

SWITZERLAND  
& SINGAPORE'S  
EMERGING  
IP-DLT  
REVOLUTION:  
AN  
INTRODUCTION

# Foreword

New technologies have the potential to revolutionise our lives. The speed of these new developments seems to be ever-increasing. Artificial intelligence, particularly ChatGPT, which received 100 million users just two months after its launch, Dall-E, cryptocurrencies, NFTs, metaverse, and blockchain are just a few examples of major developments in recent years. While some new technologies are still in their “hype phase”, for others, this phase is over. But this does not mean that the technologies are a thing of the past. They have simply reached a state where applications for the public are being developed and are on the path to becoming ubiquitous.

One promising technology that has gained relevance in recent years is the distributed ledger technology (DLT), especially its most well-known form – blockchain. DLT is revolutionising the way in which we carry out transactions and secure data. Some blockchains even provide the option to implement smart contracts.

The nexus between DLT technology and intellectual property (IP) is clear and warrants a closer look.

When new developments occur, there are two options: you can either wait and see how things will evolve or you can decide to be proactive by analysing the situation and preparing yourself the best you can. The Intellectual Property Office of Singapore and the Swiss Federal Institute of Intellectual Property have decided to pursue the latter approach.

Singapore and Switzerland are very similar in several aspects. Both countries are highly innovative knowledge-based economies and there are many areas that both can learn from each other. When it comes to IP, both economies are forward-looking and recognise the importance of encouraging the commercialisation of IP. This is why we decided to conduct a joint study to learn more about the nexus between DLT and IP, its potential benefits and use cases, as well as its challenges.

We hope that the findings and reflections of this joint study will contribute to a stronger collaboration between the IP and DLT stakeholders and thereby further the development of the international IP system.

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# Abstract

Distributed ledger technology (DLT), including blockchain, provides a trusted and immutable way to record transactions across a distributed network. Over the past decade, DLT has attracted significant investment and media attention as a frontier technology. DLT is most widely used in the finance industry. Many sectors, including Intellectual Property (IP), are exploring its relevance.

IP rights are crucial for businesses, innovators, artists, and creators to safeguard their inventions and creative works. Successful commercialisation of new works, products, and services depends on the assurance of strong IP protection.

Various stakeholders have suggested solutions to facilitate the protection, management, and commercialisation of IP. However, each of these suggestions comes with its own challenges. DLT offers potential remedies to overcome these challenges.

Findings from secondary research surveys and roundtable sessions show that stakeholders see great potential for DLT's applications in the IP ecosystem. For instance, a DLT-based registry can be more secure and transparent than traditional solutions and allows multiple stakeholders to access up-to-date information concurrently. DLT can also be employed in tracking supply chains, combating counterfeiting, and creating transparency in complex supply chains like pharmaceuticals and food.

To learn more about the link between IP and DLT and explore the potential impact of DLT on the work of IP offices and other IP stakeholders, the Intellectual Property Office of Singapore (IPOS) and the Swiss Federal Institute of Intellectual Property (IPI) conducted a joint study of their respective countries.

In the surveys and roundtables conducted in Switzerland<sup>1</sup> and Singapore<sup>2</sup>, participants generally held positive sentiments about the potential of DLT. A key challenge raised in both countries is the lack of a clear purpose for this technology in the IP ecosystem. That said, some promising areas suggested by respondents include a registry function for non-registrable IP (trade secret, copyright, etc.) and support for IP commercialisation.

The result of this joint study underlines the importance of strengthening the link between IP and DLT stakeholders. It is essential that all stakeholders have a good understanding of each other's capabilities, and efforts should be made to strengthen the cooperation between the IP and DLT communities. For the development of DLT solutions within the IP ecosystem, interoperable DLT infrastructures and standards will play a key role.

<sup>1</sup> DLT and the Intellectual Property Ecosystem of Switzerland, 2023 ([Link](#))

<sup>2</sup> Bridging Blockchain and IP: A Singapore Perspective ([Link](#))

# Overview of Intellectual Property & Distributed Ledger Technology

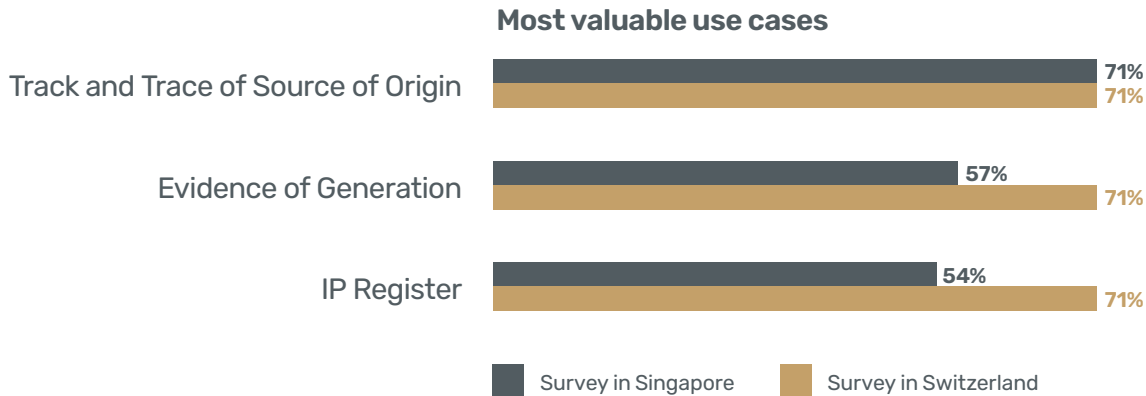
IP is a legal concept that refers to creations of the mind, such as inventions, literary and artistic works, and symbols, names, and images used in commerce. Intellectual property rights (IPRs) refer to the legal rights that protect these creations of the human mind, such as patents, trademarks, and copyrights. IPRs are essential for many businesses, artists, and creators to protect and commercialise their inventions and creative works.

DLT enables immutable and transparent transactions without the need for intermediaries. This is because DLT is a decentralised database that maintains an ever-growing list of records, called blocks, that are linked and secured using cryptography. Unlike traditional databases that run centrally on a server, a distributed ledger is a database in which all members of the network possess a copy of the ledger, so the data is stored in a distributed form. Synchronising information among network members increases security and builds trust in the veracity of the data.



# Main Findings

The use of DLT in the IP ecosystem offers immense opportunities. For example, DLT can enable more efficient management of IP assets, facilitate the licensing and transfer of IP, and create new markets for IP assets.



**Figure 1:** Top 3 common areas where participants believe DLT can bring the greatest benefit to the IP ecosystem.

The surveys in Singapore and Switzerland revealed the areas in which stakeholders see the greatest potential for DLT in IP (Figure 1). The survey participants could select multiple use cases as important. In both countries, nearly three in four respondents (71%) indicated track and trace of source of origin (provenance) as an important use case. Also amongst the top three common use cases<sup>3</sup> of both countries are evidence of generation and IP register. Other important use cases at the intersection of DLT and IP mentioned by respondents in both countries include IPRs transfers, IP licences and certification marks.

The results from the surveys are in line with the feedback from Singapore roundtable participants, who highlighted the usefulness of provenance information for copyright verification and traceability, and DLT's potential in the monetisation of IPRs.

<sup>3</sup> Determined by the top 3 use cases with the highest combined percentages.

## a. More efficient and transparent IP management systems

Many of the use cases that are deemed valuable have the potential to lead to more efficient and transparent IP management systems. They can pave the way for new business models and markets in IP, creating new opportunities for creators, investors, and businesses alike, while also fostering innovation and collaboration in the IP domain.



### **Track and trace the source of origin including anti-counterfeiting**

Counterfeiting is costly for the economy. Counterfeit goods hurt customers who buy goods of lower quality, and harm original manufacturers/inventors because of the loss of turnover and damage to the reputation of a firm or even an entire industry. The problem of counterfeits originates from a lack of transparency in supply chains and lack of evidence to verify the authenticity of a product. DLT solutions have been proposed to track and trace the origin, the supply chain, and the stakeholders involved in the production of goods. With a tamper-proof record in the supply chain, authorities, stakeholders, and customers can verify the authenticity of the product and compliance of production process as defined by the IP owner. This can help prevent IP theft and infringement.

Survey participants saw great potential value in the use of DLT for anti-counterfeiting and tracing the origin of works, such as for tracing of ownership for copyrighted works.

## Evidence of generation including certification marks and timestamping

Proving the creation and existence of intangible digital assets is challenging. As more and more documents and files are exchanged digitally, a reliable proof of existence is increasingly necessary. This is also true of works, for example creative works, which are protected by copyright at the time of creation. But proving their creation (e.g., authorship/creatorship and time of creation) requires some form of trusted certification. DLT's secure and immutable ledger enables certification and timestamping. Time-stamped blocks uniquely identify digital assets and confirm their existence. DLT-based timestamping is faster, more cost-effective, and eliminates the need for intermediaries, increasing the effectiveness and efficiency of IP protection. Certification marks in which details (including ownership and certification authorities) are stored can help to raise the transparency in transactions.

Some survey participants viewed DLT as an inexpensive solution for proof of generation, while others highlighted existing cryptographic timestamping alternatives outside of DLT.



## Transfer of IP rights and licensing

Owners can monetise their IPRs by offering exclusive products or by selling and licensing their IPRs. Taking the example of musicians selling song licences, end consumers pay intermediaries, who in turn pay artistes for licences to broadcast or stream their music in traditional value chains. With DLT, direct licensing and transfer of IP assets can occur without intermediaries, made possible by smart contracts. Smart contracts are self-executing contracts with the terms of the agreement between buyers and sellers directly written into lines of code. Smart contracts automate IP licensing agreements, thus improving efficiency, reducing costs, and enhancing trust in the system.

Survey participants both in Singapore and Switzerland viewed IPRs transfer as a valuable DLT use case for IP.

## b. IP registers

Most IP registers are national registers. The territorial nature of IPRs refers to the boundaries of the jurisdictions within which these rights are recognised and enforced. This provides clarity about the specific geographical areas in which IPRs are protected. Due to the territorial nature of IPRs, owners often must go through similar registration and examination processes in multiple countries. This can lead to duplicate records of nearly the same IP asset across different countries. Currently, access to information on registered IPRs is possible through platforms such as the national IP registers and the WIPO databases, but users often need to use multiple platforms, as information may not always be fully available on a single platform. Distributed IP registers could potentially overcome these inefficiencies. They provide information to stakeholders, enable secure information transfer, and track the life cycle of IP assets. Such systems could also improve the accuracy of IP asset management by reducing the risk of human error and serving as a single source of truth for IP asset information.

However, these benefits can only be realised if national IP offices' solutions for DLT-enabled IP registers can exchange information easily. Interoperability of the blockchain standards across jurisdictions is crucial for achieving these benefits, in addition to cutting registration and management costs of IPRs.

Survey participants in both countries viewed IP registers as one of the most valuable DLT use cases for IP. Participants noted that for transparency reasons, IP offices should provide relevant and legally binding databases for registration and documentation, and DLT was seen as a potential solution to the current fragmentation of the database landscape in IP ecosystems. At the same time, participants recognised the importance of interoperability for DLT solutions to deliver desired value.





### c. Other use cases and touchpoints of DLT and IP

Both country reports have also identified the following use cases:



**Metaverse and Web3:** A metaverse allows users to interact in a virtual(ly augmented) world. People can learn, work, play, and shop in a metaverse through avatars. The metaverse is often tied to Web3, which is often seen as the next generation of the internet. Web3 is based on decentralised and tokenised platforms. This means that it works with independent nodes where no single entity has authority. Open questions remain on how the IPRs of real-world assets can be protected in a metaverse. Tokenisation and Non-Fungible Tokens (NFTs) are potential features to address this.



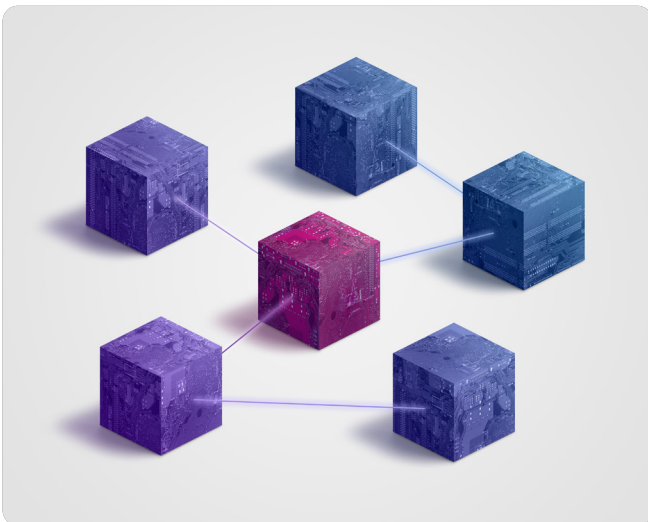
**Digital arts, copyrights and NFTs:** NFTs represent unique digital assets and have diverse applications, including IP-related tokenisation. They facilitate artist-audience connections, enable royalty rights sales, and reduce reliance on intermediaries like auction houses and record labels, simplifying transactions and fostering new markets.



**Digital Identities:** DLT can provide the basis for a tamper-proof and transparent system to protect the identity of individual users and solve identification issues. A DLT-enabled digital identity can enhance the efficiency of communication, bureaucratic and business processes.



**IP Rights Enforcement:** The enforcement of IPRs becomes increasingly challenging with the ongoing digitalisation of societies and economies. The vast amount of data makes it difficult to identify and provide evidence of infringement. Moreover, the interactions and information exchange between authorities and rights holders can be time-consuming and expensive. DLT and blockchain solutions aim to streamline processes, interactions, and information sharing among stakeholders and authorities.



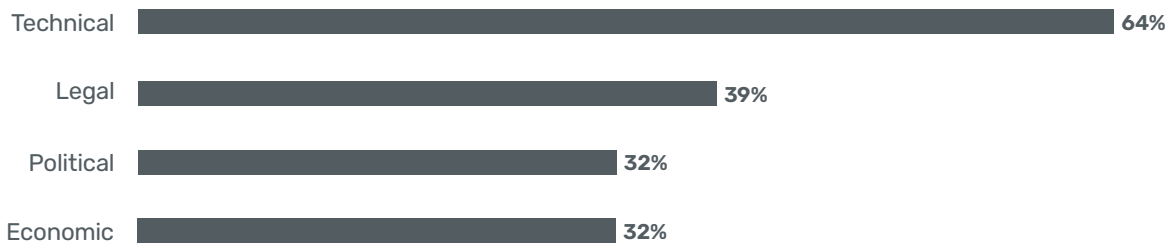
**Collaboration and Innovation:** DLT has the power to foster collaboration and facilitate innovation by establishing decentralised networks that enable IP sharing and collaboration. In doing so, DLT can accelerate the pace of innovation and improve the quality of IP assets.

These use cases show that DLT has the potential to change the way IP is managed, commercialised, and enforced. The joint study highlights that the connection of IP and DLT is still nascent and there is potential for more innovative solutions to emerge in this field.

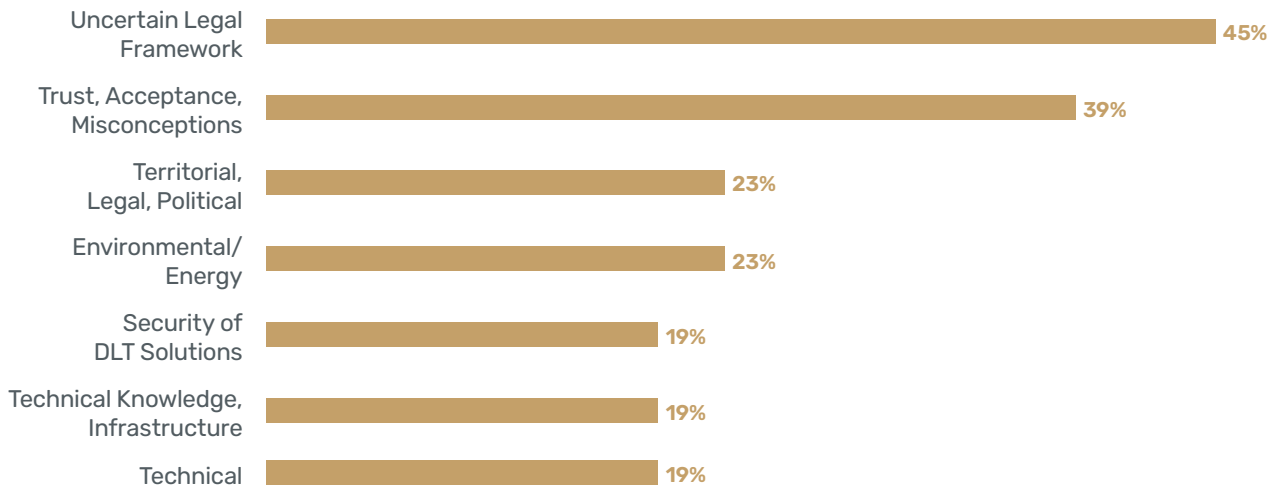
# Key Challenges and Changes Required for the IP system to Capture DLT Development

Finally, the joint study explores uncertainties and challenges related to DLT and IP. DLT is still new, evolving quickly, and not fully understood by most people. Many are also sceptical about its main association with cryptocurrencies like Bitcoin, leading to diverse opinions.

**Important uncertainties and challenges in Singapore**



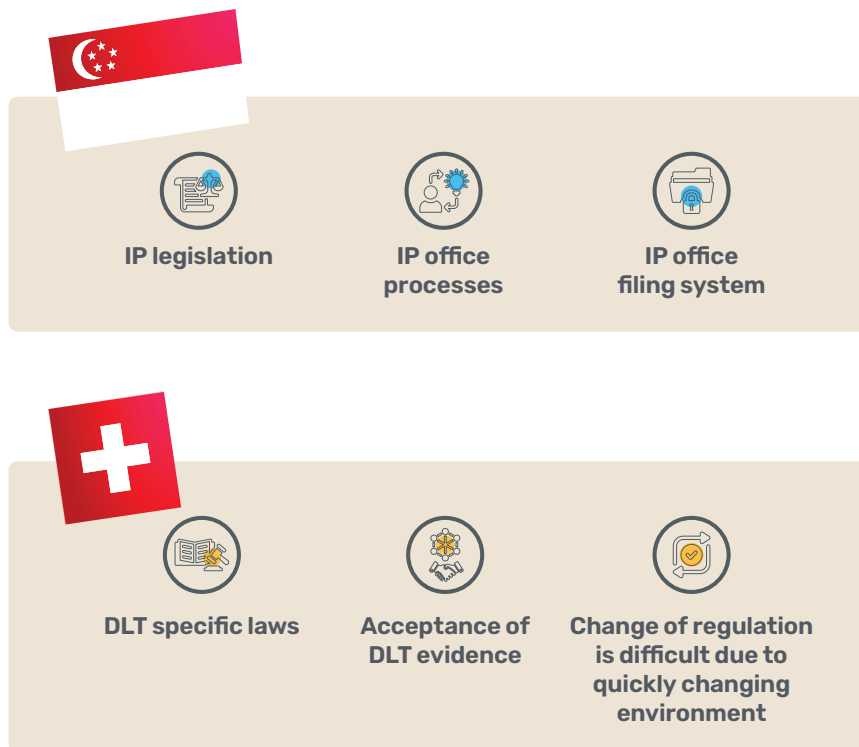
**Important uncertainties and challenges in Switzerland**



**Figures 2 and 3:** Areas with the greatest uncertainties and challenges in the intersection of IP and DLT.

Figures 2 and 3 show that, for Switzerland, survey participants from the DLT and IP ecosystem felt that the uncertain legal framework posed the biggest challenge. Specifically, the legal status of evidence on blockchains was unclear to them. Moreover, environmental concerns about the energy consumption of the technology also presented another area of uncertainty.

For Singapore, over two-thirds of respondents identified technical issues as the main uncertainty and challenge. While the respondents were optimistic about the potential opportunities that blockchain could bring, the IP ecosystem required a deeper understanding of the technology to fully realise these opportunities.



**Figure 4:** The top 3 areas where survey participants felt that change was required to capture blockchain developments in IP. Multiple answers could be selected.<sup>4</sup>

The Singapore participants highlighted services that could potentially be provided by the IP office, including registers for currently non-registrable IP (e.g. copyright, trade secrets), open-source repositories, and support for IP dispute resolution. On the other hand, the Swiss participants concentrated on individual and private use cases, both already in existence and potentially upcoming, such as tracking and tracing, timestamping, and similar applications. These distinct focuses were also reflected in the responses to the question seen in Figure 4, outlining the possible changes for the IP system to capture DLT developments in Singapore and Switzerland, respectively.

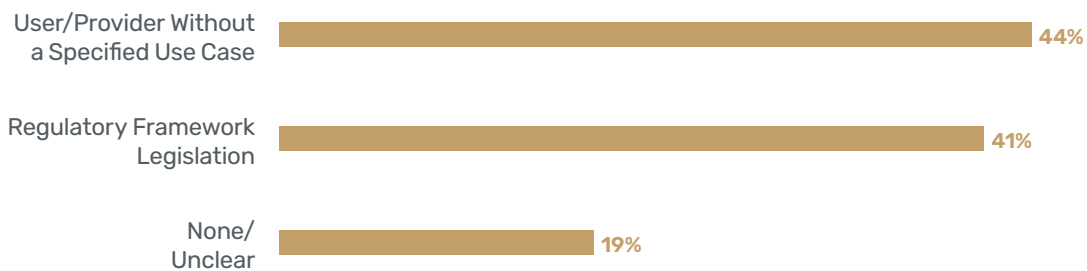
Figure 4 also shows similarities between the survey respondents in Switzerland and Singapore. Respondents across both countries suggested to amend existing IP legislation or to better integrate DLT aspects into existing legislation. For Switzerland, the greatest number of respondents listed legal recognition of digital evidence on DLT as an important change to capture opportunities from DLT. In Singapore, deep dive discussions during the roundtables suggested that changes, if any, should not be implemented hastily (i.e., there is a need for better understanding between the blockchain and IP ecosystems before any changes are taken).

<sup>4</sup> The categories were created based on the open text answers.

**What role should IP offices take according to survey in Singapore?**



**What role should IP offices take according to survey in Switzerland?**



**Figures 5 and 6:** The role which national, regional, and international IP offices should take in relation to the technological transformations in the IP ecosystem. Multiple answers could be selected. The answer options were not identical in the two surveys.

The respondents were also asked about the role that IP offices should take in the development of the IP and DLT ecosystem. Figures 5 and 6 show that respondents from both countries offered unique perspectives on this matter. In Singapore, respondents believed that the IP office should continue to serve as a source of information and engage in educational and awareness raising activities.

This is augmented by its conventional role of serving as an IP registry. Whereas in Switzerland, respondents hoped that the IP office could be a user/provider of DLT even in the absence of a specified use case. In addition, the IP office could look into the necessary regulatory framework/legislation.

# Recommendations

To further enhance the possibilities of the interconnection between IP and DLT, the joint study provides several recommendations.

Regularly re-assess the DLT and IP ecosystem and provide information:

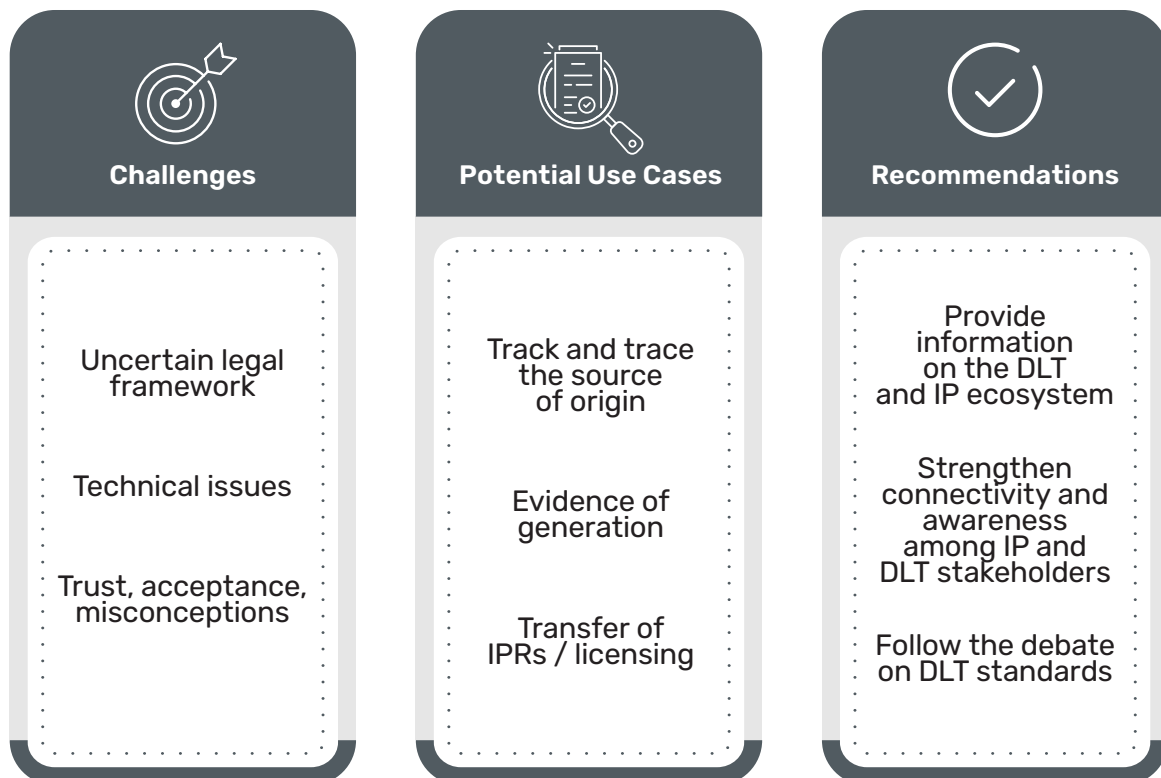
- IP offices should continue to monitor DLT developments and engage the relevant stakeholders. Use cases and related challenges can also be actively explored by IP offices, in collaboration with the industry stakeholders. This may take the form of interviews, workshops, or roundtables.
- IP offices should also examine the value of DLT to the owners and users of IP, beyond its use in cryptocurrencies. In doing so, it is important to recognise and explain the need for careful analysis of other mature technologies to find the best solution to a given problem.

Strengthen connectivity and awareness among stakeholders in the IP and blockchain community:

- There is considerable legal uncertainty around DLT use cases for IP. IP offices can inform stakeholders about important court rulings and clarify some misconceptions. Beyond legal concerns, there is also a need to address misconceptions and environmental concerns through easy-to-understand information about DLT.
- IP offices play a vital role in raising awareness of and facilitating connections between the IP and blockchain sectors. Fostering a better understanding of the intricacies and developments in both IP and blockchain will benefit the innovation community. Such efforts promote closer collaboration and the advancement of joint solutions.
- IP offices should continue to work with like-minded IP offices, industry partners, and stakeholders to facilitate further discussions on cross-border blockchain applications/ transactions. To reap the full benefits of DLT, there is a need for international coordination in the IP ecosystem and for the system to change the way it operates. The success of a DLT-enabled international registry would require international adoption and interoperability.

## Follow the debate on DLT standards:

- If DLT is truly to play a decisive role in transforming the IP ecosystem, the development of an internationally interoperable blockchain infrastructure is necessary. However, the efforts of IP offices alone cannot drive this development. This process will benefit from dialogue with stakeholders from both the blockchain and IP sectors, so that all parties can understand the intricacies and latest developments in blockchain and IP. In any case, it is important that IP offices continue to monitor the ongoing debate on DLT standards and, where possible, be part of their development. At the same time, it is important that IP offices are also open to embracing DLT for their operations.
- When it comes to the [World Intellectual Property Organization](#) (WIPO), the [Committee on WIPO Standards](#) (CWS) is actively involved in advancing this discourse. The CWS published a white paper titled “Blockchain Technologies and IP Ecosystems: A WIPO White Paper”.<sup>5</sup> The paper explored potential applications and opportunities presented by blockchain technologies to IP ecosystems, identified challenges and issues that should be addressed to determine the feasibility and cost-effectiveness of utilising such technologies for the benefit of all IP stakeholders. The CWS has also initiated the Global Identifier project, which aims to explore the feasibility of using blockchain technologies to introduce global digital identifiers for individuals and companies operating in the IP ecosystem, which could help streamline their IP journeys.<sup>6</sup>



**Table 1:** Summary of the most important challenges, use cases, and recommendations on IP and DLT from the IPOS and IPI surveys.

<sup>5</sup> Blockchain Technologies and IP Ecosystems: A WIPO White Paper, 2022 ([Link](#))

<sup>6</sup> Committee on WIPO Standards. Global identifier for natural persons and legal entities ([Link](#))

# Conclusion

In summary, the joint study revealed that DLT has the potential to improve the transparency and efficiency of various ecosystems, including the IP ecosystem. This holds great promise for improving IP management, such as tracking and tracing IP ownership, timestamping, or licensing and transferring IPRs, thereby reducing transaction costs. The benefits of this technology will become even more apparent when more companies, countries, and IP offices adopt DLT with interoperable standards. However, certain challenges persist. The compelling *raison d'être* for the application of DLT in the IP sector needs to be refined, and stronger efforts to address environmental concerns need to be made. Additionally, addressing lingering questions regarding the legal and regulatory framework is key to provide more certainty to stakeholders.

DLT is still at its early stage, especially when it comes to applications in the IP ecosystem. Before it can be adopted on a large scale, IP stakeholders need to get a better understanding of the benefits and IP-related use cases of DLT and learn about the associated challenges. Therefore, it is important for IP stakeholders to stay informed of new developments and adapt accordingly. The same is true for IP offices. The Intellectual Property Office of Singapore and the Swiss Federal Institute of Intellectual Property will continue pursuing the topic of IP and DLT and contribute to its development.





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