

**BLOCK
CHAIN**

NO
PAIN
no
GAIN

SATOSHI NAKAMOTO



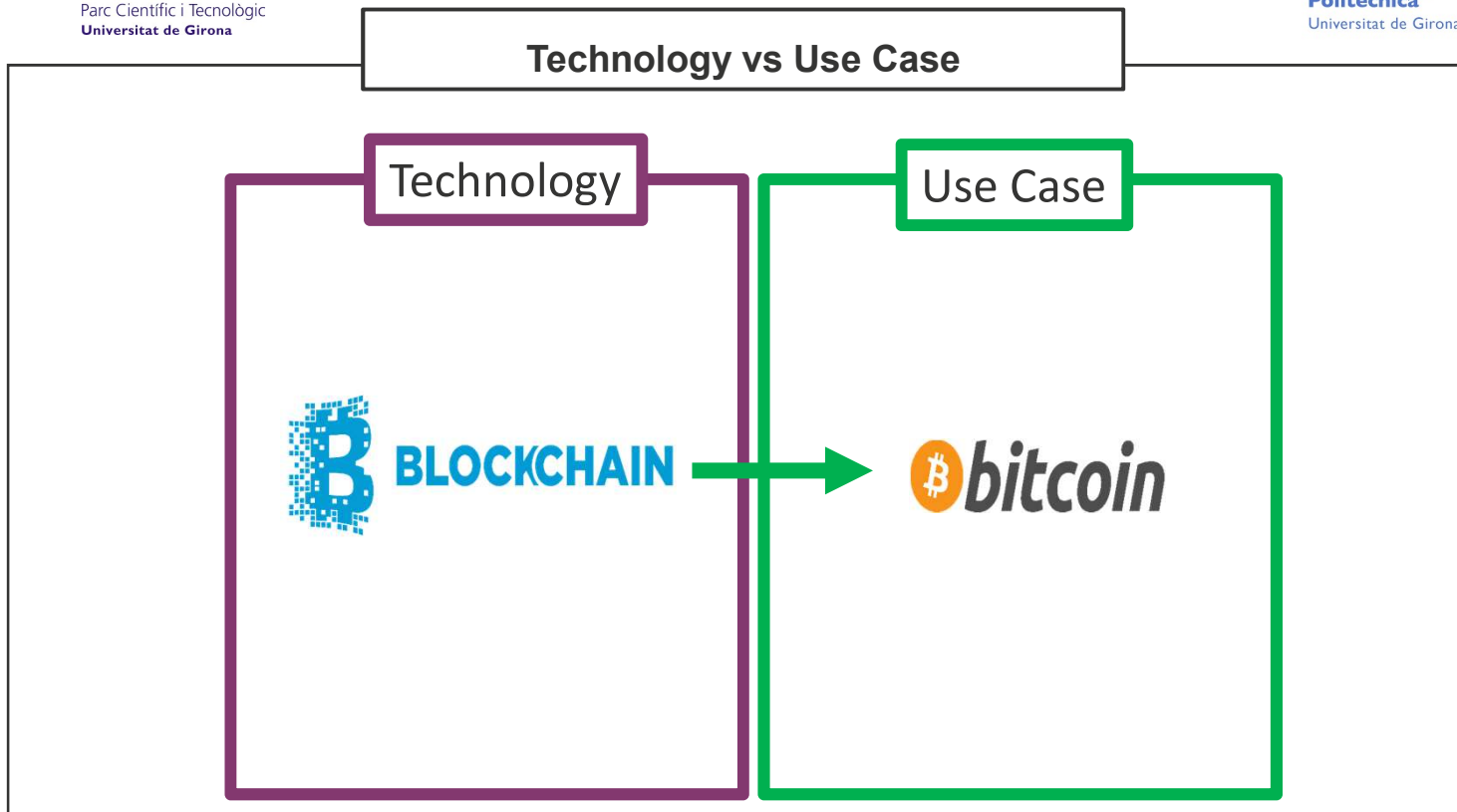
2008

**BLOCK
CHAIN**

FIRST USE CASE

**BLOCK
CHAIN**





Definition

Blockchain is an open technology for the creation of distributed/replicated databases.

Each database is made of a continuously growing list of [records](#), called *blocks*, which are linked and secured using [cryptography](#).

Each block typically contains a [cryptographic hash](#) of the previous block ID, a [timestamp](#) and transaction(s) data.

“...” Once recorded, the data in any given block cannot be altered retroactively without the alteration of all subsequent blocks, which requires collusion of the network majority.

Own source and Wikipedia

Encrypted

Decentralized

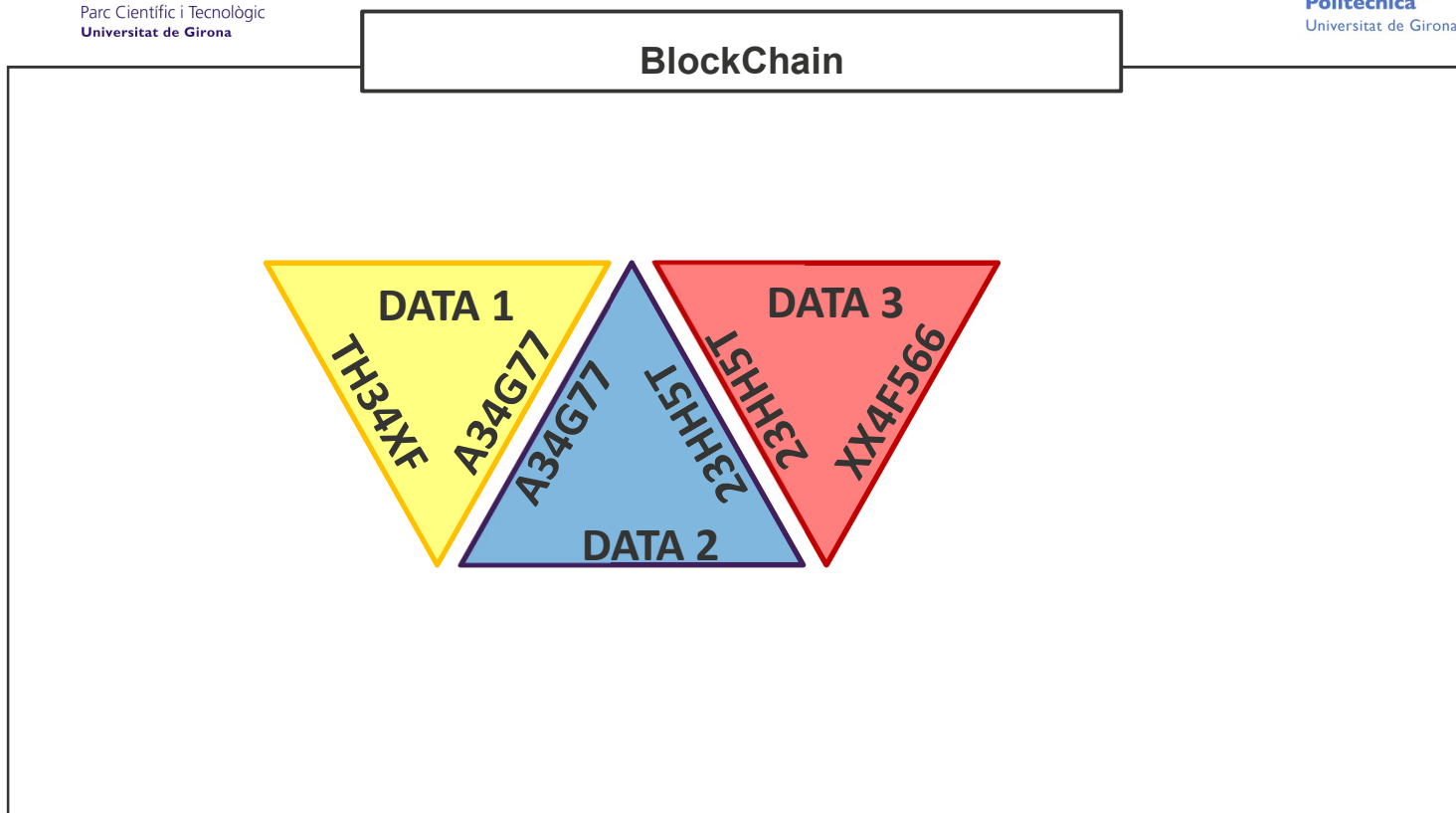
Immutable

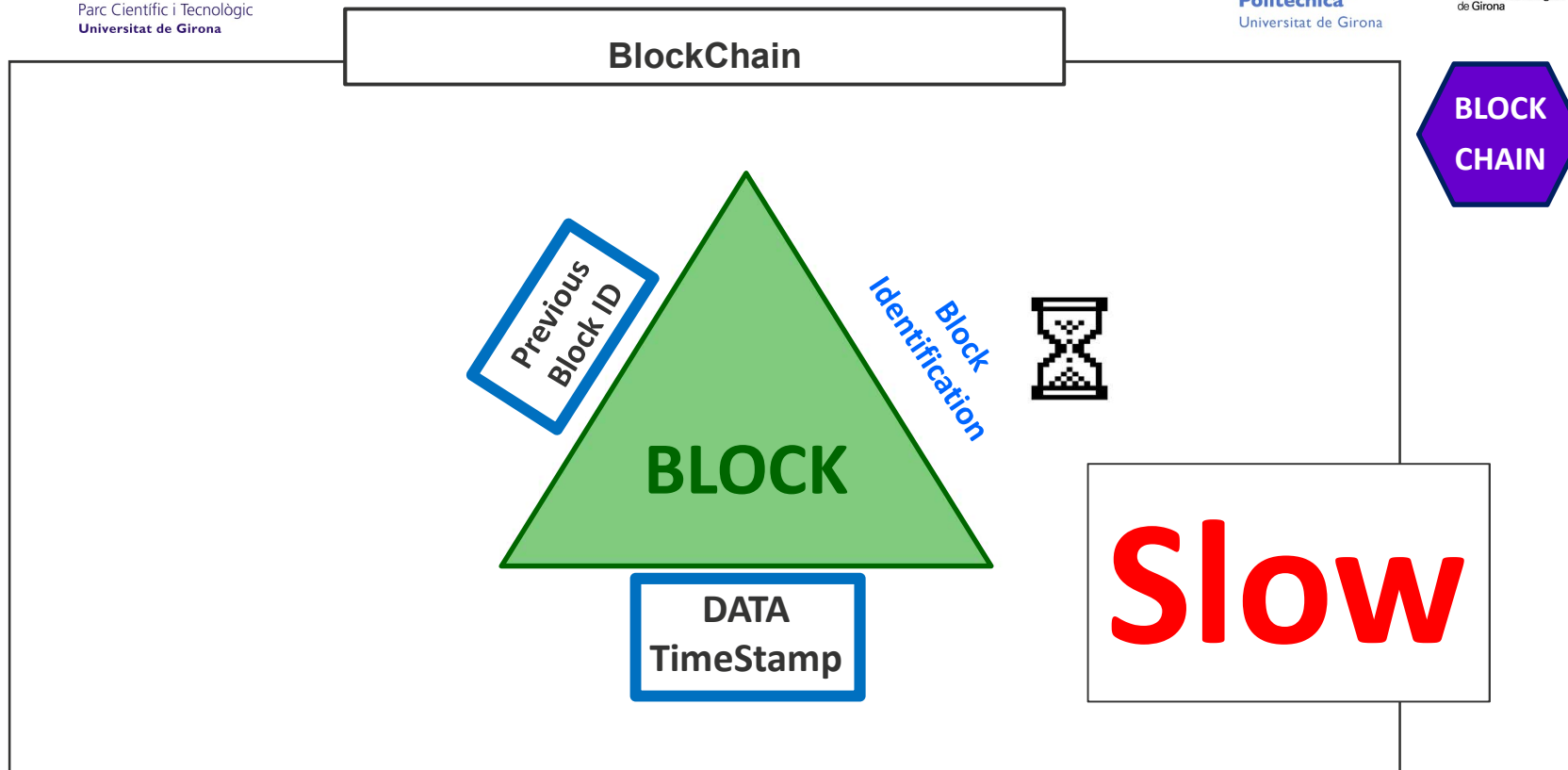
C.R. ~~XX~~

BLOCK
CHAIN

Open
Source

Chained

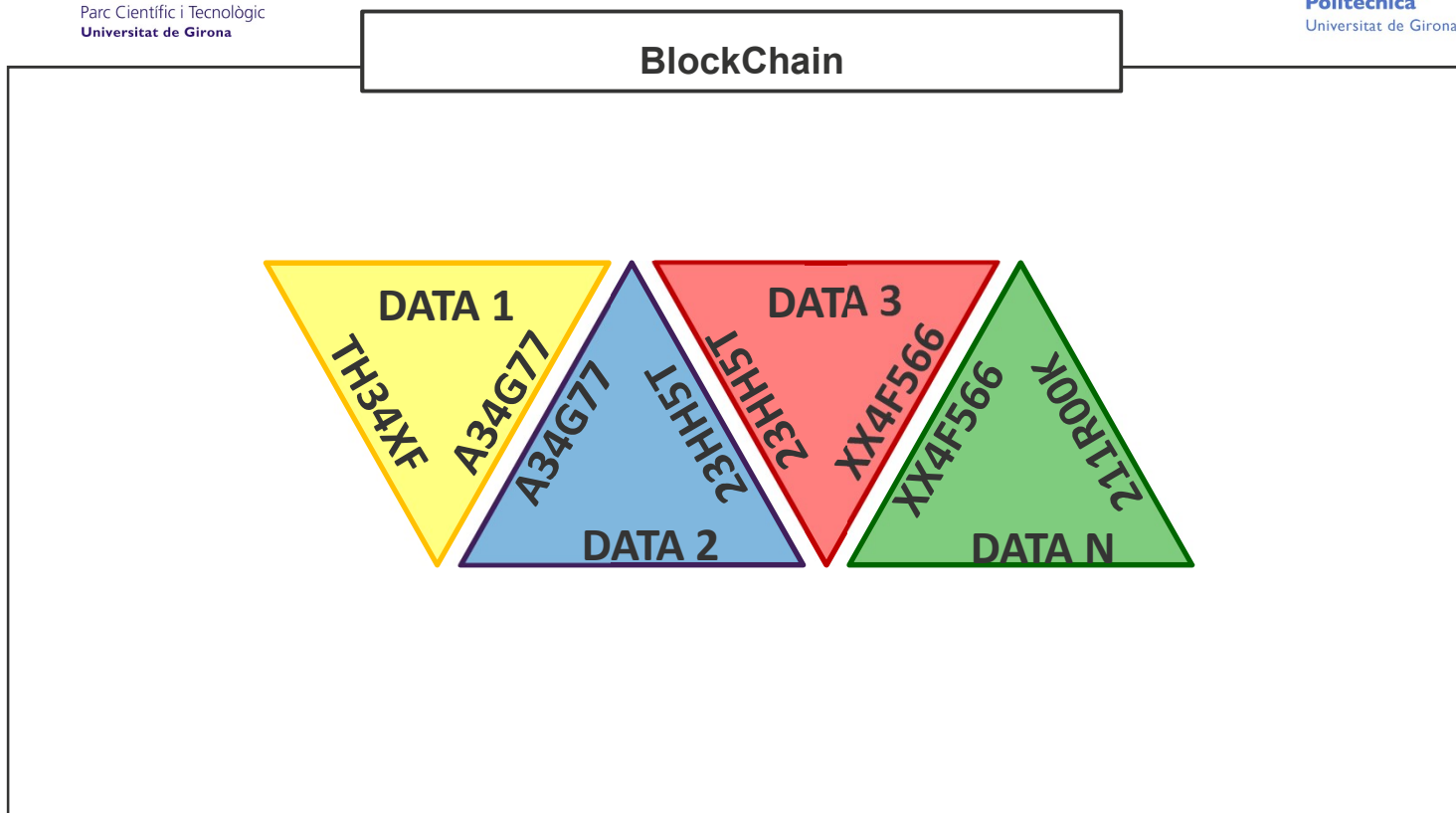


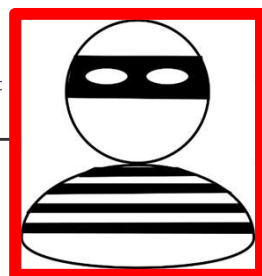


<https://en.bitcoin.it/wiki/Block>

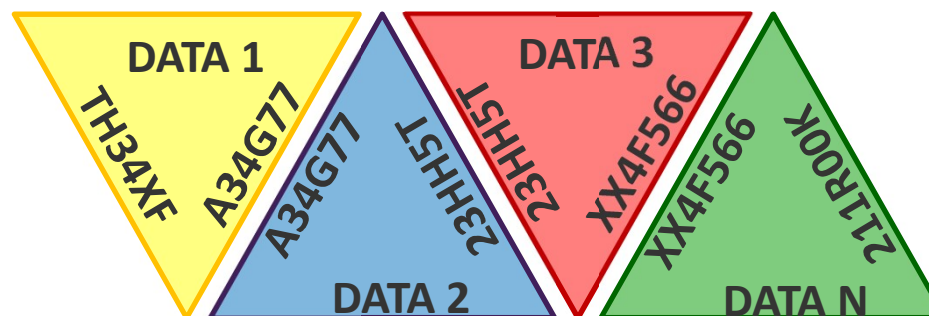
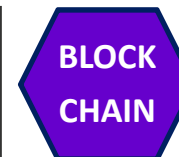
Current block count <https://blockexplorer.com/api/status?q=getBlockCount>

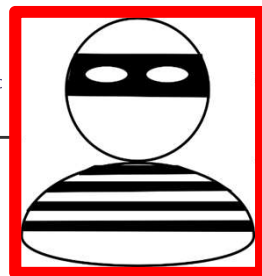
Block hashing algorithm https://en.bitcoin.it/wiki/Block_hashing_algorithm



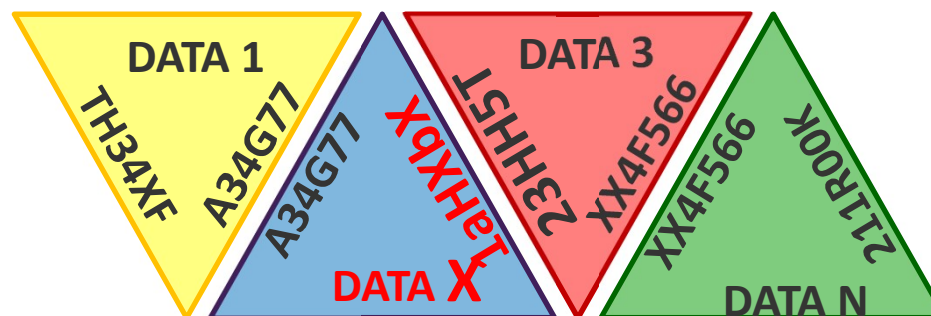
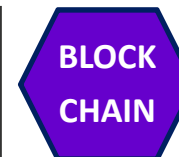


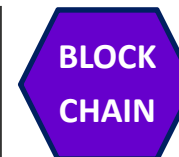
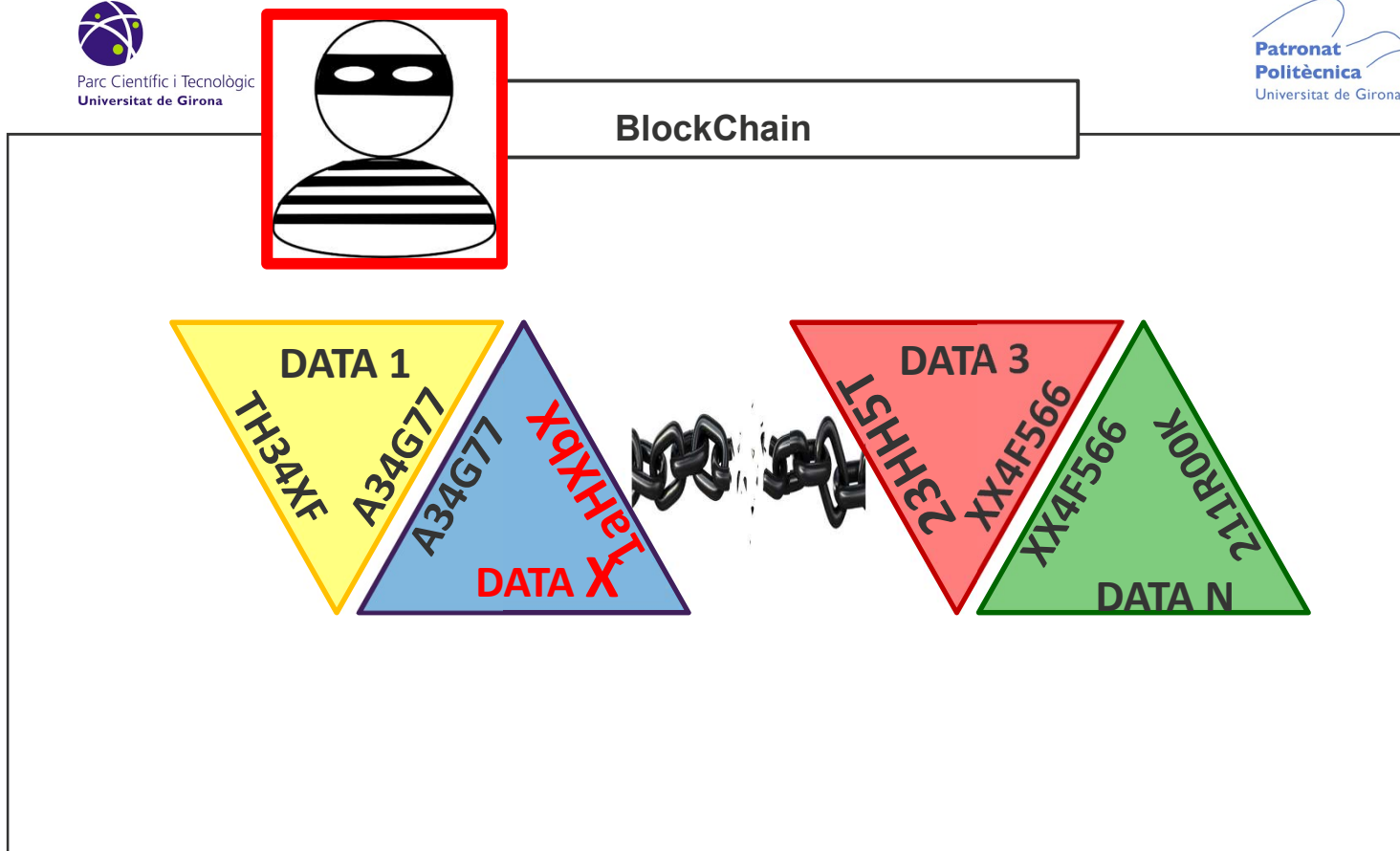
BlockChain





BlockChain

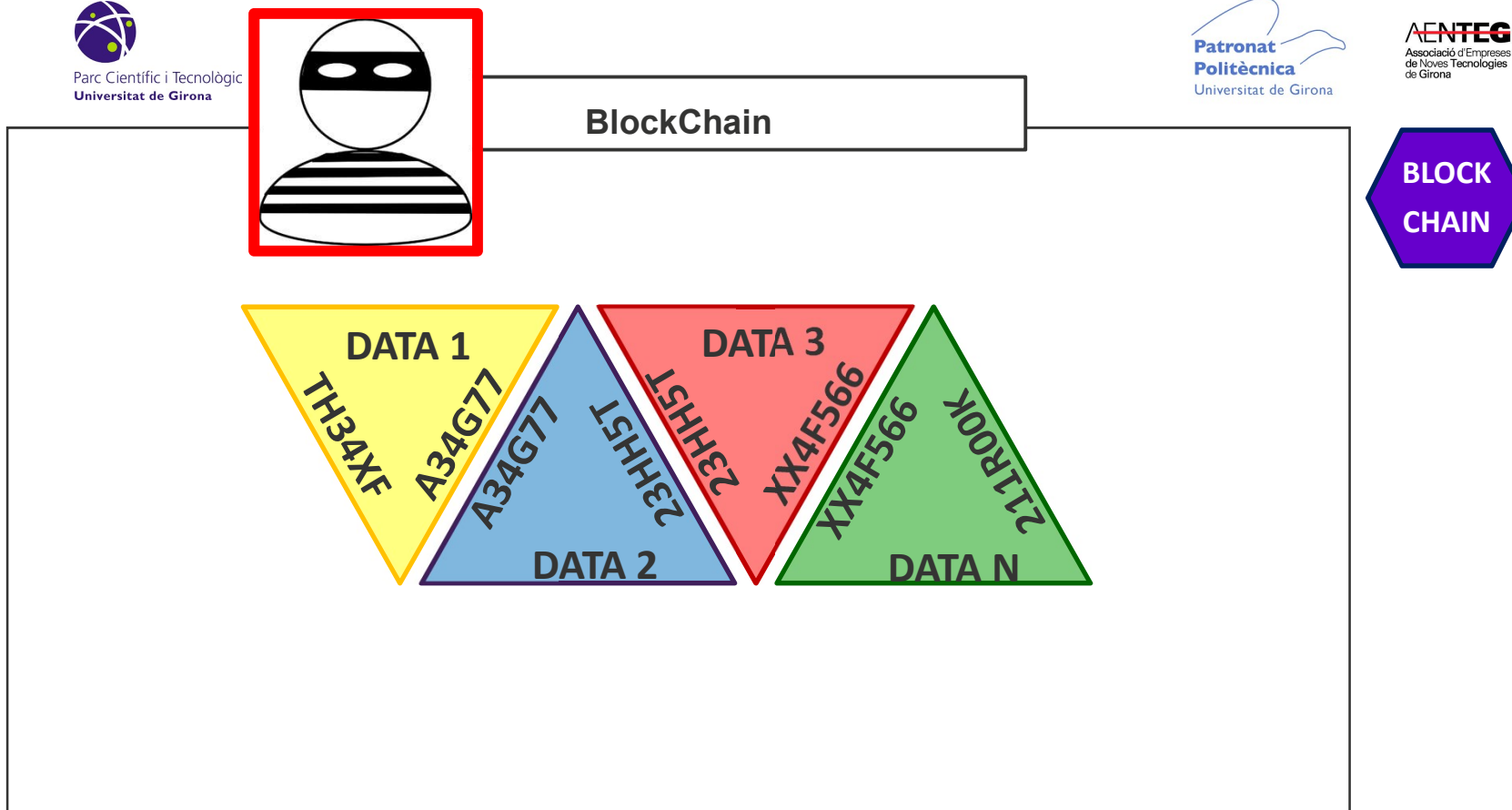




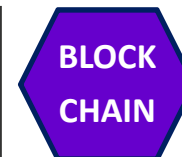
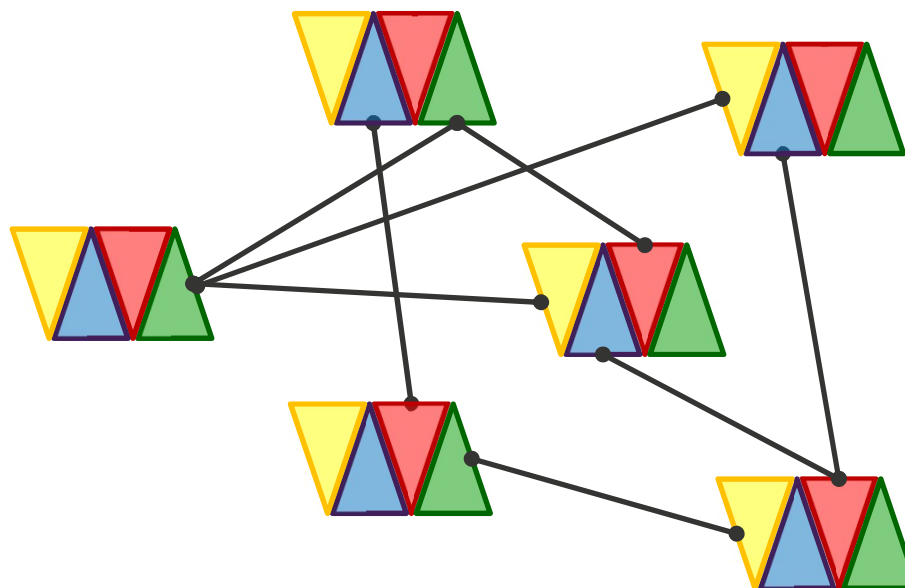
BlockChain



**BLOCK
CHAIN**



Blockchain



Bitcoin's Network

**BLOCK
CHAIN**

GLOBAL BITCOIN NODES DISTRIBUTION

Reachable nodes as of Mon Dec 31 2018
10:28:48 GMT+0100 (Hora estàndard del Centre d'Europa)

10289 NODES

[24-hour charts »](#)

Top 10 countries with their respective number of reachable nodes are as follow.

RANK	COUNTRY	NODES
1	United States	2466 (23.97%)
2	Germany	1949 (18.94%)
3	France	711 (6.91%)
4	Netherlands	489 (4.75%)
5	China	479 (4.66%)
6	Canada	412 (4.00%)
7	United Kingdom	349 (3.39%)
8	Singapore	304 (2.95%)
9	n/a	281 (2.73%)
10	Russian Federation	262 (2.55%)

[More \(99\) »](#)

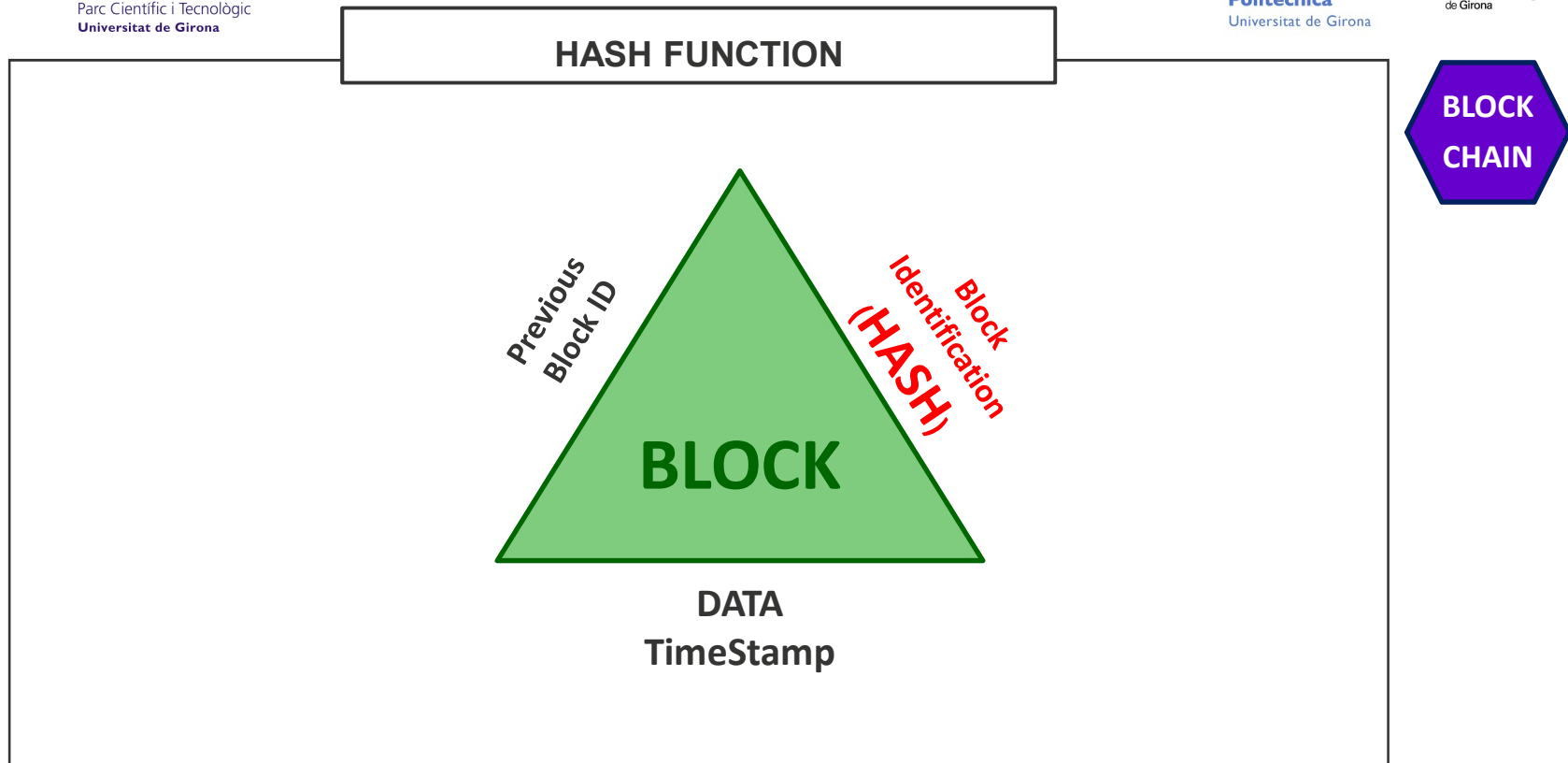
10.289

Nodes by December 2018

Map shows concentration of reachable Bitcoin nodes found in countries around the world.

[LIVE MAP](#)

Source: <https://bitnodes.earn.com/> December 2018



<https://en.bitcoin.it/wiki/Block>

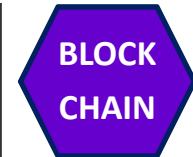
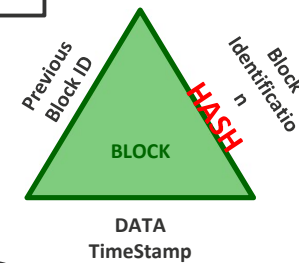
Current block count <https://blockexplorer.com/api/status?q=getBlockCount>

Block hashing algorithm https://en.bitcoin.it/wiki/Block_hashing_algorithm

Blockchain uses 'SHA-256' hashing function

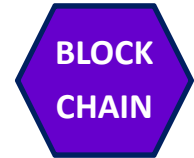
SHA-256

Secure Hash Algorithm



SOURCE: wikipedia <https://en.wikipedia.org/wiki/SHA-2>

SHA-256 hash calculator <http://www.xorbin.com/tools/sha256-hash-calculator>



10 Minutes per BLOCK

SitePoint.com <https://www.sitepoint.com/proof-of-stake-vs-proof-of-work/>

CONSENSUS ALGORITHM

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Proof of Work (PoW)

MINERS



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Source. CryptoSolarTech construirá la granja de minería de criptomonedas con energías renovables más grande de España
<http://www.expansion.com/mercados/divisas/2018/04/17/5ad64824e5fdea50158b461f.html>
¿Qué es Minar Bitcoins? <https://blog.bit2me.com/es/que-es-minar-bitcoins/>

network

REWARD

12,5 Bitcoins

(42.000 euros)

The Bitcoin block mining reward **halves** every 210,000 blocks (aprox. **4 years**), the coin reward will decrease from 12.5 to 6.25 coins in 2021.

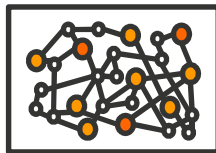


BLOCK
CHAIN

We need to be SLOW



**BLOCK
CHAIN**



If increases the
computational
Power of the
MINERS



... will **DECREASE** the
time needed to find the
Block ID

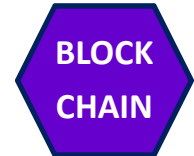


... So the MINING
time will be
around 10 min
each Block, AGAIN



... so, will be increased the
DIFFICULTY LEVEL
(more Zeros at the
beginning of the Block ID)

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The Difficulty value is
revised every 2 weeks
(2.016 blocks)

2009: 8 leading zeros
2018: 17 leading zeros

IS IT FREE ?



***Not Really Free**

**BLOCK
CHAIN**

BLOCKCHAIN EXAMPLES

- ✓ **Cryptocurrencies**
- ✓ **Notary**
- ✓ **Certification of authenticity**
- ✓ **Tracing**
- ✓ **No Intermediaries**

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Cryptocurrency





















**BLOCK
CHAIN**

Source imatge: <https://blog.goodaudience.com/5-cryptocurrencies-to-watch-in-2018-47a77e2c17f0>

Cryptocurrency Market Capitalizations

**BLOCK
CHAIN**

All ▾	Coins ▾	Tokens ▾	USD ▾		← Back to Top 100				
#	Name	Symbol	Market Cap	Price	Circulating Supply	Volume (24h)	% 1h	% 24h	% 7d
1	 Bitcoin	BTC	\$116,235,342,819	\$6,848.28	16,972,925	\$5,139,200,000	0.13%	-0.18%	0.47%
2	 Ethereum	ETH	\$41,795,811,150	\$423.16	98,769,770	\$1,592,820,000	0.26%	1.49%	11.08%
3	 Ripple	XRP	\$20,019,483,026	\$0.512079	39,094,520,623 *	\$565,533,000	0.34%	4.39%	3.17%
4	 Bitcoin Cash	BCH	\$11,388,318,873	\$667.20	17,068,900	\$287,725,000	0.80%	2.31%	4.21%
5	 EOS	EOS	\$6,731,367,655	\$8.54	788,382,523 *	\$2,482,140,000	2.20%	33.04%	49.01%
6	 Litecoin	LTC	\$6,436,378,773	\$114.84	56,045,513	\$268,961,000	0.42%	0.41%	-3.32%
7	 Cardano	ADA	\$4,522,821,893	\$0.174444	25,927,070,538 *	\$274,883,000	0.85%	12.39%	16.68%
8	 Stellar	XLM	\$3,885,726,550	\$0.209459	18,551,251,319 *	\$67,812,000	-0.05%	4.18%	4.86%
9	 NEO	NEO	\$3,637,634,000	\$55.96	65,000,000 *	\$215,790,000	0.13%	3.61%	19.16%
10	 IOTA	MIOTA	\$2,931,320,432	\$1.05	2,779,530,283 *	\$27,170,000	1.12%	2.80%	8.67%
11	 Monero	XMR	\$2,684,891,282	\$168.64	15,921,034	\$44,433,300	0.79%	1.33%	-1.28%
12	 Dash	DASH	\$2,466,119,025	\$308.06	8,005,450	\$71,461,900	0.46%	2.22%	2.61%
13	 TRON	TRX	\$2,336,280,250	\$0.035534	65,748,111,645 *	\$328,555,000	0.03%	-3.17%	-6.01%
14	 Tether	USDT	\$2,215,214,218	\$0.994694	2,227,030,844 *	\$2,246,640,000	-0.44%	-0.51%	-0.62%
15	 NEM	XEM	\$2,171,304,000	\$0.241256	8,999,999,999 *	\$19,770,100	0.17%	2.48%	7.66%
16	 VeChain	VEN	\$1,469,142,258	\$2.80	524,770,505 *	\$71,248,800	0.38%	1.88%	16.96%
17	 Ethereum Classic	ETC	\$1,415,132,506	\$13.99	101,117,729	\$121,626,000	0.28%	0.99%	3.36%
18	 Binance Coin	BNB	\$1,386,128,975	\$11.92	116,261,604 *	\$101,405,000	-0.15%	0.52%	-3.95%

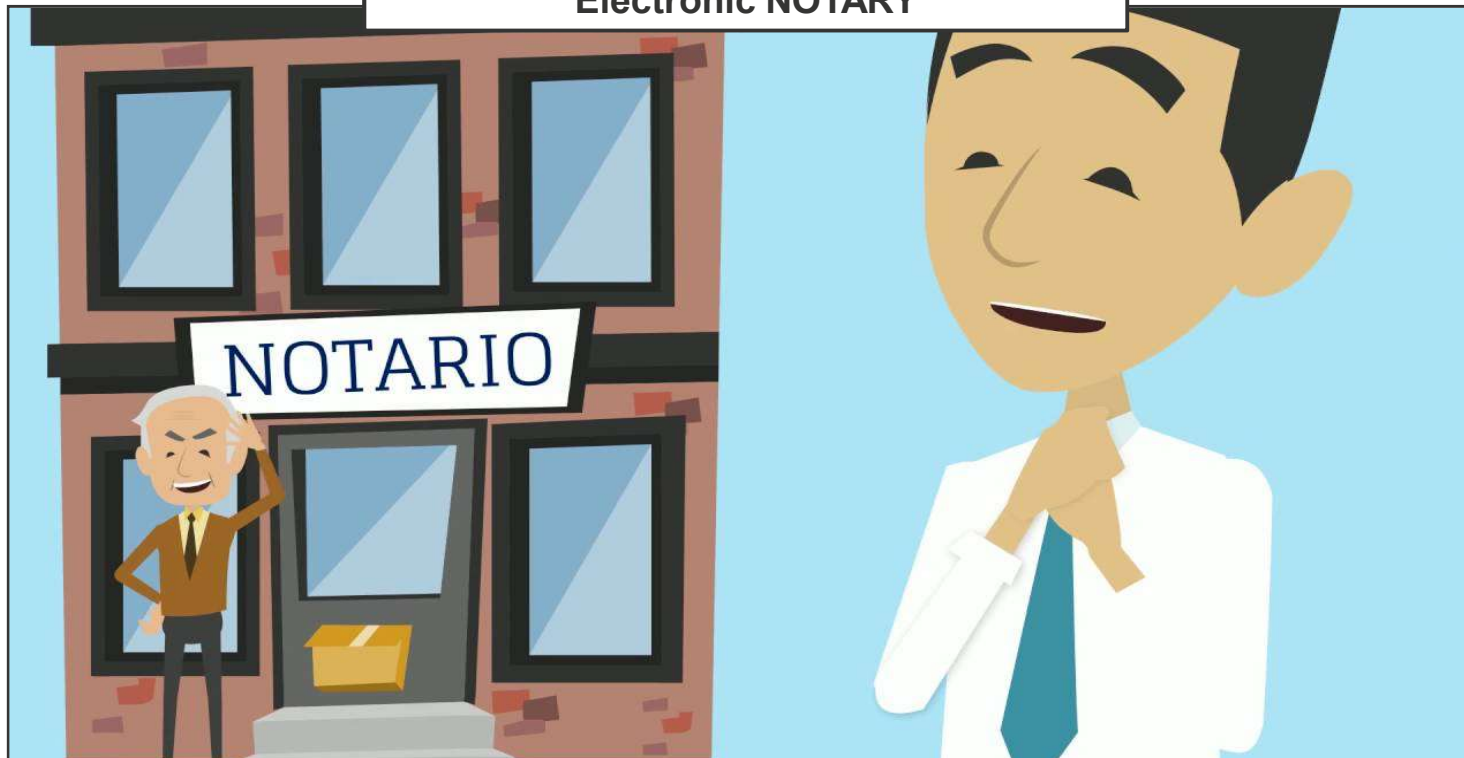
Source: <https://coinmarketcap.com/all/views/all/>

BLOCKCHAIN EXAMPLES

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Electronic NOTARY



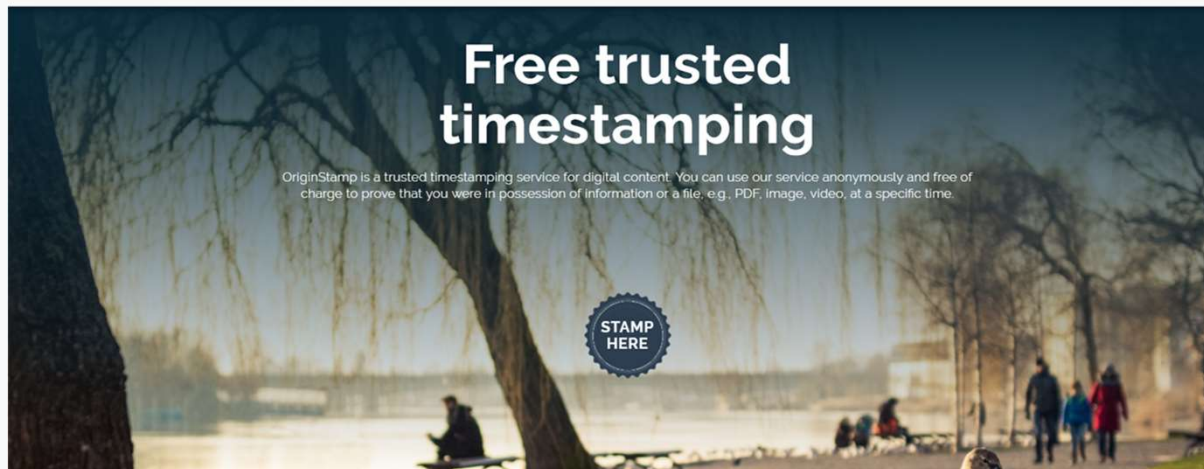
**BLOCK
CHAIN**

Notarization: originstamp.org

**BLOCK
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Immutable Data Trails

<https://originstamp.org/home>

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**BLOCK
CHAIN**

CARREFOUR: FOOD TRACING

BLOCK CHAIN



CALIDAD Y ORIGEN
Carrefour

Pollo Campero*

✓ Criado sin tratamientos antibiótico
✓ Alimentados con un 70% de cereales siendo el 50% maíz*
✓ Criado en Galicia

*Menciones certificadas conforme al Rto. CE 543/2008

ORIGEN ESPAÑA

SGS
Reglamento (CEE) nº 543/2008
Nº 020901/CP

SGS
POLLO
Criado sin Tratamientos Antibióticos

POLLO ENTERO LIMPIO

ENVASADO ATMÓSFERA PROTECTORA
PRODUCTO FRESCO / CATEGORÍA A.
CONSERVESE ENTRE 0° Y 4°C.
CONSUMIR COCINADO COMPLETAMENTE.

Envasado en España por
Coren S.C.G.,
Centro de Procesado Avícola, para:

Centros comerciales Carrefour, S.A.
C/ Campezo 16 - 28022 Madrid.
Tel. 914 908 900

fecha de caducidad 30.12.18
Precio kg. 4,99€
Peso Neto 1,603kg

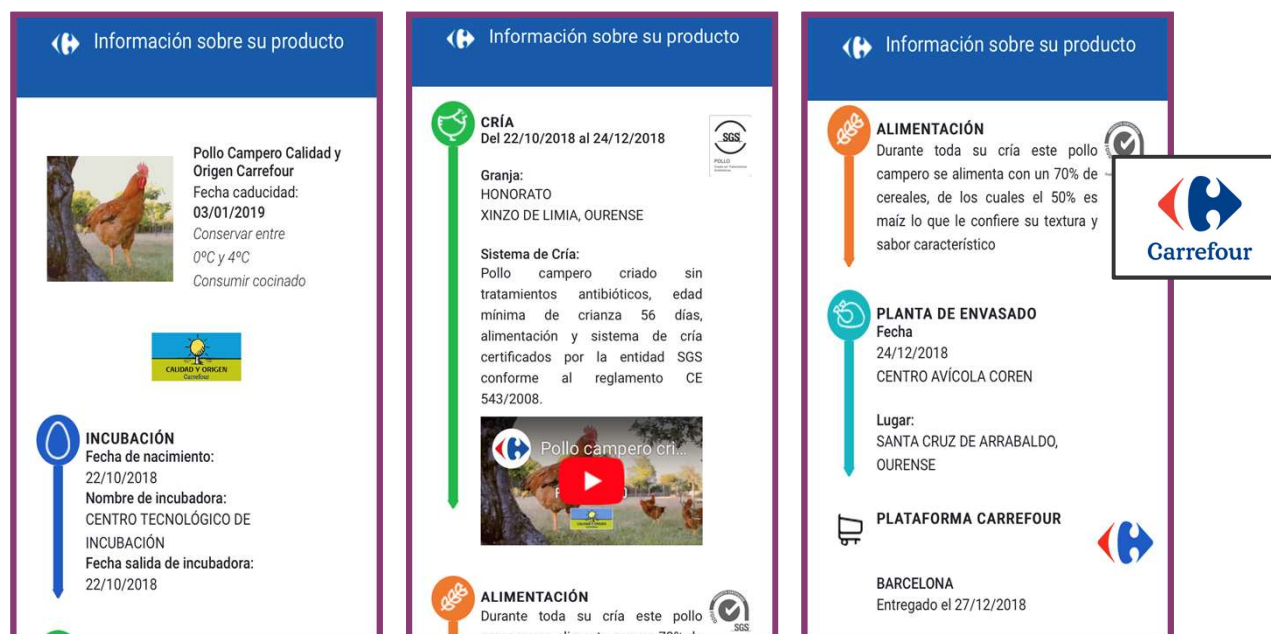
L: 83556281 IMPORTE R29M12
TOTAL 8,00€

2 989345 008002



CARREFOUR: FOOD TRACING

BLOCK CHAIN



**BLOCK
CHAIN**



BLOCKCHAIN EXAMPLES

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**BLOCK
CHAIN**

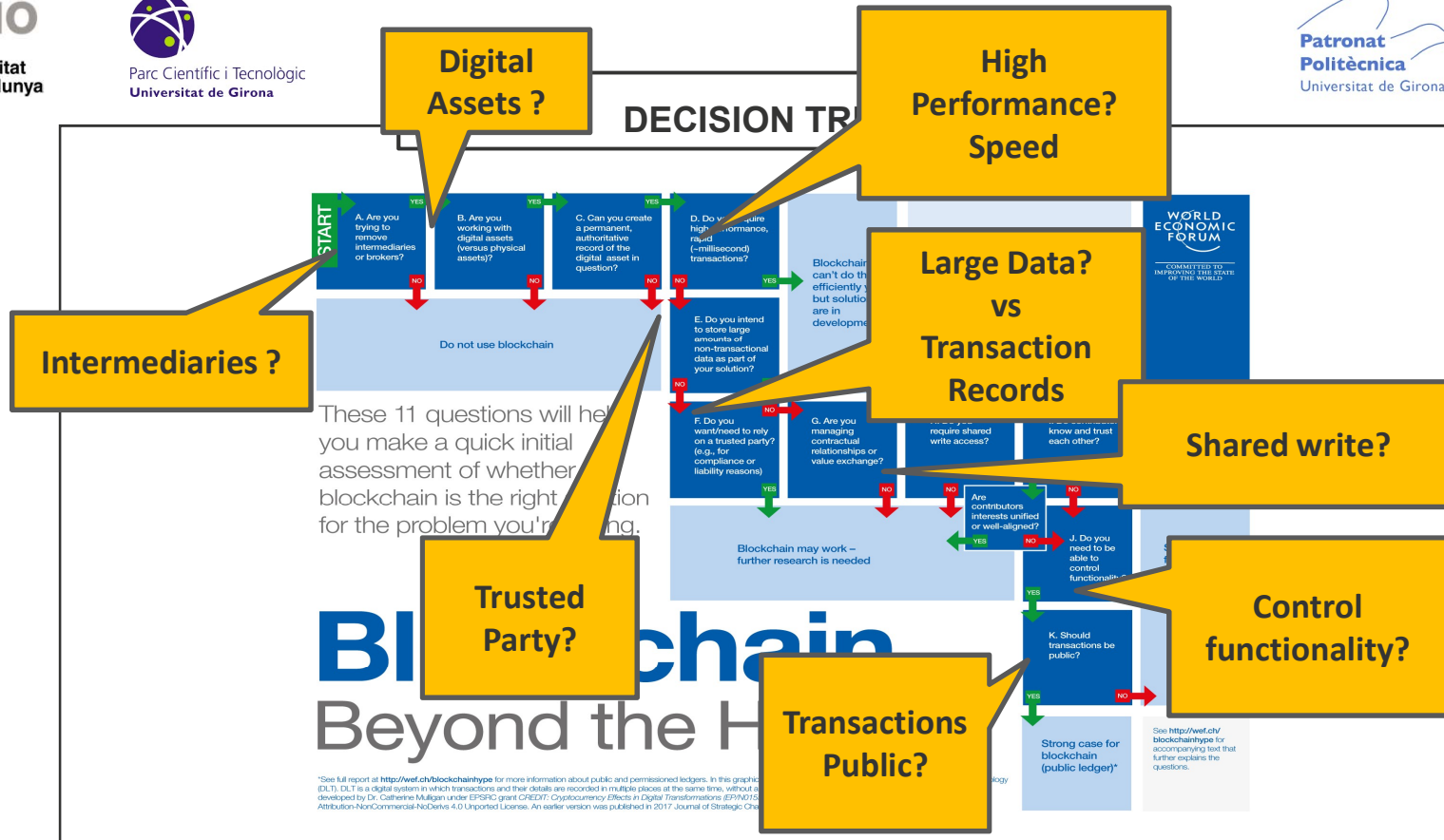
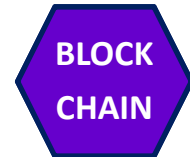
as strong as its weakest link

**BLOCK
CHAIN**



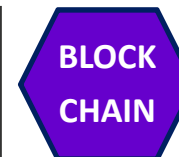
mediachain 

Source. Spotify acquires blockchain based music data solutionmediachain labs
<https://www.cryptoninjas.net/2017/04/26/spotify-acquires-blockchain-based-music-data-solution-mediachain-labs/>





World Economic Forum <https://www.weforum.org/whitepapers/blockchain-beyond-the-hype>

Do You Need a Blockchain? <https://spectrum.ieee.org/computing/networks/.Wu4zsKp6qgc.mailto>



Gràcies

Carles Gómara
 @cgomara
 cgomara
cgomara@gencat.cat