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Blockchain and the New Zealand Agtech Industry

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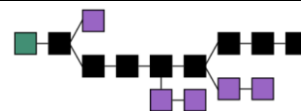
Blockchain technology can be traced to the early 1990s^{1,2}, but first came to mainstream public attention in 2008 when Satoshi Nakamoto published a peer-to-peer transaction system for electronic cash (Bitcoin)³.

The technology allows online transactions (e.g. payments, or other exchanges of assets) to be sent directly between willing parties in a way that eliminates the need for a trusted third party (a central organisation or system) to be involved to guard against fraud³.

Blockchain is a type of open and distributed ledger across a peer-to-peer computer network that records transactions as a continuously growing list of records (blocks) that are⁴:

- Linked and secured using cryptography
- Containing timestamp and transaction data
- Inherently resistant to data modification

Illustration of a Blockchain Network⁵



Although it is not impossible to alter the records within the blockchain, the decentralised design means that information within any specific block (transaction) cannot be altered without affecting all subsequent blocks, and only with the consensus of the trusted network⁶.

Blockchain, or more broadly the distributed ledger, is a powerful tool to more efficiently manage many types of assets and transactional processes, including financial, contract and supply.

Blockchain and New Zealand Agtech

Agriculture has long been a significant part of the New Zealand economy and continues to be so. Aotearoa is also rapidly becoming a leading player in the global high-tech industry, an initiative with government backing^{7,8,9}, with the New Zealand Agtech sector itself becoming recognised as a significant global player in this emerging space¹⁰.

¹ Haber, S. & Stornetta, W.S. (1991). "How to time-stamp a digital document." *J. Cryptology* **3**(2), 99-111. <https://doi.org/10.1007/BF00196791>. Retrieved August 24, 2018.

² Bayer, D., Haber, S., Stornetta, W.S. (1993). "Improving the Efficiency and Reliability of Digital Time-Stamping." In: Capocelli, R., De Santis, A., Vaccaro, U. (eds) *Sequences II*. Springer, New York, NY. https://doi.org/10.1007/978-1-4613-9323-8_24. Retrieved August 24, 2018.

³ Nakamoto, S. (2008). "Bitcoin: A Peer-to-Peer Electronic Cash System." Retrieved August 24, 2018, from: <https://bitcoin.org/bitcoin.pdf>.

⁴ Wikipedia. "Blockchain." Retrieved September 05, 2018, from: <https://en.wikipedia.org/wiki/Blockchain>

⁵ Ibid.

⁶ Ibid.

⁷ Sawe, B.E. (2018, February 21). "The Biggest Industries in New Zealand." Retrieved September 06, 2018, from: <https://www.worldatlas.com/articles/the-biggest-industries-in-new-zealand.html>

⁸ New Zealand Now. "Economic Overview." Retrieved September 06, 2018, from: <https://www.newzealandnow.govt.nz/investing-in-nz/economic-overview>

⁹ Ministry of Business, Innovation & Employment. "Digital Economy." Retrieved September 05, 2018, from: <https://www.mbie.govt.nz/info-services/digital-economy>

¹⁰ Agritech New Zealand. (2018, September 03). "NZ Agritech is officially recognised by globally connected venture capital." Retrieved September 06, 2018, from: <https://agritechnz.org.nz/2018/09/03/nz-agritech-is-officially-recognised-by-globally-connected-venture-capital/>

The benefits of blockchain and other distributed ledger technologies to manage assets and transactions are rapidly being realised in many spaces beyond cryptocurrency, including the Agtech industry. Examples include^{11,12,13}.

- Food Safety: bringing transparency to the supply chain
- Traceability: promoting customer confidence in the source of their food
- Transaction Costs: improving efficiency to benefit the bottom line
- Opening New Markets: building trust between players
- Logistics: minimising uncertainty and further improving efficiency
- Resource Management: optimising farm agronomics
- Quality Control: environmental factors during growth and final product quality
- Smart Contracts: effectively managing complex contractual obligations

There is the potential for distributed ledger technologies to disrupt the Agtech industry by taking it in new, sustainable directions as it faces the challenges of a changing world and agricultural landscape, resulting from climate change, shifting resource availability and customer demands.

Blockchain Intellectual Property

The number of patents protecting blockchain technology is growing rapidly, and in areas beyond cryptocurrency, with applicants in the US, China and Australia (amongst others) emerging as major players^{14,15}.

New Zealand's strong agricultural and high-tech sectors ideally position the country to take a global lead in this space. However, a clear understanding of the IP landscape, a strong portfolio and adopting an appropriate strategy will be integral to business management and success.

Robust patent landscaping and analytics are an essential first step in understanding how Agtech innovations fit into this rapidly evolving landscape and assisting in positioning businesses for the future.



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¹¹ Hammerich, T. (2018, January 04). "5 Potential Use Cases for Blockchain in Agriculture." Retrieved September 06, 2018, from: <https://futureofag.com/5-potential-use-cases-for-blockchain-in-agriculture-c88d4d2207e8>

¹² Schmaltz, R. (2018, May 21). "Blockchain is Coming for Agriculture and You Might Not Even Notice." Retrieved September 06, 2018, from: <https://agfundernews.com/blockchain-is-coming-for-agriculture.html/>

¹³ CCgroup. "Identifying practical applications of Blockchain technology in the agriculture sector." Retrieved September 06, 2018, from: <https://ccgrouppr.com/practical-applications-of-blockchain-technology/sectors/agriculture/>

¹⁴ Chiu, H. (2017, November 08). "An Overview of the Blockchain Patent Landscape." Retrieved September 06, 2018, from: <https://clarivate.com/blog/overview-blockchain-patent-landscape/>

¹⁵ IPR Daily. (2018, March 27). "China led global blockchain patent applications in 2017: WIPO." Retrieved September 06, 2018, from: <http://www.iprdaily.com/article/index/14931.html>