Mycelium

Submission

Senate Select Committee on Australia as a Technology and Financial Centre

Third Issues Paper

Contents

About Mycelium

Mycelium is a technology company, based in Brisbane, Australia. We specialise in building with blockchain technology, particularly within the data and finance industries. Our focuses are:

1. Providing secure, accurate and timely data, as part of a decentralised network, to enable blockchain-based transactions;
2. Enabling the community to visualise the end-to-end relationship between data and blockchain-based transactions (notably those occurring via decentralised finance applications);
3. Researching and investing in applications of blockchain technology, particularly relating to decentralised finance and other Web3 applications; and
4. Building financial applications with blockchain technology.

Mycelium is taking a considered approach to building with blockchain technology in Australia by ensuring that we: have strong partnerships and advice within Australia; consistently speak with others building with blockchain technology abroad; and keep a close eye on other progressive jurisdictions. Our partnership with Blockchain Australia is very strong, and continues to be an important vehicle for effecting positive change in the space. Building in Australia is a highly desirable outcome for us. We are "innovation maximalists looking to build on the cutting edge of technology with a global solution."[1]

In recent years, we have grown to employ over 50 Australians. Due to the nature of our work, we are largely interested in public blockchains. At the time of writing, the largest public blockchains are Bitcoin and Ethereum, but there are already hundreds of other public blockchains in use. By our estimations, there are currently over 1200 public blockchains and well over 8000 cryptocurrencies. Generally, a public blockchain allows anyone with an internet connection to read or write, meaning that they can:

1. Create accounts and contracts;
2. Engage with accounts (ie, enter transactions) and contracts (ie, execute contracts); and
3. View account and contract data.

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[1] James Eyers, 'UQ alumni raise $6m for DeFi derivative system', *Financial Review* (online, 29 June 2021) <https://www.afr.com/companies/financial-services/meet-the-defi-developers-who-ve-raised-funds-for-a-derivatives-system-20210628-p5850t>.

Executive Summary

In preparing this submission and our recommendations, we have relied upon our experience operating in the blockchain industry, research conducted internally to stay abreast of global regulatory developments and consultation with industry leading academics and professionals from Australia. Throughout this submission, we make the following recommendations:

1. The Australian Government should expedite the ratification (with appropriate amendments for the Australian law context) of the Coalition of Automated Legal Applications' ("**COALA's**") Model Law for Decentralized Autonomous Organizations ("**DAOs**"), otherwise known as the "DAO Model Law";
2. The Australian Government should legislate a regime of mandatory minimum requirements for decentralised systems to publicly display:
    a. Their underlying source code and bytecode ("**code**");
    b. Their audit report (see recommendation 3); and
    c. The classification of token(s) associated with the decentralised system (if any) according to a multi-agency digital asset taxonomy,

    while ensuring that any such requirements allow Australians to continue to protect their personal information;
3. The Australian Government should legislate a regime of mandatory minimum standards and compulsory registration for smart contract audits and auditors;
4. The Australian Government should legislate a regime of mandatory minimum requirements, based on consumer law, for graphical user interfaces ("**GUIs**") which provide access to decentralised systems; and
5. The Australian Treasury should expand the existing FinTech sandbox to enable Australian entrepreneurs to continue building and interacting with decentralised systems.

About this Submission

We are grateful for this opportunity to contribute to the Senate Select Committee on Australia as a Technology and Financial Centre's ("**Committee's**") consultation on Australia's role as a technology and financial centre. We are well positioned to provide a submission on this topic as we have already contributed to the growth of financial technology in Australia and look forward to continuing doing so in the future.

Our intended outcome for this consultation is to remove barriers and clarify uncertainties that exist for those building and interacting with decentralised blockchain-based systems ("**decentralised systems**"). Our submission aims to contribute to removing barriers and clarifying uncertainties by:

1. Highlighting issues for those building and interacting with decentralised systems; and
2. Providing recommendations that will remove more barriers to Australian growth as a technology and finance centre.

Accordingly, this submission responds to the following focuses of the Senate Committee, as outlined in the Third Issues Paper:

1. The regulation of cryptocurrencies and digital assets; and
2. Instances of corporate law holding back investment.

1. The Regulation of Cryptocurrencies and Digital Assets

The two most common kinds of decentralised systems are public blockchains (eg, Bitcoin and Ethereum) and DAOs. Generally, each of these two kinds of decentralised systems will include a token, which grants token holders certain rights (including governance, economic or utility rights). In order to speak sensibly about the regulation of "cryptocurrencies and digital assets" in the context of decentralised systems, we must first speak about the regulation of decentralised systems.

1.1 Recognition and Regulation of Decentralised Systems

On 19 June 2021, COALA published the DAO Model Law.[2] COALA includes preeminent members in the space, from academic and industry backgrounds, with a range of incentives and perspectives (including Harvard Law School, Ethereum Foundation, BNP Paribas and MakerDAO). For the last 18 months, COALA's members have turned their minds to creating a framework that will allow national jurisdictions to uniformly regulate decentralised systems. This builds upon nations developing legislation, such as the State of Wyoming's legislation on DAOs, which addresses these issues in the context of the jurisdiction's own corporate law.[3] Following Mycelium's review of COALA's DAO Model Law, we broadly support its adoption in Australia, and are happy to work with key stakeholders towards that end. Significantly, it provides answers to questions that have troubled those that have observed the growth of decentralised systems, such as: legal personality, liability, dispute resolution and taxation.

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[2] Coalition of Automated Legal Applications, *Model Law for Decentralized Autonomous Organizations (DAOs)* (Report, 19 June 2021) ('*COALA DAO Model Law*').

[3] *Wyoming Decentralized Autonomous Organization Supplement*, Wyo Stat § 17-31-110 to 17-31-116 (enters into force on 1 July 2021).

a. Legal Personality and Limited Liability

In Australia, DAOs are not recognised as entities with legal personality or limited liability. Until such recognition, we are left with DAOs who do not operate as people within the eyes of the law. Currently, most Australian lawyers interpret DAOs as partnerships. These interpretations each lead to concerns that, amongst an organisation of potentially infinite parties, each individual party could be held personally liable for the debts of the organisation.

The current legal status of DAOs is analogous to the legal status of corporations prior to limited liability companies. Prior to limited liability companies, it was untenable for individual shareholders to have 'moral culpability' for the actions of corporations, as they lacked the power and control mechanisms to discipline errant management.[4]

It is equally untenable for individual stakeholders of decentralised systems, such as decentralised financial applications, to have moral culpability for the actions of those decentralised systems, because the individuals lack the power and control mechanisms to discipline errant decision-making. Further, errant decision-making in one jurisdiction (according to that jurisdiction's laws) may not be errant decision-making in another jurisdiction. This leads to the concern that an Australian DAO member could be punished personally for the action of a foreign DAO member which is legal in the foreign jurisdiction. For these reasons, in addition to recommending that DAOs should benefit from legal personality, we also recommend that DAOs should benefit from limited liability.

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[4] Stephen Bainbridge and M. Todd Henderson, *Limited Liability: A Legal and Economic Analysis* (Edward Elgar Publishing 2016) 46.

b. Decentralised Systems and Operating Systems

Similar to a decentralised system, an operating system is a foundational piece of computing infrastructure on top of which other programs are built and run. Operating systems are enormously complex, and as all connected programs rely upon their functioning, there is a high degree of reliability expected by users.

The three main computer operating systems in use today are Microsoft Windows, Apple Mac OSX, and Linux. Due to the complexity of such softwares and the reliability requirements of producing operating systems that can facilitate all other possible connected applications to safely and efficiently run on top of them, the resources necessary to build and maintain such operating systems are immense. The reason that decentralised systems have emerged in comparably staggering timeframes and numbers is because it is industry standard for these systems to be open source, forkable and licenced permissively (usually with an MIT Licence[5] or GNU General Public Licence[6]). In practice, this means that, if person A were to design and deploy code that served some novel purpose, person B could immediately view, fork and deploy that same code with little or no changes.

Neither Apple's OSX nor Microsoft's Windows are open source, as they are funded through for-profit ventures and their source code is inaccessible to scrutiny by third parties. In contrast, over the last 30 years, the Linux community has amassed 1.15 billion lines of code from over 235,000 developers, enabling companies and individuals to drive global innovation by building open source technology ecosystems.[7] Although the Linux operating system is not built on a blockchain, it is decentralised, open source and non-profit. The range of applications which can be built on top of Linux's open-source software is infinite. In fact, when you are interacting with an application built on Linux, it is likely that you are building on top of multiple layers of software accessible globally, built by a globally distributed range of members of the Linux community, third parties, or both.

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[5] Open Source Initiative, *The MIT Licence* (Web Page) <https://opensource.org/licenses/MIT>.

[6] GNU Operating System, *GNU General Public Licence* (Web Page) <https://www.gnu.org/licenses/gpl-3.0.en.html>.

[7] The Linux Foundation (Web Page) <https://www.linuxfoundation.org/>.

Realising this, legal scholars have suggested that the appropriate legal framework for decentralised systems might be international law.[8] This suggestion follows a realisation that, on a blockchain, the layers of software that exist between an application and the blockchain itself are not bound to any nation's jurisdiction and; therefore, are analogous to international waters.

Under the laws in national jurisdictions, the creator of the Linux operating system will generally not be held accountable for the applications built on top of Linux, or the interactions between those applications and their users. The function within the technology stack, the complexity of software and the infinite range of connected applications of decentralised systems are each analogous to the Linux operating system. It is unreasonable to burden software infrastructure developers with liability for the use of their general purpose infrastructure that facilitates a wide variety of applications.

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[8] Sven Riva, 'Decentralized Autonomous Organizations (DAOs) as Subjects of Law – the Recognition of DAOs in the Swiss Legal Order' (LLM Thesis, University of Neuchâtel, 2019).

c. Corporations Act Incompatibility

We recommend a "regulatory equivalence" approach to regulation, being the equivalence between the function of a legal rule and the function of a technology. The 1997 Financial System Inquiry ("**Wallis Inquiry**") has noted in relation to the role of the Australian Securities and Investments Commission ("**ASIC**"), the importance of a licensing regime to ensure market integrity and consumer confidence (including consumer protection).[9] In order to achieve the same policy goals (market integrity and consumer confidence) in an environment with decentralised systems, we must focus on substance and form of the underlying contracts that users will be interacting with.

The nature of decentralised systems on public blockchains are such that:

1. Everyone connected to the internet can observe and access the system;
    a. This means that each time a blockchain, or an application built on a blockchain, is deployed, it is accessible by everyone in the world. Under the current legal regime, this would require entities involved with decentralised systems to seek legal advice from every jurisdiction with an internet connection (eg, privacy law, consumer law, corporations law, etc.).
    To emphasise the complexity of a "global on day one" strategy for a software solution, particularly from a compliance perspective, think of Uber, who has sought global expansion since 2008;[10]
    b. Unless Australia makes its own position clear, entities will avoid building such systems in Australia, while Australians will continue to access those systems;
2. Everyone connected to the internet can copy the code underlying the system, with some or no modifications (known as "forking");
3. Users of the system are "pseudonymous", meaning that they are identifiable by their account number, which may or may not be tied to their identity; and
4. The system, once deployed, cannot be changed by its deployer, unless in accordance with predefined rules written into the system.

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[9] Australian Securities and Investments Commission, *Overview of licensing and professional registration applications: July to December 2014* (Report No 433, May 2015) 4.

[10] Uber, History (Web Page) <https://www.uber.com/en-AU/newsroom/history/>

Terms in the *Corporations Act 2001* (Cth) ("**Corporations Act**") such as "custodial"[11], "dealing"[12] and "providing"[13] can be applied to the roles of participants in centralised systems, but are not compatible with decentralised systems. Decentralised systems consist of code deployed in a blockchain environment. They are made up of a set of predefined and deterministic instructions executed in a distributed manner by the nodes of the underlying blockchain network. One single entity cannot unilaterally affect the operation of a decentralised system.

According to John Bassilos, a specialist financial services, managed funds and blockchain lawyer from Hall & Wilcox:

> *The regulatory regime for managed investment schemes in Australian is incongruent with an open source, global, decentralised system that is intended to allow for the free and unfettered transfer of tokens that are used as the digital currency for the decentralised system.*

The types of entities currently making up decentralised systems are:

1. **Software developers** – who code the decentralised system (or part of the system);
2. **Auditors** – who review the code for the decentralised system, to ensure it works as intended and is secure;
3. **Governors** – who participate in proposals and votes in order to make changes to the decentralised system;
4. **Token-holders** – who hold some rights (governance, economic, utility, etc.) in relation to the decentralised system;
5. **Oracles** – who provide data to decentralised systems, allowing them to make decisions or execute transactions;
6. **GUI providers** – who build, deploy or maintain a GUI (including a website or app) to the decentralised system; and
7. **Users** – who use the decentralised system.

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[11] Corporations Act 2001 (Cth) s 9.

[12] Ibid.

[13] Ibid.

Current interpretations of the Corporations Act mean that all of these parties are exposed to uncertain legal risk; risk that is difficult to mitigate without leaving Australia, or not serving the Australian market (an impossibility for applications deployed on public blockchains). The question is: which of these entities is exposed to risk, and what is that risk?

According to Associate Professor Chris Berg, Principal Research Fellow at RMIT University and co-director and co-founder of the RMIT Blockchain Innovation Hub:

> *Australia's Corporations Law is not suitable for decentralised organisations that have real value or real money at stake. Australia's Corporations Law has a lengthy tradition that is on the cusp of being disrupted by fundamentally new technologies. Blockchain is just one of those new technologies, but it is the one that is both most imminent and dramatic.*
>
> *However, rather than Australia going down a root and branch review of the idea of "what a corporation is" at law, there is a number of international precedents and frameworks that could be adopted that would quite easily allow regulatory certainty for groups and entrepreneurs experimenting with new technologies and assure that their innovation can remain in Australia, to the benefit of the Australian economy.*[14]

[14] *COALA DAO Model Law* (n 1) 40.

d. Transparency and Privacy

The systems themselves will be software running on a public blockchain, but the way that these systems will be accessed by most of the public is via interfaces (i.e. websites or phone applications). One way to think about public blockchains is as a "global software layer". The difference between this generation of financial software and the previous generation of financial software is transparency. Compared to the existing, centralised software systems that most Australians are accustomed to interacting with, the industry standard for decentralised systems is for their underlying code to be open sourced. This means that, generally, the rules, mechanisms, governance, transaction data, community discussions, etc. for decentralised systems are completely public.

The exception to complete transparency lies in personal data. Most entities interacting with decentralised systems would prefer that all of their interactions with those systems be visible to everyone in the world. Solutions that track and map the activity of a certain address (ie, address A did X, then Y, then Z) have matured greatly (eg, Chainalysis[15]). While there is huge upside for those entities who successfully map, interpret and commercialise this data, in order to preserve privacy rights, it is important that there are options for those who would like to remain pseudonymous. That is, those who would prefer not to tie all of their on-chain activity, particularly their transactions and asset ownership, to their public identity. Protecting these forms of personal information accords with Australia's Privacy Act[16] and a movement known as "self-sovereign identity" ("**SSI**"). Innovative solutions have emerged which ensure such data is protected (eg, zero-knowledge proofs[17]). We recommend that the usage of such solutions continue to be supported.

All stakeholders (including regulators) can observe, verify and interact with decentralised systems and the ways that those systems are being used (save for personal information). To ensure that this level of transparency remains the industry standard for decentralised systems, we recommend that the level of transparency and disclosures, described above, is required by legislation.

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[15] Chainalysis (Web Page) <https://www.chainalysis.com/>.

[16] *Privacy Act 1988* (Cth)

[17] Vitalik Buterin, An approximate introduction to how zk-SNARKS are possible (Blog Post, 26 January 2021) <https://vitalik.ca/general/2021/01/26/snarks.html>.

e. Points of Regulation

According to Professor Stephen Gray, Malcolm Broomhead Chair in Finance at The University of Queensland:

> *DeFi (Decentralised Finance) is fundamentally changing the structure of the modern day financial system, and rethinking many of the assumptions that underpin it. Specifically in my field of Finance, DeFi has displayed the rise of novel implementations and solutions in the form of exchanges, corporate finance, trustless lending and borrowing, peer-to-peer derivatives, and asset management. Given the success of a number of DeFi projects in drawing liquidity from the traditional financial system, I expect the next generation of financial systems to rely heavily on blockchain technology.*

In our view, the two sensible points of regulation is the regulation of:

1. Auditors; and
2. The GUI.

Auditors are emerging in the space who generally conduct quality and security assurance checks for underlying code and provide reports detailing compliance, or lack thereof. We recommend that regulation is necessary in this vein, and is the most suitable target for regulation, in order to achieve "market integrity and consumer confidence" (i.e. the stated goals of ASIC's licencing regime). We are not the first to recognise the critical need for an assurance framework[18]. Our recommendation is to introduce a regulatory framework for smart contract audits (and auditors) which ensures that decentralised systems being built and accessed by Australians are functional and secure, that will prioritise:

1. Industry standards for smart contract auditors and the smart contract auditing process, centred upon:
    a. Logical verification by means of a mathematical proof; and
    b. Security verification by means of testing the functionality of security-critical properties;
    c. Security verification by means of testing the substance, form and functionality of any oracle(s) used in the contracts; and
2. The requirement for decentralised systems to have undergone an audit from a licenced auditor. The licensing framework for auditors should be based on experience and education (a similar framework to Australia's existing AFSL framework);
3. The requirement for decentralised systems to make their audit report, prepared by a licensed auditor, publicly available, with no significant security risks remaining;

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[18] *COALA DAO Model Law* (n 1) 15.

4. The requirement for decentralised systems to undertake a public bug bounty so that members of the public are incentivised to test the full functional correctness of the security-critical properties of the system; and
5. Accommodating the continuous changes as a result of upgrades, modifications and migrations, minimum standards throughout these changes to ensure that 'restructurings' do not subvert the standards and protections provided by the licensing regime.

Until this recommendation is followed, the lack of regulation surrounding auditors gives rise to an "anyone can be an auditor problem" which, in the long run, will be harmful to all stakeholders.

Unlike traditional GUI providers, in the case of decentralised systems, it is not uncommon for the GUI provider to have no control over the operation of the underlying decentralised system. Further, it is now possible for interfaces to be hosted in a decentralised way (see, for example, IPFS). For this reason, we recommend that regulation imposed on GUI providers should stem from consumer law, rather than corporations law. The underlying policy goal should be to ensure that the funding situation, governance mechanism and token mechanisms are described accurately, and readable by anyone seeking to access a decentralised system. It is the role of the auditor to ensure that the decentralised system works correctly and explained in layman's terms publicly. It is the role of the GUI provider to ensure that, if an interface to that system is to be provided to consumers within a certain jurisdiction, that interface complies within the consumer law (or similar) requirements within that jurisdiction.

1.2 Tokens

There are infinite different kinds of tokens that can exist on blockchains. The fact that it is common for these different kinds of tokens to be grouped together as "cryptocurrency" is a sign of market immaturity and will not be commonplace in the future. For example, a digital piece of art and a Bitcoin equivalent are both "cryptocurrencies", but are vastly different in substance and form. Without a classification system, it will be very difficult for regulators to speak sensibly about tokens. The three kinds of tokens identified by the United Kingdom's Financial Conduct Authority ("**FCA**") in 2019 were:[19]

1. **Exchange tokens** – tokens used "as a means of exchange", usually functioning as a decentralised tool to enable the buying and selling of goods and services, or to facilitate regulated payment services;
2. **Security tokens** – tokens used "for investment", with firms and consumers gaining direct exposure by holding and trading tokens, or indirect exposure by holding or trading financial instruments that reference tokens; and
3. **Utility tokens** – tokens used "to support capital raising and/or the creation of decentralised networks", through offerings or other distribution mechanisms.

As the industry (and the types and uses of tokens) has continued to evolve, leading industry bodies, such as the Global Blockchain Convergence ("**GBC**")[20] and the Digital Law Association ("**DLA**") are offering improvements upon FCA's three pronged approach. We recommend that:

1. The Australian Treasury should prepare and release a multi-agency working taxonomy of tokens that sets out the Australian legal and tax implications for individuals and businesses creating and interacting with tokens; and
2. Decentralised systems should be require decentralised systems to publish the classification of token(s) associated with the decentralised system (if any) according to the DLA's multi-agency digital asset taxonomy

To this end, we endorse the submission provided by Joni Pirovich and the rest of the DLA team to this Committee.

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[19] The Financial Conduct Authority, 'Guidance on Cryptoassets' (Consultation Paper CP19/3*, January 2019) <https://www.fca.org.uk/publication/consultation/cp19-03.pdf> ('*FCA Guidance on Cryptoassets*').

[20] Global Blockchain Convergence, 'A Sensible Token Classification System' (LinkedIn), June 2021, <https://www.linkedin.com/posts/global-blockchain-convergence_token-classification-system-activity-6797956164828086272-ukK0/>.

2. Instances of Corporate Law Holding Back Investment

The Corporations Act, as it exists today, is insufficient to regulate those building and interacting with decentralised systems.

We are witnessing economies and their markets becoming reformed and transnational on public blockchains and via DAOs. We suspect that we have only seen the beginning of this reformation and, as it continues, there will be winners, who understand and support the reformation, and losers, who do not.

According to Michael Bacina from Piper Alderman:

> *[what is needed is a] clear message that the Australian government and regulators support the revolutionary changes which Blockchain technology delivers.*[21]

While it remains unclear how the Australian Government will resolve the uncertainties relating to decentralised systems and tokens identified above, we have observed that:

1. Foreign investors will avoid Australian projects due to regulatory uncertainty; and
2. Founders will move their operations offshore.

Accepting that regulatory change will not occur overnight, we recommend that Treasury should expand the existing FinTech sandbox to enable Australian entrepreneurs to continue innovating with decentralised systems and Australian regulators to continue to learn more about such systems. In relation to their own sandbox, the FCA commented that it allowed firms to "test their innovative propositions in the market, with real consumers, within the confines of a controlled environment."[22]

According to Steve Vallas, Chief Executive Officer of Blockchain Australia:

> *This future of this industry is built on open networks and partnerships, both data driven and human-centric. I have observed the Mycelium team engage with industry leaders including educators and technologists. They have proactively sought out the peak body Blockchain Australia with a view to securing support, local resources and the momentum needed to build a world class organisation.*

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[21] Piper Alderman, Submission No 56 to Senate Select Inquiry into Financial Technology and Regulatory Technology (3 January 2020) 8.

[22] *FCA Guidance on Cryptoassets* (n 18) 44.

Yours sincerely,

Jack Deeb (for Mycelium)

With thanks, for their contributions to this submission, to:

1. John Bassilos, a specialist financial services, managed funds and blockchain lawyer from Hall & Wilcox;
2. Associate Professor Chris Berg, Principal Research Fellow at RMIT University and co-director and co-founder of the RMIT Blockchain Innovation Hub;
3. Professor Stephen Gray, Malcolm Broomhead Chair in Finance at The University of Queensland;
4. Joni Pirovich from the Digital Law Association and Mills Oakley;
5. Michael Bacina, Piper Alderman and Blockchain Australia; and
6. Steve Vallas, Chief Executive Officer of Blockchain Australia.