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Out of the blocks – mitigating patent risk over distributed ledgers

This rapidly developing technology is set to be hugely disruptive across a range of sectors. Companies should act fast to ensure they are aware of the IP risks

By Mehdi Ansari, Jay Thornton, Raffaele DeMarco and Rudy Kleysteuber

Few recent digital innovations have captured the business community's imagination more than blockchain and other distributed ledger technologies. These technologies not only enable bitcoin, Ether and other cryptocurrencies or crypto-assets, some innovators have devised diverse new commercial uses for them – from global supply-chain tracking, energy distribution and trading to secure digital identity management and tamper-proof voting and elections.

Some commentators predict that these systems will become the new fabric of commercial exchange and will generate hundreds of billions of dollars of economic value-add in the coming decades. While only time will tell whether distributed ledgers are a truly paradigm-shifting innovation, current figures suggest that companies are already spending several billion dollars a year to build or deploy such systems, with these amounts forecast to rise even further.

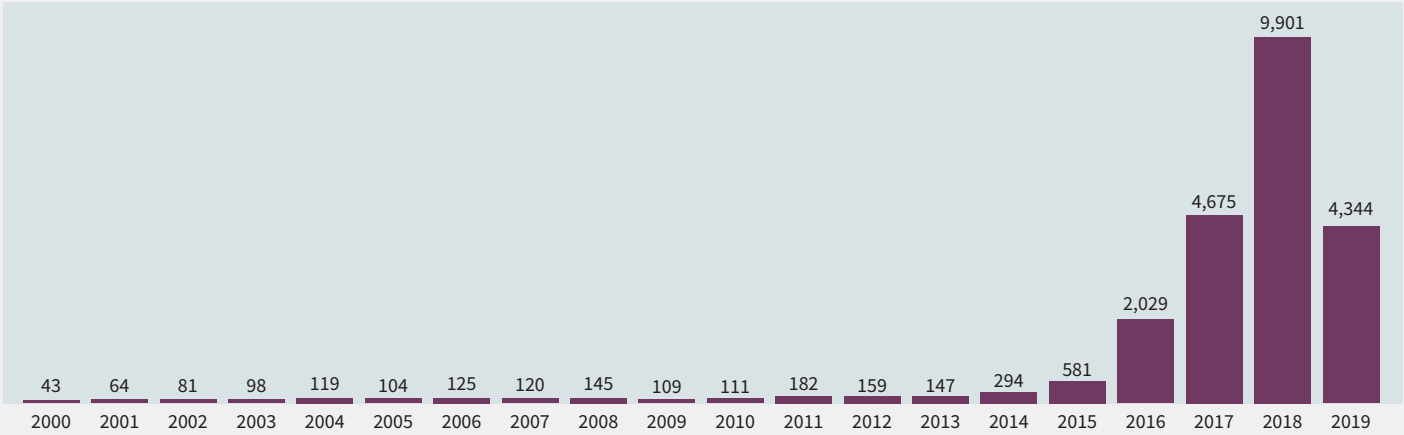
The term 'distributed ledger' describes a database used to record transactions or interactions with two defining features. First, such a database is distributed across a number of nodes without relying on a central authority. Second, it includes a mechanism to automatically ensure the accuracy of certain information across these nodes and to protect against improper interference by those controlling certain nodes. The core value proposition of distributed ledgers is that they serve as a medium of interaction or exchange between dispersed parties, which may not know or trust each other, without the need for intermediation by a trusted central authority. Blockchain technology is a leading example of a distributed ledger, in which information is stored in blocks; once a block is created and accepted by network consensus, it is added to the chain of all previous blocks.

In parallel with growing business appreciation of – and spending on – distributed ledgers, a number of prominent companies have been building portfolios of patents in this area at a rapidly accelerating pace. The existence of such patent rights, which apply to various components of distributed ledger technology, suggests that many of the companies building, acquiring or otherwise deploying distributed ledgers (or those that plan to do so in the future) may be at risk of patent liability and litigation down the road.

This article first describes and discusses the growing volume of these patents and patent applications – along with the resulting risks and opportunities that arise for various players – and second proposes some potential mitigation strategies to address such risks.

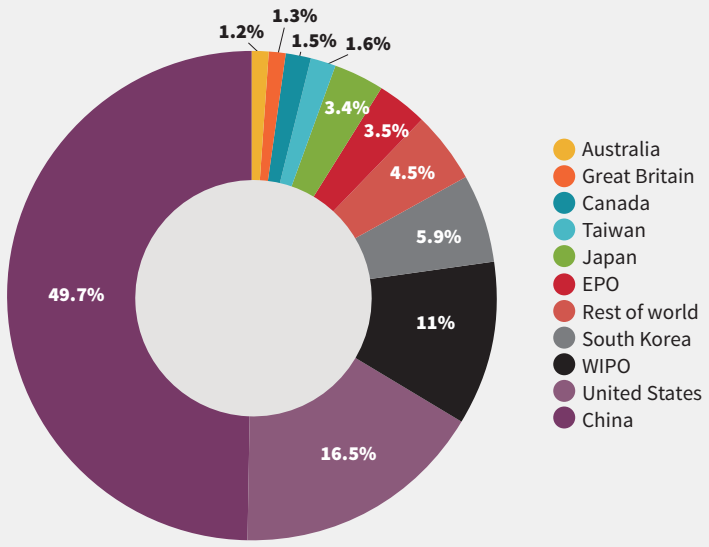
Picture: dotshock/shutterstock.com

FIGURE 1. Worldwide patents and published patent applications related to search criteria filed, whether active or not. (Note: duplicates, such as for an issued patent and its corresponding application or its multiple publications, have been removed)



Source: S&C using Innography

FIGURE 2. Active patents and published applications related to search criteria by jurisdiction



Source: S&C using Innography

Why has there been so little litigation so far?

To date there has been little patent litigation over distributed ledgers, with some commentators expecting this situation to remain unchanged going forward, in part because of *Alice*. While *Alice* may mitigate the risk of some patent infringement claims related to distributed ledgers, it is more likely that the limited litigation to date can be better explained by two tactical motivations. First, while companies are pursuing commercial distributed ledger deployments, most such applications are not yet generating material revenues or posing a material competitive threat to interested patent holders. The incentive to sue will increase as the economic value and competitive threat of distributed ledgers increase. Second, a patent holder interested in generating royalties from its patent portfolio is more likely to wait until later in the patent's life to file an infringement suit because if an infringement suit is filed early on, the patent may be invalidated in the course of such litigation and thus cost the owner the opportunity to collect royalties from willing licensees. For these reasons, the lack of patent litigation over distributed ledgers to date is no guarantee that it will not pick up in the future.

The patent landscape

We conducted a number of searches of patents and published patent applications related to distributed ledgers in order to identify trends in the rate of filings and the nature of patent holdings in this sector. These searches were conducted using the patent search tool Innography, which aggregates patent information from over 90 jurisdictions. On 13 December 2019 we searched for worldwide patents and published patent applications reported through Innography that included any of the terms 'blockchain', 'cryptocurrency' or 'distributed ledger' (and several variations of each) in the title, abstract or specification. Although some results may be due to the search terms being used only in the background portion of the specification, a review of a sample of the results suggests that even this was sufficient to identify a patent relevant to our search criteria. A number of interesting trends emerged from analysing the results of these searches.

The first trend of interest is that the number of patents and published patent applications related to distributed ledgers has increased at a rapid rate over the past five years, as illustrated in Figure 1. The information shown here underrepresents the actual number of relevant patents and patent applications because for many jurisdictions such materials are not published for up to 18 months after their filing, making the number of – and growth in – such filings greater than is shown, particularly for 2018 and 2019.

Beyond the general increase in the number of patent applications and issuances, their distribution by jurisdiction is also noteworthy. China has the greatest number of filings, with approximately half of all filings, and the United States and China together account for roughly 65% of relevant patent applications and issuances identified in our searches (see Figure 2).

Figures 3 and 4 illustrate the five largest US and Asia-Pacific-based holders of distributed ledger-related patents.

Looking further down the ranking of major patent holders, Figure 5 represents the top 20 distributed ledger patent holders separated by sector. Three sectors emerge

as particularly active. The first is technology companies, which includes both technology vendors and companies that provide products or services that rely on IT. The second leading sector consists of companies that have business models focused on distributed ledgers, either as vendors of distributed ledger technologies or through sale of particular products or services that inherently rely on distributed ledgers (eg, a cryptocurrency). The final major sector is financial services. In addition to these three groups, there is a long tail of other companies that have filed or held relevant patents and patent applications, including retailers, industrial companies and educational institutions, among others.

The results of these searches point to a number of relevant conclusions. First, there is substantial growth in the number of distributed ledger patent applications and issuances, which is expected given the commercial focus on distributed ledgers. Second, certain sectors, including financial services firms, technology companies and fintech or distributed ledger-centric businesses, have been the most active filers or acquirers of such patents, suggesting that companies wishing to deploy distributed ledgers to capture competitive opportunities in these sectors may want to proceed with greater caution.

Finally, most patents relevant to distributed ledgers have been filed in either the United States or China, which means that companies wishing to deploy distributed ledgers in either of the world's two largest economies may face more potential patent infringement claims relative to other jurisdictions. As discussed later, these two jurisdictions also have unique procedural features that affect how IP rights are protected and enforced.

Patentability of distributed ledger technology

While the substantial and growing number of patent applications and issuances suggests an increased risk of related litigation and liability over distributed ledgers, a number of procedural and substantive legal issues help to inform the nature of that risk.

Under US law, there is some uncertainty as to the eligibility of software for patent protection. This stems in large part from the 2014 decision by the US Supreme Court in *Alice Corp v CLS Bank International* (134 S Ct 2347 (2014)), which involved a patent for a computerised scheme for mitigating financial settlement risk. The Supreme Court held the scheme for which the patent was granted to be ineligible for protection because the claims at issue were drawn from the abstract idea of intermediated settlement.

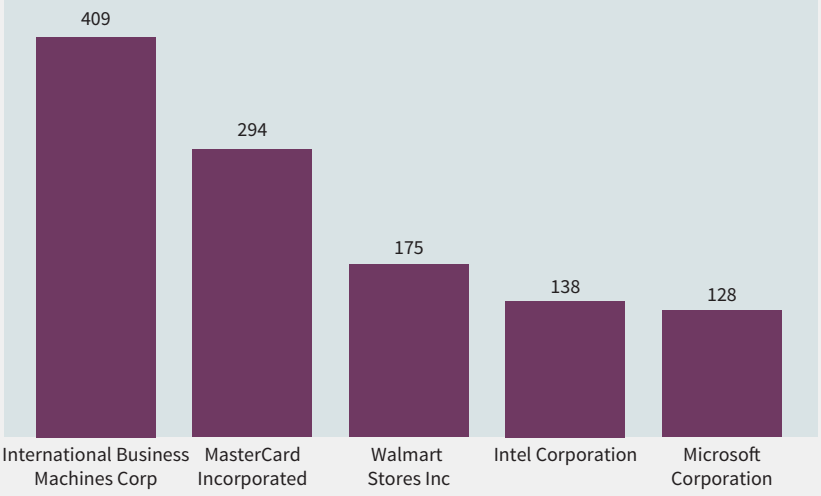
The court explained that merely including generic computer implementation is insufficient to transform an abstract idea into a patent-eligible invention. However, it did not explain what further features or content would make such an invention patent-eligible. Since *Alice*, software patents have more frequently been invalidated in litigation on eligibility grounds as the courts have found a number of such claims to be patent-ineligible abstract ideas.

If *Alice* were the last word on the patent eligibility of software, we might expect more patents on distributed ledger technologies to be held invalid for being too abstract. However, subsequent decisions by the Court of Appeals for the Federal Circuit have held certain other computer-focused inventions to be patentable and non-abstract.

In particular, in *Enfish LLC v Microsoft Corp* (822 F 3d 1327 (Fed Cir 2016)), the Federal Circuit held that a data storage and retrieval system for a computer was patent-eligible because "the claims [we]re directed to a specific implementation of a solution to a problem in the software arts" (*Id* at 1339). "Much of the advancement made in computer technology consists of improvements to software that, by their very nature, may be defined… by logical structures and processes" (*Id*). The Federal Circuit did not see in the Supreme Court's decisions "an exclusion to patenting this large field of technological progress" (*Id*).

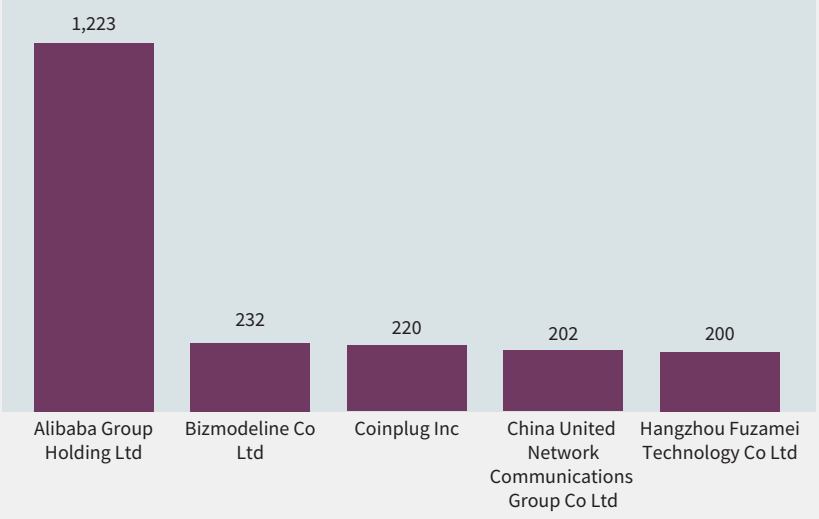
Other Federal Circuit decisions since *Alice* have similarly found certain software patents non-abstract, although most of the Federal Circuit's decisions regarding subject-matter eligibility have deemed the challenged subject matter to be abstract.

FIGURE 3. Top five US-based holders of patents and applications related to search criteria (active patents/applications worldwide)



Source: S&C using Innography

FIGURE 4. Top five Asia-Pacific-based holders of patents and applications related to search criteria (currently active patents/applications worldwide)



Source: S&C using Innography

In addition to these court decisions, the USPTO recently issued new guidance on how it will assess whether a software invention is too abstract to be patentable when deciding whether to grant new patent applications. While the office's legal interpretations are not binding on the courts (whose interpretations of the relevant statutes are ultimately what matters in the context of litigation), the USPTO's interpretation will affect those trying to file such patents and, for that reason, will ultimately influence the nature of the distributed ledger-related patents that accumulate in the United States in future.

In the opinion of many commentators, recent changes in leadership at the USPTO have repositioned the agency to act in ways that more frequently favour patent owners and applicants, whereas the previous leadership was generally perceived to be acting in ways that favoured technology implementers (which might be accused of infringing another's patent).

Pursuant to the USPTO's new guidance, the agency appears to be streamlining its analysis under *Alice* in a way that makes software patents more likely to be granted. Specifically, when assessing a claim in a patent application, unless that claim falls clearly into one of three enumerated exceptions to patentability – mathematical concepts, methods of organising human activity and mental processes that can be performed by the human mind – the USPTO will presume the claim to be non-abstract and patent eligible, and will treat the claim as too abstract only in "rare circumstances".

In order for those rare circumstances to exist, the initial patent examiner evaluating the application must believe the claim to be a patent-ineligible abstract idea; the director of the technology centre to which they belong must then agree with this analysis. The practical effect of this guidance is that more patents related to distributed ledgers will likely be granted by the USPTO. Depending on the strategic business objectives of patent holders, this may increase the possibility of litigation even if such patents may ultimately be ruled invalid by the courts.

Another recent procedural decision by the Federal Circuit will likely make it more costly and time consuming to dispose of infringement claims based on patent ineligibility grounds. In *Berkheimer v HP Inc* (881 F 3d 1360 (Fed Cir 2018)), a case involving software for processing and archiving digital information, the Federal Circuit held that patent eligibility is a question that will often have factual components that are not proper for dismissal as a matter of law, making early disposal of litigation on patent eligibility grounds less likely. This decision means that lower courts will have greater difficulty disposing of software eligibility claims at summary judgment and that more patent infringement lawsuits may proceed to trial. This will likely make it more costly and time consuming to dispose of patent infringement claims related to distributed ledgers.

Looking briefly to the other key jurisdiction for distributed ledger patent filings (ie, China) suggests further reasons to expect meaningful risk of patent liability or litigation. First, a number of procedural reforms made to China's IP filing and dispute resolution processes have apparently made IP rights more readily enforceable. Two such procedural changes are the creation of specialised IP courts and more widespread publishing of judicial decisions related to intellectual property, both of which should make IP enforcement more transparent and predictable.

Second, commentators on Chinese IP law point out that it is expressly protective of software patents as a substantive matter, in contrast with the *Alice* standard in the United States. Finally, injunctions are more readily available as a remedy in patent infringement suits in China than in the United States. These reforms, which are part of the Chinese government's broader prioritisation of IP reform, suggest that relevant Chinese patents could form the basis for substantial infringement actions.

The eligibility of any patent related to distributed ledgers will ultimately depend on that particular patent. However, the two major distributed ledger patent filing jurisdictions (which also happen to be the world's two largest national economies) have a number of legal features that together provide a framework for rights holders to assert that their truly novel patents related to distributed ledgers are valid and enforceable. Over time, this may translate into a meaningful risk of infringement liability for other users of those technologies.

FIGURE 5. Top 20 distributed ledger patent holders by sector

Technology companies	Fintech or distributed ledger-centric companies
• Alibaba Group Holding Ltd • International Business Machines Corp • Ping An Technology (SHENZHEN) Co Ltd • Baidu Inc • Tencent Holdings Ltd • Intel Corporation • Microsoft Corporation • Accenture Plc • Zhongan Information Technology Services Co Ltd	• nChain Holdings Limited • Bizmodeline Co Ltd • Coinplug Inc • Hangzhou Fuzamei Technology Co Ltd
Financial services companies	**Other**
• MasterCard Incorporated • Visa Inc • Bank of America Corporation	• China United Network Communications Group Company Limited • Walmart Stores Inc • Shenzhen Launch Tech Company Limited • Siemens AG

Source: S&C using Innography

Potential mitigation strategies

The natural next question is: what can be done to mitigate this risk? Given the diverse applications for distributed ledgers and the varied profiles of those companies deploying them, there is no one-size-fits-all solution. That said, there are a number of mitigation strategies available, one or more of which can be employed to address patent risk. This list is not intended to be exhaustive and, depending on the circumstances of a company, other mitigation strategies may be available. Figure 6 illustrates this menu of strategies in a rough hierarchy from easiest to implement to most difficult.

Vendor-based strategies

Many companies do not have the in-house technical capabilities to build a distributed ledger system. For that reason, they may turn to a technology vendor, many of which have built out their distributed ledger product and service offerings in recent years. Indeed, many technology vendors have been active filers of distributed ledger-related patents. Involving such a technology vendor offers two possible mitigation tools – one preventative and one remedial – for companies concerned about patent risk.

As to the preventative, given that such vendors have substantial resources and are repeat players in this sector (building many systems for diverse customers), they may have developed best practices to limit patent risk (eg, by designing around key patent claims). In addition, any patents owned by the vendors themselves, to the extent embodied in the systems produced or services provided by the vendors, would presumably be exhausted or licensed (or perhaps subject to an implied licence), unless they were expressly excluded from such a transaction.

As to the remedial, any company negotiating to have such a vendor build a distributed ledger system can include indemnification clauses in the contract, pursuant to which the vendor would indemnify the company from any patent infringement claims based on the distributed ledger system, preferably with a high cap. Successfully negotiating such an indemnity could help cover any patent liability that later arose from using a distributed ledger system, although the vendors may resist providing such an indemnity – this is ultimately a matter of risk allocation between the parties. While simple strategies, these approaches are practical ways to mitigate relevant patent risk when involving seasoned and well-resourced vendors.

Monitor and respond

A more resource-intensive strategy is to actively monitor relevant patent filings and take appropriate responsive action if a problematic patent or patent application is identified. This might include filing a legal challenge, negotiating a licence or designing around a problematic patent claim.

A number of digital tools make it easier than ever to actively monitor relevant patent applications and issuances around the world. Before discussing the mitigation strategies enabled by such tools, however, it is worth noting that a balance must be struck between remaining informed of relevant patent filings and unintentionally enabling wilful patent infringement claims, which can lead to treble damage awards if successful.

Experienced legal counsel can help to craft a patent search protocol that appropriately balances these competing goals and provide, if available, non-infringement opinions for patents identified through such search protocols. Once this protocol is put into practice, it can provide the information to implement three general kinds of responsive action.

First, in the United States, patent applications and issued patents can be challenged under a variety of procedural mechanisms that vary depending on the relevant patent's place in its lifecycle. Figure 7 summarises the key features and issues with these mechanisms – although it does not comment on comparable procedures in China.

Second, if a problematic patent is identified that does not seem susceptible to a challenge, it may be advisable to negotiate a licence. This could be structured to capture:

FIGURE 6. Hierarchy of patent risk mitigation strategies

If using a technology vendor to create distributed ledger systems, consider including a patent indemnity with a high cap

Monitor patent applications and consider filing challenges, designing around applicable patents or negotiating a licence

Consider joining or forming a patent consortium or similar body

Develop or acquire a patent portfolio as a deterrent to, and leverage in case of, an infringement suit brought by another practising entity

FIGURE 7. Overview of methods to challenge US patents

For US patent applications that are still pending in prosecution, it is possible to submit prior art or other facts for the examiner to consider for little or no fee. While such information can help examiners reject the patent application, if the application makes it through this stage, such an approach could actually make the patent stronger, as the examiner will either consider such prior art and dismiss it or the applicant will amend claims to get around such prior art.

For US patents that are granted, for nine months after grant, it is possible to challenge the patent using post-grant reviews, including the covered business method category of review. Unlike the submission of prior art or other facts, these two methods of review can be instituted only upon a showing that it is more likely than not that a patent claim is unpatentable.

From nine months after grant until one year after being served with a complaint for infringement of a patent, it is possible to challenge through an *inter partes* review. In order to institute such a review, there must be a reasonable likelihood that the petitioner would prevail on at least one claim. These challenges can usually be completed within roughly 18 months and will likely cost several hundred thousand dollars. To date, roughly 70% of *inter partes* reviews have led to the invalidation of the underlying patent claims.

FIGURE 8. Summary of select relevant consortia or organisations

The LOT Network	Open Invention Network	The Hyperledger Project	Unified Patents
• Founded by Google and several other companies in 2014. • 270+ members with ~1.2m patent assets (250,000 US assets) committed. Members include Alibaba, Cisco, Microsoft and TD Bank. • Purpose is to protect against disaggregation of patents from operating companies to NPEs. • When a member transfers a patent to an NPE, other members are automatically granted a royalty-free licence under that patent for its remaining term. • The LOT Network does not appear to have a programme specifically targeted to distributed ledgers, but has recently added numerous mentions of distributed ledger technology on its website.	• Founded by IBM, Novell, Philips, Red Hat and Sony in 2005. • Focused on the Linux ecosystem, including Apache, Firefox, Mozilla, MySQL and Python. • 2,650+ licensees, including Alibaba, Cisco, IBM, Microsoft and Sony. • Acquires patents and licences them to licensees who agree not to assert their own patents against Linux and related systems. • It plans to include certain core blockchain open source technology from Hyperledger within the scope of its protection of the Linux ecosystem.	• Founded by the Linux Foundation in 2015. • Focused on open source blockchain technologies. • Establishes shared standards for distributed ledger applications, with a particular focus on improving performance and reliability so that compliant systems are capable of supporting global business transactions by major technological, financial and supply chain companies. • Accepts inbound IP contributions (eg, licensed under the Apache License, Version 2.0), which is then made available to other members under the same licence. • Members include Accenture, American Express, IBM and Intel.	• Founded in 2012. • 200+ members, including Cisco, Google, MasterCard, Philips and Salesforce, among others. • Uses a variety of tactics, including invalidity contests, analyses, *amicus* briefs, PTAB review and other studies to deter invalid patent assertions in certain technology zones. • Blockchain is included as a component of the Transactions Zone.

- only specific patents and patent applications;
- all patents and patent applications of the patent holder existing as of the date of the agreement; or
- all patents and patent applications filed by a party within a capture period (eg, on or prior to the five-year anniversary of the date of the agreement).

Whether it is advantageous to approach a patent holder proactively to negotiate a licence (as opposed to waiting for it to approach) must be evaluated on a case-by-case basis. While we have not identified much patent licensing activity related to distributed ledgers to date, this obvious method for limiting patent risk should not be discarded in this context.

Looking to the future, there is precedent for broad licensing activity in patent-intensive sectors. In some sectors (eg, semiconductors), in which operating companies have built large patent portfolios covering each other's products, many companies have entered into portfolio cross-licences; in some cases, these cross-licences were coupled with a balancing payment from one party to the other. This could emerge as a model for distributed ledgers as relevant patent portfolios grow and if patent litigation and liability heat up.

Finally, a company could design around a problematic patent claim. The feasibility and expense of doing so will vary depending on the particular deployment and patent claim at issue.

Taken together, current digital search tools allow potential users of distributed ledgers to remain better informed than ever before with regard to relevant patent applications and issuances. While an appropriate patent surveillance protocol must be crafted, the improved information made available by these search tools allows traditional patent risk mitigation techniques (eg, legal challenges, licensing and designing around problematic patents) to be implemented with greater efficacy and speed.

Consortia and similar bodies

More resource-intensive mitigation options include various group strategies, which generally involve a number of companies addressing a risk collectively and may require greater effort for companies to implement. One reason for this is the presence of antitrust or competition law issues, which often arise when coordinating activities among potential competitors. As a result, care should be exercised and the advice of antitrust counsel sought, before any of these group strategies are pursued. In addition, binding a company to one of these organisations can impose broad contractual obligations that can touch on a company's operations and competitive balance in many ways, the effects of which must be carefully evaluated before joining.

In contrast to a cross-licence, which is typically between two parties, consortia and similar organisations seek to clear or mitigate patent risk among a large group of parties. Various consortia and other organisations have evolved over the past 20 years to address diverse kinds of IP risk in different ways. A number of such previously established consortia are now paying greater attention to distributed ledgers. Recent years have also witnessed the establishment of a number of new consortia specifically focused on the distributed ledger space. Figure 8 summarises four such organisations.

A few aspects of these consortia have special relevance to patent risk surrounding distributed ledgers. First, some of these – namely the Open Invention Network and the Hyperledger Project – offer operational benefits in addition to a mechanism to mitigate IP risk. Such benefits include the creation of an ecosystem of code and developers focused on relevant technology, as well as – especially in the case of the Hyperledger Project – the establishment of certain standards designed to make relevant systems interoperable and sufficiently robust for widespread commercial use.

Each of the consortia or organisations described above seeks to tackle the problem of IP risk in a slightly different manner. The LOT Network, for example, seeks to limit the risk of claims from NPEs by having all members automatically grant a licence to the other members under patents that a member sells or assigns, either directly or indirectly, to an NPE.

In contrast, the Hyperledger Project and the Open Invention Network address a broader set of IP risks. These organisations either acquire or otherwise obtain key patents and other intellectual property and in turn license these to the other members. Unified Patents uses a variety of tactics to reduce patent risk in certain defined zones of activity.

Whether any of these existing consortia or organisations adequately address the patent risk and operational issues faced by a particular company depends on the company, its patent portfolio and the competitive landscape, among other factors. In addition, companies and other organisations interested in using distributed ledgers can establish new consortia to mitigate or clear patent risk for the distributed ledger ecosystem and address relevant operational issues.

Develop or acquire a patent portfolio

Finally, we turn to what could be a costly and resource-intensive approach for mitigating patent risk with respect to other practising companies but which could have a possible monetary upside: building or acquiring a portfolio of relevant patents. As the patent searches discussed at the beginning of this article demonstrate, a number of companies appear to be pursuing this strategy.

Certainly, it offers several possible advantages, including deterrence, negotiation leverage and a potential source of revenue. First, a practising company is less likely to bring an infringement action if it is concerned about patent infringement counterclaims from the respondent, which could be brought if the respondent has its own portfolio of relevant patents. Second, even after an infringement lawsuit is filed, having such a patent portfolio that reads on the claimant's products or services can help to drive settlement negotiations towards more favourable terms. Third, owning such a patent portfolio creates a potential commercial upside, in that if distributed ledger usage becomes widespread and relies on a company's patents, that company will likely have a lucrative market in which to license its patents. Moreover, even if large-scale market use of the patents in such a portfolio never develops, other companies may have relied on granted patents (and to a lesser extent, pending applications) to signal technological leadership and innovation to the marketplace – to both potential investors and acquirers.

However, this strategy has a number of drawbacks. Developing a patent portfolio based on internal research and development takes considerable time and money. Acquiring a portfolio of valuable distributed ledger patents would be similarly expensive. At the same time, for the reasons discussed above related to *Alice*, such patents may have uncertain value, which may make heavy investment in them a difficult value proposition to justify before internal stakeholders.

Action plan

Distributed ledgers look set to play a significant role across a range of industries, meaning that businesses need to keep a close eye on how the IP landscape develops, along with possible risks.

- Companies in multiple sectors are already actively filing patents and recent USPTO guidance on Section 101 suggests that we may see further increases in grants.
- The United States and China are leading the way in terms of number of patent applications; interested parties should keep close tabs on the rapidly developing Chinese IP system in particular.
- Stakeholders looking to lessen their IP risk can pursue a number of strategies, including joining a defensive consortium or looking to acquire assets.

In addition, given that this market is relatively young, patent values – which are often based on comparable past sales or royalties – are difficult to establish and may present a challenge to reaching an agreement on patent sale terms. Even for a company willing to accept the costs, the efficacy of such a strategy in mitigating patent risk is only partial because owning a portfolio of patents would not deter infringement suits brought by NPEs, as this would only offer leverage over an entity practising the relevant technology.

"While there is some uncertainty as to the precise future value of distributed ledger patent rights due to various doctrinal and procedural issues, the patent risks cannot be ignored"

Taking action

If the promise of distributed ledgers to rewire interactions and transactions in our economy and serve as a new basis for commercial exchange is realised, the economic value of such technology will be significant and will provide fertile ground for those seeking to monetise relevant patent rights. A substantial number of companies – including major financial services, technology and fintech or distributed ledger-centric companies – appear to have embraced this vision and, to this end, have been filing or acquiring a growing number of related patents. While there is some uncertainty as to the precise future value of distributed ledger patent rights due to various doctrinal and procedural issues, the patent risks cannot be ignored.

A menu of possible risk mitigation strategies exists for companies individually, or for entire sectors, that are keen to deploy distributed ledgers. Proactively addressing patent risk through one or more of these strategies can be crucial, given that the value of distributed ledgers can be realised only if such systems are used by many diverse parties. Left unaddressed, patent litigation or liability could prevent or impede the potential of this technology from being actualised. iam

Mehdi Ansari is a partner, **Jay Thornton** is an associate, **Raffaele DeMarco** is a practice area associate and **Rudy Kleysteuber** is a former associate at Sullivan & Cromwell