PATENTS AND THEIR SECURITY ISSUES USING BLOCK CHAIN TECHNOLOGY

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ABSTRACT: Blockchain technology is a recent development in the Internet world that has impacted a variety of industries. In a distributed system, data and transactions can be shared securely using point-to-point connections.The purpose of this study is to conduct research on how a person or organization may develop a patent strategy to safeguard patent rights and how patent data is protected using blockchain technology. The suggested blockchain-based patent data protection solutions offer improved data security, data strategy and performance enhancements. This paper discusses some well-known patent technologies to emphasize the need of protecting an idea or invention. As technology advances daily via the advancement of gadgets, it is more necessary to protect an original concept by filing a patent.

INTRODUCTION

The world has changed extremely in recent years. China is developing a new paradigm, where the massive domestic cycle of a patent product is the emphasis and the internal and exterior double cycles mutually reinforce one another. The cloud technology will take center stage in the effort to unlock the "several cycles" since it is the foundation of the digital civilization. (Xing, et al., 2020)Cloud services have become more popular across a variety of sectors, including the internet, politics, finance, logistics, transportation, and education. In addition to actively promoting the expansion of urban government and rising industrial progress, this has accelerated up the deployment of "all web services, all systems cloudification. "Big data has entered every profession and work unit, and it has become an important factor of productivity.(Wang, et al., 2020)Big data and cloud computing have made research more and more crucial to society. The idea of quality control has been completely transformed in the era of big data by "cloud government affairs," which is based on big data. Big data's immense value and centralized data management method made it a prime target for network vulnerabilities. Data theft and ransom attempts in the context of big data are on the rise. (Tariq & N. et al., 2019)Internal leakage risks are increased by data concentration, external leakage risks are increased by data distribution, and risk concerns are increased by a growth in data-related individuals.(Zeng, J., & Su, & G., 2018) According to He *et al.*, there is no better way to protect user data. Under the era of big data, user privacy is in danger since data given by internet users is dependent on third-party platforms.(He, et al.,

2019), although many researches on ensuring confidentiality have been published too far. Yet, the findings of these studies are difficult to apply to specialized domains.(Fang, et al., 2017)As a result, data access management and protection have become scientific a challenge that must be addressed immediately. Patent data safeguards user privacy. Because of the current approach, each patent application and approval contains confidential info such as the applicant's certification number, mobile number, and particular residence. Second, the patent data contains valuable technical innovation information. Furthermore, patent inspection findings and reconsideration information that is invalid represent major interests of parties involved.(Xiong, et al., 2020)The present domestic patent data protection, according to Joung and Kim 2017, is dependent on the introduction and development of technologies for patent analysis and recovery that, by employing cloud computing and big data processing technology, significantly enhanced the security of access to patent data.(Joung, J., & Kim, & K., 2017)According to Bhattarai *et al.*, the limited amount of product patent offices and efficient processing capabilities, often lead to prolonged patent data processing and evaluation. As a result, while employing typical data access confidentiality, should not only data security and privacy be prioritized, but worldwide distribution must also be maintained. Patent review efficiency might be enhanced in this manner.(Bhattarai, A., & et al., 2017) With examiners from all across the nation, the continuous expansion of review centers will impose increased demands on the data computation and availability zones of patent systems.(Du, J., & et al., 2018)To keep up with the most recent advancements, a

new patent reporting system that can efficiently spread processing while preserving data privacy has been constructed.

METHODOLOGY

The primary goal of this research paper is to thoroughly examine how blockchain technology and patents relate. We want to look extensively into the many facets of Blockchain, including how it operates, how it is categorized, and what difficulties it presents. The study also focused on patents, which included the fundamental rights related to obtaining a patent, and it investigated how blockchain technology can be used to effectively protect patents and the prospects for patents in the context of the quickly developing blockchain industry. This paper aims to provide readers with a clear grasp of how Blockchain functions and investigate the various blockchain technology classes; Blockchains may be divided into many sorts depending on various variables, such as public or private. By examining this categorization, we can also identify the problems surrounding this technology. We have outlined very briefly, the fundamental rights of inventors in the area of patents when submitting a patent application. To lay a basis for understanding the importance of patents in creativity and technical progress, it covered issues such as patent granting, Patent invalidity, patent infringement, patent applications, and patent prosecution. Patent protection can be achieved via Blockchain technology.

Blockchain technology is projected to significantly influence the patent landscape as it continues to develop and disrupt several industries, including banking, supply chain, healthcare, and more. We intended to offer perspectives on how patents may evolve and change in the dynamic world of Blockchain technology by talking about these possibilities.

Literature Review

Developing patent information: Cloud computing may supply computing power and storage services to consumers all over the world through the internet, moreover, it might serve as the hardware backbone for handling internet data. Huge volumes of internet data may be processed online using the big data software architecture, which uses increasingly sophisticated cloud computing techniques to extract key information for creation, retrieval, and integration.(Stergiou, et al., 2018)Cloud technology is a virtual machine of resources, whereas big data is indeed the effective processing of massive amounts of data. In recent years, as the copyright strategy has been advanced in detail, public understanding of patents has risen in China. As a result, the quantity of patentability continues to rise.

Additionally, this situation has made it more difficult for the Chinese National Intellectual Property Office evaluates patents.(Stergiou, et al., Algorithms for efficient digital media transmission over IoT and cloud networking, 2018) For innovation-driven development, intellectual property protection is a "strict requirement." The most crucial technological pillar for enhancing information systems' business defensive capabilities is intelligence. The national patent review and retrieval system's smart upgrade uses a small framework with "better reliability and reduced coupling" for the infrastructure resource country and service application in the "platforms + modules" approach. (Kravets, et al., 2017)Asset recovery quality and efficiency may be increased by integrating artificial intelligence servers into critical cloud services, big data platforms, business units, business software's, security systems, and general maintenance and support. As a result, improving and optimizing system operations and technological capabilities can aid in the further growth of patent review services.(Hui Li && Ming Li, 2022)

Types of patent data: The four categories of patent data include organized data, unstructured data, non-public data, and publicly available data. Data on key equipment parameters, national technology and regulatory requirements, as well as the nature and goals of data analysis, are all contained in patent data. Many limited files of unstructured data describe patent data. Every year, about four million applications are submitted, resulting in 160 million documents in XML (Extensible Markup Language), PDF (Portable Document Format), and other kinds. With no fresh data on the internet, many users rarely access the same data at the same time, and the cache impact is not visible.The same person will have access to and change the same patent's files and data during a predetermined time frame. Several departments may be obtaining data and files at the same time, requiring that the amended information be made available to other parties as soon as possible. Data is accessed often and in large quantities. Statistics may be used to display the quantity of various facts. The patent office holds all of the data, and all branches must access it through a huge centralized system. The national economy will be severely harmed if data is leaked.(Ampornphan, P., & Tongngam, & S., 2020).

Technology used for information security protection: Because of the increasing issues in security and privacy, a new generation of big data and cloud computing-enabled patent assessment and retrieval systems is now being created. The security threats increase when most valued and private data is concentrated, and current operational maintenance providers and data management suppliers must take additional efforts to avoid data leakage(Abouelmehdi, et al., 2017). The most recent system generation may maximize the use of various external agencies' computer resources while ensuring the safety of future data decentralized distribution in various

examination and consultation centers and agencies., and lessen the load on patent office networks and calculations. Many developed countries throughout the world have recently devised and set in place privacy security procedures, schemes, and laws, as well as methods to protect data security and confidentiality with in context of big data and big data development strategies. To lead in the global competitiveness of big data technology, they have also enhanced big data utilization and security protection. By using context-sensitive access, users may log in from any platform and from any location, which can improve security and make user operations simpler.(Zhang, *et al*., 2018)In order to safeguard individuals from the potential consequences of

credential theft, it provides a security key generated by Google that verifies its integrity. The DDoS and application defense services from Cloud Guard offer access control options depending on location. Businesses may now limit system access based on the geographic location of their clients, thanks to this new functionality. Depending on user-specified settings, it may also execute flow control at the third to seventh levels, deploy pre-defined avoidance tactics for cross-site hacking assaults, and set a blacklist to block harmful traffic. (Kaaniche, N., & Laurent, & M., 2017)The above solutions, however, are insufficient for the extensive data protection and privacy requirements in the patent market.
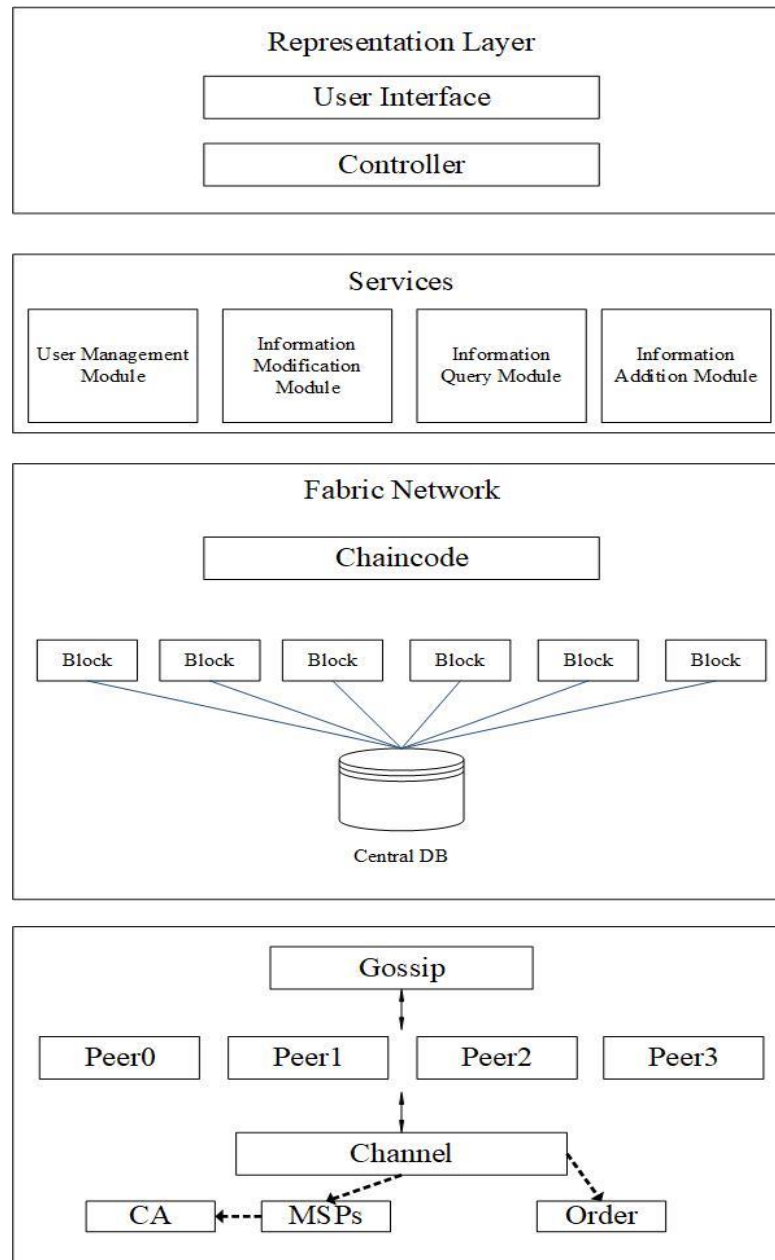
Fig 1. Framework of patent data protection using blockchain technology

Overview of Block-chain: Blockchain technology uses a distributed ledger to store data. The integrity and availability of the blockchain system are provided by the capacity for participants to create, retrieve, and verify transactions that are kept in a distributed ledger. It does not, allowfor the deletion or alteration of any operations or other information recorded in its ledger. Cryptographic protocols and fundamentals like digital signatures and hashing algorithms enable and safeguard the blockchain system. These primitives guarantee the authenticity, non-repudiation, and protection against manipulation of the transactions that take place in the ledger. A communication protocol, or simply a set of guidelines that all users must stick to in order to arrive at a globally united image, is also necessary since blockchain technology is indeed a distributed network.In a trustless environment, blockchain is valued for its decentralization, autonomy, authenticity, untraced ability, verification, responsibility to fix, secrecy, accuracy, and visibility, which all have gained a lot of attention from academic and business fields in recent years. Because of these complex features, blockchain technology has recently attracted the interest of academics and businesses.(M.S. Ali, M. Vecchio, M. Pincheira, & , et al., 2019; I.-C. Lin, & T.-C. Liao,, 2017; Z. Zheng,, S. Xie,, H.-N. Dai,, X.Chen,, & H. Wang., 2018)

**Classification & Evolution of Blockchain:** Blockchains are categorized into three basic categories as the blockchain technology moves forward in relation to how they are created, accessed, and verified:

Public blockchain: which enables anybody to participate the consensus process and decide which blocks include valid transactions and are added to the blockchain. This blockchain is available for anyone to view, transmit, or receive transactions on.

Consortium blockchain: All network participants have read access, but Consortium Blockchain has limited write permissions so that only a smaller set of users may control and supervise the consensus process.

Private blockchain: whose write access is carefully controlled to a single user, but whose reading permissions are either open or limited to a small number of network users (or organization).

Although they are different in terms of the speed of consensus (SoC), the employment of trust authorities (TAs), and the number of TAs needed, but from a performance and security standpoint. As a result, three different kinds of blockchain all share some characteristics: **(1)** they all conduct transactions through decentralized peer-to-peer networks; **(2)** they all demand that every transaction will be updated regularly and can be included to the blockchain; **(3)** each peer node keeps a duplicate of a distributed global record transactions; and they all depend on consensus to network-wide duplication synchronization.(Rui Zhang, Rui Xue, & Ling Liu, 2019)
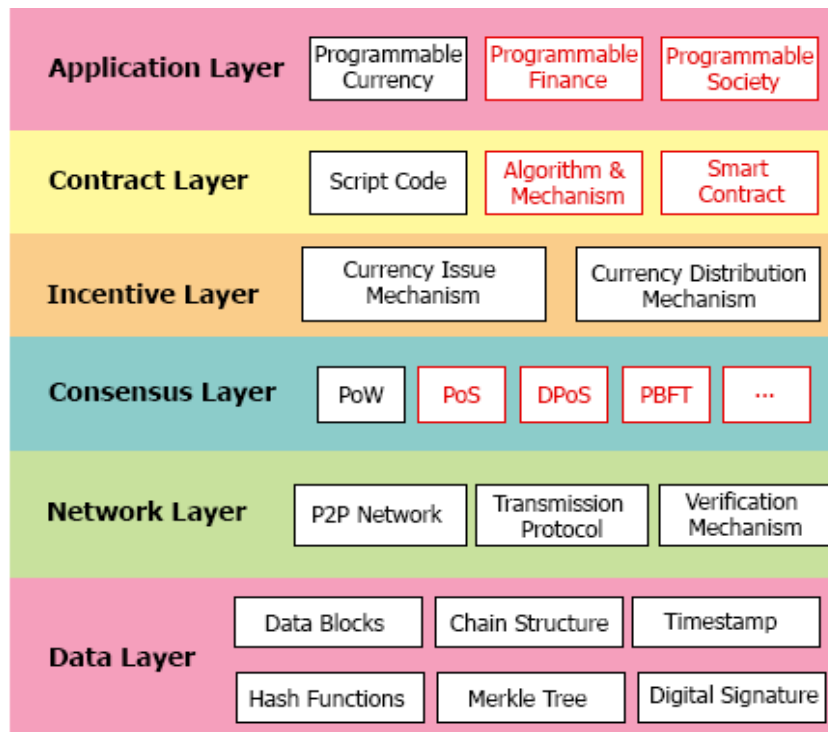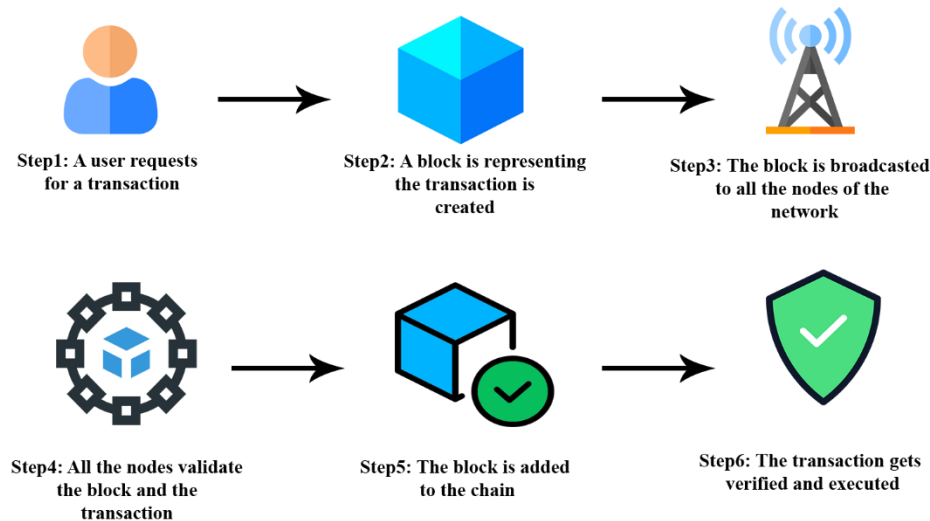
Fig 2. Architecture of Blockchain

2009 saw the public launch of Bitcoin(Satoshi Nakamoto, 2008) the first peer-to-peer electronic money system uses the blockchain as its public record for all transactions and is based on the idea that was initially suggested in 1991 to employ cryptography to create a safe chain of blocks.(Stornetta) The earliest description of trees as a hash chain efficiency improvement came from Bayer and Haber 1993 saw Stornetta.(Dave Bayer, 2022) Blockchain has developed over the past ten years to go

beyond cryptocurrencies. To smart contracts (Blockchain 2.0), to the blockchain (Blockchain 1.0) and to several other decentralized partnerships with high standards for responsibility, security, and trustworthiness (Blockchain 3.0).

Working of Blockchain technically: Following picture depicts how blockchain works

Step1: A user requests for a transaction

Step2: A block is representing the transaction is created

Step3: The block is broadcasted to all the nodes of the network

Step4: All the nodes validate the block and the transaction

Step5: The block is added to the chain

Step6: The transaction gets verified and executed

Fig 3. Blockchain Working (Hasib Anwar, 2018)

Step 1: When users requires a transaction, the first thing they must do is request one.

Step 2: As a result of that request, a block is generated, and this block now reflects the transaction that the user requested.

Step 3: The block will be distributed to all network nodes.

Step 4: All of the nodes in the network will verify the block and the transaction to see whether the transaction is valid in terms of authentication.

Step 5: The requested block will be added to the chain of blocks after being verified, and those blocks also reflect requests that were made by people throughout the world.

Step 6: At the end, the transaction is ultimately validated and carried out.

Challenges of Blockchain: The Internet and the quantity of information have generated new issues about protection and security. As a result, online information and transactions must be safeguarded against hackers and traitors. One of the security solutions that may be used to gain the required level of security is Blockchain. Blockchain technology faces several challenges and difficulties.(J. Yli-Huumo, D. Ko, S. Choi, S. Park, and K. Smo, 2016)

Problems with Blockchain Technology: Two difficulties that trustworthy Blockchain networks are immune to are
1.   Double spending
2.   Byzantine Generals
        Nevertheless, these problems have the potential to seriously damage the blockchain network if an attacker manages to seize 51% of the network's power. As a result, a strong mechanism must be created to oppose and prevent these assaults.

Double Spending Problem: This problem happens when the same cryptocurrencyis spent twice in two distinct transactions. Processing the transaction, on the other hand, requires a specified length of time before it is done; for example, each Bitcoin transaction takes about 10 minutes to execute. As a result, this time period aids in the solution of the problem.(D. Bradbury, 2013)

Byzantine Generals: After the network nodes agree on the validity of a transaction, it is acknowledged in the Blockchain system. An attacker might take advantage of this situation by influencing network nodes to validate a fraudulent transaction.(L. Lamport, 1982) As a result, in blockchain networks, gaining acceptance across non-trustworthy nodes is a key challenge.

Things to Know about Patents

History of Patents: The Venetian Patent Statute of 1474 is usually acknowledged as the earliest legislative patent system, despite the fact that,in Greek city of Sybaris, there are some signs that patent rights were acknowledged in Classical Greece.(Anthon)(Naucratis, 1854)However, a recent historical analysis suggests that the 1474 Venetian Patent Statute may have been inspired by Kingdom of Jerusalem rules that granted monopolies to developers of innovative silk-making techniques.(Merges) As of 1474, patents were routinely given in Venice. At that time, the Republic was required to be informed of new and creative methods in order to get lawful protection against prospective infringers. The protection lasted for ten years.(Patent law of venice, 1474)In their new nations, emigrants from Venice desired the same patent protection. As a result, patent laws began to expand to other countries(Frumkin, 2019). The English patent system evolved from its early Medieval origins into the first modern patent system that emphasized intellectual property rights in order to promote invention; this was the crucial judicial foundation upon which the mass Production could build and flourish.(Leaffer)Significant modifications to patent law took place during the 18th century as a result of a delayed judicial interpretation process. Applications for patents during the era of Queen Anne were required to contain a comprehensive explanation of the invention's working principles for use by the general public.(The 18th century, 2008): on April 10, 1790, the U.S. Congress approved the first patent law under the title "An Act to encourage the advancement of useful Arts".(A Century of Lawmaking for a New Nation: U.S. Congressional Documents and Debates, 1774 - 1875, n.d.)On July 31, 1790, Samuel Hopkins was awarded the first patent under the Act for a method of producing potash (potassium carbonate). After a new version of the patent legislation was approved in 1793, a significant revision was made in 1836**.** The Act of 1836 established a far stricter appeal procedure that included the implementation of an exam system. Between 1790 and 1836, almost ten thousand patents were granted. About **80,000** patents were granted as a result of the American Civil War.(Gabriel, 2014)

Granting patents: According to national laws and international agreements, the process for acquiring patents, restrictions placed on the registered proprietor, and the extent of the exclusive rights vary greatly between nations. However, a patent application typically has to have one or more claims that specify the boundaries of the protection being claimed. One or more claims may be included in a patent, and each claim will explain a different property right. As long as an invention is unique, includes an inventive step, and has the potential for industrial application, it should be eligible for patent protection in WTO member states, based on the TRIPS Agreement of the World Trade Organization

(WTO). However, there are differences in what is considered patentable subject matter across nations, as well as between WTO members. Additionally, TRIPS stipulates that the duration of the protection shall be at least twenty years.(2008)

Impacts: A patent prevents an invention from being produced, utilized, or sold. Instead, throughout the term of the patent, which is actually normally 20 years following the date of filing, the owner of the invention has the legal right to stop anybody from producing, using, distributing, offering for sale, or importing the innovation as long as maintenance fees are paid.(Youngstown, Herman v. Youngstown Car Mfg. Co., 216 F. 604 (1914))(TRIPS_Agreement, 1994)But it is better and maybe fairer to argue that a patent offers its owner "a power to exclude by appealing the patent in court" because so many issued patents are subsequently ruled to be invalid when their owners seek to claim them in court.(Lemley & Shapiro)Even if a patent is an exclusive right, the holder may not actually be able to commercialize the invention it protects. For instance, many inventions are just improved versions of older concepts that might still be protected by a patent that owns to someone else. When an inventor receives a patent for changes to an existing invention that is still protected by a patent, they are only officially permitted to make use of the improved innovation with the prior inventor's consent, who has the authority to reject (Youngstown, Herman v. Youngstown Car Mfg. Co., 191 F. 579, 584–85, 112 CCA 185 (6th Cir. 1911), 1935).

Patent Invalidity: Opposition proceedings, which are available in the majority of nations, allow third parties to question the validity of a patent that has been approved or issued at the regional patent office. It is also an option to argue against a patent's validity in court. The opposing party seeks to establish that the patent should not have been awarded in either scenario. There are several reasons for challenges, such as the fact that the claimed invention isn't even patentable, that it wasn't novel or obvious to someone with ordinary skill in the relevant field at the time the application was made, or that some sort of forgery was carried out during court proceedings with reference to the creator listing, tries to claim about when inventions were made, etc. Any of these elements may cause a patent to be partly or completely invalid.(Ford, 2021)(Silverman, 1990)

Patent Infringement:A patented invention is made, used, or sold by a third party without the patentee's consent, which is considered patent infringement. However, national laws govern the enforcement of patents. For instance, unless the product was imported into the US, the manufacture of a product in China that would violate a US patent would not be considered an infringing under US patent law.(Mallor, 2012) Literal

patent infringement occurs when someone engages in an activity that is forbidden and is so protected by the patent. The Doctrine of Equivalents is another approach that guards against the development of products that are essentially, and legally, identical to those that are protected with only minor changes.(Doctrine of equivalents, 2023) For two further types of infringement, there is legal responsibility in several nations, including the United States. One is collaborating in another's infringement, or contributory infringement. This might be a firm selling a patented product made by another company or assisting another company manufacture a patented product. (contributory_infringement, 1952)When one party promotes or assists another party in violating a patent, this is referred to as "inducing infringement." An example of this may be a company hiring a third party to create a patentable goods in an effort to eliminate a competitor from market share.(inducement_of_infringement, 1952)When a patent owner sells a product in country A, where they have the product patented, and a third-party purchase and sells the product in country B, in which the holder also has a patent for the product, without the holder's authorization, this is essential. Because it was already sold in another country, the patent holder will not have a legal basis to try to enforce the patent in country B if it has an international exhaustion policy. However, the owner may still be able to assert their patent rights if country B adopts a strategy of national or regional exhaustion.(Halle, 2007)

Patents Enforcement: Although certain nations have harsh laws for willful infringement, patents are often exclusively enforced through civil lawsuits (Cary, 2005). In addition to monetary compensation for prior acts of infringement, a patent owner often asks for either damages alone or an order to prevent the offender from committing future activities of infringement. To prove infringement, the patent holder must establish that the claimed infringer complies with every requirement of at least one patent claim. The accused infringer may challenge the integrity of the patent that is said to have been violated in a counterclaim. A patent may be rendered invalid for the explanations provided in the relevant patent laws, which varies by country. The justifications are typically a part of the requirements in the relevant country to be awarded a patent. Regardless, an infringer is frequently allowed to depend on any reasons for invalidity. In return for a fee or other consideration, the patent holder (the licensor) agrees to provide the licensee the right to produce, distribute, import, or otherwise make use of the claimed invention.(Katz & Shapiro)(Schmitz, 2002) Companies working in highly technical industries frequently sign many licensing agreements related to the creation of a single product. As a way to share the benefits of

exploiting each other's patented innovations, rivals in these sectors frequently enter into cross-licensing agreements to license each other's patents. Due to the grouping of the three intellectual assets into one main license, licenses like the Apache 2.0 License are a combination of copyright, trademark, patent, and contract laws. This may make enforcement difficult because patent licenses cannot be granted in this way under copyright protection and must beviewed as contracts (Problems with Apache License and Others Involving Non-Copyright Uses, 2022)

Patent Application & Patent Prosecution: You must ensure that your idea is patentable before filing an application, which must be paid for whether or not a patent is given. Anything natural cannot be patented since patented stuff must be synthesized. For instance, while it is not possible to patent materials, metals, genes, facts, creatures, or biological processes, the creation of new things using them in an imaginative, non-obvious way could be eligible for patent protection.(Chakrabarty D. , 2023)A formal application must be submitted to the appropriate patent office in order to request a patent. The "applicant" is the individual or business who submits the application. Either the inventor or their assignee may be the applicant. The application includes instructions on how to create and utilize the invention, which must be sufficiently detailed for someone with the necessary technical knowledge to do so. In certain countries, it is necessary to provide certain details, such as the innovation's use, the best way the inventor knows of to carry it out, or the technical difficulty or problems the invention resolves. Drawings can also be used to illustrate the invention. The spectrum of a patent is defined by one or more claims included in the application. After filing, an application is usually stated to as "patent pending". Although a patent cannot be implemented until it is granted, this word acts as a notice to possible infringers that they can be held accountable for damages if invention is obtained. (https://en.wikipedia.org/wiki/Intellectual_Property_Offic e_(United_Kingdom), 2023) A legal document is "prosecuted" after filing. A patent examiner looks at the patent application to see if it complies with that nation's standards for patentability. In the event that the application is not in compliance, objections are informed to the applicant by an Office action, to which the applicant may reply. Depending on the jurisdiction, there may be a number of Office actions and answers before the patent office sends a final rejection or grants the patent application, which, after paying extra costs, results in an issued, enforceable patent. Third parties may file an opposition procedure before, after, or between the grant and issue of a patent in various countries. Most nations need renewal payments for patents after they are awarded in order to maintain them in effect. These costs are

typically due once a year. Before a patent is issued, several nations or regional patent office's further demand the payment of yearly renewal costs for a patent application.

Patent Strategies: A patent strategy is a set of procedures takes to protect your ideas, developments, or intellectual property.(Thomas Franklin, 2022) A company's patent strategy is mostly defined by its size, resources, industry demand, and commercial requirements. Large companies, pursue extensive patent strategy due to financial and resource limitations. Small businesses, on the other hand, employ successful yet cost-effective techniques (Sagacious IP).

Types of patent strategies: There are two major types of patent strategies known as;
* Offensive patent strategy
* Defensive patent strategy

OFFENSIVE PATENT STRATEGY

TYPES OF PATENT STRATEGIES
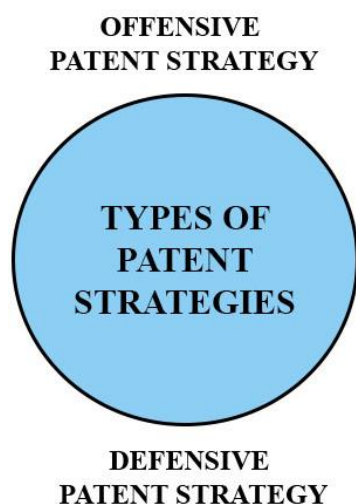
DEFENSIVE PATENT STRATEGY
Fig 5. Types of patent strategies (IP, 2021)

Offensive Patent Strategy: In order to get profitability, by developing an asset that can be licensed or sold to keep competitors off the market this is known as offensive patent strategy. The capacity to file an enforcement action against an infringement to force them to cease selling the patented item or pay royalties is the ultimate power of an offensive patent. Patents are assets because of their enforcement authority.

Defensive Patent Strategy: In order to protect an invention and prohibit someone else from obtaining a patent on the same invention. Defensive patenting is what it's called. Inventors, on the other hand, may benefit from filing a defensive patent application. Because your patent application includes search criteria against others to stop someone else from obtaining a patent concerning the same idea one submits a defensive patent application & goes through the publication procedure.As a result,

someone else may be unable to get a patent on the same subject matter.(Berks, 2019)

Developing a Patent Strategy: Developing a plan for your company's patents could be important for both new and established businesses. Above all, a patent strategy could provide a business more options. Similar to what a business plan accomplishes for the company as a whole, a patent strategy offers a "broad vision" perspective of what the patent represents now and, perhaps more crucially, what it will appear like in the future. This perspective allows the company to consistently use the patent and compete more effectively. A well-thought-out patent strategy may also be a show of commitment to investors or stakeholders for developing businesses. In many aspects, creating a patent strategy is comparable to developing a business plan, both in terms of main objective but also in terms of business growth.(Beetham, 2016)

Protection of Patent Data using Blockchain: One of the most advanced and safe methods for patent security today is blockchain. Rapid developments in digital technology have given rise to new problems with data security. To protect their data, organizations need to use authentication methods and cryptographic key vaulting methods. Data security issues can be solved with blockchain technology, which can also stop undesired cyberattacks. Followings are some techniques used by blockchain technology to protect data.

Encryption and validation: Blockchain technology can handle any situation and ensure that data is not altered in any way. Blockchain can provide enough authentication, because it is encrypted by nature. Blockchains and smart contracts may be used together to ensure that certain validation occurs each time a set of conditions is met. If data is updated, all of the ledgers on every node in the network confirm that the change was done.

Secure data storage: Blockchain technology is the most effective way to protect a shared community's patents. Any sensitive data saved via the blockchain's capabilities cannot be viewed or used by anybody. It is advantageous to manage data that is dispersed over a network of people. Moreover, the technology might be applied to government activities to retain decentralized and safe public records. In addition, a business model can use a Blockchain to hold a lot of data related to patents. Customers might feel confident knowing that sensitive data is protected as a result. Blockchain is employed in shared storage applications to split enormous data volumes into manageable chunks. This may be accessed in encrypted files through a network, guaranteeing the privacy of any data.

Unfeasible to attack: Blockchain is incredibly difficult to get into or attack. The data may be trusted since

blockchain is decentralized, encrypted, and cross-checked. Because there are so many nodes on the blockchain, it is challenging to hack the most of them at once. Data integrity is one of the fundamental characteristics of distributed ledger technology. By making sure that no event or activity can be changed or duplicated, it offers a completely new level of security. Using this method, many nodes throughout the network validate each transaction.(Gautam Raturi, 2020)

Patents Future with Blockchain: Blockchain technology, as a distributed technology, has the characteristics of, management of identities and access Data security, secure communication, Security for smart contracts, transaction approval. These qualities can be used to improve the integrity and dependability of managing and storing patent information, protecting rights and ensuring patent originality. By ensuring that distinct nodes link to trust and openness through this disruptive technical framework, trade processes are autonomous on the basis of mutual ignorance and the absence of third parties. Asymmetric encryption and smart contract on blockchain let multiple user nodes participating in the patent trade system simultaneously with varied permissions. In the private nodes, participant users' privacy is likewise protected. Consequently, this paper's primary research goals and contributions are dual. Mainly, we discuss how blockchain works, how patents can be generated, secondly it is stated that how blockchain technology can protect patents. As above mentioned, characteristics of blockchain technology it is proved that blockchain technology is capable of protecting patents.

More characteristics of Patenting Data and Protection

i. With a license, you have the power to forbid unauthorized production, distribution, importation, or replication of your invention.
ii. For a set period of time, you are protected, giving you the advantage over rivals.
iii. After that, you may implement your innovation yourself.
iv. As a substitute, you might allow people to use your patent or sell it. This could be a sizable source of revenue for your business.
v. Publishing particular, in-depth information about your invention is an element of your patent application. It's possible that preserving your plan a secret may discourage rivals more effectively.
vi. Applying for a patent can take a long time (often three to four years), and by the time you acquire a patent, markets may have altered or technology may have improved to the point where your invention can be replaced.
vii. Cost - You will be required to make payment for the application, checks for previous art patents, and a patent lawyers' fees whether you are successful or not, all of which can add up to a sizable expenditure of money. If you forget to pay your yearly fee, your patent will expire.
viii. The power to defend your patent will be necessary. It may be exceedingly expensive to take legal action against a violator. However, a patent may serve as a deterrence, negating the need for defense (content/advantages-and-disadvantages-getting-patent).

DISCUSSION

There has been much media exposure of the rise in patents over the past two decades, which affected everything from electronics and software to human DNA sequences. Its causes and economic effects have also received much attention. Questions have been raised concerning the effects of patent protection on the development of science and technology as a result of universities' acceptance of patenting. Concerns about invention becoming more challenging and the commercialization of ideas being held back by patents are increasing as inventions become more interconnected and innovation depends more and more on segmented privileged data. However, many patents relate to a recent wave of technical developments (such as information and communication technology and biotechnology), which may not have materialized or may have been delayed. Because of this, it is essential to comprehend how patents may create barriers to the distribution of technology, how to remove them, and how patents may be included into contracts to maintain market movement. The benefit of patents is that they grant their owner the only right to an innovation in their nation and prevent anybody else from producing, using, or commercializing the invention for the duration of the patent. But receiving a patent has its difficulties. A patent must meet a number of requirements, most of which are common with minor variations. It all usually comes down to safety when it comes to patents. A patent gives you exclusive rights and around 20 years to develop and market the invention before your rivals do.

Conclusion: Research is presented for how people or organizations may develop patent plans to safeguard their rights and ensure that a third party cannot steal or benefit from their idea or creation. Furthermore, a study is proposed that how patent data is protected based on blockchain technology under the blockchain scenario. The performance of shared resources and private data processing can be improved with blockchain-based privacy protection, but security performance will be compromised. As a result, balancing safety performance while increasing efficiency is a subject that has to be researched further. An excellent idea is to file a patent for your invention, whether it be an idea, a product, or a

service, since this will protect it from copying and enable you to capitalize on the value of your creation to the fullest. You will own all of the rights to your innovation if you obtain a patent. A patent is an exclusive right granted by the government to an inventor to prohibit unauthorized.

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