



Training Academy Session #15

Patenting Blockchain Technology: Practice Tips and Trends

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Session Overview

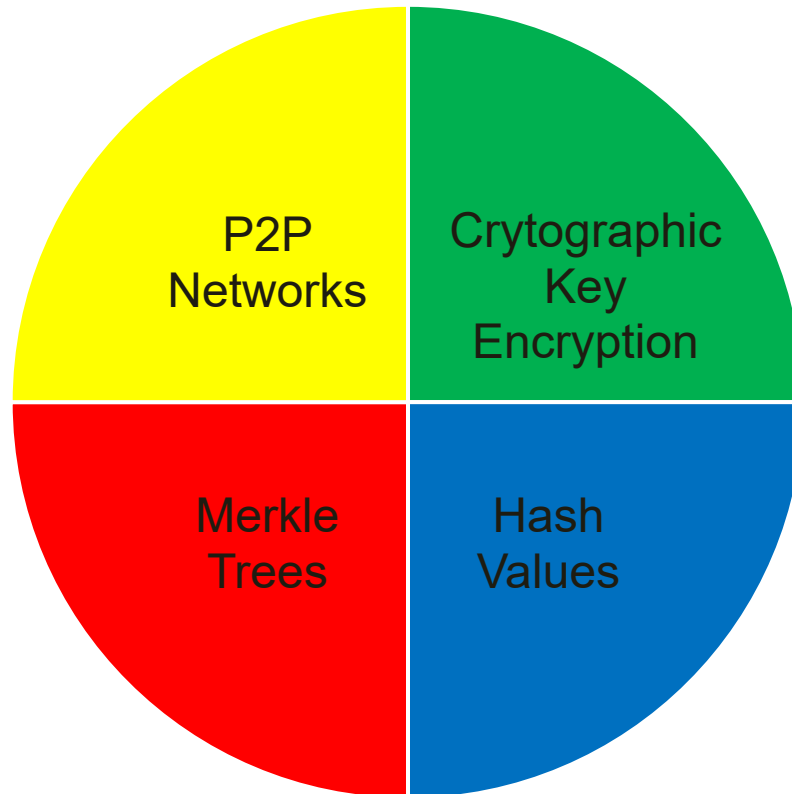
- Blockchain Fundamentals
- Blockchain Applications and Uses
- Patenting Trends
- Drafting and Prosecution Tips
- Foreign Filing Considerations

BLOCKCHAIN FUNDAMENTALS

- WHERE IT ALL STARTED?
 - Blockchain technology was initially developed for digital currency transactions
 - Satoshi Nakamoto's 2008 White Paper
 - <https://bitcoin.org/bitcoin.pdf>
 - However, its uses go well beyond such transactions (we will get to this in a bit)

BLOCKCHAIN FUNDAMENTALS

- Blockchain is built from a combination of known technologies:



BLOCKCHAIN FUNDAMENTALS

DEFINITION:

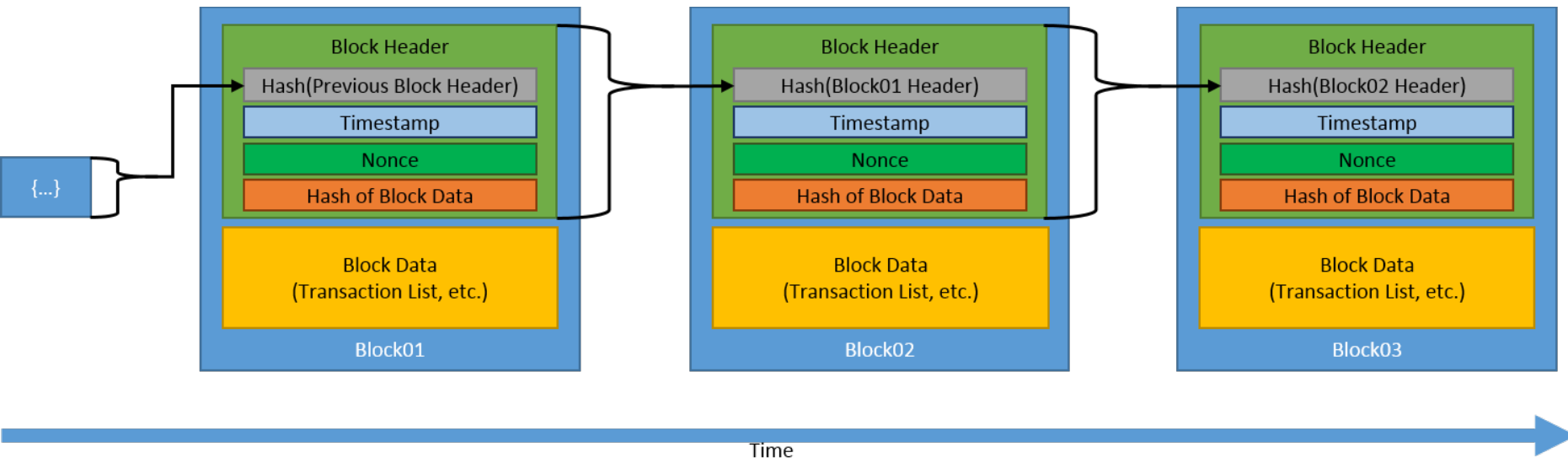
An anonymous, decentralized, distributed, and immutable digital ledger for recording and storing data across a peer-to-peer network

BLOCKCHAIN FUNDAMENTALS

- **Anonymous**
 - All exchanges are done with an electronic wallet, i.e., a Private Key
- **Decentralized**
 - No one controlling authority
- **Distributed**
 - Ledger is distributed across multiple nodes
- **Immutable**
 - Enhanced security of data – nearly impossible to tamper with data once it has been added

BLOCKCHAIN FUNDAMENTALS

- ANATOMY OF A BLOCKCHAIN
 - A series of linked “blocks”



Source: *nist.gov*

BLOCKCHAIN FUNDAMENTALS

- Hashing

- Example SHA-1 hashes (40 characters):
 - “Sean” – 600570e88bc88a9f06fd69ef203fdc4321e02da3
 - “Seán” – 22ffb50e28c674b8ff9a3eef8695034c518925ba
 - “Sean ” – e47c129f9a576a064dacc441398e6d78986e8044
 - “sean” – d7e19930cc1f42c2d0781f4d9e6f1fe5891bf9cf
 - “seán” – 1c0af93bdc04dec8502de6ac5c9a6fc107f09f1c
 - “seán ” –fd2407909b795e71a7d589bd897d5369c13a8d47
- Most blockchains use SHA-256 (64 characters)
- Chance of a collision: 6.94e-47%
- You’re significantly more likely to buy a single ticket and win Powerball...5 weeks in a row

BLOCKCHAIN FUNDAMENTALS

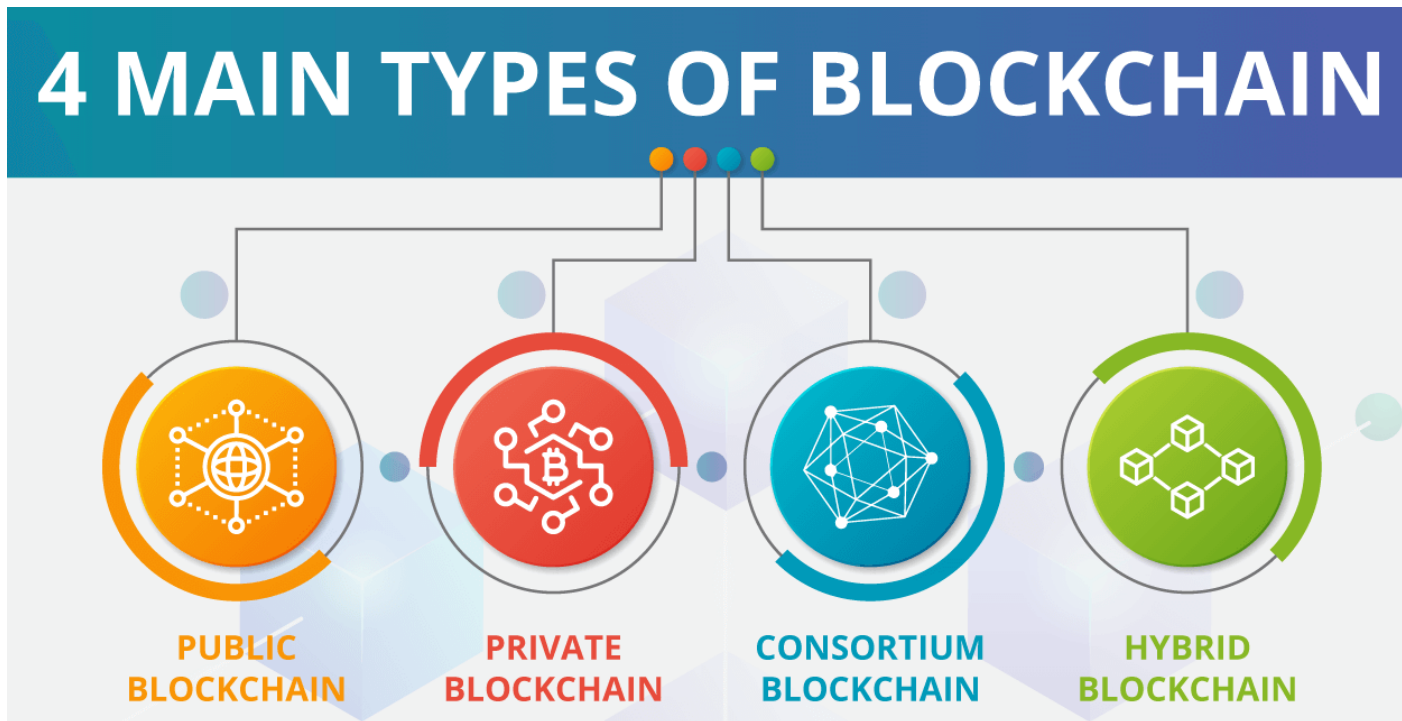
HOW DOES THIS LEAD TO IMMUTABILITY?

- A block reference value hashes the block header of the prior block
 - So any modification to a block header results in a different hash value for that header
 - For instance, changing a timestamp to fake a different time/or date
- Similarly, modifying a transaction results in a different transaction reference value, which changes that block header
- Any attempted modification has to be carried out through **every** subsequent block
- The distributed nature of the blockchain means that all of these blocks must be modified at **every** blockchain node
- A modification must be performed between the generation and validation of new blocks

BLOCKCHAIN FUNDAMENTALS

- SIMPLIFIED ANATOMY OF A BLOCKCHAIN TRANSACTION
 - A piece of data is transferred from a first wallet (sender) to a second wallet (recipient)
 - A “wallet” is a private key of a key pair
 - A lost private key cannot be recovered
 - Has led to key repository services, which have been notorious targets for hackers leading to millions of dollars in losses
 - A private key is akin to paper currency
 - The first wallet proves ownership of the data being sent via a digital signature generated using their private key
 - The second wallet is identified via an address generated using their corresponding public key

BLOCKCHAIN FUNDAMENTALS



Source: www.blockchain-council.org

BLOCKCHAIN FUNDAMENTALS

SUMMARY OF ADVANTAGES AND DISADVANTAGES

- Advantages
 - Anonymous
 - Decentralized
 - Distributed
 - Immutable
- Disadvantages
 - Anonymous - this can be a double-edged sword
 - Computational power

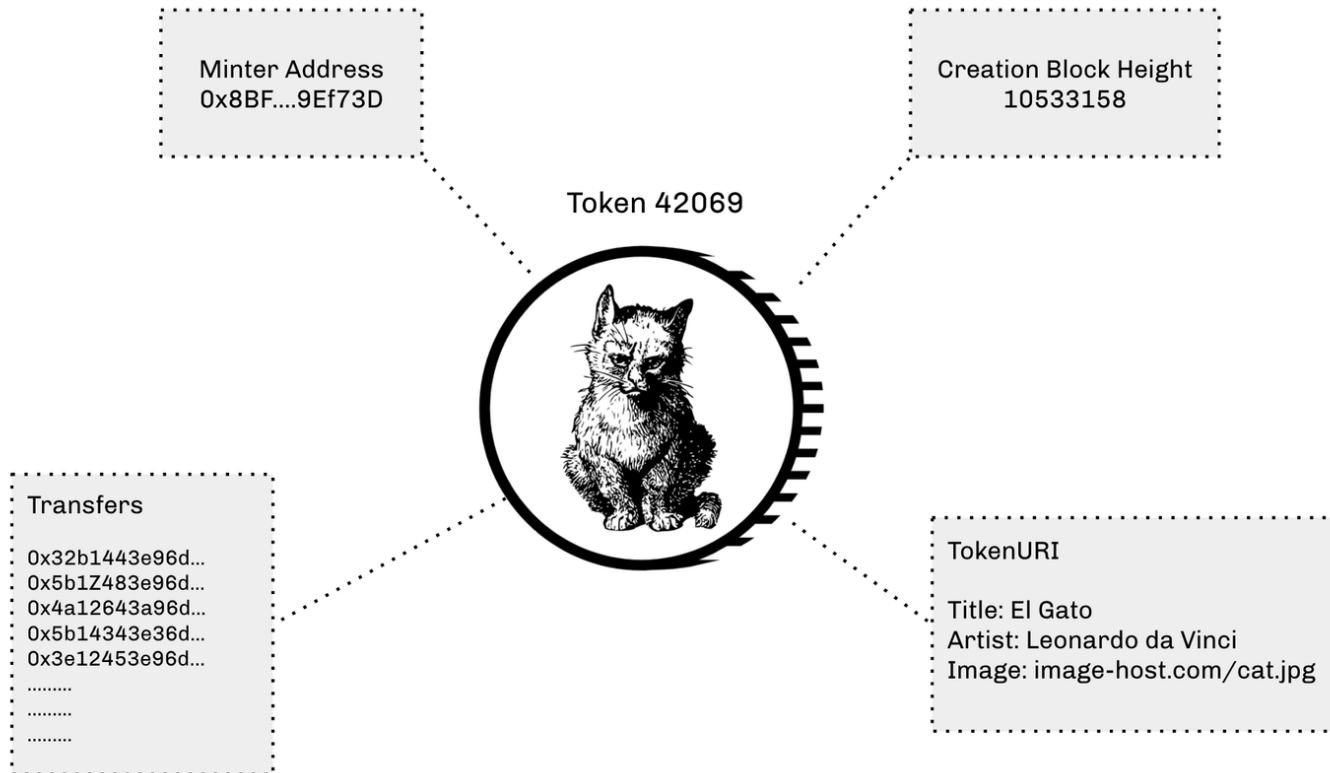
BLOCKCHAIN APPLICATIONS AND USES

- **GOVERNMENT**
 - VOTING
 - TRANSPARENT BUDGETING
 - VITAL RECORDS
 - DRIVING RECORDS
- **HEALTHCARE**
 - MEDICAL RECORDS
- **MEDIA AND ENTERTAINMENT**
 - TICKETING
 - DIGITAL RIGHTS MANAGEMENT
- **REAL ESTATE**
 - PROPERTY RECORDS
- **SUPPLY CHAIN MANAGEMENT**
 - SHIPPING
 - TRANSPORT RECORDS
 - PROVIDENCE
- **FINANCE**
 - CRYPTOCURRENCY
 - SETTLEMENT
 - TRADING
- **ENERGY**
 - METERING
 - BILLING
 - OWNERSHIP
- **TRAVEL**
 - BOARDER CONTROL
 - AIRLINE RECORDS
- **PERSONAL DATA**
 - EMPLOYMENT HISTORY
 - PERSONAL IDENTIFICATION
 - CREDIT HISTORY
- **INTELLECTUAL PROPERTY**
 - ASSIGNMENTS
 - PATENT FAMILY

BLOCKCHAIN APPLICATIONS AND USES

- Non-Fungible Tokens (NFTs)
 - Non-fungible = unique and one of a kind (can't trade one for another like a Bitcoin)
 - Doesn't necessarily mean there's only one copy of the art
 - Tokens
 - Not the asset itself!
 - Proves ownership of the asset

BLOCKCHAIN APPLICATIONS AND USES

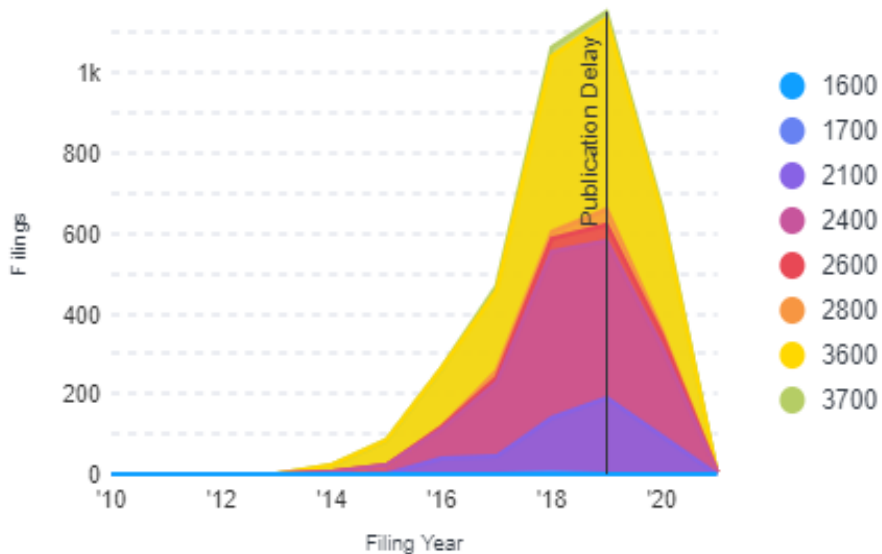


Source: <https://editorial.superrare.co/2020/07/28/cryptographic-hashing-and-why-your-tokenized-art-collection-is-worthless-without-it/>

BLOCKCHAIN APPLICATIONS AND USES

- SMART CONTRACTS
 - Self-executing scripts that can be stored in a blockchain that will execute when criteria is satisfied
 - Commonly used for escrow

BLOCKCHAIN APPLICATIONS AND USES

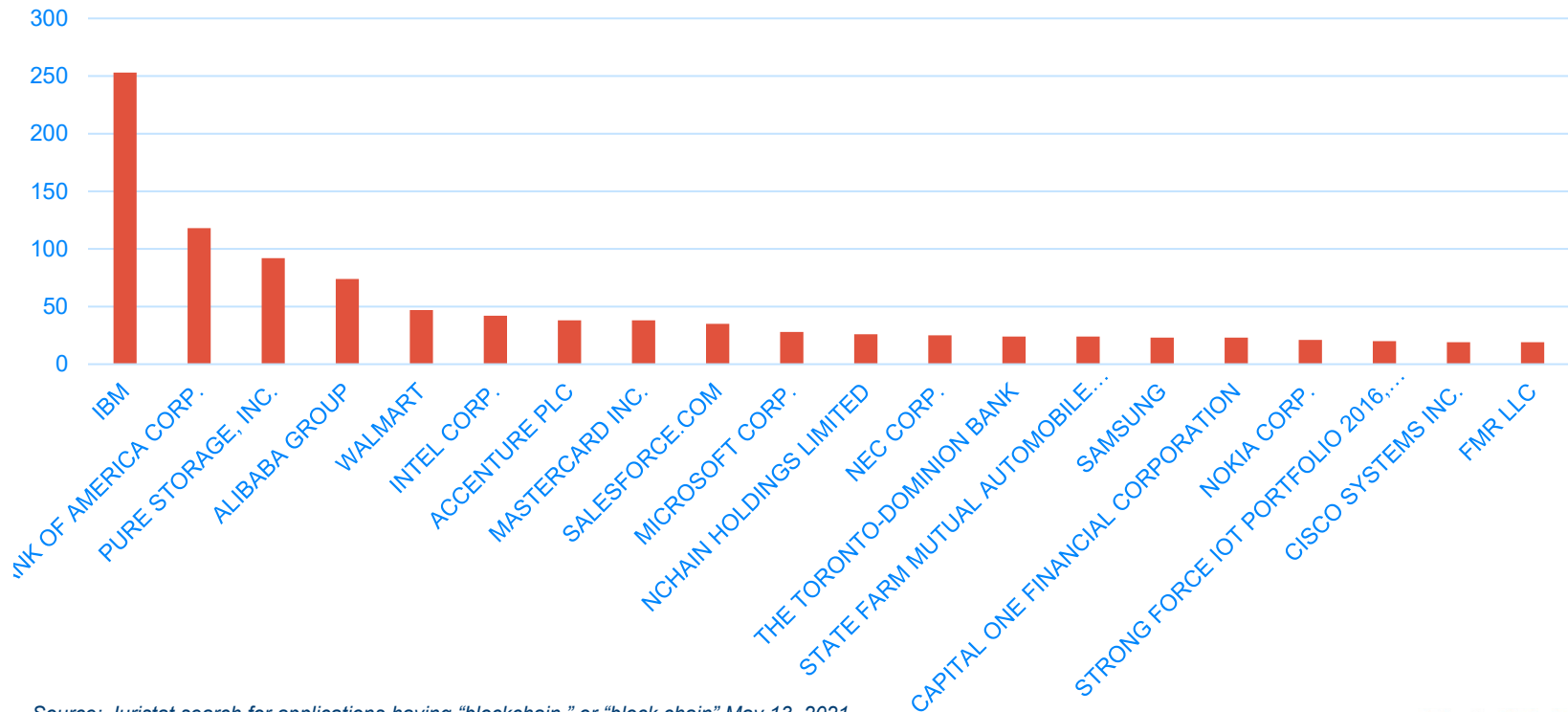


Source: Juristat search for applications having "blockchain," or "block chain" May 13, 2021

- 1600 – Biotechnology and Organic Fields
- 1700 – Chemical and Materials Engineering
- **2100 – Computer Architecture/Info. Security**
- **2400 – Computer Networks/Cryptography**
- 2600 – Communications
- 2800 – Semiconductors/Elec. & Optical Sys.
- **3600 – Transportation/E-Commerce**
- 3700 – Mechanical Engineering

BLOCKCHAIN APPLICATIONS AND USES

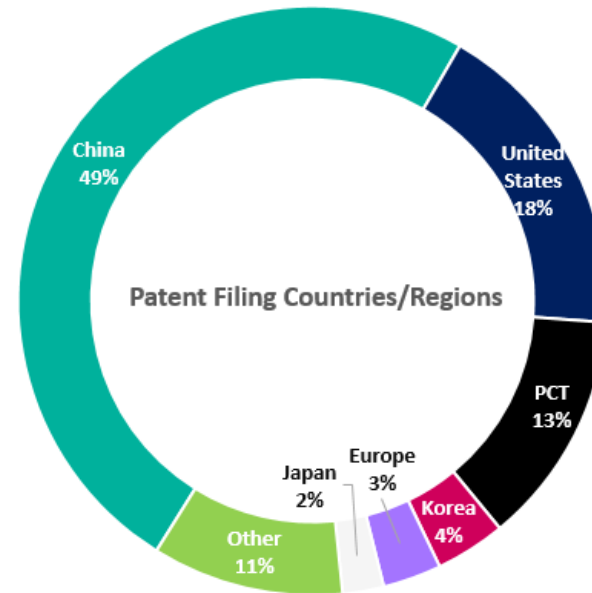
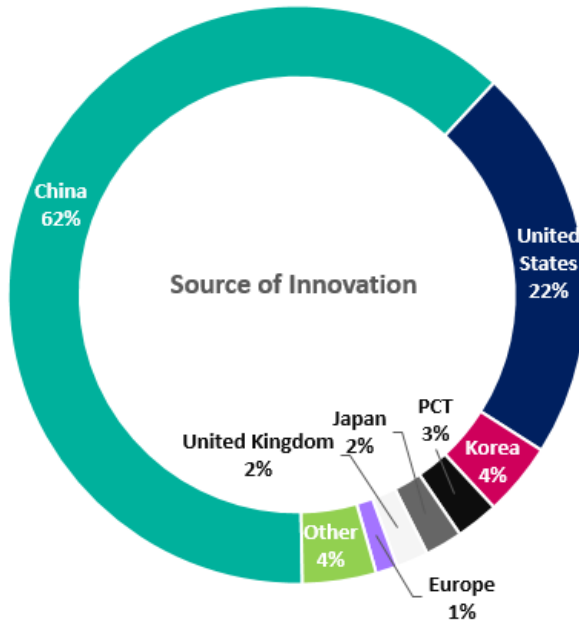
Filed U.S. Applications



Source: Juristat search for applications having "blockchain," or "block chain" May 13, 2021

TRENDS

Through April 2019



Source: <https://www.iam-media.com/patents/revealed-countries-leading-race-blockchain-patents>

TRENDS

- THIS FOLLOWS OVERALL PATENTING TRENDS:



TRENDS

- WHO IS FILING BLOCKCHAIN APPLICATIONS?



TRENDS

WHO IS FILING BLOCKCHAIN APPLICATIONS WORLDWIDE?

Top Companies in Worldwide Blockchain Patents & Pending Applications - 2021

Show entries Search:

COMPANY	ACTIVE WORLDWIDE PATENTS AND PENDING APPLICATIONS
Alibaba Group Holding Ltd	2588
Ping An Insurance (group); Company Of China, Ltd.	2075
Advanced New Technologies Co., Ltd.	1914
Tencent Holdings Ltd	1703
Nchain Holdings Limited	1196
Alipay.com Co., Ltd	1094
International Business Machines Corp.	962
Shenzhen Oneconnect Technology Co., Ltd.	587
China United Network Communications Group Company Limited	516
Baidu, Inc.	429
Hangzhou Fuzamei Technology Co., Ltd.	378
Mastercard Incorporated	361

Source: <https://harrityllp.com/titans-of-technology-blockchain-the-top-companies-in-blockchain-patents-2021/>

TRENDS

WHO IS FILING BLOCKCHAIN APPLICATIONS IN THE US?

Top Companies in US Blockchain Patents & Pending Applications - 2021

Show entries Search:

COMPANY	US PATENTS	US PENDING APPLICATIONS	GRAND TOTAL
International Business Machines Corp.	341	435	776
Advanced New Technologies Co., Ltd.	453	310	763
Bank Of America Corporation	89	79	168
Nchain Holdings Limited	3	150	153
Mastercard Incorporated	45	104	149
Dell Technologies Inc.	57	53	110
Capital One Financial Corp.	54	51	105
Accenture Plc	49	40	89
Microsoft Corporation	33	54	87
Intel Corporation	26	53	79

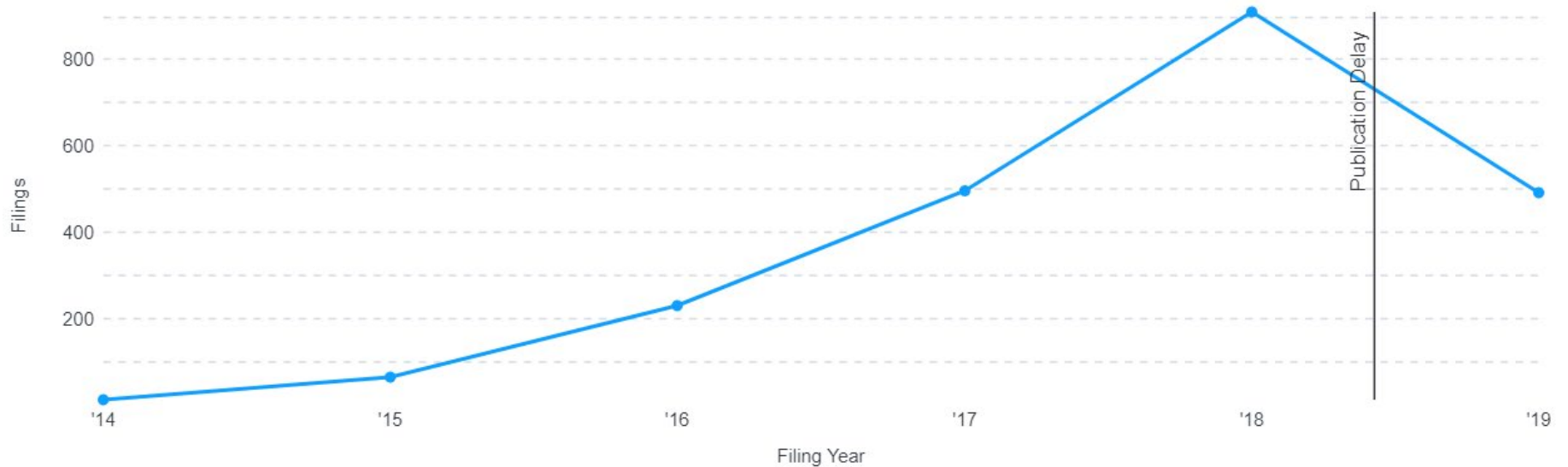
Showing 1 to 10 of 107 entries ◀ Previous [Next](#) ▶

Source: <https://harrityllp.com/titans-of-technology-blockchain-the-top-companies-in-blockchain-patents-2021/>

TRENDS

U.S. BLOCKCHAIN FILING STATISTICS

Filings



DRAFTING TIPS

Identifying Inventors

- Inventors who know Blockchain Technology to a degree
- Inventors who know the hype

Identifying the Invention

- What is different?
- Does Blockchain ledger entries differ from other type of storage
- Core, combination and ancillary technologies
 - Is blockchain technology being changed
 - Consensus
 - Proof of Work, Proof of Stake;
 - Wallets; permissioned chains, partitioned chains, smart contracts
 - Access to data
 - Does Blockchain change overall technology
 - Security
 - Is an ancillary technology changed by blockchain

DRAFTING TIPS

WRITTEN DESCRIPTION

- Enablement and Possession of Invention
 - Enablement: in theory, saying “stored on a blockchain” might be enough
 - Advocacy suggests more is better
 - Possession: Evidence of possession of an invention rather than a mere concept
 - Both enablement and possession of invention are best demonstrated with:
 - Flowcharts
 - Increasingly, pseudocode
 - Main point of departure from Prior Art and Features that support claim of improvement should be well explained in detail
 - Often not enough to say disclosure is enabling
 - It may be, but still lack evidence that inventors have identified at least one way to carry out the invention to possess invention

PROSECUTION TIPS

35 U.S.C § 103 – OBVIOUSNESS

- At first, reciting “blockchain” in claims was enough
 - Nascent technology often has a high patenting rate
 - Lack of indexed prior art
 - Lack of examiners having sufficient knowledge
 - Large potential for creative solutions and other innovations
- Maturing Technology often requires more
 - Increased awareness by examining corps and richer databases
 - Antonopoulos, "Mastering Bitcoin - Unlocking Digital Cryptocurrencies," December 20, 2014, pp. 1-298, O'Reilly Media as resource
 - Ford, Bryan, “Untangling Mining Incentives in Bitcoin and ByzCoin,” October 25, 2016
 - Greater filter and awareness of enablement, possession and prior art

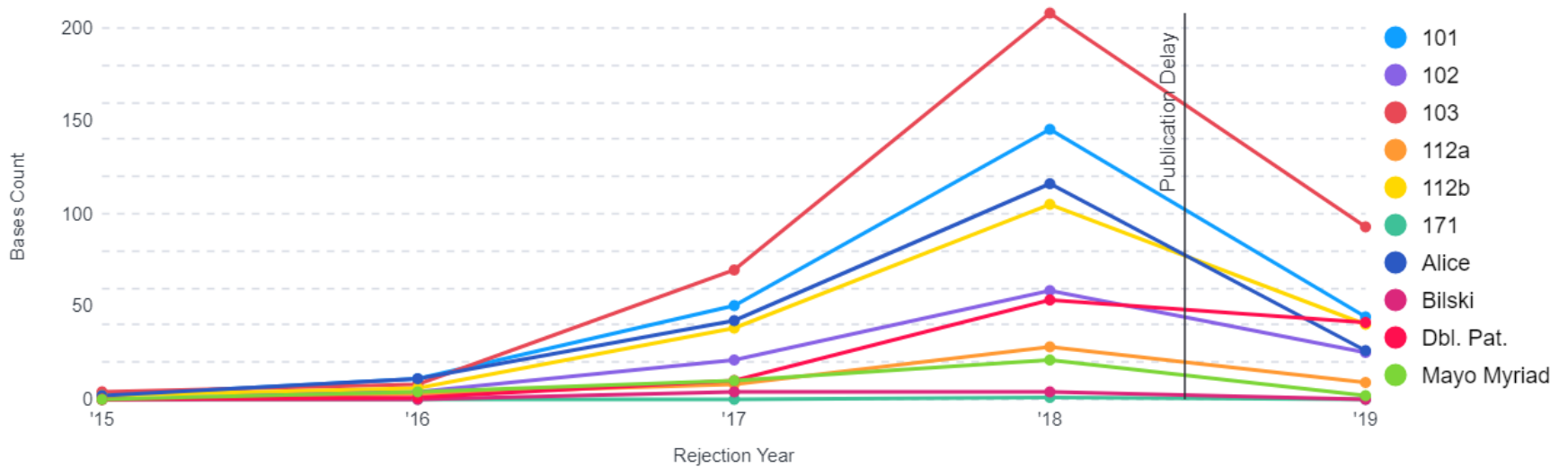
PROSECUTION TIPS

35 U.S.C § 101 – PATENT INELIGIBILITY

- Identifying Potential Improvements to Technology
 - Seminal S.Ct case of Alice Corp v CLS Bank Int’l in 2014
 - Difficult to define a line between impermissibly abstract claims and those that have “meaningful limitations”/”practical application”
 - 2019 Revised Patent Subject Matter Eligibility Guidance (“the 2019 PEG”) issued on Jan. 7, 2019 and the October 2019 Update: Subject Matter Eligibility (“October 2019 Update”
 - *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335, 118 USPQ2d 1684, 1688 (Fed. Cir. 2016)(general purpose computer)
 - *McRO, Inc. dba Planet Blue v. Bandai Namco Games America Inc.*, 120 USPQ2d 1091 (Fed. Cir. 2016)(general purpose computer)
 - *CosmoKey Solutions GMBH & Co. KG v. Duo Security LLC*, 2020-2043 (Fed. Cir. 2021)(system providing increased security)

PROSECUTION TIPS

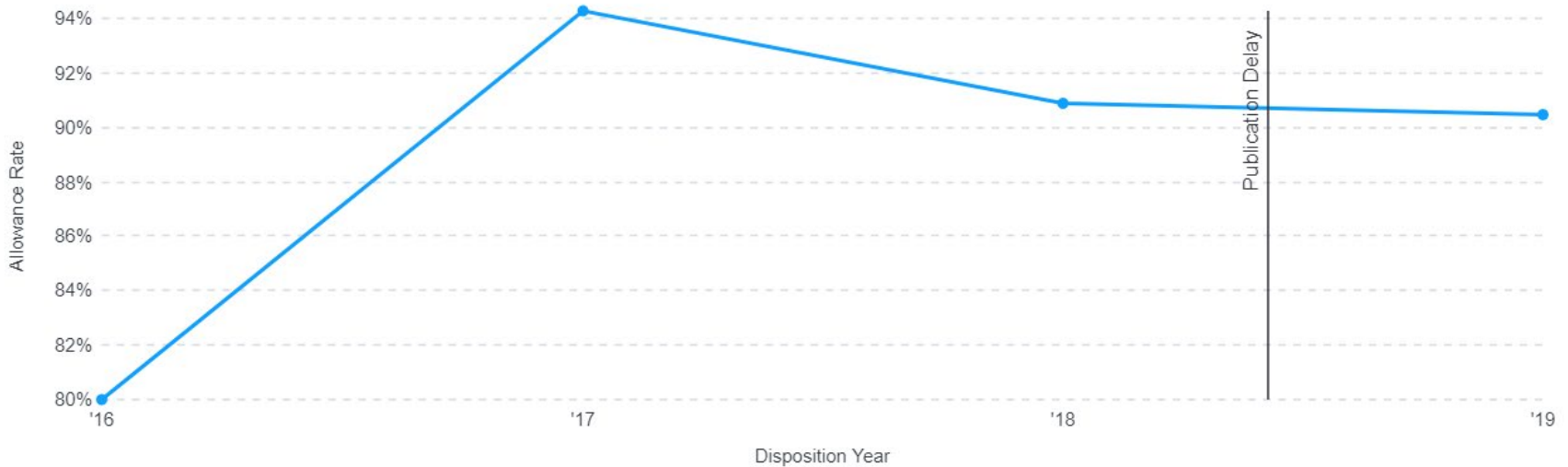
Rejection Bases



Source: Juristat search for applications having “blockchain,” “block chain,” or “distributed ledger” Dec. 4, 2019

PROSECUTION TIPS

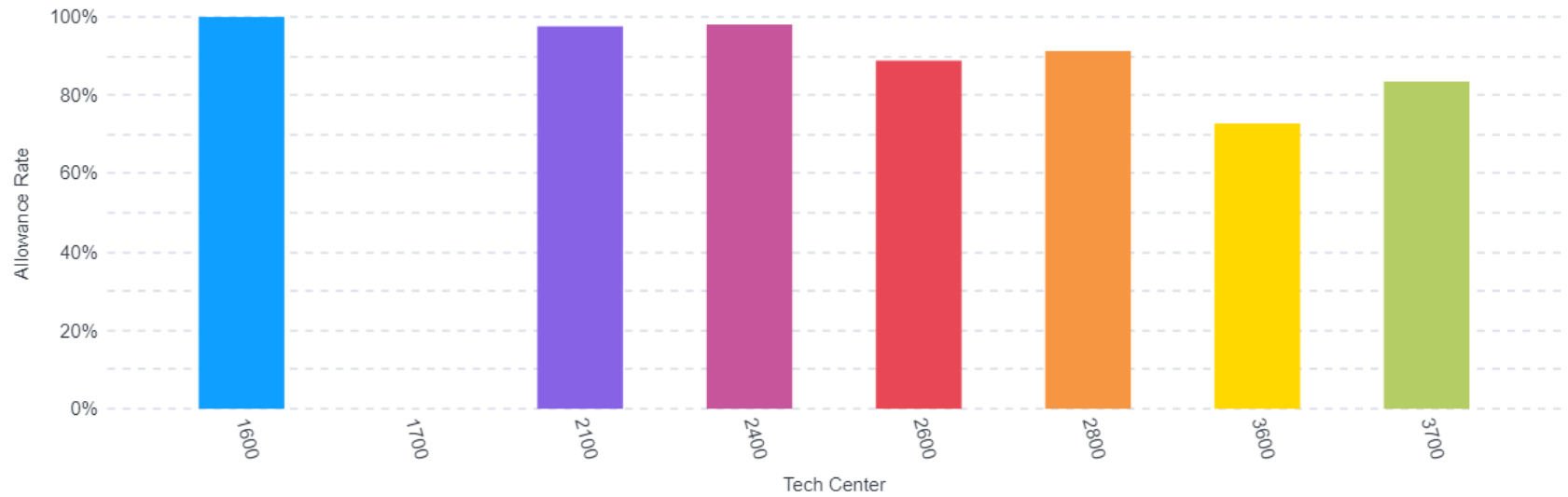
Allowance Rate



Source: Juristat search for applications having “blockchain,” “block chain,” or “distributed ledger” Dec. 4, 2019

PROSECUTION TIPS

Allowance Rate by Tech Center



Source: Juristat search for applications having “blockchain,” “block chain,” or “distributed ledger” Dec. 4, 2019

PROSECUTION TIPS

INFRINGEMENT

- Detectability of Infringements
 - Not unique to blockchain, but for private (permissioned, consortium and some hybrid) blockchain the internal working may not be determinable
- Divided/Joint Infringement Concerns
 - Being decentralized, there are multiple players
 - Akamai v. Limelight Networks – “directs or controls” by single infringer; joint if an entity conditions participation or receipt of a benefit performance of a patented method, use of all elements in a system claim, importation of a product made from a patented method, etc.
 - Draft claims from one entity’s perspective when possible

PROSECUTION TIPS

FOREIGN FILING CONSIDERATIONS

- Japan, South Korea, China and Singapore tend to patent blockchain innovations at a higher rate than other countries
- U.S. and AU are usually reasonable (though AU recently had an appellant case decided that seems to be raising the bar to patentability)
- EPO has its version of patent ineligibility rejections that are difficult to overcome
 - Often a blockchain invention will be not patented in the EU even though patented in many countries
- Other countries may not have sufficient experience but often follow lead of one of the top five patent systems
- PCT or direct national applications
 - Follow the normal analysis
 - Lead countr(ies) and follow on counties
 - South Korea is a good choice for ISA in blockchain and computer implemented inventions

TAKEAWAYS

- Blockchains are:
 - ANONYMOUS
 - DECENTRALIZED
 - DISTRIBUTED
 - IMMUTABLE
- Blockchains are not limited to cryptocurrency uses
- Worldwide Patent Offices are more familiar blockchain technology (EPO is especially difficult)
- Patent ineligibility rejections remain high
- New blockchain applications should clearly describe/claim technical improvement being realized

Speakers



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