



IGE | IPI

DLT and the Intellectual Property Ecosystem of Switzerland

Editor

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From time to time, the IPI publishes studies on intellectual property topics. The studies are intended to contribute to the public discussion. The opinions expressed by the authors do not necessarily reflect those of the IPI.

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Foreword

The development of new technologies is revolutionising our world. Such progress is often met with considerable enthusiasm. However, we need to ask ourselves at the same time how these developments will influence our lives, our work and our interactions with other people. The Swiss Federal Institute of Intellectual Property (IPI) has set itself the goal of examining the potential influence of new technologies in the area of intellectual property (IP) and identifying related opportunities and challenges.

One very promising technology that has gained in importance in recent years is 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. The IPI sees it as having potential in the area of IP too and is thus keeping a close eye on corresponding developments.

This study shows that there are companies and organisations in Switzerland that are working at the interface between DLT and intellectual property. There are already various applications in this area. For example, DLT can be used to show where goods in a supply chain are located in real time, which significantly increases transparency. Likewise, blockchain-based time stamps make it possible to indicate the exact time when a file was created, received or amended or when an event took place. The resulting increase in transparency provides legal certainty, for example in the area of copyright. There are also applications in the areas of IP rights licensing and assignment, as well as for new kinds of IP registers. Nonetheless, these applications are still at a relatively early stage. The IPI will actively monitor further developments.

This study is part of a larger project that the IPI has carried out together with the Intellectual Property Office of Singapore (IPOS). The IPOS has published a corresponding country study that examines Singapore's blockchain ecosystem. It analyses the impact of DLT on the state's economy and the interplay between IP and DLT. By the end of 2023, a comparison will be made of the two country studies in order to gain an additional understanding of the subject.

I'd like to thank Swiss Economics for its excellent work and for conducting this study. Thanks are also due to the participants in the interviews and the survey. Their valuable input, commitment and expertise have considerably helped to clarify how DLT can be used in the area of intellectual property in Switzerland.

Catherine Chammartin

Director General of the Swiss Federal Institute of Intellectual Property

Bern, July 2023

Vorwort

Die Entwicklung neuer Technologien revolutioniert unsere Welt. Dieser Fortschritt geht oft mit grosser Begeisterung einher. Es ist jedoch wichtig, dass wir uns gleichzeitig die Frage stellen, wie diese Entwicklungen unser Leben, unsere Arbeit und unsere zwischenmenschlichen Interaktionen beeinflussen werden. Das Eidgenössische Institut für Geistiges Eigentum (IGE) hat sich zum Ziel gesetzt, den möglichen Einfluss der neuen Technologien im Kontext des geistigen Eigentums (engl. Intellectual Property, IP) zu untersuchen und die damit verbundenen Chancen und Herausforderungen zu identifizieren.

Eine vielversprechende Technologie, die in den letzten Jahren zunehmend an Bedeutung gewonnen hat, ist die Distributed Ledger Technology (DLT), insbesondere ihre bekannteste Form, die Blockchain. DLT revolutioniert die Art und Weise, wie wir Transaktionen durchführen und Daten sichern. Das IGE sieht in der DLT auch im IP-Bereich Potenzial und verfolgt daher die entsprechende Entwicklung aufmerksam.

Die vorliegende Studie zeigt, dass es in der Schweiz Unternehmen und Organisationen gibt, die an der Schnittstelle zwischen DLT und geistigem Eigentum arbeiten. Es existieren bereits verschiedene Anwendungen in diesem Bereich. So kann beispielsweise durch DLT die Information, wo sich Güter im Rahmen einer Lieferkette befinden, in Echtzeit zur Verfügung gestellt werden, was die Transparenz signifikant erhöht. Blockchain-basierte Zeitstempel wiederum ermöglichen es, den genauen Zeitpunkt von Erstellung, Empfang oder Änderung einer Datei oder eines Ereignisses zu kennzeichnen. Die hiermit gewonnene Transparenz sorgt für Rechtssicherheit, beispielsweise im Bereich des Urheberrechts. Weiter gibt es Anwendungen im Bereich der Lizenzierung und Übertragung von Rechten des geistigen Eigentums sowie neue Varianten von IP-Registern. Diese Anwendungen befinden sich aber noch in einem relativ frühen Umsetzungsstadium. Das IGE wird die weitere Entwicklung aktiv beobachten.

Diese Studie ist ein Teil eines grösseren Projekts, das das IGE gemeinsam mit dem IP Office Singapore (IPOS) durchgeführt hat. Das IPOS hat eine entsprechende Länderstudie veröffentlicht, die das Blockchain-Ökosystem Singapurs untersucht und die Einflüsse von DLT auf die dortige Wirtschaft sowie das Wechselspiel von IP und DLT analysiert. Bis Ende 2023 wird ein Vergleich der beiden Länderstudien vorgenommen, um so ergänzende Erkenntnisse zu gewinnen.

Ich danke Swiss Economics für die hervorragende Arbeit und die Durchführung dieser Studie. Mein Dank geht auch an die Teilnehmerinnen und Teilnehmer der Interviews und der Umfrage. Sie haben mit ihren wertvollen Beiträgen, ihrem Engagement und ihrer Expertise in grossem Masse zum Verständnis der Einsatzmöglichkeiten von DLT im Bereich des geistigen Eigentums in der Schweiz beigetragen.

Catherine Chammartin

Direktorin des Eidgenössischen Instituts für Geistiges Eigentum

Bern, Juli 2023

Avant-propos

Le développement de nouvelles technologies révolutionne notre monde et suscite souvent un grand enthousiasme. Or, il est également important de s'interroger, en parallèle, sur l'impact qu'auront ces progrès sur nos vies, notre travail et nos interactions humaines. L'Institut Fédéral de la Propriété Intellectuelle (IPI) s'est fixé pour objectif d'étudier ces nouvelles technologies sous l'angle de leur possible influence dans le contexte de la propriété intellectuelle (PI) et d'identifier les opportunités et les défis qui en découlent.

Ces dernières années, une technologie prometteuse s'est imposée sur le devant de la scène, à savoir la technologie des registres distribués (Distributed Ledger Technology, DLT), en particulier sa forme la plus connue, la blockchain. La DLT révolutionne la manière dont nous effectuons nos transactions et sécurisons des données. L'IPI considère que la DLT dispose également d'un potentiel dans le domaine de la PI et suit donc son évolution de près.

La présente étude montre qu'il existe en Suisse des entreprises et organisations qui travaillent à l'interface entre la DLT et la propriété intellectuelle. D'ailleurs, différentes applications existent déjà dans ce domaine. Ainsi, la DLT permet par exemple de fournir en temps réel des informations sur l'emplacement de marchandises au sein d'une chaîne d'approvisionnement, ce qui augmente la transparence de manière significative. L'horodatage basé sur la blockchain permet quant à lui d'associer une date et une heure à la création, à la réception ou à la modification d'un fichier ou d'un événement. La transparence ainsi obtenue assure la sécurité juridique, par exemple en matière de droit d'auteur. Il existe également des applications dans le domaine de l'octroi de licences et du transfert de droits de propriété intellectuelle ainsi que de nouvelles variantes de registres de propriété intellectuelle. Toutefois, ces applications se trouvent à un stade de mise en œuvre assez embryonnaire. L'IPI suivra attentivement l'évolution de la situation.

Cette étude fait partie d'un vaste projet mené par l'IPI en collaboration avec l'Office de la propriété intellectuelle de Singapour (IPOS). Ce dernier a publié une étude de pays correspondante qui a pour objet l'écosystème de la blockchain à Singapour et qui analyse les influences de la DLT sur l'économie locale, ainsi que l'interaction entre l'IPI et la DLT. D'ici fin 2023, il sera procédé à une comparaison entre les deux pays de l'étude afin de recueillir des informations complémentaires.

Je remercie Swiss Economics pour son excellent travail et la réalisation de cette étude et adresse également mes remerciements aux personnes ayant participé aux entretiens et au sondage. Par leurs précieuses contributions, leur engagement et leur expertise, elles ont grandement contribué à la compréhension des champs d'application possibles de la DLT dans le domaine de la propriété intellectuelle en Suisse.

Catherine Chammartin

Directrice de l'Institut Fédéral de la Propriété Intellectuelle

Berne, juillet 2023

Prefazione

Lo sviluppo di nuove tecnologie sta rivoluzionando il nostro mondo e questo progresso è spesso accolto con grande entusiasmo. Tuttavia, allo stesso tempo è importante chiedersi anche come questi sviluppi influiranno sulla nostra vita, sul nostro lavoro e sulle nostre interazioni con altre persone. L'Istituto Federale della Proprietà Intellettuale (IPI) si è posto come obiettivo di esaminare il possibile influsso delle nuove tecnologie nell'ambito della proprietà intellettuale (PI) e di individuare le relative opportunità e sfide.

Una tecnologia promettente, che negli ultimi anni ha assunto sempre più importanza, è la cosiddetta Distributed Ledger Technology (DLT), soprattutto nella sua forma più conosciuta, ossia la blockchain. La DLT sta rivoluzionando il modo in cui eseguiamo le transazioni e salviamo i dati. L'IPI vede nella DLT un potenziale anche per il settore della PI e continuerà dunque a osservare con attenzione i corrispondenti sviluppi.

Il presente studio illustra come in Svizzera ci siano imprese e organizzazioni che lavorano a interfacce tra DLT e PI. In questo settore esistono già diverse applicazioni. Mediante la DLT è ad esempio possibile mettere a disposizione in tempo reale informazioni sulla posizione di determinate merci in una catena di approvvigionamento, incrementando la trasparenza in modo significativo. La marcatura temporale basata sulla blockchain permette invece di contrassegnare il momento esatto della creazione, ricezione o modifica di un file o di un evento. La trasparenza così ottenuta garantisce sicurezza giuridica, ad esempio nel settore del diritto d'autore. Esistono poi applicazioni nell'ambito delle licenze e del trasferimento dei diritti di proprietà intellettuale, nonché nuove varianti di registri relativi alla PI. L'implementazione di queste applicazioni è, però, ancora relativamente agli albori. L'IPI intende seguire attivamente gli ulteriori sviluppi in questo ambito.

Questo studio è parte di un progetto mantello portato avanti dall'IPI in collaborazione con l'Ufficio della proprietà intellettuale di Singapore (IPOS). L'IPOS ha pubblicato uno studio di paese che analizza l'ecosistema della blockchain di Singapore ed esamina gli influssi della DLT sull'economia singaporiana nonché l'interazione tra PI e DLT. Entro la fine del 2023 verrà effettuato un confronto tra i due studi di paese per raccogliere informazioni complete in merito.

Desidero ringraziare Swiss Economics per l'eccellente lavoro e l'esecuzione di questo studio e tutti coloro che hanno partecipato alle interviste e al sondaggio. Con i loro preziosi contributi, il loro impegno e le loro conoscenze specialistiche hanno aiutato a favorire in larga misura la comprensione delle possibilità di impiego della DLT nel settore della PI in Svizzera.

Catherine Chammartin

Direttrice dell'Istituto Federale della Proprietà Intellettuale

Berna, luglio 2023

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Abbreviations

CMO	Collective Management Organization
DLT	Distributed Ledger Technology
EPO	European Patent Office
EUIPO	European Union Intellectual Property Office
INATBA	International Association for Trusted Blockchain Applications
IPI	Swiss Institute of Intellectual Property
IP	Intellectual Property
NFT	Non-Fungible Token

POW	Proof of Work
POS	Proof of Stake
R&D	Research and Development
SME	Small and Medium-sized Enterprises
WIPO	World Intellectual Property Organization
WEF	World Economic Forum
WTO	World Trade Organization

Executive Summary

Distributed ledger technology (DLT), including its most well-known form, blockchain, has garnered significant attention in recent years due to its application in cryptoassets. However, DLT is a technology that has been explored and employed in many other areas. In this study, we focus on DLT in the intellectual property (IP) ecosystem within Switzerland, examining its use cases, stakeholders, and challenges posed by such technological innovations.

IP rights are fundamental to many businesses, artists, and creators to protect their inventions and creative works, allowing for commercialization. Switzerland, which has been ranked first in the [Global Innovation Index 2022](#) for the 12th consecutive time, places particular emphasis on IP rights in the form of patents, particularly in knowledge-intensive industries such as pharmaceuticals, biotechnology, and engineering. Additionally, Switzerland is home to a vibrant art and luxury market, protected by registered designs, trademarks, and copyrights.

To protect, manage, and commercialize IP, different stakeholders collaborate and compete with each other. The registration of IP rights, their transfer, and the detection of illicit IP use require multiple stakeholders from the private and public sectors to be involved in the processes. DLT is considered a solution for overcoming some of the hurdles in these processes and interactions. For instance, DLT is explored as a registry that is more secure and transparent than traditional solutions, allowing multiple stakeholders to access up-to-date information at the same time. DLT is also used to track the supply chain of products, enabling the fight against counterfeits of watches and other luxury goods and creating transparency in complicated supply chains, such as in the pharma and food sectors.

Because of the novelty of the technology, it is unclear for which IP rights and processes DLT will be used in IP ecosystems. In this study, we shed light on the intersection of DLT and IP in Switzerland. We examine stakeholders and their use cases for DLT in IP, investigate the role of technology standardization, and evaluate the role of the Swiss Intellectual Property Office (IPI). The aim of the study is to provide an overview of this rapidly developing field and offer guidance to the IPI regarding potential opportunities, challenges, and policy adaptations in Switzerland.

As a part of this country study, we conducted a survey of stakeholders based in Switzerland, or with ties to Switzerland. We also conducted interviews with five stakeholders to gain further insight into their knowledge of DLT and IP in Switzerland. We identified the following critical use cases for Switzerland:

- *Tracking and tracing the source of origin:* DLT can be used for both supply chain management as well as anti-counterfeiting initiatives, and given the importance of the pharma and luxury industries in Switzerland, these solutions have significant potential. Notable stakeholders involved in such projects include Novartis and Roche, both participating in the EU's [Pharma Ledger](#) project. Several organizations in Switzerland implement DLT

solutions for anti-counterfeiting, such as the [ORIGYN Foundation](#), [Adresta](#) (recently bought by the Swiss jewelry business Bucherer), and the [Aura Blockchain Consortium](#) (backed by, among others, Richemont and Cartier).

- *Evidence of generation and timestamping:* In various industries and for different types of IP, creating immutable records of an asset's creation, existence, and ownership can be highly valuable. Cheap and reliable DLT solutions are especially useful for protecting unregistered rights, such as copyrights. The Swiss company [OriginStamp](#) was among the first to offer such a solution. Although the WIPO has discontinued its timestamping services ([WIPO PROOF](#)), various private stakeholders now provide similar services, such as Swiss patent and trademark attorneys [P&TS](#) in collaboration with [Bernstein](#).
- *Licensing and transfer of IP rights:* DLT offers new ways of managing and commercializing IP. [IPwe](#), who collaborates with the Swiss-based blockchain company [Caspar Labs](#), provides such services for patents. Their services are particularly valuable for firms without the resources to negotiate licensing deals, such as SMEs. DLT solutions can also facilitate commercialization for other IP rights by reducing the role of intermediaries and their revenue shares. For instance, in the [music](#) and [video](#) streaming industries, use cases exist for copyright-protected work that creators worldwide, including those in Switzerland, can potentially benefit from.
- *IP registers:* The majority of the surveyed stakeholders in IP and/or DLT consider IP registers the most important use case of DLT. The European Union Intellectual Property Office's trademark and design registers already use DLT in their [TMview](#) and [DesignView](#) databases. Solutions such as [IPwe](#)'s patent licensing are based on a blockchain register of patents. [IPwe](#) has announced plans to turn its [Global Patent Registry](#) into a Swiss non-profit foundation.
- *Other use cases and touchpoints of DLT and IP in Switzerland:*
 - DLT and the metaverse are closely linked, in that DLT enables the functioning of transactions in this digitally augmented world. Tokenization and Non-Fungible Tokens (NFTs) will likely play a crucial role in the **metaverse**.
 - Additionally, **NFTs** can simplify transactions and reduce the role of intermediaries such as auction houses or record labels. Due to the large art market in Switzerland, we see this as another important use case of DLT for IP.
 - A **DLT-powered digital identity** can enhance the efficiency of communication, bureaucratic, and business processes in various domains, including IP ecosystems. The city of Zug in Switzerland is an early adopter of digital identities utilizing DLT. With ongoing digitalization, this use case is likely to become even more important.
 - As the amount of data grows, **enforcing IP rights** becomes more challenging. Solutions like [IPBee](#) (supported by [OriginStamp](#) in Switzerland) can facilitate the processes, interactions, and information sharing between stakeholders and authorities, representing another use case that we consider relevant for the Swiss IP ecosystem.

In addition to examining the various use cases of DLT for IP and the stakeholders involved, our study also delves into the role of technological standards. As most current DLT applications take the form of blockchain technology, the standardization debate primarily centers around blockchain standards. These standards, as argued by the [European Commission](#), “ensure interoperability, generate trust in and help ensure ease of use of the technology”.¹ However, our surveyed and interviewed stakeholders do not consider standards to be a critical issue at present. This is possibly because it is still unclear which specifications of this new technology will be useful in the market. Furthermore, for smaller firms and startups, adopting blockchain standards can be too expensive and limiting in terms of the solution they want to bring to the market.

Finally, our study explores uncertainties and challenges about DLT and IP. Surveyed stakeholders from the DLT and IP ecosystem state that the uncertain legal framework poses the biggest challenge. Specifically, the legal status of evidence on blockchains is unclear to the survey participants. Moreover, environmental concerns about the energy consumption of the technology and misconceptions around DLT are perceived as uncertainty and challenge.

This study is the first of its kind in Switzerland and provides valuable insights into the intersection of DLT and IP, including key stakeholders, use cases, challenges, and uncertainties. Based on our findings, we have developed several recommendations for IPI:

- **Monitor use cases and regularly re-assess the DLT and IP ecosystem in Switzerland:** IPI should regularly assess and monitor the identified use cases and stakeholders in Switzerland. Furthermore, we suggest conducting a similar investigation in the future to update the mapping of relevant stakeholders and use cases for the Swiss IP and DLT ecosystem. Additionally, IPI should zoom in on specific use cases and their associated challenges through interviews, workshops, or roundtables.
- **Coordinate with like-minded countries to establish DLT-enabled international IP registers:** International coordination is necessary to change the functioning of the international IP ecosystem and establish DLT-enabled international registers that increase efficiency and enable further innovations. Therefore, we recommend IPI to coordinate with like-minded countries to promote this innovation.
- **Follow the debate on blockchain standards:** IPI should follow the ongoing debate on blockchain standards through [INATBA](#) in Europe and WIPO's [blockchain task force](#).
- **Provide guidance on the legal framework of DLT and associated use cases:** There is considerable legal uncertainty around DLT use cases for IP, especially in terms of the legal status of evidence on blockchains. IPI can inform stakeholders about important court rulings and clarify some misconceptions and environmental concerns by providing easy-to-understand information about DLT. Explaining how DLT creates value for

¹ <https://digital-strategy.ec.europa.eu/en/policies/blockchain-standards> [13.11.2022].

owners and users of IP, detached from its known application in cryptocurrencies, can further remove misconceptions.

1 Introduction

1.1 Motivation

Distributed ledger technology (DLT) in general, as well as blockchain technology in its best-known form, have experienced a surge in interest and applications over the past years. Many people associate the technology with speculations in cryptocurrencies. However, the potential of blockchain technology goes far beyond cryptocurrencies: it may potentially increase efficiency, transparency, and security in many industries.

Also, the advancement of DLT² solutions will affect the intellectual property (IP) ecosystem in several dimensions. Currently, only a few DLT applications exist in the context of the IP ecosystem. These applications mostly tap into the area of tracking the source of origin of IP and into their licensing. Another domain where DLT solutions gain traction is in the efforts of preventing counterfeit products from reaching the market. Lastly, several national and international IP offices have begun using DLT for IP registers. Because of the novelty of these technologies, however, it is unclear in which ways they will further affect the IP ecosystem and whether they will find wide-spread adoption.

Analyses of how DLT can benefit IP ecosystems so far exist only at the global level (see WIPO, 2020). For Switzerland, an overview of already involved and potentially relevant stakeholders, private and public initiatives, as well as an assessment of the challenges that arise from these developments in the Swiss IP ecosystem are missing. To date, it is still largely open and undetermined how the Swiss Federal Institute of Intellectual Property (IPI) should get involved. Moreover, it is unclear if and how regulators should adjust IP policy and legislation to keep up with recent developments regarding DLT.

This study aims at filling this gap by providing an overview of the involved stakeholders, actual and potential use cases³, and challenges of DLT for the Swiss IP ecosystem. While the application of DLT must be carefully evaluated against other technological solutions to solve a given problem, such comparisons are not part of this study.

1.2 Goals

The goal of this study is to shed light on recent developments regarding DLT and IP in and around Switzerland. It will deal in particular with the following aspects:

1. Identification of the stakeholders in the Swiss DLT sector that interact – to date and in the future – with and impact the Swiss IP ecosystem.

² For simplicity we use the term DLT when speaking of the technology. Only when talking about specific use cases or standards that are based on blockchain technology (a subset among DLT), we use the term blockchain. Note, however, that the two terms are not synonyms.

³ A use case is a situation or case in which a service or product can be utilized. In this study, use cases refer to cases, where DLT and blockchain technology can potentially be used as part of one or several processes in IP value chains. More on use cases and the IP value chains can be found in Section 2.1.3 and 3.2.

2. Identification of what standards are and will be established regarding DLT and what stakeholders the IPI should communicate with to stay up to date on the development of standards.
3. Identification of the potential use cases of DLT in Switzerland that require action of the IPI in the future, and of existing use cases that could be adapted by the IPI to improve their services.
4. Assessment of uncertainties and challenges that arise from the use and development of DLT in relation to the Swiss IP ecosystem.
5. Recommendation for actions by the IPI regarding the above objectives.

To achieve these goals, we reviewed the literature, studied the relevant markets, and collected opinions from the Swiss DLT and IP ecosystem.

1.3 Methodology

In our country study of Switzerland, we explore use cases and involved stakeholders in and around the Swiss economy. We conducted a survey among stakeholders in the DLT and IP ecosystem to learn about use cases and the touchpoints of these two realms. We asked survey participants about the use cases identified by the [World Intellectual Property Organization](#) (WIPO) in their global study published in 2022. Moreover, we studied other literature and interviewed selected stakeholders from the private and public sectors.

1.4 Structure

This report is structured as follows:

- In **Section 2** we introduce the topics of this study.
- In **Section 3** we present the results.
- In **Section 4** we derive recommendations and conclude this report.

2 Background

In this section, we briefly introduce important terms and concepts in IP as well as the Swiss IP industry. Analogously, we also give an introduction to DLT. We furthermore shed light on the overlap of the two topics.

2.1 The Swiss Intellectual Property Ecosystem

In this section, we review the Swiss IP ecosystem. We start with the definition of IP and its purpose. Next, we explain the types of IP rights and the generalized value chain of IP. Finally, we describe the main stakeholders in the Swiss IP ecosystem.

2.1.1 Definition of Intellectual Property

According to the definition of the World Trade Organization (WTO), IP rights are

“...the rights given to persons over the creations of their minds. They usually give the creator an exclusive right over the use of his/her creation for a certain period of time.”⁴

The legal protection of such *creations of the mind* is an important tool to create incentives for innovation. In particular, the protection of intellectual property ensures financial rewards for innovation and promotes the distribution of knowledge. In this sense, IP facilitates commercialization (Maskus, 2000).

2.1.2 Types of Intellectual Property Rights

In the Swiss legal system, copyrights and industrial property rights (consisting of patents, designs, and trademarks) are the main IP rights categories. We describe them in the following:⁵

- *Copyrights* mainly protect artistic works, but under certain conditions, software and website design also fall under copyright protection law. On the one hand, Swiss law automatically protects literary and artistic works upon creation for 70 years. Software, on the other hand, is protected for 50 years.
- *Patents* protect technical inventions, products and processes for a limited period of 20 years in the countries where the patent is granted. Details about the invention must be made public as part of the patent documents in the patent register. Before filing for patent registration, inventors should check whether their invention fulfills the novelty, inventiveness and industrial applicability criteria. The novelty and inventiveness criteria are not explicitly checked in the Swiss granting procedure.⁶ In case they are not met, they might lead to ex-post lawsuits. For preliminary clarifications, applicants may contract patent experts. Such actions may be taken according to the findings: maintain the patent application, apply for a patent abroad, change the claims of the patent or withdraw the application.⁷
- *Trademarks* help consumers to distinguish the products and services of firms from one another. Consequently, trademarks – which usually consist of words, images, and other visual elements – should be distinctive. To acquire the protection of trademarks in Switzerland, these must be registered at the Swiss Federal Institute of Intellectual Property. Applicants are advised to conduct research into similar trademarks to verify that the trademark they are about to file for protection is unique and not registered yet.

⁴ https://www.wto.org/english/tratop_e/trips_e/intel1_e.htm [20.10.2022].

⁵ <https://www.kmu.admin.ch/kmu/en/home/concrete-know-how/sme-management/intellectual-property/trademarks-patents-designs-copyright.html> [20.10.2022].

⁶ The Federal Council adopted the partial revision of the Patents Act at its meeting on 16 November 2022. The Patents Act is to be adapted to international standards, and the Swiss patent system is to be made more attractive to SMEs and individual inventors by introducing the option of full examination. Parliament deliberates on the draft bill in 2023.

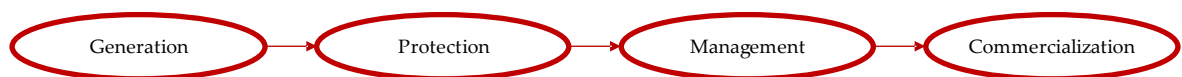
⁷ https://www.ige.ch/fileadmin/user_upload/dienstleistungen/patentrecherchen/d/TEPATHDL_FS_ORNA_D_082021.pdf [20.10.2022].

- *Designs* can be protected for a maximum of 25 years. Design refers to the shape of a product, both in 2 and 3 dimensions. Before registering a design at the IP office’s design register, similar individual research should be carried out as is recommended for trademarks.

2.1.3 The IP Value Chain

According to the WIPO (2022), the *IP ecosystem* is a network of various stakeholders that interact with each other in the IP environment, using resources to generate, protect, manage, and/or commercialize intellectual assets. In a generalized framework, the WIPO (2022) describes the process or lifecycle of an IP asset as the *IP value chain* (Figure 1). Because of the diversity of IP assets and IP rights, these value chains can take different forms and the phases identified may overlap, be skipped, or take place in a non-sequential manner.

Figure 1: The IP Value Chain



Source: Swiss Economics

We used this generalized framework of IP value chains in our analysis of use cases of DLT and IP.

The WIPO (2022) defines the different phases as follows:

- *Generation*: In this phase, the idea is generated, conceptualized and a minimum viable product is produced.
- *Protection*: The protection phase can be divided into ownership registration, IP maintenance and IP enforcement. It includes all the efforts which are made to get legal protection for the idea created in the generation process.
- *Management*: This phase focuses on the activities an IP right holder could undertake to raise the value of their IP portfolio. It can include audits, portfolio analyses and life cycle analyses of IP.
- *Commercialization*: The IP portfolio is managed such that it generates financial utility for the rights holder. This phase can involve IP finance, collection and distribution and monetization activities.

2.1.4 The Swiss IP Industry

In this section, we will first introduce the major public stakeholders in the Swiss IP industry, stakeholders at the boundary of the public and private sectors as well as private stakeholders.

The Swiss Federal Institute of Intellectual Property (IPI) works together with other stakeholders in the federal government to draft legislation regarding IP rights, and examines, grants, and administers industrial property rights. The granted IP rights are valid in Switzerland and Liechtenstein. As the national IP office, the IPI is also in charge of negotiating

international agreements, with other IP offices, like the WIPO or European Patent Office (EPO), to facilitate the registration and protection of IP internationally.⁸

Another role of the IPI is to approve and supervise the collective management organizations (CMOs) in Switzerland.⁹ These organizations help individual copyright-holders to protect, manage and commercialize the rights over their creative works. Currently, five CMOs are approved by the IPI:

- [ProLitteris](#) for rights to literature, photography, and visual arts,
- [Société Suisse des Auteurs](#) for rights to dramatic works, musicals, and audio-visual works,
- [SUISA](#) for rights to non-theatrical musical works,
- [SUISSIMAGE](#) for rights to audio-visual works,
- [SWISSPERFORM](#) for related rights.¹⁰

Furthermore, the IPI is the operating entity of the Swissreg database, which contains information on trademarks, designs and patents registered in Switzerland. It serves as the first information base, for those who want to register their IP rights. A similar “database” is the [Culture Collection of Switzerland](#) (CCOS), which is part of the [International Depository Authority](#) (IDA) and collects cell cultures, fungi, and similar biological materials. The IDA has an essential role in patenting inventions which involve microorganisms across borders.¹¹

Next to these public entities, there exist multiple industry associations like, e.g., [Swiss Textiles](#), [Interpharma](#), [Swissmem](#), [the Swiss Trade Association](#), [economiesuisse](#) or associations for specific causes like [Stop Piracy](#), [Promarca](#), [the Swiss Label Association](#) and many more. The role of these associations ranges from organising information campaigns to the representation of interests in legal disputes regarding IP rights or contract negotiations of their members.

Further public stakeholders who have an essential role in the IP ecosystem, are universities and research facilities such as the [Paul Scherrer Institute](#) or the [Empa](#). They generate IP themselves and boost innovativeness in Switzerland.

Lastly, there is a broad range of private stakeholders which also play an important role in the Swiss IP ecosystem. Important private stakeholders in Switzerland can be categorized as follows: multinational enterprises, small and medium-sized enterprises (SMEs) and start-ups. These stakeholders might either generate IP themselves and/or use the IP of other stakeholders or provide IP-related services along the IP value chains. These services include, among others:

⁸ <https://www.ige.ch/en/about-us> [24.10.2022].

⁹ <https://www.ige.ch/en/protecting-your-ip/copyright/the-tasks-of-the-ipi> [24.10.2022].

¹⁰ <https://www.ige.ch/en/protecting-your-ip/copyright/collective-management-organisations> [24.10.2022].

¹¹ <https://www.wipo.int/budapest/en/> [24.10.2022].

- IP audit,
- IP searches,
- enforcement services,
- licensing services,
- portfolio analysis,
- life-cycle analysis,
- IP strategy consultation, and
- legal advisory (i.e., patent and trademark attorneys).

The main generators of intellectual property in the private sector are firms with research and development (R&D) activities, marketing departments, or creative producers. According to the report issued by the State Secretariat for Education, Research and Innovation (2020), around two-thirds of the R&D conducted in Switzerland is funded and pursued by multinational companies and SMEs. Depending on the industry in which a specific firm is operating, patents for new medicines, machines, production processes, household item designs, vehicles, etc. or trademarks and designs are registered.

Even though the range of industries is broad, there are a few notable areas in which Switzerland is especially active. According to a report by Bechtold and Rassenfosse (2020), the proportion of world-class patents per head in emerging technologies such as advanced materials, digital, energy and environment, and Life Sciences is well above the OECD average in Switzerland. The sectors which applied for the most patents in 2021 were MedTech, consumer goods, metrology, electronic devices and machines, pharmaceuticals, chemistry, and biotech sensors. The firms which filed for the most patents were Roche, followed by ABB, Japan Tobacco, Philip Morris, Nestlé, and the Swatch Group.¹²

2.2 The Swiss DLT Ecosystem

In this section, we give a brief introduction to DLT, define important terms and describe the industry in Switzerland. Together with the previous introduction to IP, this sets the stage for diving into the overlap of DLT and IP.

2.2.1 DLT and Blockchain Technology

Technically, Distributed Ledger Technology (DLT) describes a database, also referred to as a *ledger*, where data is not stored centrally but in a *distributed* form.¹³ Compared to traditional databases, which are run centrally on a server, a *distributed ledger* is a database in which all members of the network store a copy of the ledger. The fact that information is

¹² <https://www.swissinfo.ch/eng/switzerland-remains-global-patent-leader/47492196> [25.10.2022].

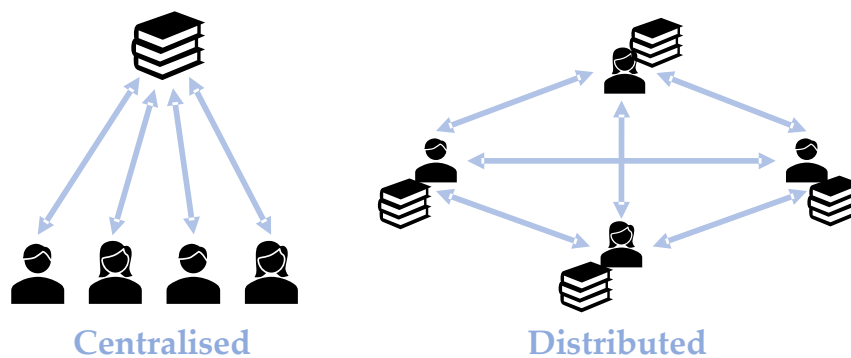
¹³ There exist many sources explaining the basics of DLT and blockchain technology. For this reason, we do not provide an extensive introduction within this country study. Readers requiring a more thorough introduction may refer to the whitepaper from the WIPO (2022) or to these articles: [IBM's Blockchain for Dummies](#) and [Amazon Web Services' Explanations](#).

synchronized between the members of the network increases security and generates trust in the correctness of the data. In traditional database systems with central storage, the security and trustworthiness of the data rely on a single stakeholder: the central storage entity (see Figure 2: Illustration of Traditional and Distributed Databases).

Blockchains are a specific form of distributed ledger technology. Because it is the best-known form of DLT, the terms are often used synonymously even though blockchain technology constitutes a subcategory of DLT. The key difference is that data stored in the form of *blocks*, linked to each other, and forming a *chain*, is specific to blockchains and not a general feature of DLT.¹⁴ In this report we use the term DLT such that we mean both DLT and blockchain. Only when the point of discussion (e.g., a project or standards organization) refers specifically to blockchains, and not DLT generally, do we use the term blockchain.

In the first application of blockchain, the technology was used to store transaction data of the digital- or cryptocurrency, Bitcoin (Nakamoto, 2008). The transactions stored in the immutable blocks allow users to trace back the whole transaction history. However, in general, blockchain technology can record and track the movement of any intangible or tangible asset. In a blockchain network, *consensus mechanisms* involving multiple members of the network and cryptography ensure that the data stored is correct and cannot be mutated (see A.1 in the appendix for definitions).

Figure 2: Illustration of Traditional and Distributed Databases

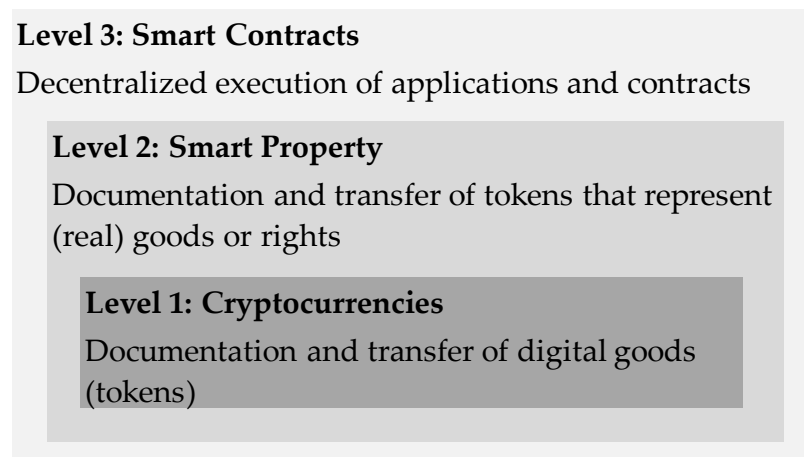


Source: Swiss Economics

Bitcoin and other cryptoassets based on blockchain technology have received much attention in the past years. This led some people to believe that blockchain technology and cryptocurrencies are the same. Cryptocurrencies are, however, only the first and most basic applications of DLT and blockchain. In particular, three different application types can be distinguished, as shown in Figure 3:

¹⁴ <https://www.techtarget.com/searchcio/definition/distributed-ledger> [06.12.2022].

Figure 3: Levels of Applications of DLT and Blockchain Technology



Source: Swiss Economics

1. The original and first application of blockchain technology is cryptocurrencies. These are digital assets that can be traded among stakeholders without any intermediary and do not represent anything but themselves. The value of cryptocurrencies is derived from their functionality and scarcity.
2. The second application level is smart property, wherein tokens represent goods or rights. They work either like electronic vouchers (so-called utility tokens) or securities (so-called security tokens). Smart Property can enable the trading of illiquid assets such as patents.
3. The third application level consists of smart contracts (see section A.1 in the appendix for definitions). In this case, a blockchain hosts the decentralized and automatic execution of computer applications and contracts. This allows the transfer of value between different parties according to specific rules without the need for actions by intermediaries.

In section A.1 in the appendix, we explain some other important terms and characteristics of DLT and blockchain technology.

Besides cryptocurrencies, DLT is being used and explored for multiple purposes in various industries. In logistics, they are being used to track and manage shipments and transactions transparently and securely. In the luxury industry they are used to validate the originality of luxury products and to help identify counterfeits. In healthcare, DLT is increasingly being studied for its potential to efficiently make data accessible to multiple stakeholders securely and cost-effectively.¹⁵ Moreover, governments are exploring the technology progressively for its use to create digital identities. Lastly, tokenization and smart contracts can potentially facilitate interactions and transactions in various parts of the economy, including IP value chains.

¹⁵ More examples of the usage of DLT for different purposes and in different industries can be found in <https://builtin.com/blockchain/blockchain-applications> [18.11.2022] and Labazova, Dehling and Sunyaev (2019).

It should be noted that DLT is not a silver bullet for all of society's problems. Nevertheless, it is still a rather new technology that deserves to be considered as an option to enhance the functioning of economic processes and well-being around the globe.

2.2.2 The Swiss DLT Industry

The DLT industry in Switzerland has grown rapidly in recent years, consisting of more than 1'100 organizations by the end of 2021.¹⁶ These organizations are highly concentrated in the Canton of Zug, however, a substantial number of blockchain companies have established themselves in other areas as well. As of 2021, there were 204 DLT organizations in Zurich, 69 in Geneva, 55 in Neuchâtel and 50 in Ticino, for example. Globally, Switzerland is considered one of the major DLT and blockchain hubs and is referred to as the Crypto Valley (CV VC, 2022).

Among the major DLT companies in Switzerland are 14 unicorns¹⁷ and some of the biggest and globally best-known blockchain projects (e.g., [Ethereum](#), [Polkadot](#) by the [Web3 Foundation](#), [Solana](#) and [Cardano](#)) that provide level-one solutions (see Figure 3). Based on these blockchains, the majority of organizations in Switzerland develop level two and three solutions.

Aside from the numerous genuine blockchain organizations, several established technology companies as well as large companies in other sectors have developed DLT solutions. Among these are large tech companies such as IBM, Amazon and Google.¹⁸ IBM and Amazon developed solutions for large enterprises, whereas Google partnered with Dapper Labs and serves as a network operator of the FLOW blockchain. Large firms outside the tech industry that have invested in DLT projects in Switzerland include Novartis and Nestlé. Novartis is a member of the [PharmaLedger](#) project of the EU and Nestlé is using the [IBM Food Trust Blockchain](#).

In general, besides the numerous startups, established tech and non-tech firms are increasingly becoming involved in DLT projects. This is also reflected in the growing number of consultancies offering services related to legal, technical, and economic aspects of DLT.¹⁹

Besides private companies and startups developing and running DLT projects, there are several other stakeholders in the Swiss DLT industry:

¹⁶ These organizations take different organizational forms. While the majority are private companies, other projects' legal status is that of an association or foundation. We refer to them generally as organizations.

¹⁷ The term *unicorn* refers to startups that are privately owned and which have a valuation of at least one billion USD.

¹⁸ See more about these developments here: <https://www.ibm.com/de-de/blockchain>, <https://aws.amazon.com/de/managed-blockchain/> and here <https://coinmarketcap.com/alexandria/article/what-is-google-doing-with-blockchain> [24.01.2023].

¹⁹ Hereby are we mean large international companies, like Deloitte, Accenture, EY, etc. See, for example <https://blockchain.ey.com/> [20.01.2023].

- Many of the most renowned Swiss universities have established chairs, centers, or institutes dedicated to topics around DLT and blockchain technology.
- There are several public organizations and industry organizations fostering collaboration, research, education, and investment in the Swiss DLT industry. Among these are the [Swiss Blockchain Federation](#), [Crypto Valley Association](#), [Bitcoin Association Switzerland](#), [digitalswitzerland](#) and the venture capital investment company [CV VC](#).
- Several cantonal governments are building expertise in DLT as part of their digitalization efforts (e.g., Zug²⁰ and Neuchâtel²¹).

In summary, the DLT landscape in Switzerland includes a wide variety of stakeholders from the public and private sectors, from small startups to traditional tech firms, financial service providers, consultancies, research institutes and various industry organizations.

2.3 The Overlap of DLT with IP Ecosystems

Several of the use cases identified globally (WIPO, 2022) could be of value for Switzerland. For example, the Swiss watch and luxury industry suffers economic losses due to counterfeits which could potentially be mitigated with innovative DLT solutions. Moreover, the pharma and food sector could benefit from DLT solutions in facilitating supply chain management. On the other hand, innovative licensing services using DLT could offer new ways for SMEs, which represent a large share of the Swiss economy, to commercialize their IP. These examples embody only a few examples of the potentially relevant use cases in Switzerland.

As described in the section above, DLT is developed and utilized by new organizations as well as more established enterprises (e.g., in the pharma, food and luxury goods industries). Because IP and IP rights play an important role in the value chain of many businesses, it is of no surprise that practitioners, researchers, and governments are continuously exploring ways to improve efficiency and develop new business cases. However, IP issues have emerged from technological developments of DLT (for example in the metaverse). Therefore, there are several overlaps between DLT and IP.

In the following, we give a brief introduction to these overlaps on a global scale, before zooming in on the case of Switzerland.

- **Initiatives from public stakeholders:** The [European Union Intellectual Property Office \(EUIPO\)](#) as well as several countries' IP offices have moved existing IP registers to DLT

²⁰ Zug offers inhabitants a blockchain-based digital ID, ensuring the ownership personal data through decentralized storage. Applications of the digital ID for better governmental service-provision are continued to be explored as part of the city's e-government initiatives. See <https://www.stadtzug.ch/newsarchiv/431448> [26.01.2023].

²¹ The Canton of Neuchâtel hosts another sub-national blockchain hub which the government actively fosters, demonstrated by its recent joining of the Swiss Blockchain Foundation. See <https://neuchateleconomie.ch/en/neuchatel-open-en/canton-neuchatel-joins-the-swiss-blockchain-federation/> [26.01.2023].

registers. In spring 2021, the EU's TMview and DesignView registers have been moved from traditional databases onto DLT registers. In Canada, DLT registers are being developed by the national IP office, as well as the collecting societies (WIPO, 2022).

- **Initiatives from private stakeholders:** A broad number of use cases exist for different IP rights and different phases of the IP value chain. These include general services like timestamping and proof-of-existence (see section 3.2.2 for more on these use cases) that can be useful at multiple stages, whereas others aim to create value at specific phases such as the phase of IP rights commercialization. Commercializing intellectual property like patents can be done by using it to sell a product based on this patent. Commercialization can also be achieved by licensing the patent to another organization while keeping the ownership, and by selling the patent and handing over the ownership. To simplify some of these processes, [IPwe](#) created a platform based on DLT to tokenize patents and facilitate the licensing process both for the owner of the patent and the licensee.
- **IP issues related to DLT:** Lastly, besides the above-mentioned use cases of DLT for IP, IP issues arise from technological innovations. Such issues include the protection of IP in new environments like the metaverse, as well as the protection of new forms of digital assets and digital arts (NFTs). Moreover, the digitalization of public and private life with the use of digital identities is relevant for IP (and of potential use for it) as well.

3 Analysis

The previous background section introduced readers to the Swiss IP ecosystem and Swiss DLT industry as well as general touchpoints of DLT and IP. In this section, we dive into the country study of Switzerland and present use cases that we have identified to be important. We discuss the findings extracted from the survey and interviews about the opinions, beliefs and needs of stakeholders in the Swiss DLT industry and IP ecosystem.

3.1 Methods

We combine a mix of methods to achieve the study goals introduced in Section 1.2. As part of a *literature and market analysis*, we study what use cases of DLT exist in the Swiss IP ecosystem in terms of Swiss organizations, organizations with offices in Switzerland or other ties with Switzerland in the form of partnerships, clients, etc. The goal of this review is to narrow down the broad overview of use cases given by the whitepaper of the WIPO (2022). In other words, this review is a first step in understanding what use cases of DLT and IP are relevant in Switzerland now and (potentially) in the future.

Because of the novelty of the technology and its applications for IP, the academic literature on DLT and IP is thin. Therefore, our literature review also included gray literature (e.g., conference proceedings, working papers, reports, articles, newsletters and blogs from firms, associations, and public organizations). This literature was identified by searching for keywords identified in the use case descriptions of WIPO (2022).

Based on the review of use cases, we identify involved stakeholders – i.e., stakeholders developing, offering, or using new, DLT-based services in the IP ecosystem. We then talked to selected stakeholders in *open interviews* to learn about their opinions regarding the study's goals (a list of the conducted interviews is included in the appendix). These interviews helped us to complete our map of stakeholders in the Swiss DLT and IP ecosystem and to collect answers for achieving the study's goals.

Following the literature review, market analysis and expert interviews, we conducted a *survey* among the identified stakeholders in the DLT and IP ecosystem. The survey allowed us to further extend the map of stakeholders, and to collect answers to questions regarding expectations and opinions around DLT and IP. Due to the exploratory nature of this study, many of the survey questions were open-ended in nature.

The survey was implemented as an online survey, distributed to previously identified stakeholders (close to 100). The recipients included i.a. several industry organizations. Therefore, the number of invited stakeholders from IP and/or DLT exceeded 100 invitations. We conducted the survey in October 2022 and received 41 responses.²²

In the following, we present the results of our study, starting with the mapping of stakeholders and use cases.

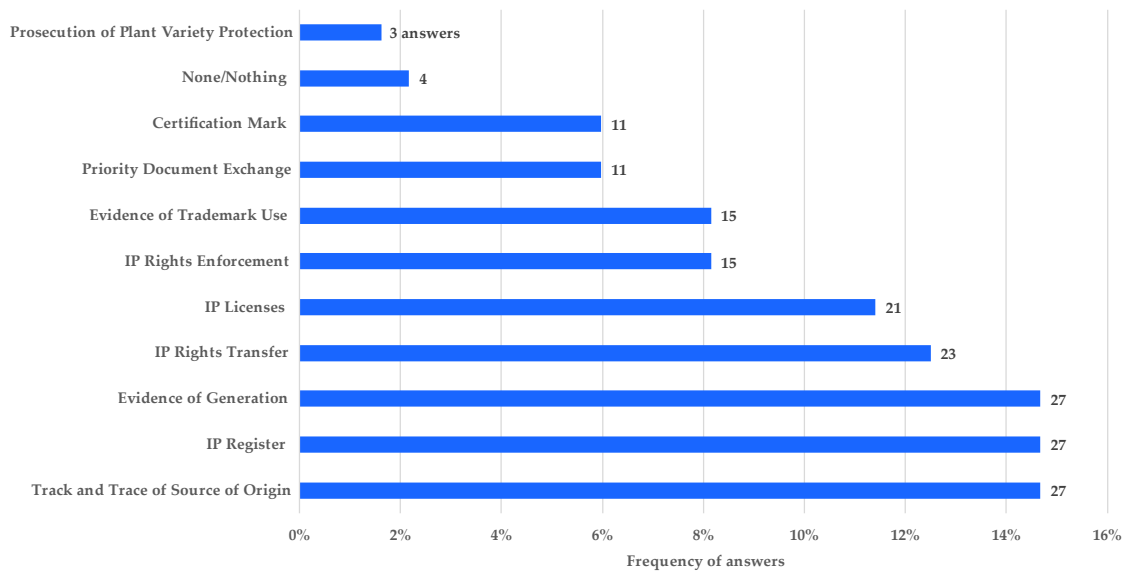
3.2 Mapping of Stakeholders and Their Use Cases

In this section, we discuss the *stakeholders* involved in DLT and IP along with the *use cases* they are involved in. The focus is on stakeholders in Switzerland or stakeholders with ties to Switzerland (in the form of partners, clients, etc.) as well as use cases that could potentially become relevant for Switzerland in the future.

The selected use cases consist of those that participants of our survey regarded as most valuable to the IP ecosystem (see Figure 4). However, we also discuss use cases where we identified stakeholders and/or activity in Switzerland as part of our literature review and market analysis. In our survey, we worked with the use case categorization of the WIPO (2022). In the following presentation of the results, we collapse some of the categories due to their similarities.

²² More information about the survey and its participants (in anonymized form) is included in the appendix.

Figure 4: In what areas do you think blockchain technology use cases can potentially be most valuable for the IP ecosystem? (multiple choice question)



Note: 38 participants answered this question.

Source: Swiss Economics

Through the survey, we found the following use cases of DLT for IP to be perceived as important for Switzerland:

- Track and trace the source of origin including anti-counterfeiting,
- evidence of generation including timestamping,
- licensing and transfer of IP rights,
- IP registers,
- and others, including the metaverse, art & NFTs, digital identities and IP rights enforcement were identified through desk research and may also be of importance for Switzerland.

Table 1: IP Value Chain Phases and Where Presented Use Cases Apply

IP Value Chain Phase	Generation	Protection	Management	Commercialization
Track and Trace of Source of Origin and Anti-Counterfeiting	✓	✓	✓	✓
IP-Registers		✓	✓	✓
Evidence of Generation and Timestamping	✓	✓	✓	✓
Evidence of Generation and Timestamping			✓	✓

Source: Swiss Economics

Table 1 indicates in which phase(s) of the IP value chains (generation, protection, management or commercialization) the identified use cases can be applied.

3.2.1 Track and Trace of Source of Origin and Anti-Counterfeiting

Counterfeits are costly in terms of direct damages to firms, customers buying counterfeits of minor quality as well as indirect effects (e.g., reputational damages). These indirect damages from counterfeited products affect not only the brand concerned but also related brands from the same industry or even the whole economy by damaging the Swiss label. The OECD (2021) estimates that in 2018, revenue loss of Swiss companies due to counterfeits sums up to around 4.5 billion CHF, with the watch and jewelry industry bearing a substantial share of damages. The problem of counterfeits originates from a lack of transparency in supply chains and lacking evidence to verify the authenticity of a product.

- **Solution:** DLT solutions have been proposed to track and trace the source of origin, the supply chain and the stakeholders involved in the production process of goods. In doing so, a tamper-proof record of the relevant steps in the production process and the supply chain is created. Authorities, along with stakeholders involved in the supply chain as well as end-customers, can then verify both the authenticity of the product and whether it follows the production process as defined by the owner of the IP.

A critical part of this solution is the connection between a physical asset and its digital counterpart. Traditionally, this has been done using tags, marks, QR codes or other unique identifiers on the physical asset or its packaging. This is also an integrated part of some DLT applications.²³ Biometric technology can serve as another solution to this

²³ See for example <https://www.circulor.com/solutions> and <https://authena.io/shield/> [04.11.2022].

problem. High-resolution images are taken of the physical asset to a detail where the photos of the object reveal unique features not visible to the human eye.²⁴

- **Reasoning for the use of DLT:** Firstly, DLT are tamper-proof and the created records therefore immutable. Thus, the steps of the production process of goods can be stored using DLT and inspected by all (permissioned) members of the network. Because of the distributed nature of a DLT, different stakeholders can access the most recent information simultaneously and no trusted central register is required.
- **Phases of the IP value chain and IP rights concerned:** This use case can be applied to all phases, but it is of special importance for the protection and commercialization of products protected under the copyright or industrial property rights.
- **Solution providers:** Through desk research we identified [Adestra](#) (focusing on the luxury industry), [Authena](#) (active more broadly in pharma, luxury, food & beverage and other industrial sectors), [Scantrust](#), [Vault Security Systems](#), [PharmaLedger](#) (an EU project to create transparency in pharma and health, including anti-counterfeiting), IBM ([Food Trust Chain](#) to increase general transparency across the supply chain), [ORIGYN Foundation](#) and [Aura Blockchain Consortium](#) (anti-counterfeiting for luxury goods) as well as the EUIPO which is developing an anti-counterfeiting blockchain solution as part of the European Blockchain Services Infrastructure Initiative.²⁵
- **Users:** Through desk research we identified [Bucherer](#), [Lebois & Co.](#), [Bianchet](#), [Richemont](#) and other firms in the Swiss watch and luxury industry; [Roche](#) and [Novartis](#) from the pharma industry; [Nestlé](#) from the food industry.
- **Insights from survey participants:** Survey participants also see a large potential benefit in the use of DLT to fight counterfeiting and track the origin of works. One participant noted that works which were made “*offside the typical commercial production environments*”, which are protected by copyright but for which there is no trusted registry, could benefit the most from this use case.

3.2.2 Evidence of Generation and Timestamping

It is difficult to prove the creation and existence of intangible, digital assets at a specific point in the past. According to the European [eIDAS](#) regulation, timestamping solves this problem. Since an increasing number of documents and files are exchanged digitally, the need for reliable, irrefutable, and easy-to-use proofs of existence is increasing.

These proofs are necessary for a wide variety of contexts but are especially relevant in the IP ecosystem. For example, creative works are protected upon creation under copyrights, but proving their creation requires some form of trusted certification. Traditional solutions involved trusted intermediaries to provide legally recognized certification of what time,

²⁴ See <https://www.origyn.com/> [04.11.2022].

²⁵ See <https://euiipo.europa.eu/ohimportal/en/web/observatory/blockathon> <https://ec.europa.eu/digital-building-blocks/wikis/display/EBSI/What+is+ebsi> [04.11.2022].

which digital asset was created, transacted, and owned by whom. Receiving such services from an intermediary is time-consuming and costly.

- **Solution:** DLT can facilitate the certification of generation and timestamping. Instead of a trusted intermediary, the trust is generated by the immutability and security of the distributed ledger. For these solutions, part of the digital file (its metadata) is added in a cryptographic and unique form to a blockchain. The evidence of generation or proof-of-existence of a digital asset is hence added to a timestamped block on the chain. The digital asset and its existence at a certain point in the past is uniquely identified by the timestamped block. The timestamp of the block verifies the time when the certificate was issued.
- **Reasoning for the use of DLT:** Due to the technical properties of blockchains, the timestamp created cannot be changed (immutability). For larger, established blockchains such as Bitcoin and Ethereum this has become practically impossible (and has never occurred so far). Moreover, the possibility of providing such a service without involving an intermediary makes blockchain-timestamping faster and cheaper. This can increase the effectiveness and efficiency of IP protection.
- **Phases of the IP value chain and IP rights concerned:** Evidence of generation and timestamping is a general use case that is part of other use cases for IP (e.g., track and trace of the source of origin) as well as for other purposes like digital identities and record keeping of financial transactions. Within the IP ecosystem, it has many applications across all phases of IP value chains and for all IP rights.
- **Solution providers:** [OriginStamp](#) and [P&TS](#) (in collaboration with [Bernstein](#) in France) are two solution providers in Switzerland. The WIPO also created a similar blockchain service for timestamped fingerprints of digital assets (WIPO PROOF). However, similar and rapidly advancing solutions developed by private stakeholders have forced WIPO PROOF out of the market.²⁶
- **Users:** Wide range of users: basically anyone who creates digital files (R&D departments, researchers, students, businessmen, journalists, authors, etc.).
- **Insights from survey participants:** The survey participants had a mixed opinion on the usage of DLT for timestamping/proof-of-existence mechanism. Some noted that it is a cheap solution to generate a proof of generation. Others pointed out that reliable timestamping solutions based on cryptography but without the use of DLT exist and are widely used (see section A.1 in the appendix for definitions).

3.2.3 Licensing and Transfer of IP Rights

Owners can utilize their IP rights and create value from them by offering the resulting products exclusively. However, they can also generate revenue by selling and licensing their IP rights. This is possible with various types of IP assets and IP rights. For example, musicians

²⁶ <https://www.wipo.int/wipoproof/en> [24.02.2023].

can sell licences for their songs. In these value chains, the end-consumers pay an intermediary, who is paying the artists for the license to broadcast or stream their music. In the example of music streaming platforms, specifically, there is an ongoing debate on whether artists are paid enough or whether large streaming platforms exert market power to the disadvantage of (small) artists.²⁷

- **Solution:** A possible solution to make these transactions more efficient is to eliminate intermediaries or diminish their role in the value chain. In the above example, this would imply that artists are being paid in a more direct form, e.g., by the listeners themselves. Moreover, the use case can facilitate IP rights transfers which in current IP ecosystems require intensive interaction among stakeholders and authorities. Such a solution is based on different elements and other general use cases, including timestamping, digital identities, smart contracts, and IP registers.
- **Reasoning for the use of DLT:** One of the main advantages of DLT is that it enables transactions between stakeholders without the need for a trusted central authority overseeing and executing transactions. DLT could thus serve as an option to license and transfer IP assets and rights directly to buyers/licensors without the need for the active involvement of third parties.
- **Phases of the IP value chain and IP rights concerned:** Currently, DLT-based licensing and transfer of IP rights are being used during the management and commercialization phases of the IP value chain. We identified stakeholders offering such solutions for patents, copyright-protected work, trademarks and designs.
- **Solution providers:**
 - **IPwe** which partnered with **IBM** and **Casper Labs** (Swiss blockchain company) tokenizes patents to facilitate patent management and commercialization. The recently announced partnership with **Clarivate**²⁸ highlights that traditional and established firms from the IP ecosystem recognize the potential of DLT solutions for IP.²⁹
 - Regarding public initiatives, the national IP office of Russia (**Rospatent**) is developing an IP management and commercialization solution based on DLT.³⁰
 - Regarding copyrights, numerous use cases exist for the usage of DLT to offer streaming services for music and films. **Musicoin**, **Audius** and **Theta** are examples of such platforms. They are not Swiss based but can potentially be used by Swiss artists and creators as well.

²⁷ <https://www.ft.com/content/299d9936-3b66-401b-99c4-2294699301cb> [08.11.2022].

²⁸ Clarivate is one of the largest IP services, analytics, and consulting firms (see <https://clarivate.com/> [16.11.2022]).

²⁹ <https://ipwe.com/clarivate-partners-with-ipwe-enhance-ai-blockchain-patent-solutions/> [16.11.2022].

³⁰ https://www.wipo.int/edocs/mdocs/cws/en/wipo_webinar_standards_2021_19/wipo_webinar_standards_2021_19_presentation9_mamontov.pdf [16.11.2022].

- The art market and the market for collectable NFTs experienced a boom in the past two years. Although the legal aspects of these NFTs are not entirely clear on many marketplaces, they are marketed as granting buyers the full IP right upon purchase of an NFT (more on this in Section 3.2.5).
- The German startup [license.rocks](#) is offering DLT based licensing services for a broad range of digital and physical products, including designs and trademarks.
- **Insights from survey participants and interviews:** Survey participants see IP licenses and IP rights transfer as one of the most valuable use cases of DLT for IP. The open-text answers did not reveal additional insights into which IP right types and/or which services are considered especially important.

3.2.4 IP Register

Most IP registers are national registers. To protect an IP asset in multiple jurisdictions, IP owners might in some cases go through similar registration and examination processes in different countries.

For example, in the case of patents, although there is an option to choose one of the international respectively regional application or examination procedures, patents still go through a national phase. During this phase, minimal changes may occur, meaning the same patent may not be exactly the same in every country.

Firstly, this mechanism might lead to extensive costs to register and manage IP rights. Secondly, from a governing perspective, this leads to double records of nearly the same IP asset with multiple IP offices.

- **Solution:** Distributed IP registers are proposed as a solution to overcome these inefficiencies and double records. However, these promises can only be met if national IP offices' solutions for DLT-enabled IP registers can exchange information easily. Only by ensuring interoperability across jurisdictions can efforts and costs to register and manage IP rights be cut both by private and public stakeholders.
- **Reasoning for the use of DLT:** A DLT-enabled IP register can make information available to all private and public stakeholders. It can enable the secure transfer of confidential information between specific stakeholders and allow tracking of the life cycle of an IP asset.
- **Phases of the IP value chain and IP rights concerned:** IP registers on blockchains exist for all types of IP rights and are envisioned to facilitate the commercialization, protection, and management of IP.
- **Solution providers:** As mentioned in Section 2.3, publicly owned IP registers based on DLT have been created by international (EUIPO) as well as national IP offices (e.g., Canada, Australia, Malta). Private IP registers exist for copyrights ([Binded](#), [FileProtected](#), and [CopyrightBank](#) are examples of such platforms; they are not Swiss based but can potentially be used in Switzerland) as well as for patents ([IPwe](#) and its [Global Patent](#)

Registry, which IPwe announced to transform into a Swiss non-profit foundation once the DLT registry reached a critical size / coverage).

- **Insights from survey participants:** Survey participants considered IP registers as one of the most valuable use cases of DLT for IP as well as the use case which is likely to become established the soonest. Participants noted that for transparency reasons, IP offices should offer the only relevant and legally binding database for registration and documentation. According to some opinions, DLT might solve the database landscape fragmentation in IP ecosystems. Lastly, some participants acknowledged the need for interoperability for DLT solutions to create the desired value.

3.2.5 Other Use Cases and Touchpoints of DLT and IP

Some use cases and touchpoints of DLT and IP were not prominently mentioned in our survey. However, because they appeared repeatedly in our literature review and market analysis, we discuss them briefly below. Except for IP rights enforcement, these use cases are applicable or relevant for all phases of IP value chains.

- **Metaverse and IP:** The metaverse is a combination of social media, augmented reality, virtual reality, gaming, and cryptocurrencies. A metaverse allows its users to interact with each other in a digitally augmented world.³¹ It does not exist yet for mainstream usage, but major technology firms (e.g., Meta, formerly Facebook Inc.) are involved in its development. It is envisioned that people will be able to learn, work, play and shop in the metaverse through their avatars.

The metaverse and the concept of Web3 are closely linked: Web3 is considered the next generation of the Internet, based on fully decentralized platforms, where users own their personal data.³² DLT is a potential enabler technology of Web3.³³ Therefore, the metaverse and DLT are closely related. Open questions remain on how the IP rights of real-world physical and digital assets can be protected in the metaverse. Tokenization and NFTs will likely play a crucial role.

- **Digital arts, copyrights and NFTs:** NFTs are cryptographic assets, which – unlike cryptocurrencies – are non-fungible (see the definitions in Section 2.2.1). They are considered as a useful technology to represent unique assets digitally. In recent years, they have been mainly associated with artistic works, although the technology as such can be used for various other purposes around IP (e.g., tokenization of patents and licensing). Proponents of NFTs emphasize that the new form of connection between artists and audience allows them to sell shares of royalty rights³⁴ to music or shares of physical artworks

³¹ <https://www.investopedia.com/metaverse-definition-5206578> [13.12.2022].

³² <https://www.bipc.com/navigating-intellectual-property-rights-of-nfts-and-the-metaverse> [13.12.2022].

³³ <https://101blockchains.com/blockchain-in-web-3-0/> [13.12.2022].

³⁴ An owner of a royalty right over e.g., a song gets the whole royalty payment, after the usage of that music piece.

like those of paintings. NFTs also have the potential to boost the market for collectables and digital artworks.³⁵ Furthermore, NFTs can diminish the roles of intermediaries like auction houses or record labels, simplify transactions, and create new markets.

Survey participants mentioned several platforms through which NFTs and IP rights are interlinked. The four mentioned online platforms are not Swiss based but can potentially be used in Switzerland as well:

- [SuperRare](#), which is a platform for selling and collecting digital art.
- [AsyncArt](#) enables artists to create art and music NFTs.
- [Royal.io](#), which allows fans and artists to own copyrights of songs together.
- [Opulous](#) enables musicians to mint their music NFTs, which can then be traded on the platform.
- Sotheby's, one of the largest auction houses in the world with multiple offices in Switzerland, offers the [Natively Digital](#) curated NFT sales.

Another application of NFTs in Switzerland was a project by the [Swiss Post](#). They issued so-called NFT stamps in 2021, which were normal stamps with an NFT twin. The NFT twins could be exchanged and stored on a blockchain.³⁶ A further use case in Switzerland is the Hashmasks project, which is a digital art collectable from Zug.³⁷ Even though NFTs allow artists to share their copyright ownership with their audience, the legal background is still not straightforward. There have been many cases in which complete ownership of copyrights was promised for the buyers of specific NFTs and later it was unilaterally withdrawn or not even legally granted.³⁸

While the NFTs market experienced a boom in 2021 and the beginning of 2022, sales volumes dropped drastically – in parallel with the overall cryptocurrency market – in Spring 2022.³⁹

- **Digital Identities:** Without official and trusted digital identification mechanisms, many legal and bureaucratic processes require personal and physical presence. This lengthens the process, increases the costs for involved stakeholders and reduces overall efficiency. Furthermore, according to the WIPO (2022), there is a long-standing need to find a solution for identification across borders and national IP ecosystems.

³⁵ <https://www.investopedia.com/non-fungible-tokens-nft-5115211> [13.12.2022].

³⁶ https://www.swissinfo.ch/eng/swiss-post-to-launch-switzerland-s-first-crypto-stamp/46991360?utm_campaign=teaser-in-article&utm_source=swissinfoch&utm_content=o&utm_medium=display [13.12.2022].

³⁷ <https://www.thehashmasks.com/> [13.12.2022].

³⁸ <https://www.theverge.com/2022/8/22/23316723/nft-copyright-galaxy-report-crypto-ip-rights-licensing-ownership> [13.12.2022].

³⁹ <https://www.theguardian.com/technology/2022/jul/02/nft-sales-hit-12-month-low-after-cryptocurrency-crash> [13.12.2022].

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. According to the WIPO (2022), it could also help to solve identification issues to register IPs at different IP offices.

The Swiss city of Zug is an early adopter of digital identities in partnership with [ProCivis](#).⁴⁰ Residents of Zug can register their ID through an online portal and their registration is validated through an in-person visit to the city's government offices. Upon approval, their identity gets publicly attested on the Ethereum blockchain.⁴¹

Besides public services, digital identities are considered a valuable tool in the health sector, where they enable efficient information sharing. Guardtime's [Gravitate-Health](#), for example, aims to develop a "user-centric health information solution". It is a public-private partnership with 40 members from Europe and the US.⁴²

- **IP Rights Enforcement:** The enforcement of IP rights becomes increasingly challenging with the ongoing digitalization of societies and economies. Challenges arise, for example, in the identification and evidence provision of infringements due to the growing abundance of data. As the amount of data continues to grow, monitoring the internet for infringements of intellectual property rights has become increasingly challenging. Moreover, the interaction and information exchange between enforcement authorities and IP rights holders can be time-consuming and costly.

DLT solutions are used and developed to facilitate the processes, interaction and information sharing between stakeholders and authorities. An example of such a platform is [IPBee](#) (founded in Germany in 2016, working with the Swiss blockchain company [OriginStamp](#) to provide their services). They offer online IP rights protection for trademarks based on blockchain technology. They are monitoring different websites, like digital marketplaces, advertising on social media and search engines worldwide. For this purpose, they set up a database with several hundred million URLs.⁴³ Similar solutions for the protection of copyright-protected work exist as well. [Pixsy](#) uses artificial intelligence and blockchain technology to prove ownership of images and to monitor millions of websites worldwide for any unauthorized use of someone's IP. The services include detecting the use of copyright-protected work, brands, as well as designs. While founded in the US, their services can be used globally.⁴⁴

⁴⁰ ProCivis is a service provider for digitalization in the public sector, owned by Orell Füssli, a Swiss printing and bookselling company.

⁴¹ <https://www.stadtzug.ch/newsarchiv/431448> [10.11.2022].

⁴² <https://guardtime.com/research> [10.03.2023] originally from Estonia, guardtime has an office in Switzerland (Lausanne).

⁴³ <https://ip-bee.de/en/#aboutus> [10.11.2022].

⁴⁴ <https://www.pixsy.com/monitor/> [13.11.2022].

3.3 DLT and Blockchain Standards

3.3.1 Background

For any developing technology, standards are considered a key to success and mass adoption. Because most DLT applications nowadays take the form of blockchain technology, the standardization debate is centered around blockchain standards. Blockchain standards describe the protocols, algorithms, and data formats that are commonly agreed upon and used by participants and developers in a blockchain network. However, they also include general terms like definitions and taxonomy. As argued by the [European Commission](#), they “ensure interoperability, generate trust in and help ensure ease of use of the technology”.⁴⁵

Of the topics mentioned by the European Commission, the WIPO (2022) considers interoperability as the key reason for the need for blockchain standards. Interoperability between different blockchain solutions as well as traditional systems is required so that all interacting stakeholders can share information efficiently.

In the following, we review important standardization efforts regarding blockchain technology, the most widely used form of DLT.

3.3.2 Current Roadmap of DLT Standards

Multiple international organizations issuing technical standards have picked up the topic of standardization. Because blockchain is the most common form of DLT today, the standardization debate is centered around blockchain technology. The most important organizations active in the European and global debate and/or in the development of blockchain standards are the following:

- **Blockchain Task Force of the Committee on WIPO Standards:** Created in 2018, the task force’s mandate is to monitor touchpoints of blockchain and IP as well as to develop recommendations.

Because of its IP focus, it might be the most evident contact point for the IPI to be informed about recent developments. However, only little information and few publications can be found publicly about the work of the task force.

- **International Association of Trusted Blockchain Applications (INATBA):** The [INATBA](#) is active both on the global and European levels regarding blockchain standardization. Together with the European Commission, they recently published a joint report on the topic of standardization.⁴⁶ During a roundtable on digital identities as part of the “*Digital Blockchain Week*” organized by the INATBA in November 2022, interoperability and blockchain standards were among the central topics discussed among public and private stakeholders. Moreover, INATBA and the European Commission hosted an

⁴⁵ <https://digital-strategy.ec.europa.eu/en/policies/blockchain-standards> [13.11.2022].

⁴⁶ <https://inatba.org/reports/inatba-publishes-a-joint-report-with-the-european-commission-on-blockchain-standardisation/> [15.12.2022].

online event “*Joining Forces for Blockchain Standardization*” for the third year in a row at the beginning of December 2022.

Due to their connectedness with the blockchain industry as well as with public organizations in Europe, the INATBA presents another valuable contact point to stay up to date regarding blockchain standards. Especially about specific use cases relating to IP (e.g., digital identities).

- **Global Blockchain Business Council (GBBC):** The [GBBC](#), together with the [World Economic Forum](#) (WEF) and many other collaborators including important blockchain and technology companies, have created an overview of blockchain technical standards. Included in this white paper is a list of organizations that are leading the standard-setting agenda regarding blockchain technology (p. 16-19; WEF, 2020).
- **Other European standardization organizations relevant to blockchain technology:** [StandICT](#) (the EU’s standardisation observatory), the [European Telecommunications Standards Institute](#), the [European Committee for Standardization](#), the [European Committee for Electrotechnical Standardization](#)
- **Other global standardization organizations relevant to blockchain technology include:** [International Organization for Standardization](#) (ISO), [International Electrotechnical Commission](#) (IEC) and their joint committee [Joint Technical Committee of ISO and IEC \(JTC1\)](#), [Telecommunication Standardization Sector \(ITU-T\)](#), [Institute of Electrical and Electronics Engineers](#) (IEEE), [Organization for the Advancement of Structured Information Standards](#) (OASIS-Open) and the [Internet Engineering Task Force](#) (IETF).

The list provided above and the more extensive list of stakeholders in the blockchain technology standardization white paper of the WEF (2020) highlight a large number of organizations and stakeholders involved in the development of standards for DLT and blockchain technology.

In the industry, different blockchains and solutions built on blockchains such as Bitcoin, Ethereum, etc. have led to what some describe as *silos*. Belchior et al. (2021) argue that interoperability and standardization are also mainly tackled within these silos (e.g., within the Ethereum blockchain network⁴⁷). While this is to some extent the product of a new technology where different approaches are being developed and tested, it also risks fragmentation and difficulties in achieving interoperability across these silos.

In the following section we discuss the needs of stakeholders in the IP and blockchain ecosystem as well as further issues with the current blockchain standards landscape.

3.3.3 Insights from Expert Interviews and the Survey

Only five participants of the survey are involved in a project in which DLT is or will be used for IP. Of these, three are operating on the Ethereum blockchain and two on Bitcoin.

⁴⁷ <https://ethereum.org/en/developers/docs/standards/> [15.12.2022].

Other blockchains mentioned once as being used by the surveyed stakeholders were Casper, Hyperledger, EOS, Polkadot, Aion and Polygon.

Participants reported using only the smart contract standard on Ethereum (ERC token standards⁴⁸) as part of their solution. None of the participants reported using sets of standards defined by international organizations. Moreover, most participants did not answer the general question about the (future) role of blockchain standards. The few responses we did receive were not specific enough or could not be interpreted at all.

The expert interviews we conducted with startups offering blockchain solutions for IP provided us with some insights into the underlying reasons. In several interviews, stakeholders explained that implementing such sets of standards was costly and to a certain extent not feasible. In particular, one stakeholder reported that it was not feasible to implement the set of standards as proposed by the WIPO while offering their intended solution in the targeted markets. Moreover, for a small firm, the costs of implementing such extensive sets of standards were described as high and as a barrier to bringing innovative solutions to the market.

One stakeholder suggested that at the current stage of the industries' development, stakeholders should first demonstrate what works by bringing their solutions to markets and clients. Only then should authorities consider implementing general standards in a top-down manner.

It is noteworthy that these insights came from stakeholders involved in blockchain projects run by small firms and startups offering specific solutions. Larger tech firms that are involved in a wider range of blockchain projects could possibly have different opinions regarding blockchain standards.

3.4 Uncertainties, Challenges, and the Role of IP Offices

DLT is still relatively new, and its applications are quickly developing and changing. Moreover, it is a complex technology with the majority of people holding a limited understanding of its functioning and uses. Lastly, many people are skeptical about its most widely known application in cryptocurrencies (e.g., Bitcoin) and their opinions are polarized.

As part of this country study, we investigate what issues concern stakeholders in the Swiss IP and DLT ecosystem. In relation to perceived uncertainties and challenges, we studied if and what change in IP-policy stakeholders wish to see in response to these issues. We discuss our findings in the following.

Uncertainties and Challenges Regarding DLT and IP

Participants raised numerous concerns as shown in Figure 5. Many participants raised concerns over the legal framework as well as territorial, legal, and political issues. Moreover, environmental concerns about DLT and issues of trust, acceptance, and misconceptions

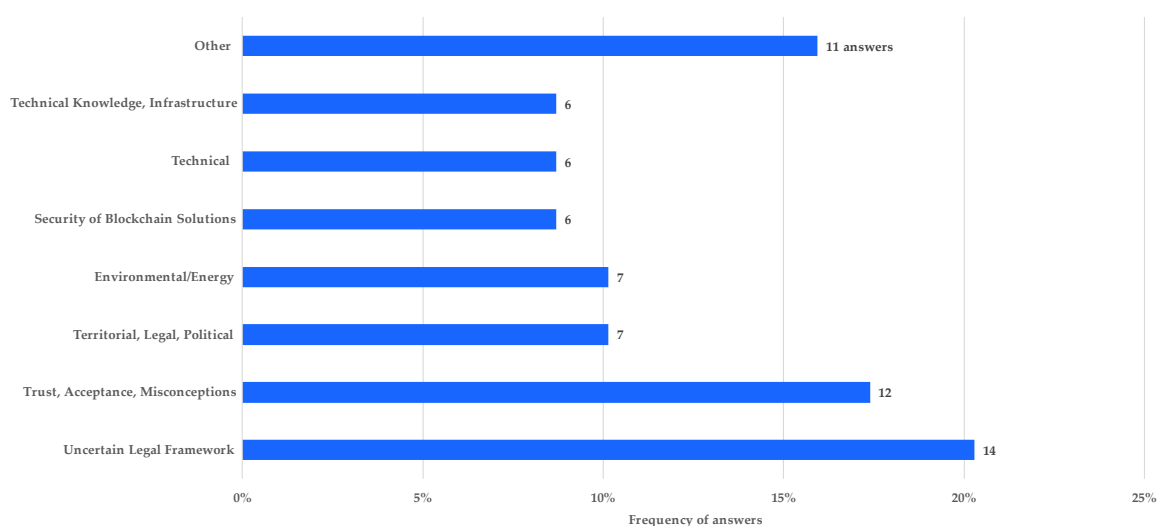
⁴⁸ <https://ethereum.org/en/developers/docs/standards/tokens/#token-standards> [26.01.2023].

were brought up repeatedly by participants. The environmental concerns regarding DLT can also be a result of misconceptions about the energy consumption of these technologies.

POW-blockchains⁴⁹, such as Bitcoin indeed require a lot of energy to function (equivalent of Sweden’s annual energy consumption). However, POS blockchains⁵⁰, such as Ethereum or Cardano are much less energy-consuming. It is also important to note that large energy consumption is not equivalent to a large carbon footprint, because the energy might originate in part from renewable energy sources.⁵¹

It is also not surprising that concerns regarding trust in the technology were mentioned so frequently in the light of recent scandals, like FTX and Luna.⁵² Participants also pointed out the security, general technical barriers as well as a lack of technical knowledge and infrastructure as main challenges to tackle.

Figure 5: Uncertainties and Challenges Regarding IP Issues with Blockchain



Note: 31 participants answered this question.

Source: Swiss Economics

Demand for Changes in IP Policy and Legislation

When asked about the need for changes in IP policy and legislation, around half of the participants stated that there is a need for changes in IP policy and legislation as shown in Figure 6.

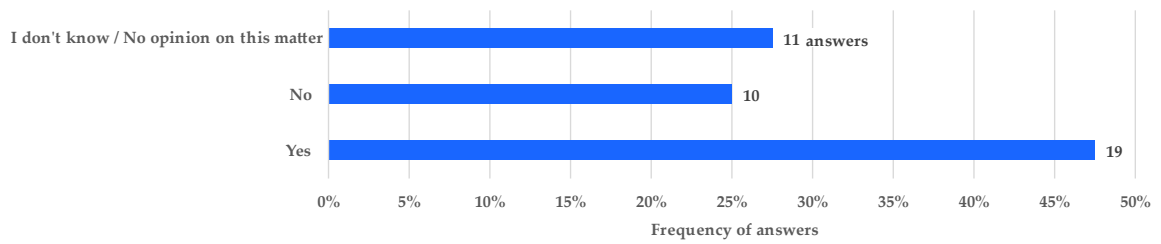
⁴⁹ See glossary in Appendix A1.

⁵⁰ See glossary in Appendix A1.

⁵¹ <https://hbr.org/2021/05/how-much-energy-does-bitcoin-actually-consume> [15.12.2022].

⁵² You can read more about these scandals here: <https://www.theguardian.com/commentis-free/2022/dec/15/crypto-financial-and-corruption-making-it-worse-ftx>, and here: <https://news.deede.io/tech/defi/terra-luna-crash-2022-is-this-the-worst-scandal-in-crypto-history/> [15.12.2022].

Figure 6: Do you think IP policy and legislation need to be adapted due to blockchain applications in the IP ecosystem?



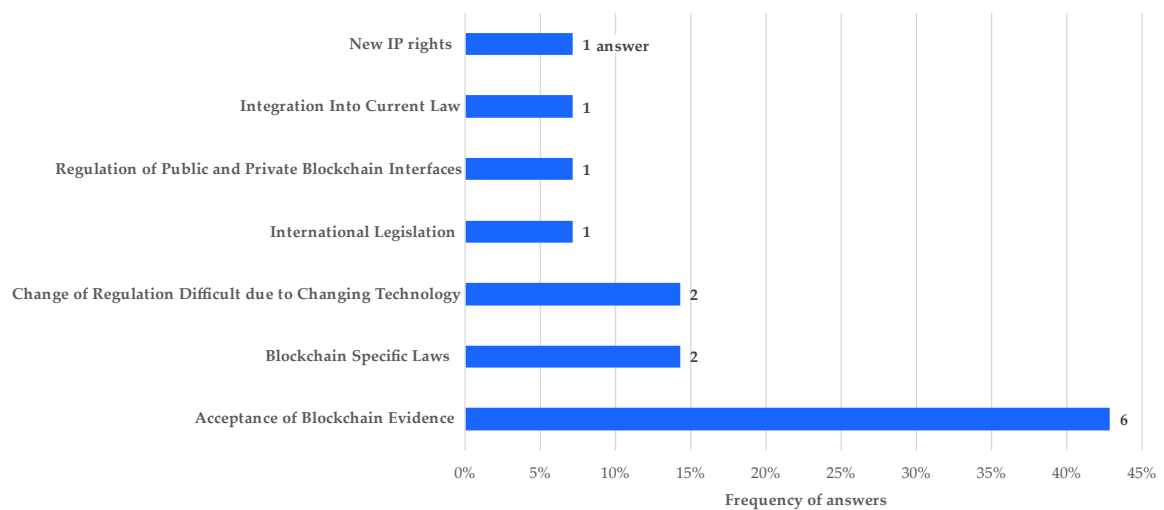
Note: 40 participants answered this question.

Source: Swiss Economics

Those who stated that a change is required were forwarded to the next question, in which they could specify their answers.

The answers from this follow-up question are shown in Figure 7. The most frequently mentioned change which respondents thought should be enacted was the need for legal recognition of digital evidence on blockchains. Many participants further stated that they would like to see specific blockchain laws, while others favor the integration into current legislation. Participants also mentioned the need for regulation of the interaction between private and public blockchain (see section A.1 in the appendix for definitions) solutions. Related to this, participants also wished for a higher degree of coordination from international legislation, to enable interoperability. Lastly, they also acknowledged that the design of changes in legal frameworks is challenging due to the quickly changing nature of the technology and ecosystem.

Figure 7: What kind of IP policy and legislation adaptation is required?



Note: 16 participants answered this follow-up question. Two answers were vague and unclear and have therefore been excluded.

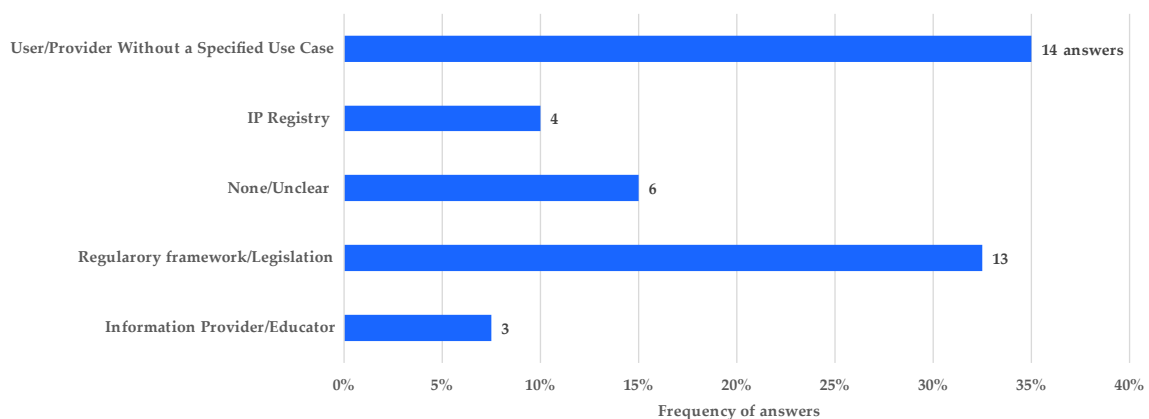
Source: Swiss Economics

The Role of IP Offices and the Use of DLT for IP Offices Themselves

Figure 8 shows the most frequently given responses of participants about what role IP offices should assume in technological transformations of the IP ecosystem using DLT. Of the 32 participants that answered this question, about a third stated that IP offices should act as a regulator and/or adapt legislation. This reflects what was discussed in the previous section on IP policy and legislation.

Another third of participants stated that IP offices should make use of DLT themselves but did not specify how. A 15 percent of the participants did not see any role for IP offices or stated that their role is unclear. Another repeatedly stated opinion was that IP offices should run IP registers on DLT and should assume the role of educator/information provider.

Figure 8: In your opinion, what should be the role of national, regional, and international IP offices in relation to such technological transformations in the IP ecosystem using blockchain technology? (multiple choice question)



Note: 32 participants answered this question.

Source: Swiss Economics

The answers to the following questions gave some more insights into the *specific use of DLT* that participants perceived as feasible for IP offices as well as the benefit its application could bring. Because there were fewer answers to these questions (< 20) and because answers were diverse, we only discuss them qualitatively.

- *What blockchain-related services do you expect from national, regional, and international IP offices in response to these technological transformations?*

Most frequently mentioned were IP registers or registration of IP rights as a service to be offered with blockchain technology. While most answers around IP registers lacked more detail, one participant stated that IP offices should offer timestamping and evidence of ownership services for unregistered rights (as of now) using blockchain technology. Moreover, some stakeholders mentioned transparent regulation and the establishment of international standards. Lastly, a more specific service that a participant described for music and film was an easily accessible database in the form of an application programming interface (API) for collecting societies.

- *In which areas do you see benefits for IP offices themselves from the usage of blockchain, e.g., to improve the efficiency and functioning of their services?*

Legal security and efficiency improvements were mentioned most frequently but without further clarifications. Two participants pointed out similar benefits concerning new “protectable fields” and new “customer segments”. Seven of the 19 participants answering this question stated that they could not recognize any benefits for IP offices themselves.

4 Conclusion and Recommendations

In this study, we examined how DLT applications add value within the Swiss IP ecosystem. We identified various use cases for DLT in IP, as well as the key stakeholders involved. Additionally, we investigated the role of DLT standards, uncertainties, and challenges in this context. Our research process involved an initial review of DLT and IP literature, followed by screening the identified use cases for stakeholders with connections to Switzerland. We conducted interviews with some of these stakeholders to gain further insights into the topic, and then invited participants from IP and/or DLT to take part in an online survey.

The final goal of this country study is to provide recommendations for IPI regarding the other goals specified in section 1.2. With these recommendations we conclude this report.

Recommendation 1: Monitor use cases and regularly re-assess the DLT and IP ecosystem in Switzerland

We recommend the IPI monitor the **use cases identified as most relevant through our survey in Switzerland** (section 3.2). This includes following the activities of involved stakeholders in Switzerland (e.g., through LinkedIn and Newsletters) and potentially getting in contact with these stakeholders to better understand their services, customer base and specific challenges.

Below, we summarize this selection of use cases we recommend monitoring:

- *Tracking and tracing the source of origin:* Supply chain tracking solutions to follow are the European [Pharma Ledger](#) project in which several Swiss pharma firms are involved. Anti-counterfeiting solutions offered by stakeholders in Switzerland are [ORIGYN Foundation](#), [Ardesta](#), [Aura Blockchain Consortium](#). Next to these, the EU’s own DLT solution, which is expected to launch in 2023, is of relevance for the Swiss market.
- *Evidence of generation and timestamping:* While uncertainties remain regarding the legal status of evidence on blockchains, evidence of generation and timestamping is a use case (as well as a feature within other use cases) that deserves IPI’s attention with [OriginStamp](#) and patent and trademark attorneys [P&TS](#) being two Swiss based stakeholders that offer such solutions.
- *Licensing and transfer of IP rights:* Because of the importance of patents for the Swiss IP ecosystem, IPwe, who work with the Swiss based blockchain company [Caspar Labs](#), may become more relevant to the Swiss market in the future. Their solution to manage and

commercialize patent portfolios might be especially beneficial for Swiss SMEs who can access as well as commercialize patents more efficiently, without extensive negotiations and legal costs.

- *IP registers:* Regarding IP registers, the initiatives by the EUIPO are arguably the most relevant use cases for registered rights for Switzerland. Regarding copyrights some use cases exist, for example for [music](#) and [video](#) streaming industries. None of these have experienced mainstream adoption yet but they hold potential and should be monitored generally.

Considering the purpose of a national IP office in a liberal economy, IPI should not offer services that private stakeholders are already offering. Therefore, IP registers are the specific use case of DLT for IP the IPI may adapt itself (see recommendation two).

This country study is the first of its kind for DLT and IP in Switzerland. Because of the fast-changing technological landscape, it is possible that other or new use cases gain relevance in the near future. We therefore advise IPI to conduct a similar investigation of the Swiss IP and DLT ecosystem in two to four years. Such an investigation is important to update the mapping of relevant stakeholders and use cases for the Swiss IP and DLT ecosystem.

We also advise zooming in on relevant identified use cases (i.e., tracking and tracing the source of origin, evidence of generation and timestamping, licensing and transfer of IP rights, and IP registers) and asking stakeholders about, e.g., the specific challenges within their use cases. To get a better understanding of the use case and to dig deeper regarding the issues with IP and DLT identified stakeholders are facing, interviews, workshops or roundtables may prove useful.

Recommendation 2: Coordinate with like-minded countries to establish DLT-enabled international IP registers

The participants emphasized the importance of IP registers based on DLT because they enable seamless integration of DLT use cases from the private sector. Without such registers many use cases cannot be developed or are less effective. In the absence of official IP registers on DLT (and the absence of interoperable solutions), an intermediary is required to pass information from the IP register to the DLT use case. Therefore, the developed use cases cannot run trustlessly. Consequently, the use cases become less efficient and may not be developed or adapted.

Moreover, to overcome inefficiencies in current registration systems and national IP registers described in section 3.2.4, an international IP register is necessary. A DLT-enabled international register can increase efficiencies in international IP value chains and enable further innovations in IP ecosystems using DLT. Such a change in the functioning of the international IP ecosystem requires substantial international collaboration. We therefore recommend IPI to coordinate with like-minded countries to promote the establishment of interoperable IP registers using DLT.

Before such registers are established, IPI can foster innovation in the Swiss IP ecosystem by ensuring that its traditional registries offer easy information access for private stakeholders'

use cases of DLT and IP. This can be achieved, for example, through Application Programming Interfaces (APIs).

Recommendation 3: Follow the debate on blockchain standards

Regarding **blockchain standards**, it is currently unclear which blockchain(s) and what international set of standards will establish themselves in the industry. We recommend following the ongoing debate through [INATBA](#) in Europe and WIPO's [blockchain task force](#) for an IP-centric view on DLT, including standardization.

Recommendation 4: Provide guidance on the legal framework of DLT and associated use cases

We recommend IPI act as an educator about use cases and legal issues regarding technological innovations in IP value chains. In this sense, IPI could tackle some of the **uncertainties and challenges** stated by the surveyed stakeholders. Most importantly, IPI should provide guidance on the legal framework of DLT in the IP ecosystem. For example, through informing stakeholders about important court rulings about DLT and IP. Besides this, IPI can clarify some misconceptions and environmental concerns by providing easily digestible information about identified use cases of DLT for IP.

Regarding uncertainty about the legal framework, IPI may suggest adaptations in IP policy and legislation. Legal acceptance of digital evidence on blockchains was most frequently mentioned by participants regarding their opinion about the need for such adaptations. We did not study how a recent revision of the EU's legislation for timestamping ([eIDAS](#)) clarifies such issues. Further work should investigate potential changes of the legal framework around traditional timestamping and timestamping on blockchains. See for example Sorge and Leicht (2022) as a starting point of the legal and technical debate.

5 References

- Bechtold, S., de Rassenfosse, G. (2020). Intellectual Property Protection and Innovation in Switzerland. Study elaborated as part of the report “*Research and Innovation in Switzerland 2020*” Part C, Study 6. Last retrieved on 02.11.2022 from https://www.sbf.admin.ch/dam/sbf/en/dokumente/webshop/2020/f-i-studie-6.pdf.download.pdf/studie_6_langversion.pdf.
- Belchior, R., Vasconcelos, A., Guerreiro, S., & Correia, M. (2021). A survey on blockchain interoperability: Past, present, and future trends. *ACM Computing Surveys (CSUR)*, 54(8), 1-41. Last retrieved on 10.03.2023 from <https://arxiv.org/abs/2005.14282>.
- CV VC. (2022). *Top 50 Report 2021*. Last retrieved on 10.03.2023 from <https://www.cvv.com/insights#>.
- Labazova, O., Dehling, T., & Sunyaev, A. (2019, January). From hype to reality: A taxonomy of blockchain applications. In *Proceedings of the 52nd Hawaii International Conference on System Sciences (HICSS 2019)*. Last retrieved on 10.03.2023 from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3250648.
- Maskus, K. E. (2000). Intellectual Property Rights and Economic Development, *Case Western Reserve Journal of International Law*, 32, 3. Last retrieved on 10.03.2023 from <https://scholarlycommons.law.case.edu/cgi/viewcontent.cgi?article=1499&context=jil>.
- Nakamoto, S. (2008). Bitcoin: A peer-to-peer electronic cash system. *Decentralized Business Review*, 21260. Last retrieved on 10.03.2023 from <https://bitcoin.org/bitcoin.pdf>.
- OECD. (2021). Counterfeiting, Piracy and the Swiss Economy, *Illicit Trade*. Last retrieved on 10.09.2022 from <https://www.oecd-ilibrary.org/sites/1f010fc9-en/index.html?itemId=/content/publication/1f010fc9-en>.
- Sorge, C., & Leicht, M. (2022). Blockchain-based electronic time stamps and the eIDAS regulation: The best of both worlds. *SCRIPT-ed*. Last retrieved on 10.03.2023 from <https://www.semanticscholar.org/paper/Blockchain-based-electronic-time-stamps-and-the-The-Sorge-Leicht/aefe8c523350f99ab85ccd3b73063f9144f38c62>.
- State Secretariat for Education, Research and Innovation (SERI). (2020). *Research and Innovation in Switzerland*. Last retrieved on 29.11.2022 from <https://www.sbf.admin.ch/sbf/en/home/research-and-innovation/research-and-innovation-in-switzerland/r-and-i-report.html>.
- World Economic Forum (WEF). (2020), *Global Standards Mapping Initiative: An overview of blockchain technical standards*. Last retrieved on 25.11.2022 from https://www3.weforum.org/docs/WEF_GSMI_Technical_Standards_2020.pdf.
- World Intellectual Property Organization (WIPO). (2022). *Blockchain technologies and IP ecosystems: A WIPO white paper*. Last retrieved 10.03.2023 from <https://tind.wipo.int/record/44950/files/Blockchain%20technologies%20and%20IP%20ecosystems%3A%20A%20WIPO%20white%20paper.pdf>.

A Appendix

A.1 Blockchain Terms and Definitions

Public vs. Private blockchains: In public blockchains like Bitcoin, anyone can use the network without any access restriction or registration process for initiating transactions. On the other hand, only defined users have access to the network in private blockchains. Therefore, public access cannot be considered a universal characteristic of DLT and blockchain technology.

Permissionless vs. Permissioned blockchains: In a permissionless blockchain like Bitcoin, anyone can participate in the verification process and, based on a consensus mechanism, add user transactions to the blockchain. In contrast, in a permissioned blockchain, the permission to write user transactions is restricted to a few entities. [Hyperledger Fabric](#) is an example of a permissioned blockchain that is used, for instance, in the IBM [Food Trust Chain](#). Permissionless blockchains rely on the consensus mechanism (see also below), while permissioned blockchains rely on trust towards the authorized entities.

Cryptography refers to the practice and study of techniques for secure communication in the presence of third parties. These techniques typically involve using mathematical algorithms and protocols to encode and decode messages, ensuring their confidentiality, integrity, and authenticity are protected.⁵³

Consensus Mechanism: Permissionless blockchains operate without a central authority to approve activity among the network's members. Therefore, achieving consensus among members is necessary to verify and add new blocks of data (transactions) to the chain. There are several different types of consensus mechanisms, but they share the characteristic of being based on predefined rules that determine which specific network member (node) adds the latest block to the chain. As compensation for this process of adding a new block (validation), the network member receives a payment (reward).

Proof of Work (POW) was the first consensus mechanism proposed and implemented in a blockchain (Bitcoin). POW operates by requiring potential nodes (referred to as "miners") to perform computational work to verify and add a new block of transactions to the blockchain. Miners who perform more computational work are more likely to be elected. Thus, POW requires significantly more energy than other consensus mechanisms that do not rely on computing power to achieve consensus.⁵⁴

Proof of Stake (POS) and its derivatives are the most widely used consensus mechanisms by blockchains. In POS, potential nodes are required to stake a certain amount of the blockchain's native tokens they possess, which involves locking up these tokens and rendering them unavailable for other purposes. Based on the staked amount, the mechanism selects a

⁵³ <https://sopa.tulane.edu/blog/what-is-cryptography> [18.11.2022].

⁵⁴ <https://www.forbes.com/advisor/investing/cryptocurrency/proof-of-work/> [18.11.2022].

node that is authorized to add the next block of transactions. The higher the stake amount a node locks up, the greater their chances of being chosen. In the event of any misconduct, such as validating false transactions, nodes risk losing their staked coins.

Smart contracts are computer programs that are immutable and intended to automatically execute code or sequences as defined in the contracts. The purpose of smart contracts is to enable contracts to be executed efficiently and rapidly without the involvement of intermediaries. For instance, a smart contract can automatically validate transactions in a licensing agreement, obviating the need for an arbitrator.⁵⁵ The underlying concept is that smart contracts implemented on a blockchain have the potential to replace intermediaries, making services more efficient, transparent, and secure.

Tokenization refers to the process of converting tangible assets (e.g., physical objects like coins or paper money) or intangible assets (e.g., ideas that possess value) into digital units. While such conversions can occur using traditional technologies, the term has become closely associated with blockchain technology, where tokenization is a crucial component in many use cases. Digital tokens on blockchains allow for peer-to-peer transactions to take place without intermediaries.⁵⁶

Non-Fungible Tokens (NFTs) are distinctive tokens that represent tangible or intangible assets, such as music, video, or visual art. Unlike cryptocurrencies like Bitcoin, which are fungible, with each bitcoin possessing the same value and exchanging one bitcoin for another having no impact on the value held by the owners, non-fungible assets like NFTs are unique and have individual values assigned to them. NFTs are designed to authenticate and prove ownership of the unique asset they represent. Stored on the blockchain, they are cryptographically verifiable and can be traded.⁵⁷

A.2 Interviews

Table 2: Interviews

Organization	Role(s)	Date(s)
IPwe	Product Management, Innovation	July 22 and 27, 2022
OriginStamp	Co-Founder	July 28, 2022
ProLitteris (CMO)	Director	August 3, 2022
Zertifier	Co-Founder	August 5, 2022
University of Neuchâtel	Law Professor	August 8, 2022

Source: Swiss Economics

⁵⁵ <https://discovery.researcher.life/article/smart-contracts-and-licensing/3b8e93ef7eb23704b975f0da034bfe55> [18.11.2022].

⁵⁶ https://assets.ey.com/content/dam/ey-sites/ey-com/en_ch/topics/blockchain/ey-tokenization-of-assets-broschure-final.pdf [25.11.2022].

⁵⁷ https://assets.ey.com/content/dam/ey-sites/ey-com/en_ch/topics/blockchain/ey-tokenization-of-assets-broschure-final.pdf [25.11.2022].

We had short calls with several other practitioners who referred us to other stakeholders in the ecosystems of DLT and IP. Only those stakeholders are included in Table 2 who shared insights that we included in this study.

A.3 Additional Results of the Online-Survey

A.3.1 Participant Information (anonymized)

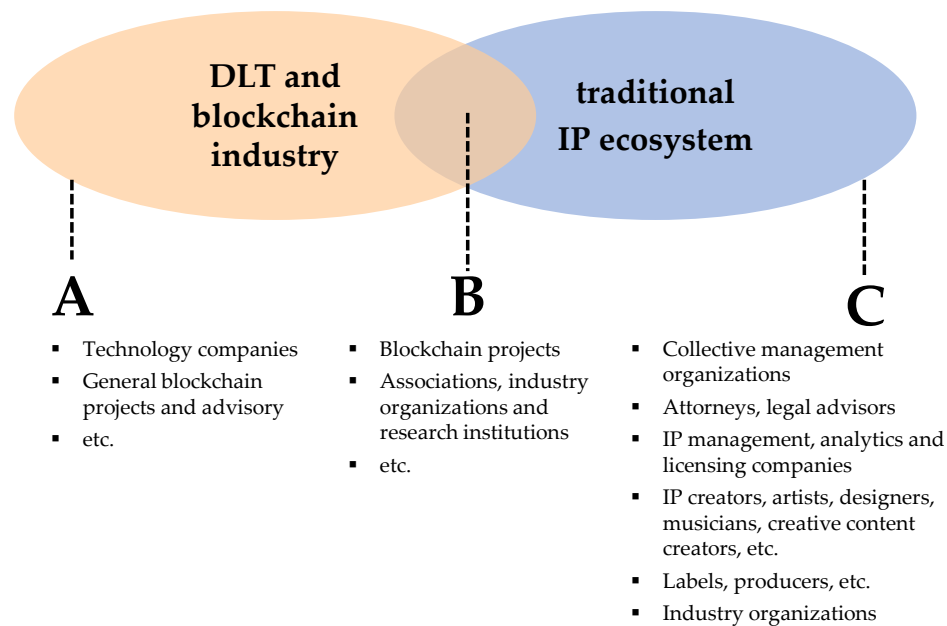
As part of our survey, we asked questions about the participants themselves, including their individual roles and how their organizations were connected to either the IP or the blockchain industry. In this section, we provide a summary of their responses to the following questions:

- a) To which part of the ecosystem(s) of blockchain and IP do you belong?
- b) As part of your role, are you a service provider or a user of blockchain and/or IP services?
- c) How would you describe your role or the role of your organization in the IP and/or blockchain ecosystem?
- d) Does your organization have any connection with the Swiss IP and/or the Swiss blockchain ecosystem?
- e) Does your organization have any plans to change or expand its relations to the Swiss market regarding clients, offices, partnerships, etc. (IP and/or blockchain-related)?

A.3.2 Participants' Industrial Affiliation

All participants answered the question about industrial affiliation (in total 41 answers). They were shown Figure 9 below to determine their general affiliation.

Figure 9: Industrial Classification of Participants



Source: Swiss Economics

According to our evaluation, 68 percent of the answers came from individuals who are involved in the traditional IP ecosystem, whereas 10 percent of the responders are from the DLT and blockchain industry. 20 percent of the individuals came from the intersection of IP and blockchain. One person chose none of the three proposed options and described their industrial affiliation as a “*traditional IP service provider, a user of cryptographic signatures and timestamps*”.

A.3.3 Participants’ Roles as Users or Providers

In this question, we asked participants whether their roles involved using or providing IP and/or blockchain services.

The percentage of participants who identified themselves as *users* or *providers* of blockchain/IP services was equal, at 46 percent. This indicates that we were able to survey a balanced number of users and providers. Additionally, three participants provided their own descriptions of their roles. One participant described themselves as a “provider of protective rights for blockchain applications,” while another identified as an advisor to IP-related businesses with potential future use of blockchain solutions. The third person described their role as an intermediary between users and the industry.

A.3.4 Role of the Participants’ Organizations

Participants were asked to identify the role of their organizations in the blockchain and/or IP ecosystem. They were able to specify multiple roles in their open text answers. We received 31 answers, but three of them were not interpretable.

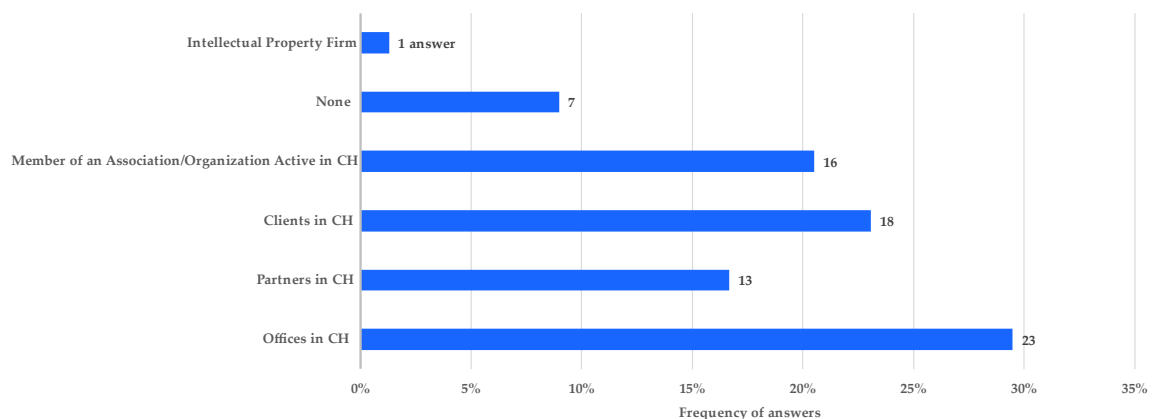
One-third of the participants identified as IP attorneys, while 21 percent were providers of legal advice. We received two answers from representatives of collective management organizations, and two answers from those involved in "IP protection". Additionally, we received one response each in the following areas, as described by the participants:

- IP management software provider
- Pharma industry
- Technology transfer
- A user of IP services
- A user of blockchain solutions
- Associations
- Blockchain enabler for innovative IP firms
- Provider of key management and a Container Operating System to run micro-services related to IP
- Storing and verifying information about music rights

A.3.5 Participants' Affiliation with the Swiss IP and Blockchain Industry

In this question, we asked participants about the connection of their organizations with the Swiss IP and/or blockchain ecosystem, if any. We received 40 responses which are summarized in Figure 10.

Figure 10: Participants' Affiliation with the Swiss Economy



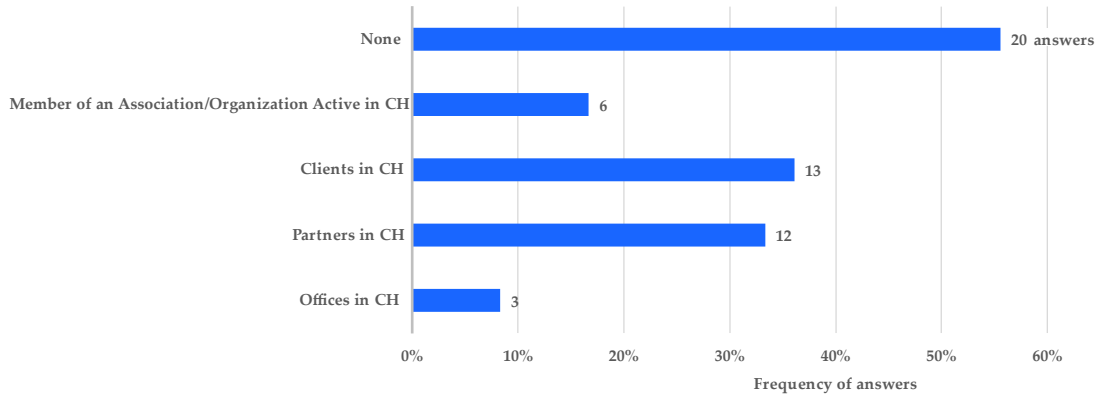
Source: Swiss Economics

23 stated that their organization has offices in Switzerland and 18 mentioned having clients there. Additionally, 16 participants are members of an association or organization active in Switzerland, while 13 have partners in Switzerland. Seven participants reported having no connections to the Swiss ecosystem, and one response was not interpretable. As this was a multiple choice question, participants could indicate multiple forms of connections to Switzerland.

A.3.6 Participants' Business Relationships in Switzerland

In this question, we evaluated whether organizations are planning to extend their business relationships with the Swiss market. 36 participants answered this multiple choice question. We summarized the answers in Figure 11.

Figure 11: Answers to the Question Regarding Plans to Expand in the Swiss Economy



Source: Swiss Economics

The majority of participants (20) indicated that their organization does not have any plans to change or increase their involvement in the Swiss market. 13 participants stated that they plan to expand their customer base in Switzerland, while 12 are planning to establish new partnerships in Switzerland. Six responses indicate that some organizations plan to become members of an association or organization active in Switzerland, while three organizations are planning to open offices in Switzerland.

A.4 Questionnaire Used in the Online Survey

The following section displays the questionnaire that was used in the online survey, along with the background information provided at the beginning of the survey. Brackets have been added to indicate where answer fields were placed in the online survey.

- Multiple choice questions [MC: ...]
- Single choice questions [SC: ...]
- Open questions [open text answer]

In some single or multiple choice questions, participants were given the option to provide a specific answer in a text field. As a result, certain multiple and single choice questions in the questionnaire below include an option that reads, "other, please specify below."

Background

Distributed ledger technology (DLT) in general, and blockchain technology as its best-known form, have experienced a surge in interest and applications over the past years. Most people associate the technology with Bitcoin, the most widely known cryptocurrency. However, the potential benefits from blockchain solutions go far beyond cryptocurrencies as they can increase efficiency, transparency, and security in many industries.

Among these, the intellectual property (IP) intensive industry can potentially benefit strongly from blockchain technology. This industry creates IP assets which can be defined as intangible assets that are owned by individuals, organizations, or companies. Such intangible assets include different asset classes which are protected under different rights. Commonly known classes are:

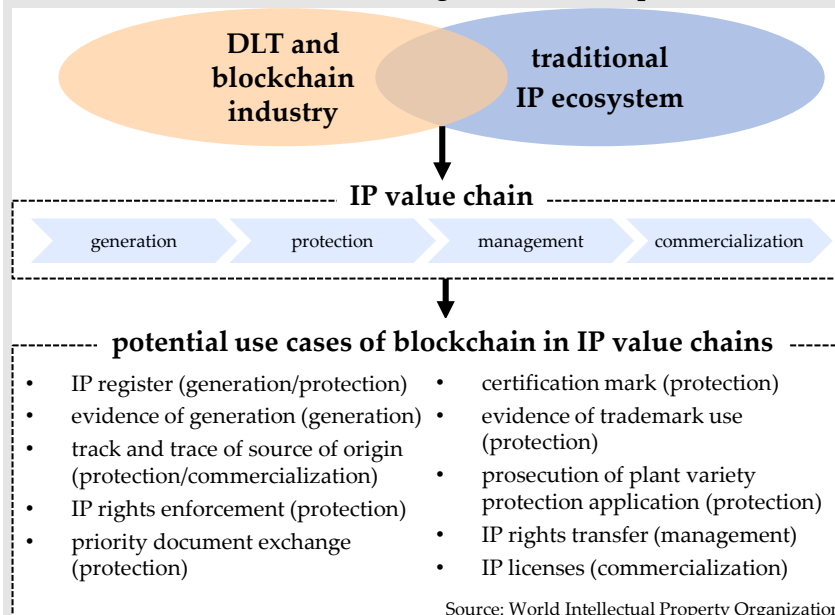
- inventions that can be protected through registered *patents*,
- creative work like music, films, books, art works and under certain conditions also databases, which are protected by *copyrights*,
- symbols, logos, brand names, etc. that can be registered as *trademarks*, and
- shapes and forms i.e. the exterior of an object that can be registered as designs. See <https://www.ige.ch/en/intellectual-property> for more information on IP and IP rights.

In the generation, protection, management and commercialization of IP, many stakeholders are involved in collaborative and competitive ways. Players in this *IP ecosystem* have broad backgrounds (artistic, technical, legal, economic, etc.) and take different roles. While some generate an IP asset (e.g., R&D departments), others determine a way to protect it (e.g., patent attorneys) and others work in the management and commercialization of this IP asset (e.g., portfolio managers licensing patent rights). Note, that this presents only one example of an *IP value chain*.

Several processes in IP value chains can potentially benefit from blockchain technology by making processes at different stages more secure, efficient, and transparent. More specifically, to give an example, blockchain technology can tackle challenges of stakeholders in IP by facilitating the proof of ownership and by offering anti-counterfeiting solutions. These potential applications of blockchain technology for IP – of which some are already existing – are the topic of this study. We further refer to these applications of blockchain for IP as *use cases*.

The figure below shows the use cases of blockchain for IP along the phases of the IP value chain which the World Intellectual Property Organization described in their whitepaper on blockchain for IP (see <https://www.wipo.int/cws/en/blockchain-and-ip.html>).

Use cases of blockchain for IP along IP value chain phases



The purpose of this survey

The Federal Institute for Intellectual Property aims to improve its services and commissioned Swiss Economics to conduct a survey. We identified you as a potential stakeholder in at least one of the described ecosystems. Therefore, we would like to ask you about your opinion and needs around technological transformations with blockchain technology in the IP ecosystem as well as about IP issues in the blockchain ecosystem.

Participation in this survey helps forming the services of the Swiss IP office related to blockchain applications for IP.

How to complete this survey

The survey includes questions of different type:

- **Multiple choice questions (MC)** offer different answers from which you may choose all that apply
- **Single choice questions (SC)** offer several answers from which you may choose the one that applies most
- **Open questions:** some questions ask you to freely formulate your answer, either in full sentences or using keywords You may write your answer/comment in English, French, German or Italian language.

While the survey is most informative if participants answer all questions, you are free to skip questions. If anything is unclear and/or if you would like to discuss a topic with the surveyor, please, contact survey@swiss-economics.ch. Additionally, there is the possibility to leave general comments and feedback at the end of this survey.

Disclaimer on anonymity

The IPI and the surveyor will use your answer to develop a country study on blockchain for IP in Switzerland. Your identity or that of your organization will not be revealed when using your responses without your consent. Hence participation in this survey is anonymous unless a participant wants to share their identity or that of their organization.

Sharing of your identity will allow the IPI to contact you in case further exchange and/or collaboration could benefit its service-delivery. Specifically, the IPI wants to establish a contact point with the industry to exchange on the topic of blockchain standards.

Question Set 1: Mapping of stakeholders

Our preliminary research identified stakeholders for several use cases in and around the Swiss IP ecosystem. Below is a non-exhaustive list of identified stakeholders. Also, some stakeholders cover several of the use cases and are hence active in several phases of IP value chains:

- IP register (generation/protection): Public IP registers like TMview and DesignView from the European Union for registered trademarks and designs, registers run by private companies such as IPwe (for patents), etc.
- evidence of generation (generation): OriginStamp, Mytitle, Bernstein, CreativitySafe, etc.
- track and trace of source of origin (protection/commercialization): Authena, ORIGYN, etc.
- priority document exchange (protection): Zertifier, etc.
- evidence of trademark use (protection): IPBee, etc.
- IP rights transfer (management): NFT marketplaces, etc.
- IP licenses (commercialization): IPwe, InvArch, utopia, etc.

Some stakeholders we identified so far offer blockchain solutions not specifically for IP but solutions that have potential use for IP too. Examples are:

- Procvivis who develop decentralized identifiers and
- OriginStamp who provide time-stamping services generally, besides specific services for IP.

For a list of all potential use cases, as described by the World Intellectual Property Organization, click on the 'overview' button.

What additional stakeholders (startups, firms, associations, research institutes, individual experts or entrepreneurs, etc.) do you know of that use or develop *blockchain solutions for application in the IP ecosystem*? These may be

- blockchain solutions specifically designed for IP (e.g., blockchain registers for IP rights) or
- blockchain solutions designed for general purposes that can also be used within the IP value chain (e.g., time-stamping services).

In the IP ecosystem in Switzerland:

[open text answer]

In other international IP ecosystems:

[open text answer]

Question Set 2: Use cases of blockchain in IP

Are you or organizations that you are involved in *developing or running blockchain solutions*?

[SC: Yes / No / I don't know]

- Blockchain services for IP we are developing or providing: [open text answer]

- Blockchain services which can potentially be used for IP we are developing or providing: [open text answer]

There are numerous potential use cases of blockchain for IP ecosystems, some of which are currently being developed or are already running. *Regardless of your involvement in such projects or your knowledge of use cases being deployed by other stakeholders*, we would like to ask you for your professional opinion on potential use cases of blockchain for IP ecosystems.

In what areas do you think blockchain technology use cases can *potentially be most valuable* for the IP ecosystems?

[MC:

Please choose the use cases along the phases of the IP value chain as described by the World Intellectual Property Organization (see overview). In case the use cases you think are most valuable are not covered in the offered selection, please specify the use case in your own words further below.

- IP register (generation/protection)
- evidence of generation (generation)
- track and trace of source of origin (protection/commercialization)
- IP rights enforcement (protection)
- priority document exchange (protection) other (please specify)
- certification mark (protection)
- evidence of trademark use (protection)
- prosecution of plant variety protection application (protection)
- IP rights transfer (management)
- IP licenses (commercialization)
- none
- other, please specify below

]

Kindly explain how you think the selected use cases will benefit the IP ecosystems e.g., most value-add, or address key challenges, etc.

[open text answer]

What use cases of blockchain for IP do you think are *most likely to be developed in the near future*?

Please select the use cases along different phases of the IP value chain (see overview). In case the use cases you think are most likely to be developed are not covered in the offered selection, please specify the use case in your own words further below.

[MC:

- The same use cases that I think are the most valuable for the IP ecosystem, as indicated in the previous answer.

The use cases along phases of the IP value chain as described by the World Intellectual Property Organization (see overview):

- IP register (generation/protection)
- evidence of generation (generation)
- track and trace of source of origin (protection/commercialization)
- IP rights enforcement (protection)
- priority document exchange (protection) other (please specify)
- certification mark (protection)
- evidence of trademark use (protection)
- prosecution of plant variety protection application (protection)
- IP rights transfer (management)
- IP licenses (commercialization)
- none
- other, please specify below

]

Kindly explain how you think the selected use cases will benefit the IP ecosystems e.g., most value-add, or address key challenges, etc.

[open text answer]

IP offices can take the role of regulator, service-provider and/or user of blockchain technology for IP purposes. In your opinion what should be the role of national, regional and international IP offices in relation to such technological transformations in the IP ecosystem using blockchain technology?

[open text answer]

What blockchain-related services do you expect from national and international IP offices in response to these technological transformations? If you already answered this question with your answer for the previous question, you may skip this question.

[open text answer]

In which areas do you see *benefits for IP offices themselves from the usage of blockchain*, e.g., to improve their efficiency and functioning of their services?

[open text answer]

Question Set 3: Uncertainties and challenges

Where do you see *uncertainties and challenges* regarding IP issues with blockchain applications in general? These might exist in terms of technical, legal, economic, and political aspects of blockchain and IP, such as IP ownership and transactions on blockchains.

[open text answer]

Do you think IP policy and legislation needs to be adapted due to blockchain applications in the IP ecosystem?

[SC: Yes / No / I don't know or no opinion on this matter]

In case participants answered 'yes':

Can you briefly describe the change in IP policy and legislation you think is needed?

[open text answer]

Question Set 4: Blockchain standards

Blockchain standards exist at different levels, i.e., the application, smart-contract and token design, the platform level, as well as regarding data and security of blockchains. These standards are expected to play an important role in ensuring interoperability of blockchain solutions, upon which many of the promised benefits of blockchain technology depend. Therefore, we would like to learn what standards are mostly used today or might be used in the future.

Note, if you have little knowledge about blockchain technology, please click the 'skip' button and you will be forwarded to the next set of question.

In case you are involved in a project where blockchain technology is or will be used for IP, please answer the following questions. Otherwise, please press the 'skip' button and you will be forwarded to question 18.

Which Blockchain Technologies are you currently working with (Layer-1)?

[MC: from a list of Blockchains]

On the mentioned Blockchain(s), which (Token-)Standard do you use (e.g., ERC-721, etc.)?

[Open Question]

Do you use sets of standards from international organizations (e.g. ISO-307, ITU, ETSI, others)? If so, what sets of standards do you use?

[SC: Yes / No / I don't know]

[Open Question]

Do you use other standards for the following topics of your blockchain solution?

[SC: Yes / No / I don't know]

- For interoperability we use: [Open Question]

- For the governance of our blockchain solution we use: [Open Question]

- For security on our blockchain solution we use: [Open Question]
- For identity on our blockchain solution we use: [Open Question]
- For smart contracts we use: [Open Question]

Do you consider changes in the usage of any standards in the future? If so, what changes do you consider?

[SC: Yes / No / I don't know]

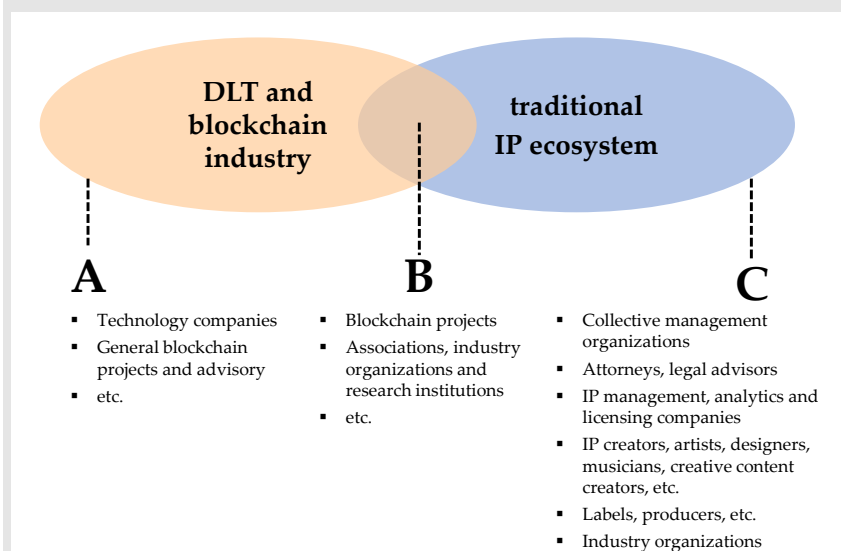
[open text answer]

Regardless of whether you are involved in blockchain projects yourself, in general what blockchain standards do you think will be relevant in the future (standards as mentioned in questions 13 to 17, in case you answered these questions)?

[open text answer]

Question Set 5: Participant information

To which part of the ecosystem(s) of blockchain and IP do you belong?



[SC:

- A: DLT and blockchain industry
- B: at the intersection of blockchain and IP
- C: traditional IP ecosystem
- other (please specify below)

]

[open text answer]

As part of your role, are you a service *provider* or a *user* of blockchain and/or IP services?

[SC:

- provider of blockchain and/or IP services
- user of blockchain and/or IP services
- other (please specify below)

]

[open text answer]

How would you describe your role or the role of your organization in the IP and/or blockchain ecosystem? If you are active in only one of these ecosystems, please describe your role accordingly. If you are active at the intersection, please specify how your work has links with the two ecosystems.

[open text answer]

Does your organization have any connection with the [Swiss/Singaporean] IP and/or the [Swiss/Singaporean] blockchain ecosystem?

[MC:

- office(s) in [Switzerland/Singapore]
- partner(s) in [Switzerland/Singapore]
- client(s) in [Switzerland/Singapore]
- member of an association or organization active in [Switzerland/Singapore]
- none
- other (please specify below)

]

[open text answer]

Does your organization have any plans to change or expand its relations to the [Swiss/Singaporean] market regarding clients, offices, partnerships, etc. (IP and/or blockchain related)?

[MC:

- office(s) in [Switzerland/Singapore]
- partner(s) in [Switzerland/Singapore]
- client(s) in [Switzerland/Singapore]
- member of an association or organization active in [Switzerland/Singapore]
- none
- other (please specify below)

]

[open text answer]

By providing an email address, you agree to reveal your identity to the study conductors. We may contact you if more information could benefit this study. We treat answers confidentially and your identity will not be revealed with the publication of the results of this survey. We will inform you about the publication of this study if you provide your email address.

You may stay anonymous and skip this answer.

[open text answer]

Review Page

You have gone through all of the survey questions. Already given answers are saved.

You may edit or complete your answers until [date when last responses of the online survey can be submitted] using the same link you used to open this survey.

If you have general comments or feedback regarding this survey or the topic of blockchain and IP, you are welcome to leave a comment below:

[open text answer]

To submit your final answers please press the 'submit' button.

You may also contact survey@swiss-economics.ch if you have any questions.

End of survey page

Thank you for participation in this survey.

Kind Regards,

Swiss Economics / cryptecon

(on behalf of the Swiss Federal Institute of Intellectual Property)

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