Transaction Records	Cultural Events	Historical Events
P2P Lending	Microfinance	Building & Other Types Of Permits	Court Records	Locational Data	Genome & DNA	Documentaries	Big Data
Account Portability	Airmiles / Corporate Tokens	Government / Listed Companies	Accounts & Annual Reports	Arbitration	Genealogy Trees	SIM Cards	Archives



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# Overview Of 'Chains'

## Making a hash of it



Each transaction in the set that makes up a block is fed through a program that creates an encrypted code known as the hash value.

Hash values are further combined in a system known as a Merkle Tree.

The result of all this hashing goes into the block's header, along with a hash of the previous block's header and a timestamp.

The header then becomes part of a cryptographic puzzle solved by manipulating a number called the nonce.

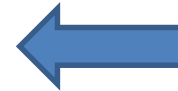
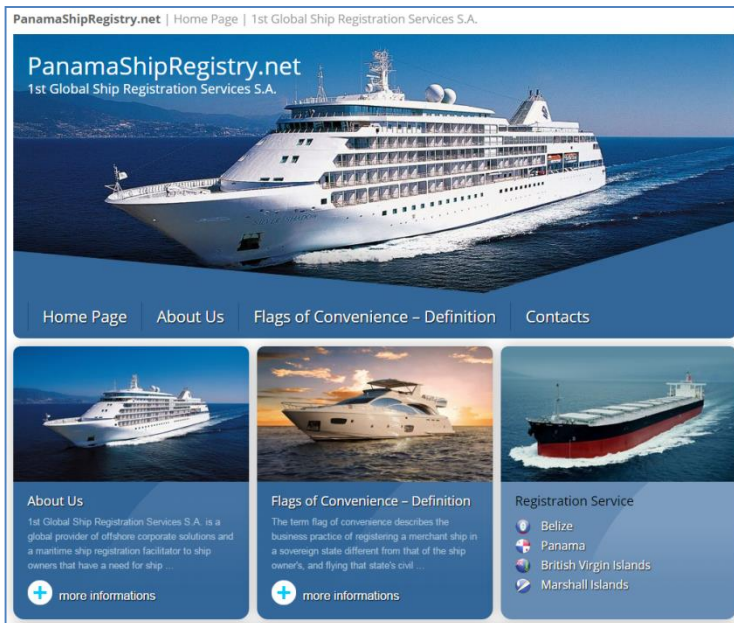
Once a solution is found the new block is added to the blockchain.



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# Central Registry As Trusted Third Party?

**Validates** – entries  
**Safeguards** – transactions  
**Preserves** – historic record







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# Terminology Evolving



- ♦ **ledger** – a record of transactions
- ♦ **distributed** – divided among several or many, in multiple locations
- ♦ **mutual** – shared in common, or owned by a community
- ♦ **mutual distributed ledger (MDL)** - a record of transactions shared in common and stored in multiple locations
- ♦ **mutual distributed ledger technology** – a technology that provides an immutable record of transactions shared in common and stored in multiple locations
- ♦ **blockchain** - “a transaction database shared by all nodes participating in a system based on the Bitcoin protocol”
- ♦ **smart ledger** – MDL with embedded, executable code



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# Myths & Legends

- ◆ Brand new technology?
- ◆ Payments?
- ◆ Speed doesn't matter?
- ◆ Economics doesn't matter?
- ◆ One true chain?
- ◆ Hard/easy to build?
- ◆ No apps? No killer app?





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# Post Truth

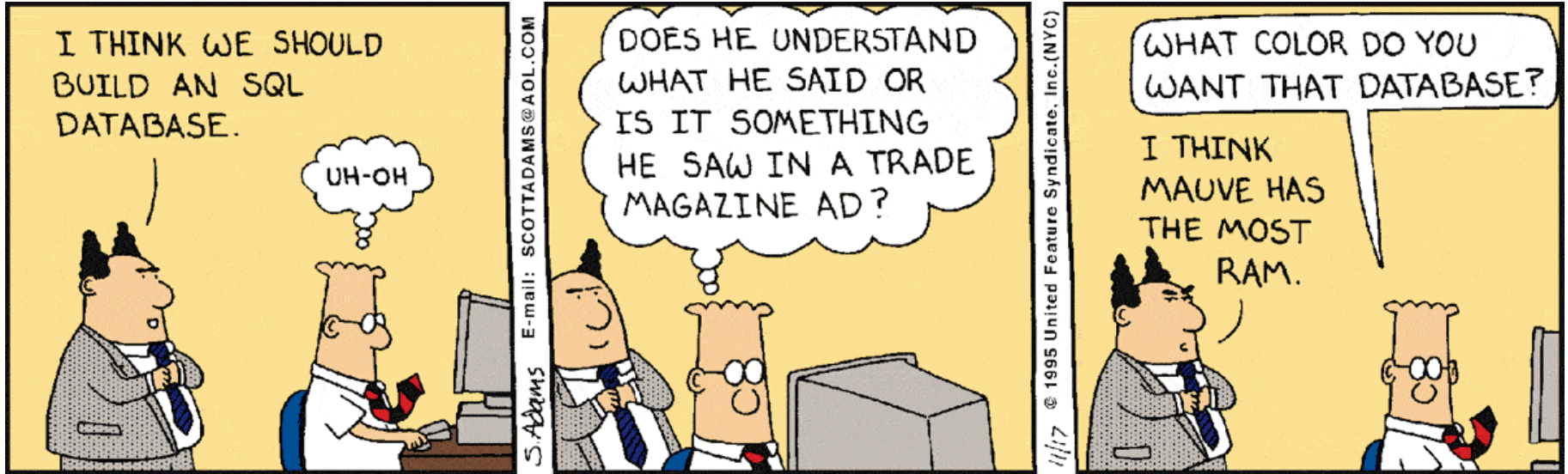


[Ken Tindell mashup - 14 May 2015 <https://twitter.com/kentindell/status/598865133247569920>]



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# Post Trade



[www.dilbert.com, Friday, 17 November 1995]

[Internet (1976 for me), databases (Oracle, Ingres, DBII, relational/hierarchical/distributed), web (SGML, Gopher), 'Internal Internets' (i.e. intranets), social media (SixDegrees)...]



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# Buzz Or Hype - Old Old Things?

- ◆ 1976 – Diffie-Hellman & Merkle (also RSA)
- ◆ 1990 – Mondex, Digicash, Flooz
- ◆ 1993 – Encrypted Open Books
- ◆ 1995 – Z/Yen Stacks & Sleeves, WebDNA
- ◆ 1996 – Ricardo payment system
- ◆ 1998 – Wei-Dai b-money, Bitgold
- ◆ 1999 – LOCKSS & CLOCKSS, Napster
- ◆ 2000 – Gnutella
- ◆ 2004 – Ripple
- ◆ 2007 – Estonia
- ◆ 2009 – Bitcoin
- ◆ 2013 – Silk Road, FBI, Alderney coin
- ◆ 2014 – Regulators – Jersey & Alderney, Isle of Man, FATF, ECB, State of New York
- ◆ 2015 – IBM-Samsung, Bank of England research agenda, UK budget for cryptocurrency standards, Barclays, UBS, BNY Mellon, Goldman Sachs, USAA, NASDAQ, Honduras land registry, Channel Islands Standards for MDLs, Fine (sic) Sign of having arrived – Ripple \$700,000, Sign of the Times – Bitcoin forking hell, Economist Special, FT Special
- ◆ 2016 – UK government, Blythe Masters DAH, R3, SafeShare Insurance, CLEAR, ...
- ◆ 2017 – CRYPTO BUBBLE?





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# Myth - New

**United States Patent** [19]

[11]

**4,074,066**

**Ehrsam et al.**

[45]

**Feb. 14, 1978**

[54] **MESSAGE VERIFICATION AND TRANSMISSION ERROR DETECTION BY BLOCK CHAINING**

[75] **Inventors: William Friedrich Ehrsam, Hurley; Carl H. W. Meyer, Kingston; John Lynn Smith; Walter Leonard Tuchman, both of Woodstock, all of N.Y.**

[73] **Assignee: International Business Machines Corporation, Armonk, N.Y.**

[21] **Appl. No.: 680,404**

[22] **Filed: Apr. 26, 1976**

[51] **Int. Cl.<sup>2</sup> ..... H04L 9/02**

[52] **U.S. Cl. .... 178/22**

[58] **Field of Search ..... 178/22; 35/4; 340/146.1 AL**

[56] **References Cited**

**U.S. PATENT DOCUMENTS**

3,657,699 4/1972 Rocher et al. .... 178/22  
3,725,579 4/1973 Sturzinger ..... 178/22

*Primary Examiner—Samuel W. Engle  
Assistant Examiner—S. A. Cangialosi  
Attorney, Agent, or Firm—Edwin Lester*

[57] **ABSTRACT**

A message transmission system for the secure transmission of multi-block data messages from a sending station to a receiving station.

The sending station contains cryptographic apparatus operative in successive cycles of operation during each of which an input block of clear data bits is ciphered under control of an input set of cipher key bits to generate an output block of ciphered data bits for transmission to the receiving station. Included in the cryptographic apparatus of the sending station is means providing one of the inputs for each succeeding ciphering cycle of operation as a function of each preceding ciphering cycle of operation. As a result, each succeeding output block of ciphered data bits is effectively chained to all preceding cycles of operation of the cryptographic apparatus of the sending station and is a function of the corresponding input block of clear data bits, all preceding input blocks of clear data bits and the initial input set of cipher key bits.

"Included in the cryptographic apparatus of the sending station is means providing one of the inputs for each succeeding ciphering cycle of operation as a function of each preceding ciphering cycle of operation. As a result, each succeeding output block of ciphered data bits is effectively chained to all preceding cycles of operation."



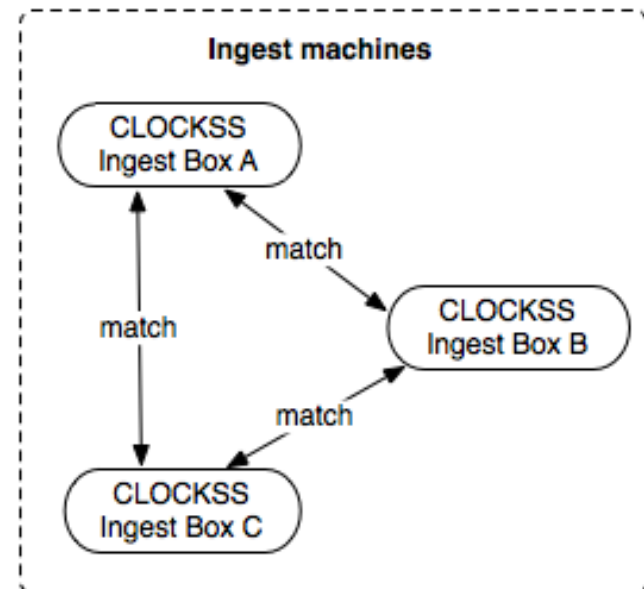
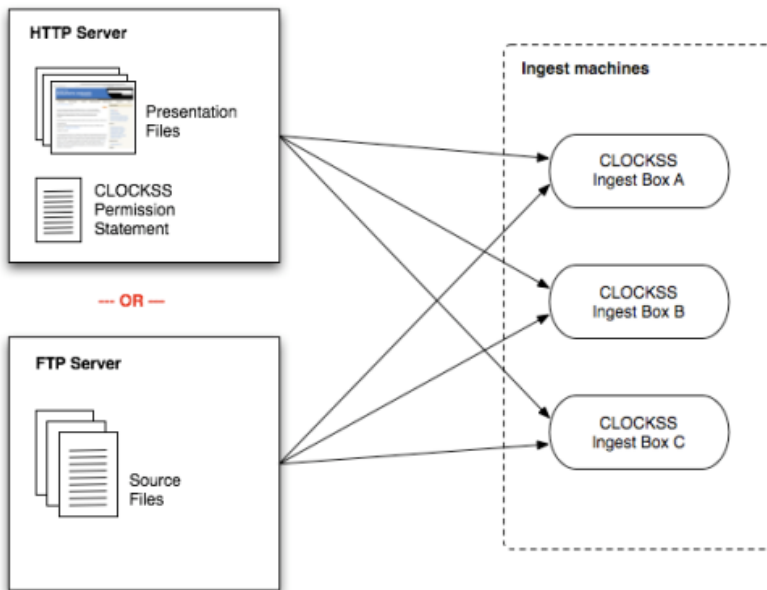
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# Myth - New

## Example




### Lots of copies keep stuff safe!





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# ChainZy.com

 ChainZy [About](#) [Stats](#) [Case Studies](#) [Products](#) [The Mutual](#)

## Case Studies

ChainZy is a set of [working products](#) handling tens of millions of transactions per year. The ledgers are sometimes viewable, and the clients below give some idea of the breadth of applications or demonstrations already complete (\* = viewable ledger, L = live application, D = demonstration/pilot).

[TimeChainZ - Clinical Assessments](#) \*L

[TimeChainZ - MovieSweep](#) \*L

[TimeChainZ - States of Alderney](#) \*L

[TimeChainZ - Youthinmind](#) L

[TimeChainZ - Regulatory Reporting For High-Frequency Trading](#) D

[TimeChainZ - Book Publishing Download Authentication](#) L

[IDChainZ - Mobile Application](#) D

[SmartChainZ - FastTrackTrade](#) \*L

[SmartChainZ - Fishface](#) L

[SmartChainZ - IoT Refrigerator Timestamping](#) D

[SmartChainZ - Cyber-Catastrophe Insurance-Linked-Security Index](#) \*L

[TimeChainZ - Catenae Uses ChainZy For Firedoor Inspections](#) L

[TimeChainZ - SafeShare Insurance](#) L, now D

[GeoChainZ - GeoGnomo](#) D

[GeoChainZ - GeoTono](#) D





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# Follower Syndicate In Code

```
set % underwriting to 0
set # Insurers >= 7% to 0
if A u/w% >= 7
do change # Insurers >= 7% by 1
if B u/w% >= 7
do change # Insurers >= 7% by 1
if C u/w% >= 7
do change # Insurers >= 7% by 1
set Total u/w% to A u/w% + B u/w% + C
if Total u/w% >= 20
do if # Insurers >= 7% >= 2
do set % underwriting to Total u/w% x 0.03
```

Language: Python

```
from numbers import Number

__Insurers_3E_7_25 = None
_25_underwriting = None
A_u_w_25 = None
B_u_w_25 = None
C_u_w_25 = None
Count = None
D_u_w_25 = None
Total_u_w_25 = None

_25_underwriting = 0
__Insurers_3E_7_25 = 0
if A_u_w_25 >= 7:
    __Insurers_3E_7_25 = (__Insur
if B_u_w_25 >= 7:
    __Insurers_3E_7_25 = (__Insur
if C_u_w_25 >= 7:
    __Insurers_3E_7_25 = (__Insur
Total_u_w_25 = (A_u_w_25 + B_u_w_
if Total_u_w_25 >= 20:
    if __Insurers_3E_7_25 >= 2:
        _25_underwriting = Total_u_w_
7

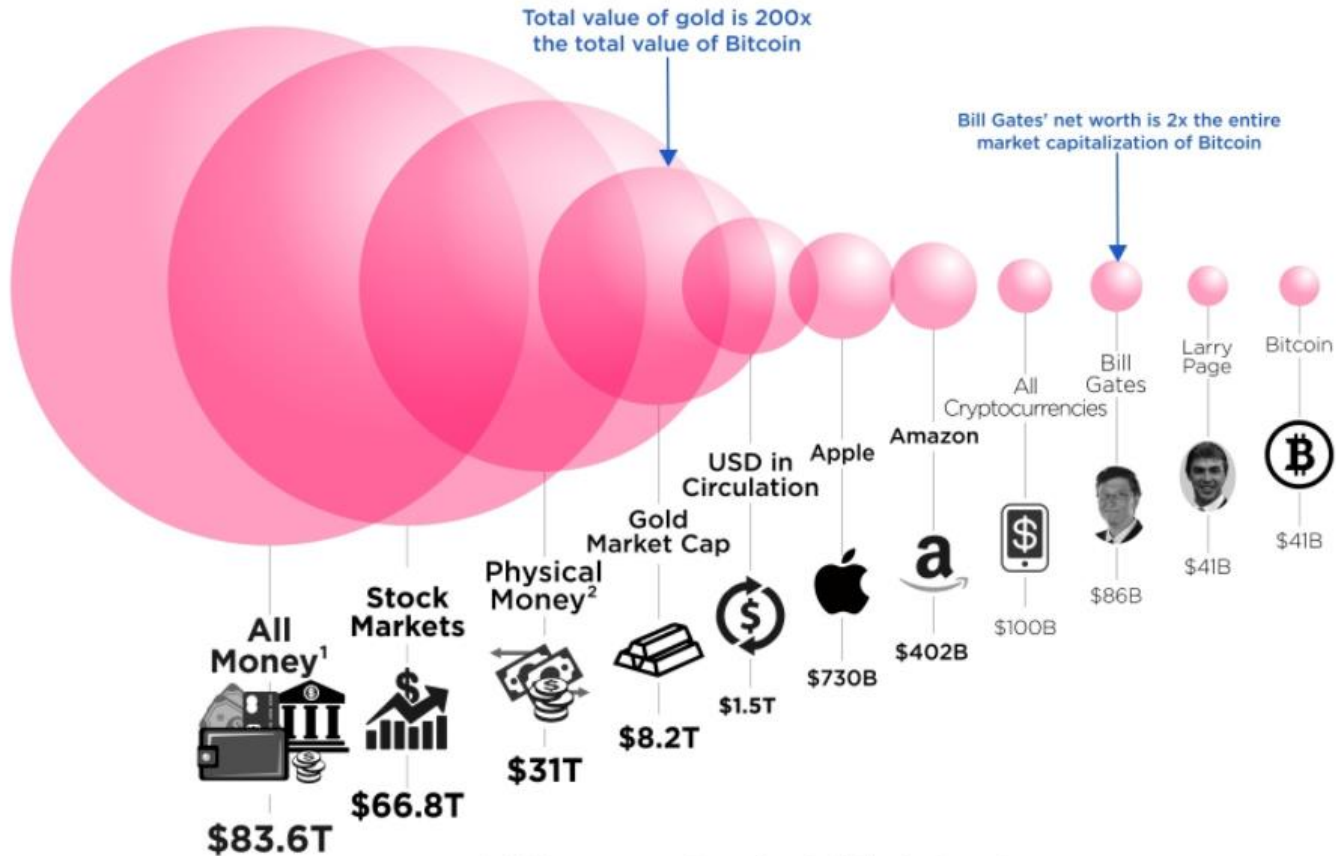
if false:
    pass
```



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# Myth – Payments Total Perspective Vortex

## Putting the World's Money into Perspective



**Sources:**

<https://howmuch.net/articles/worlds-money-in-perspective>  
<https://coinmarketcap.com>  
<https://www.forbes.com>  
<https://www.federalreserve.gov>  
<https://www.cia.gov>

<sup>1</sup> All Money = money in any form including bank or other deposits as well as notes and coins.

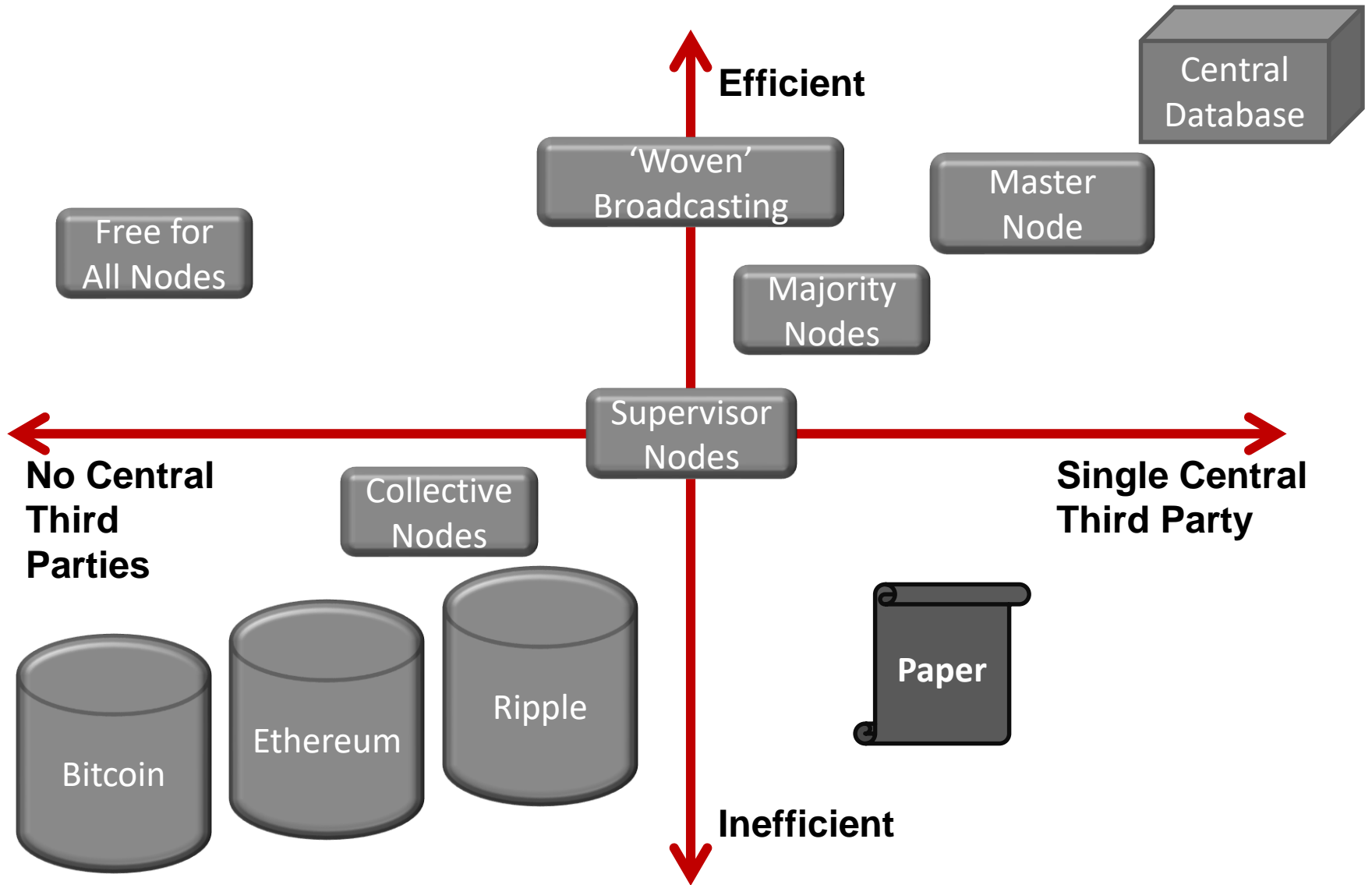
<sup>2</sup> Physical Money = money in forms that can be used as a medium of exchange, generally notes, coins, and certain balances held by banks.

howmuch.net



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# Mistrust Costs Coins





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# Myth - Speed Doesn't Matter Quantum Clock $\mu$ Sec Accuracy

## interxion™



August 2017 – 25 billion/day test rig, 1 trillion/day capacity



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# Myth - Economics Doesn't Matter

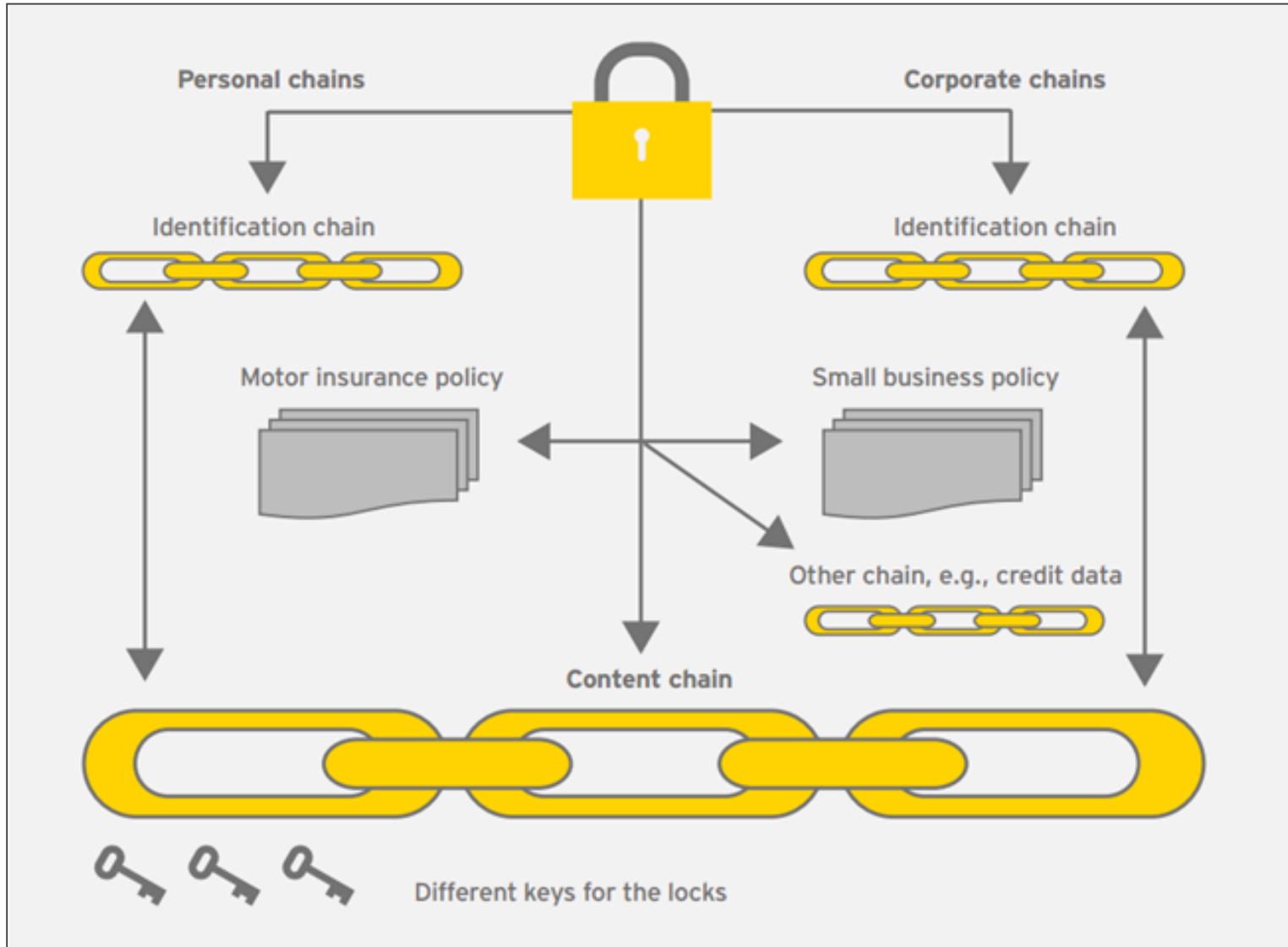
Factor	Bitcoin	Ethereum	ChainZy
Speed – transactions per second	7 tps	30 tps	2,000 to 10,000 tps (single transmitter)
Storage	Fixed	Fixed	Variable
\$/transaction	\$0.10 to \$2.50++	\$0.20 to \$5.00++	<\$0.000001
Validation time	10 minutes	15 seconds	0.0001 second

Google search	40,000 a second
Visa payments	65,000 a second
Twitter	600 a second
Facebook	700 a second
Bombay Exchange	4,600 a second
ChainZy (configured)	100,000+ a second



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# Myth – One True Chain





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# Myth - Hard or Easy to Build?

## Application: MetroGnomo – Timestamping & Datalogging



MetroGnomo BETA  
Open-Source Distributed Timestamps

Home About News

Stamp it! Check Stamp Retrieve File  
Register View Live Ledger Host Receiver

Obtaining Proof Of Existence

Home About Press Contact us

Last Metro Time  
2016-01-24 19:20:36.105496

Last Timestamp  
14s ago

Average Duration  
14s

MetroGnomo BETA  
Open-Source Distributed Timestamps

Home About News

View Live Ledger

Current Time: 2016-03-26 11:17:33 AM  
Last Metro Time: 2016-03-26 12:15:01.964577  
Last Timestamp: 153s ago  
Average Duration: 201s

Timestamp Time (s) chart: Shows bars for time intervals from 0.5 to 10.5 seconds.

Average Timestamp Duration (s) chart: Shows a line graph of average duration over time intervals from 2 to 12 seconds.

Show 10 entries

UUID	Metro Time	RowHash	TableHash	Tag
902053a5				
-5b2c-477	2016-03-26 1	47d450e098d71671e1c078648733707	32fdb23d0697a4a2342cf1864c9085010	
e-95cb-90	2:15:01.96457	8ac1b9e0928c286fb704e522d599d0e	daee2f9337f36fa4bef1e7e67319	2016-03-26T12:15:01+00:00@tmeapi.org
47577ef57	7	6		

mp Time (s) Average Timestamp Duration (s)

24  
18  
12  
6  
0

5 10 15 20 25

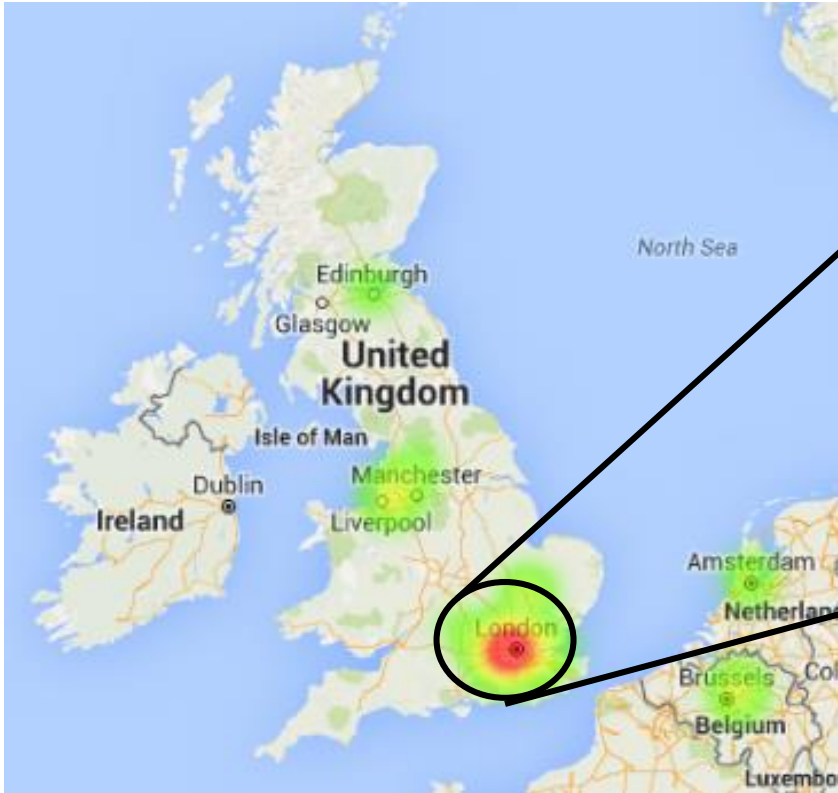
Search:

RowHash	TableHash	Tag
450ff4031de277cebdbadd67838d8 418b24ad998093fc1ecb9d4ce2a85c	4eb384a98d13c03592881cc0f3cdbe10c50 e2d4859fe9b629bfb36d01b97709	186.223.80.46
df44895a0a225ab9a938a411993192 2650b00b7e6a143d8894101810b2	6ec8845f38c3b1647ac8faf2f652318be585 aad7d42338ec8aaf7ce09e490d53	The+secular+cooling+hat+must+someday+overtake+our+planet+has+already+gone+far+in+depth+with+our+neighbor.
07f194e5ba0d3eb88859e90904f0 c055bf6e208cbf5774dde2cd2a885	772f534b6ca60d138ab7e87780c0dc16c84 dc089728bc808967eb5c0ed88aff	63+Jackson+Blvd, Northleach,+MT,+61794
64850903867119b0702b09ead9fa0 5880b00b7e6a143d8894101810b2	c9364abae46b5062756e20703b79874337 4aca5c3e2a32281e6289d290a4e31c	Jackson+Ave
4b05eccd2aef68cb8cf4c18e40305 9492bf9ab8ebd48020bc3783d580a	ce7c928eddb0a2e3d6a1c0300e7110f75eb 38319dab8c4e8d1cc7be91bce72f1	San+Martin
0185e888-4a74-49fb-8c0 c-cb55cc4f417f	2016-01-24 19:20:26.909764	
cbc804ae874c8872a6115e2fa43f437f3 d404d2e3d0945872ebfb809f1585d2	b7242a18e501cf4fd7647ef5a5385058ba28 e592fd82bfb800ef0daa4bafade	elizabethmiller@test.com



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# No Applications? Clinical Trials

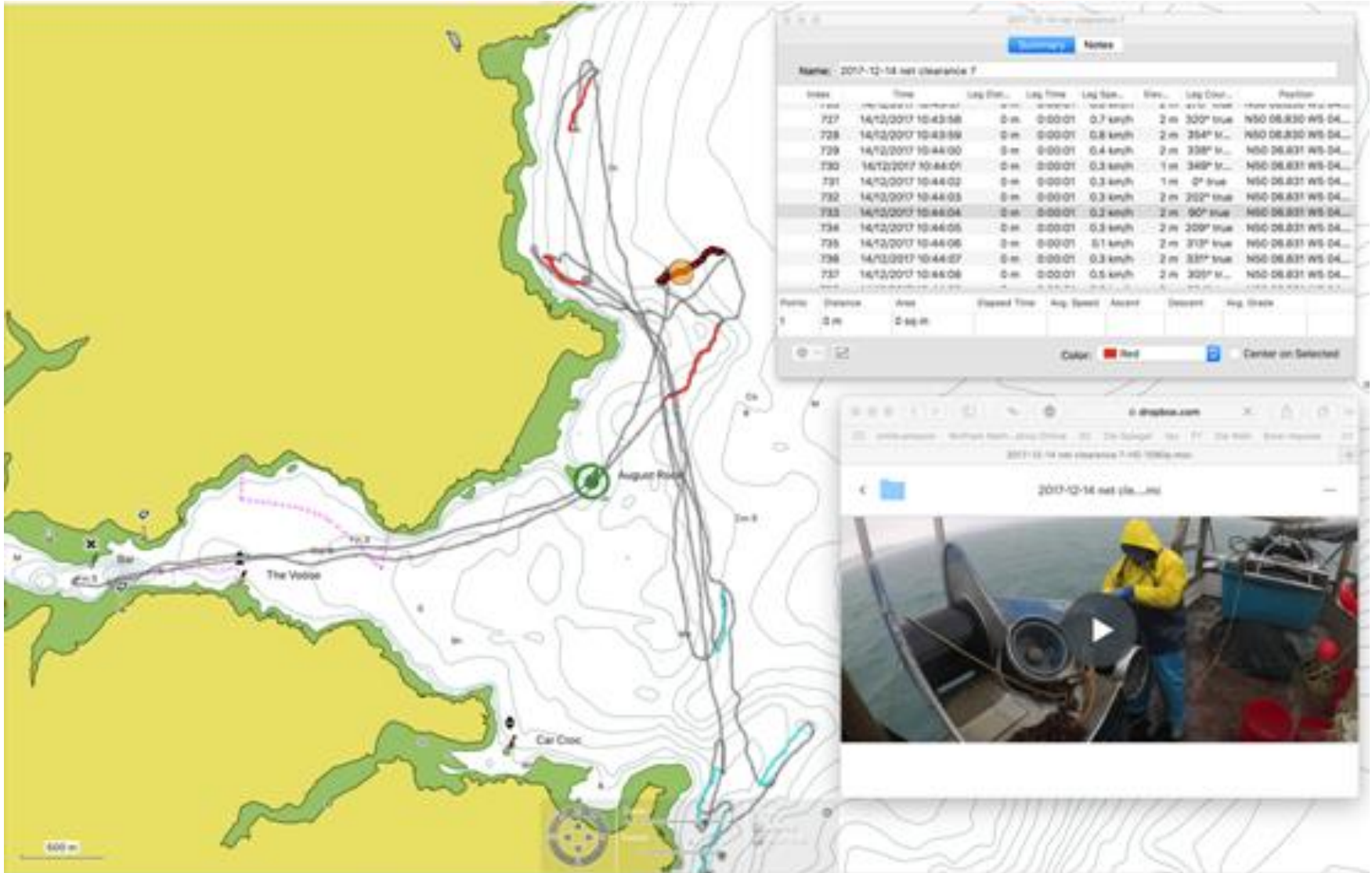






© Z/Yen 2019

# No Applications? Fishface





© Z/en 2019

# No Applications? GeoGnomo – Geostamping



<b>GeoGnomo Code</b> <input type="text" value="1,India,Quebec,Juliet,6,India,Mike,Kilo,Quebec,"/> <b>Level</b> <input type="text" value="20"/> <a href="#">Get Latitude and Longitude</a>	<b>Latitude</b> 47.2639950349 <b>Top Neighbor Code</b> N/A <b>Bottom Neighbor Code</b> 1,Juliet,6,India,Mike,Kilo,Quebec,Hotel,Alpha	<b>Longitude</b> 0.0000339739 <b>Left Neighbor Code</b> 5,Romeo,November,Quebec,November,Uniform,Victor,Romeo,Victor <b>Right Neighbor Code</b> 1,Juliet,6,India,Mike,Kilo,Quebec,Juliet,8
---	---	---

(Latitude: 47.2647, Longitude: -0.0009)

**Latitude (Decimal Degrees)**

**Longitude (Decimal Degrees)**

**Altitude/Depth(optional)**  
Please use minus sign for Depth  meters

**Level: 5**

[Use my current location](#) [Get GeoGnomo Code](#)

Click any location on the map or enter the latitude & longitude to find the code  
(Latitude: 53.696706, Longitude: -9.744873)

**Bottom Neighbor Code:**  
N/A

**Left Neighbor Code:**  
Foxtrot,4, Mike

**Right Neighbor Code:**  
Foxtrot,5, Victor

**Triangle Details**

**Point A (Latitude, Longitude):**  
(50.353157, -3.6)

**Point B (Latitude, Longitude):**  
(50.353157, 0.0)

**Point C (Latitude, Longitude):**  
(48.370815, -3.428571)



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# No Applications? Trade System



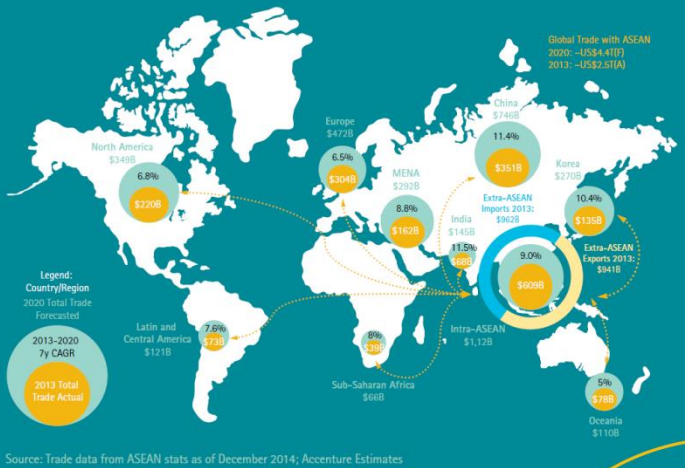
[Log In](#) [Sign Up](#)

User Name

“I want a very easy tool to sell my production abroad.”

- Thuy, Siem Reap green house

Forecast growth in trade flows between ASEAN and its major trading partners





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# IDchainZ

InterChainZ - Identity Validator Use Case
Identity Validator
Service User
Logout

### Add Data to Ledger

+ Add New Entity

+ Add Entity Data

Show 10 entries

Row Height	Row Hash	Created	Entry Type	Category	Company	File Name
1	0000f428915...	06-08-2015 09:37:41	Identity		EW715	EW715.t
2	00000150d3e...	06-08-2015 09:38:05	Company Data		EW715	EW715G eport.pdf
3	0000ebbbb48...	06-08-2015 09:38:16	Company Data		EW715	EW715ID df
4	000090d2124...	06-08-2015 09:38:29	Company Data		EW715	EW715S ySheet.p
5	000092bb08b...	06-08-2015 09:38:41	Company Data		EW715	EW715U .pdf
6	0000c10a4ca...	06-08-	Company		EW715	EW715Whole File.pdf

### Import / Export Functions

Export to file

Push to network

## EW715WorldCheckreport.pdf

Return to ledger | Download File | Verify File Hash | Verify Signature | Download Public Key

Row height	7
Row hash	0000befadd83449914c49265d53bde73ce1ad31528982359f2451c85cda8675f
Previous Row	0000c10a4cad3135d4898a2c1cbca1fa2afb1277b4f51910a1331f31f99db5c9
Created	06-08-2015 09:39:03
Entry Type	Company Data
Category	
File Hash	8d0c994bec217c45432e7e077996dcef0536988679a174c8ef136988731695e2
File Type	application/pdf
File Size	203Kb
File Name	EW715WorldCheckreport.pdf
Geo Location	(51.5151230, -0.091)
Public Key	30819f300d06092a8e5f7b3ac46d1d9a8bc847f33344c922fbb
Signature	
Nonce	

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- General Legal Notice
- Category Legal Notice
- Reported Link Legal Notice

found. All discounted based on name mismatch. One Exact Match - Queen of England (PEP)

00	Printed: 10-10-2013 10:06 UTC
Windsor	
1	
	Anne Elizabeth Alice Louise INDIVIDUAL
INDSOR	Louise INDIVIDUAL
INDSOR	Beatrice Elizabeth Mary INDIVIDUAL
	Alexandra INDIVIDUAL
	Elizabeth Alexandra Mary POLITICALINDIVIDUAL

Key Ring ID: 3cc2f819-6368-4245-8b71-b592a2d4cf98

Notes: 4

Files: 20

Sub-rings: 2

led or correlated in this profile, appears in the listed sources. We are not responsible for the content of ces. Information correlated is necessarily brief and should be read by users in the context of the fuller external sources to which hypertext links are provided. Users should also carry out independent checks formation correlated.

formation contained in the sources provided.

Properties (3) | **KRING** | History (5)

Notes (0) +

Go to subring (0)

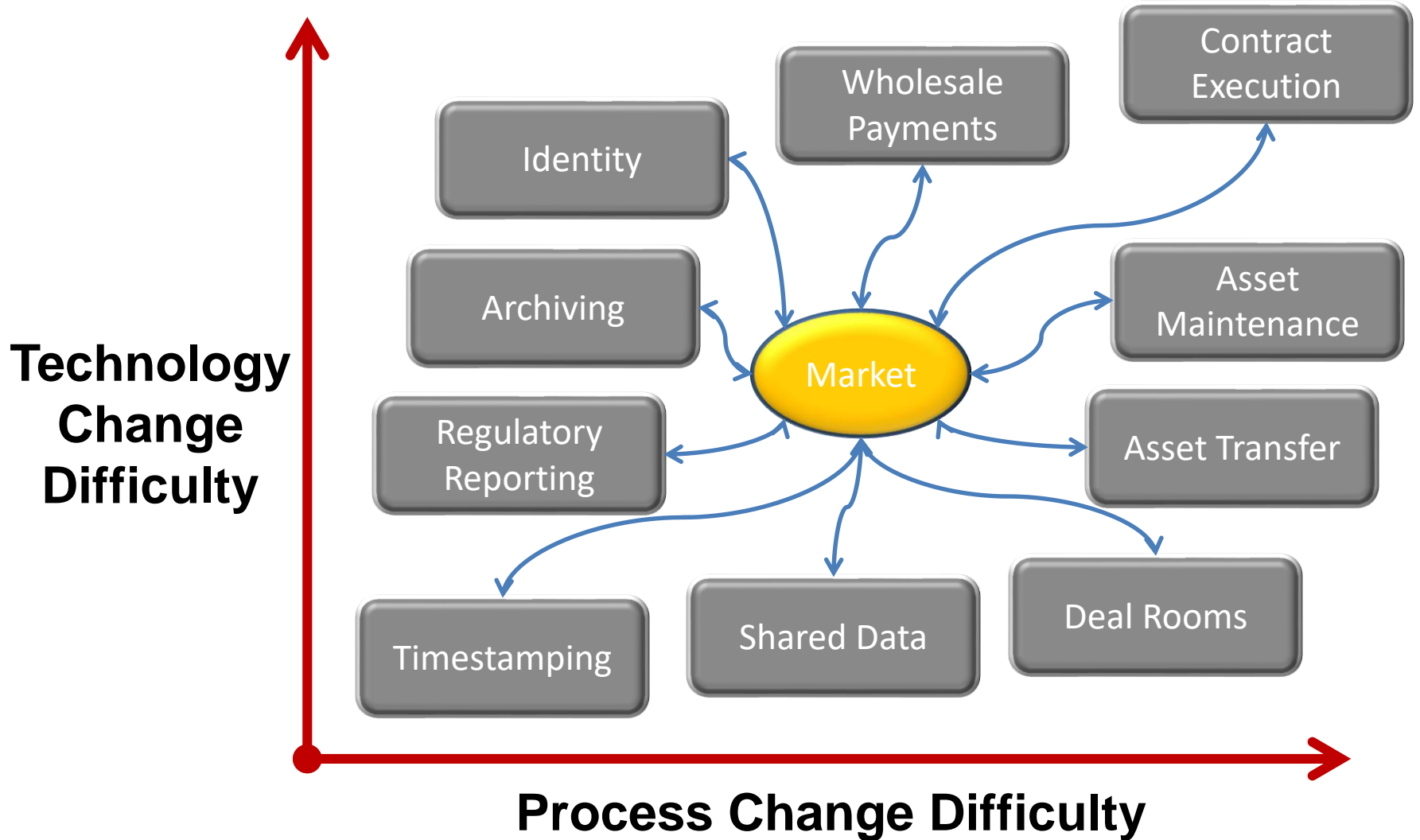
Set a subring (0)

Sprites (0) + | Files (2) ± | Copy to subring



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# Generic 'Anti-Cheating' Devices 'Performing with Integrity'





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# When The Pixie Dust Settles



- ◆ Energy consumption & slow – proof-of-stake, no IoT
- ◆ Money supply – governance, ‘tyranny of the code’ versus ‘tyranny of the majority’
- ◆ Substrate – unwind

Regulatory Backlash...

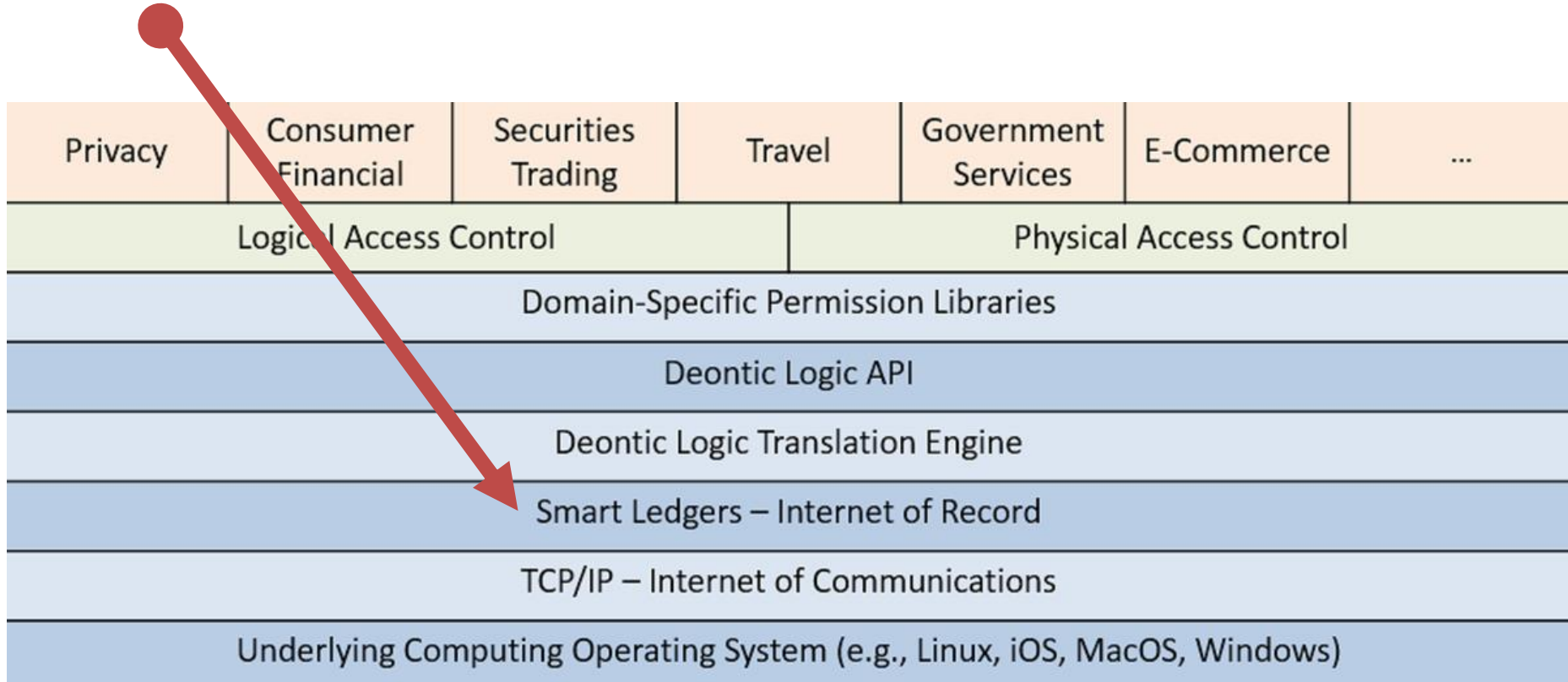
"You see her after the third glass"





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# 'Internet of Record'





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# Closing Thoughts

- ◆ Smart Ledgers help communities share information across time and space, less vulnerable to natural monopolies
  - ◆ Smart Ledgers provide persistent and permanent 'internet-of-record' utilities:
    - safeguarding transactions
    - preserving transactions & data
  - ◆ Smart Ledger technology will displace much messaging and shared data functions
- ... try one out ... [www.MetroGnomo.com](http://www.MetroGnomo.com)






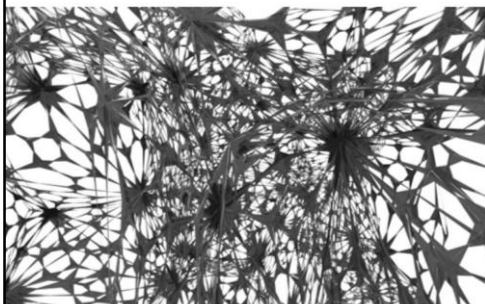
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# The Long-Term? Identity, Document, & Agreement Exchanges (IDAX)

Theme	Service	Question
Trust	Identities/Assets	Authentication
Space	Transactions	Services
Time	Debts	Value-added
Mutuality	Contracts	Common-wealth



**Chain Of A Lifetime:**  
How Blockchain Technology  
Might Transform Personal Insurance



**December 2014**  
A Long Finance report prepared by ZYen Group

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A: £2.50 net, £0.50 VAT @  
20.0% Total £3.00

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2013-06-25

SPECIAL REPORT



**Breaking bit**

Bitcoin is the poster child of the cryptocurrency world, but it's not alone. *Michael Mainelli* and *Bob McDowell* take a look at the real-world implications of the rise of AltCoins

If money can be viewed as a technology used to trade debts, to other trust-trade applications, for example transferable votes among a fixed earthly supply but is mined according to price and demand



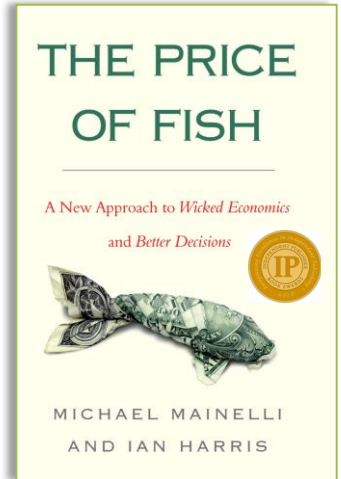
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# When Would We Know Our Commerce Is Working?



“Get a big picture grip on the details.”

*Chao Kli Ning*



“If you have trust I shall give you trust; if you have no trust I shall take it away.”

