EXCEPTIONAL RESEARCH THAT MAKES AN IMPACT

June 2021

CASE STUDY: USING SMART LICENSES TO RESTORE TRUST IN IP LICENSING

By developing a Distributed Ledger Technology (DLT) based prototype, University of Cambridge researchers have developed a trusted computing platform to automatically track, secure, and enforce licensing agreements using smart contracts.

THE CHALLENGE

Thanks to advancements in technology, the Internet of Things (IoT) is enabling devices (things) to connect to the internet at an exponential rate. As the digital economy becomes more connected, innovations incorporate increasingly complex sets of hardware and software technologies. These technologies often build on Intellectual Property (IP) from multiple originators, creating a complex 'web' of terms and conditions that licensees must comply with.

As no digital infrastructure exists to settle those complex IP licensing payments, they often tend to be carried out manually - a business process which can be time consuming and prone to errors. Furthermore, valuating and executing complex licensing agreements can be difficult, especially for companies with multiple active licenses across a number of different products, and with slow internal communications between different departments. To navigate these problems, licensors tend to use rather simplistic, often sub-optimal licensing terms, and therefore miss out on potentially fairer remuneration for their IP.

To address this situation in the licensing market, and to drive IP management systems to the digital economy, the **Innovation and Intellectual Property Management Lab** at the **Institute of Manufacturing, University of Cambridge** has developed an Automated Licensing Payment System (ALPS) technology.

Funded by Research England's **Pitch-In** project, which seeks to identify and address barriers to the successful development, introduction and exploitation of IoT, the team have successfully used Distributed Ledger Technologies (DLT) and smart contracts to digitally record and validate transactions. These transactions contain agreed terms of licensing contracts and are capable of issuing licensing payments in accordance with the specified terms.

THE PROJECT

Thought to be one of the first of its kind, the ALPS technology developed by Frank Tietze, Damiano Di Francesco Maesa and team, allows for accountable, enforceable, transparent and trusted licensing agreements. By working in collaboration with the Technical University Munich, alongside IP experts and UK-based small-medium sized companies, the team has been able to gain a better understanding of the issues encountered within the current – and often inefficient - licensing business processes.

Through interviews and workshops the project has articulated the current status quo of inefficiencies and market needs. Using these insights, the team designed and created a demonstrator prototype as a web app simulator, capable of managing an ecosystem of licensors, licensees, and devices containing a set of different IPs and associated licensing agreements. The software can simulate royalty revenue streams with the passing of time, intuitively visualising the results, and allows for fast prototyping and comparison of license agreements.

UNIVERSITY OF CAMBRIDGE Department of Engineering
IfM MANAGEMENT TECHNOLOGY POLICY
Pitch-In
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"Two years ago, my boss asked me if there was a blockchain solution for licensing. But we couldn't find a product that actually used smart contracts to automate payments." Project participant from a multinational engineering and technology company.

According to Frank Tietze, the team's proposed ALPS lowers costs for administering payments, while increasing accuracy, reducing the trust problem and minimizing the need for audits.

"Overall, it enables more efficient licensing and novel business models as well as contributing to fairer value distribution to inventors. This helps solve existing trust problems where licensors face information asymmetries when trying to verify the accuracy of payments they receive from licensees." Frank Tietze, Project Lead, University of Cambridge.

In the ALPS system, a license agreement for a given product, particularly its parts that relate to royalty payment terms, is broken down into its logical components to be represented into a structured data format, named the Bill of IP (BoIP). The structured nature of the BoIP allows for a direct translation of the licensing agreement's logic into executable data. This data is deployed as smart contracts into ALPS. As it represents the licensing logic, the smart contract is named smart license, and its execution mimics the license life cycle. By being run on a DLT, the smart license execution is delegated to the entire DLT network, rendering it non-adaptable by the licensee and licensor as well as transparent to both, while still remaining updatable in case of license agreement renegotiation. This allows for automatic payments, carried out by the contract on behalf of the licensee.

"For this solution, I see a lot of potential in complex, patented products. This could be very beneficial for both licensors and licensees." Project participant from a high-tech photonics company.

Current business processes require regular audits, which are not only costly, but can impact the relationship between licensors and licensees. The ALPS technology promises to make licensing audits at least partially obsolete.

THE IMPACT

By responding to existing market needs, the team has been able to develop technology which offers potential novel business models for managing licenses in the IoT industry. The project tackles the problem of high transaction costs in the management of IP caused by lack of transparency and highly complex payment processes.

ALPS was one of the three winners of the 2020 Cambridge Blockchain Prize. The prize, jointly run by the **Cambridge Blockchain Society** and the **Cambridge Blockchain Hub** recognises research that integrates blockchain or other forms of Distributed Ledger Technologies into a working solution.

Looking ahead, the team has recently run a first workshop with lead users from industry who combine licensing expertise with an interest in DLT to explore industrial use cases and possible research partnerships. The team have also been selected to participate in Impulse, the University's Tech Entrepreneurship programme and are currently working on putting together a founding team for a potential start-up to push the technology into the IP industry to transform IP licensing and make it fit for the digital economy.

SEE ALSO

- Tietze, F., Di Francesco Maesa, D. and Theye, J. (2020). On-demand IP licensing for the digital economy. Les Nouvelles.
- Tietze, F., Theye, J., Obermeier, D. and Di Francesco Maesa, D. (2021). Introducing the Bill of IP, a novel concept for the digital IP management applied to a DLT-based smart licensing system R&D Management Conference, Glasgow.
- Tietze, F., Di Francesco Maesa, D. and Theye, J. (2020). **On-demand IP Licensing for the DigitalEconomy**. CTM Working Paper Series. Institute for Manufacturing. Cambridge, UK. (10.17863/CAM.62025)
- Di Franceso Maesa, D., Tietze, F., and Theye, J. (2021). Putting Trust Back in IP Licensing: DLT Smart Licenses for the Internet of Things. IEEE International Conference on Blockchain and Cryptocurrency. Virtual.

PROJECT AND TEAM

M19: Prototyping an IoT platform for automated IP licensing payments.
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PITCH-IN

Pitch-In aims to collaboratively identify and address barriers to the successful development, introduction and further exploitation of Internet of Things technologies across four key sectors, Cities, Energy, Health and Wellbeing and Manufacturing, whilst also overcoming the social and organisational barriers related to Managing the Introduction of IoT.

The project is funded until 2021 through Research England's **Connecting Capability Fund**.

CBPRIZE Winner (2020)