Inquiry into Future Directions for the Consumer Data Right:

Issues Paper

Submission to Treasury

23 April, 2020

About Block8

Block8 is Australia's leading blockchain venture studio. We partner with startups, enterprise and government to bring a professional product management and technical development capability that take ideas from zero to one.

Block8 has delivered some of the most innovative blockchain and DLT solutions to market, creating over A$250m in enterprise value with a portfolio spanning fintech, regtech, proptech, energy and gaming. Our ventures have tokenised unlisted equities and residential mortgage-backed securities, as well as developed blockchain-enabled industry applications within residential tenancy, payments and identity.

Block8 has a grand vision for the future of blockchain and distributed ledger technology (DLT) in Australia. Decentralised information systems offer several unique properties over centralised information systems, and the forward challenge of national digital innovation facing our economy would not be complete without due consideration to what this technology can do for us. Our company is focused on practical solutions that save time, money, compliance overhead and maximise the potential for digital innovation.

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Introduction

These are uncertain economic times. They were so even before the recent development of the coronavirus global health crisis, when Australia was forced to take extraordinary national and state measures in order to save lives and mitigate damage to the economy. Chief among these was an enormous national JobKeeper debt, the impact of which is set to manifest over generations.

In order to accelerate our recovery, we must look to new business activities, work smarter, and work differently.

It's no secret that technology innovation - both doing new things, and doing existing things better - is a prime mover for new business activity. The progression of the Information Age over the past two decades has revealed to us significant benefits with entirely new categories of business and continuous efficiency improvements from digital transformation projects.

Yet, beyond our recent national challenges, Australia remains with a prevailing need to complete its economic transition away from primary industry and an over-reliance on mineral, resources and agriculture exports. Central to this strategy is diversification into the development of a high value services export industry.

We as a nation must also look for efficiencies internally. By developing state-of-the-art digital public infrastructure, we can improve the efficiency of delivering government services, as well as enjoy data-driven policy making and transparent policy execution.

The good news is that Australia is in a strong position for a national digital focus. We have effective government and strong regulators, as well as a well-educated workforce and digitally-literate population - all currently working on a physical national broadband infrastructure.

In this response to the Treasury Issues paper on the Future Directions of the Consumer Data Right ("the Response"), Block8 presents a vision for an optimised and consumer-centric digital economic infrastructure for Australian consumers and businesses. It revolves around data - particularly the fundamentals: identity and rights data needed for individuals and businesses to transact with one another - and the tools required to achieve superior transparency, control, and agency over the raw information generated from a consumer's daily economic activity.

We seek to develop technologies that target the most foundational digital mechanisms of our economy, for it is here that the greatest efficiencies can be found. By developing fairer and more efficient data and transaction systems for Australian businesses and consumers, we can simultaneously decrease operational and compliance costs, increase industry competition, and improve consumer outcomes.

Australia's Digital Economy Strategy

There has been an encouraging recent history of intent to improve the digital innovation landscape in Australia. While the specific branding changes its identity with the changing of the political guard, the data-related productivity and innovation political agenda has emerged from successive Government-sponsored inquiries tasked with informing national economic strategy.

The 2014 Financial System Inquiry (the Murray Inquiry) recommended a formal review into the benefits and costs of increasing the availability and improving the use of data in Australia. Similarly in 2015, the Harper Review of Competition Policy recommended a review to consider ways in which to improve individuals' ability to access their own data to inform consumer choices.

The Turnbull Government supported these findings the following year, and seeking to consider policies to increase availability and use of data to boost innovation and competition in Australia, the then Treasurer Scott Morrison commissioned the Productivity Commission with an inquiry into "Data Availability and Use" in 2016.

One of the key recommendations from that inquiry was a new "Comprehensive Right for consumers to actively use their own data and represent fundamental reform to Australia's competition policy in a digital world."[1]

Shortly thereafter, this manifested into a commitment from the Government to install what is now known as the Consumer Data Right, with the Treasury Review into Open Banking delivered in 2017 guiding the initial implementation into financial services.

This Issues Paper on the Future Directions for the Consumer Data Right is the latest instantiation of our nation's data-driven journey. "Australia's Tech Future" is the name of the latest national innovation strategy under the current Minister for Industry, Science and Technology Karen Andrews, and outlines where the Government should be investing to embrace digital technology to help Australia to "continue our strong record of 27 years of uninterrupted economic growth."[2]

Looking forward, "CDR 2.0" represents an opportunity for coordinating a broader, more integrated, and more consumer-centric delivery of Australia's digital economic strategy. There is a clear political desire to:

- **Diversify Australia's economic output, with a focus on advanced digital services**
- **Catalogue and compare sources of digital innovation**
- **Invent new sources of business activity**
- **Improve market competition and efficiency**
- **Improve the delivery of government services, including leveraging underutilised assets**

[1] *Productivity Commission data, Data Availability and Use, Inquiry Report*, 2017

[2] www.minister.industry.gov.au/ministers/karenandrews/media-releases/setting-agenda-australias-tech-future

Open Banking

The Consumer Data Right (CDR) gives customers, including individuals and business customers, the right to access certain data about them held by businesses, and direct that their information be transferred to accredited, trusted third parties of their choice. The CDR is being deployed on an industry-by-industry basis as the specific scope of data to be included under the right will vary according to the activities within that industry. At the core of the intended consumer benefit is "an improved ability to compare," in order to, "either negotiate better deals with their current providers or switch products."[3] The implementation of the CDR into financial services is known as "Open Banking."

Block8's view is that Open Banking has taken an appropriately practical approach in its current form and time horizon, and we have confidence that it will materially improve consumer outcomes in Australia in line with the stated objectives. However, the future of the scheme should appropriately investigate newly available paradigms and emerging technologies.

The implementation of Open Banking is due for industry completion in 2020, having been significantly guided by the *Review into Open Banking* ("the Review"). Gaining industry consensus on these specific datasets is one of the key activities for the CDR rollout, and the Review consulted with industry on the practical product outcomes Open Banking could unlock for the end consumer. The ability to have accurate product comparison tooling was a major theme that ultimately guided the recommended scope of data to be made available, being transactional data for transaction and lending products operated by Authorised Deposit-taking Institutions (ADIs). While the Review recommended that the implementation of the CDR should be extensible in order to support a broader data ecosystem to advance the digital economy[4], it nevertheless recommended a specific fixed number of datasets for the initial implementation that may not support the full scope of future services to be offered by the new market landscape.

Beyond the fixed scope of data included under the right is another important subtlety: the new right applies only to the access, update and release of the information. An erroneous conclusion can sometimes be drawn that the data in question belongs exclusively to the consumer. This is a subtlety that is not accurately conveyed in the common political discourse around the need for consumers to "own their data," as if it's exclusively theirs. The CDR is not an equivalent of the European GDPR (deletion is not a part of the right), nor does it cover the enriched and proprietary datasets that have used consumer data as an input. It is a joint right to access and use the generated data by both parties, not to form exclusive *ownership*. This is a relevant distinction for our recommendations later in this Response.

Fundamental change is needed. There are key unanswered questions that go to the fundamental rights of individuals to control data held about them, and how individuals — as consumers — can use data more effectively for their own benefit, that lie at the heart of data availability and use. These questions necessitate an across-the-board rethink of the way data is managed.[5]

[3] *Consumer Data Right Overview,* The Australian Government the Treasury, September 2019

[4] *Review into Open Banking,* The Australian Government the Treasury, December 2017 ("The Farrell Report")

[5] Productivity Commission 2017, Data Availability and Use, Report No. 82, Canberra

In the context of our Response, we highlight the following pertinent recommendations from the Review and offer brief comment ahead of further discussion later in the document:

Recommendation 1: ***"Open Banking should not be mandated as the only way that banking data may be shared. Allowing competing approaches will provide an important test of the design quality of Open Banking and the Consumer Data Right."***

Block8 holds the view that appropriate use of distributed ledger technology can facilitate superior CDR outcomes over some aspects of the current technological design.

Recommendation 2.9: ***"The ACCC should have responsibility for ensuring there is a public address book showing who is accredited."***

Block8 holds the view that certain kinds of public information are best delivered using a public blockchain, possibly including the implementation of the Address Book as a programmable source of truth for reference by smart-contract-enabled business processes.

Recommendation 3.4: ***"If directed by the customer to do so, data holders should be obliged to share the outcome of an identity verification assessment performed on the customer, provided the anti-money laundering laws are amended to allow data recipients to rely on that outcome."***

Block8 holds the view that anti-money laundering laws should be amended to allow 'portable KYC' to be developed using an appropriate extension of the CDR. This is a key feature for truly enabling digital identity in Australia.

Application of Distributed Ledgers

Block8's mission is to use *distributed ledgers to make a fairer and more efficient world.*

We selected the word "Fairer" because this technology is, fundamentally, a new tool in our ability to organise information. In particular, DLT provides the ability to reliably share - *decentralise* - information relating to things of value (digital representations of 'rivalrous' assets), meaning that market power no longer needs to be centralised, and parasitic information asymmetries can be minimised.

We selected the word "Efficient" because a *distributed* ledger is a modern invention that seeks to optimise a very old yet very common use case: intermediation.[6] Distributed ledgers solve intermediation with *technology* - a set of use cases that have previously enjoyed no technological innovation since the invention of the original solution: custody. Where custody is not used to facilitate a transaction between two untrusting entities, additional processes are needed to ensure each entity is satisfied with the integrity and outcome of the transaction. Hence, with a distributed ledger, the time and cost efficiency of any transaction is improved when there is an agreed source of truth (data) for that transaction process between the entities, and now, when designing information systems that facilitate interactions between entities, we have a second technology option: a distributed system.

With today's hyper-centralised information technology mix, the biggest efficiencies we observe are from the biggest centralised services. Under these centralised models, there is usually little scope for more than a single software platform (market) in any given domain; think *the* social network, *the* professional network, *the* market for ridesharing, or *the* market for short term holiday rentals.

But the centralisation of information causes the centralisation of power and the introduction of market information asymmetry. This precarious situation often leads to negative side-effects, such as data misuse (abuse) and mismanagement (breach).

[6] The word 'intermediation' here is used in a pure sense. It does not imply "intermediary". Managing intermediation may necessitate a custodial entity, or alternatively additional procedural overhead between the transacting entities.

Centralised Information Systems

With the advent of secure decentralised systems (blockchain, DLT), we have collectively begun to challenge the status quo of the use of centralised systems for delivering shared processes and information, particularly when that information is commercially valuable or in the public interest to be made public.

Fundamentally, centralised systems are closed, meaning that access is only provisioned via the central authority, and then only a 'view' of the central source of truth is provided via a digital interface (APIs); the central source of truth is never truly seen. This causes several issues:

- Misaligned incentives between the custodians of the information and the owners of the information can lead to privacy and ethical transgressions, particularly when that information is owned by a for-profit entity (consider Facebook and Cambridge Analytica).
- APIs that are supposed to provide digital access to view and change the underlying information are typically closed-source, error-prone and provide incomplete functionality, inhibiting Innovation.
- The fundamental inability to view and rely upon the underlying source of truth (without trusting the information) creates information silos, precipitating costly reconciliation processes. A simple example of the manifestation of this issue is reconciliation between banking ledgers: when transferring money between banks, reconciliation processes are required at both ends due to the inability to share a common source of data, caused by the use of multiple centralised systems. Note that in a banking context, trusting an external source of truth is often not compliant with various prudential risk regulations, which require strong operational controls to ensure information integrity.

Decentralised Information Systems

Per the above, centralised systems - by definition - create data silos, causing costly process friction, and are functionally constrained, limiting innovation. This naturally frames an argument for blockchains:

1. Shared, by default. Data is guaranteed to be both accurate and available as the shared consensus system keeps all data up-to-date for everyone at all points in time.
2. Programmable, by default. Smart contracts do not require APIs to be written in order to read or write to them; their natively open design provides read/write functions by default. This feature alone provides immense opportunity for digital innovation.[7]

The possibilities for innovation are quite promising now that we are presented with an alternative paradigm offering the following features over centralised systems:

- The ability for consumers to have programmable, shared custody over their identity information as well as the data generated in their digital economic activity. We refer to businesses and consumers alike who have this level of control and transparency over their data: "Prosumers".
- The ability to host decentralised and programmable sources of public information. These sources of truth are best used for non-sensitive public information that are intended to be agreed by all actors across an economy, such as public registers, and legal and civic rights and processes afforded by legislation.

We further illustrate these concepts in the following diagrams showing CDR 1.0 (that which is implemented today using APIs) and CDR 2.0 (that which could be implemented in the near future, using DLT).

[7] In terms of implementation cost and complexity, some of the cost that would ordinarily be expended in developing an API layer for a regular system would be expended within the logic of the smart contract itself.

A Next-Generation Consumer Data Infrastructure

Here we illustrate the current CDR model. A multi-step process is required for a Consumer to form a commercial relationship with a new provider and access their data. From an information management perspective, the message-based design presents us with a familiar set of issues:

- **Obsolescence:** Data is immediately out of date.
- **Opacity:** The truth of what is contained in the database is never directly observed; the output of an API is only ever a *report* that is generated from the underlying database (source of truth).
- **Ostensibility:** Messaging-based systems generate errors. This necessitates reconciliation processes to be operated, particularly when the data being passed around represents valuable rivalrous assets.

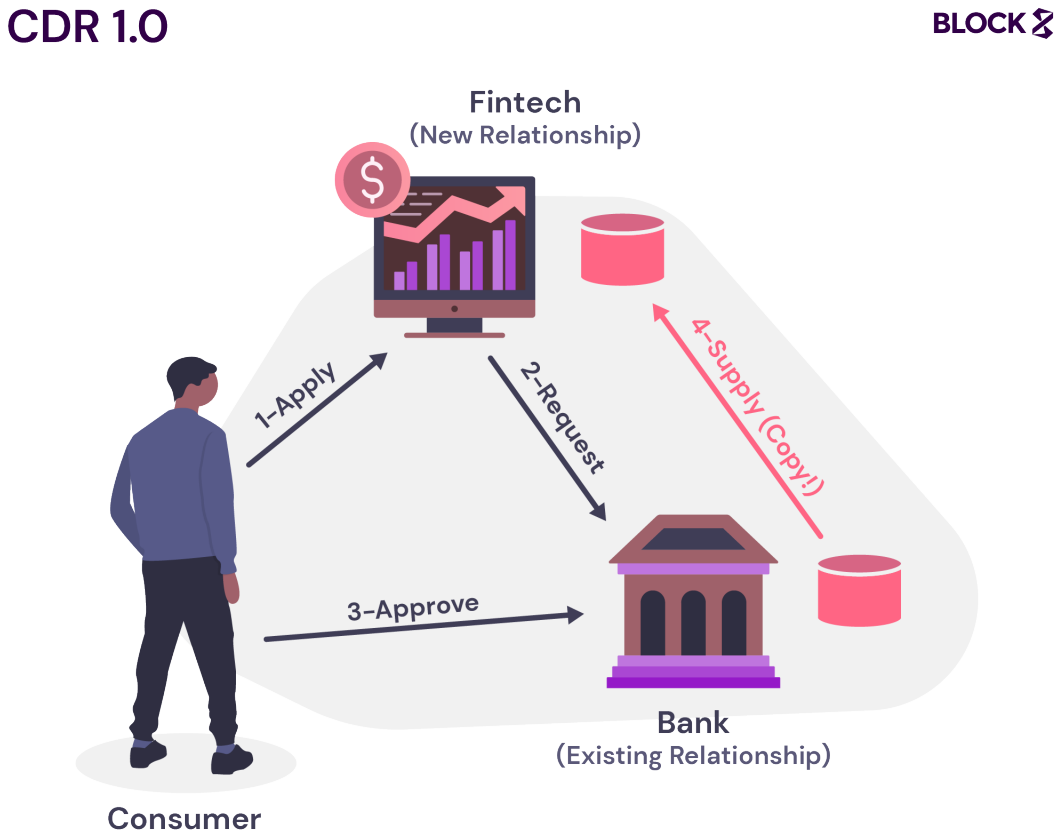

Figure 1: Conceptual model of the current implementation of the Consumer Data Right. A consent based model is used to push data between centralised systems using APIs.

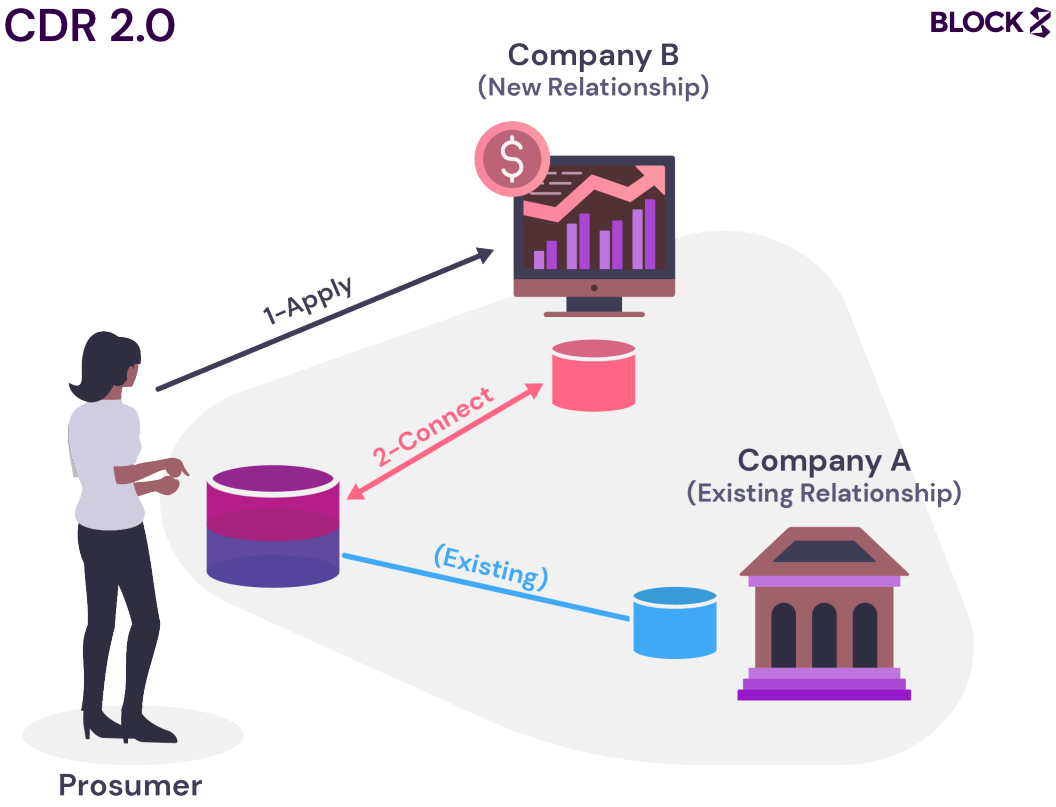

Figure 2: Conceptual model of a future implementation of the Consumer Data Right. DLT is used to keep relevant data completely synchronised.

Leveraging a decentralised architecture, we can use smart contracts to share the programming that operates the agreement between the consumer and the company. The historical transaction data that the operation of this program generates is also recorded on a ledger that is distributed between the parties.

In this way, a distributed ledger can be used as the basis for managing the "truth" of what occurs (to the extent that is possible given the reliance on inputs from external sources) such that both the consumer and the company are always in agreement with - and always have access to - the data pertaining to their commercial relationship.

Leveraging a distributed ledger design means the data:

- Is always current;
- Is always correct (always the agreed truth);
- Never needs to be reconciled before making business decisions; and,
- Suffers no errors or omissions according to the shared programming (or if bugs are present, they are known to all parties at once).

In the context of Open Banking, this would mean the defined data sets for transaction and lending accounts would be appended-to using a distributed ledger system that is operated between the consumer and their bank. The mechanism of keeping the databases synchronised is called **consensus**, and the shared program that is used to operate that relationship is called a **smart contract**.

In an initial implementation, a smart contract would only involve the basic fundamental operations of the specific product being offered by the company. The key difference is that the source of truth relating to the history of that account is the shared system of record (distributed ledger). Not all functions of a given financial product may necessitate being codified into a smart contract. Initially,

only the basic function for recording transaction history would be required in order to bring the system to feature parity with CDR 1.0; the company offering the product would need to refer to this ledger as the source of truth for integrating into their downstream systems. In the future, from this baseline, the smart contract can expand to incorporate more functions in the financial product stack, such as identity, authorisation, and payments.

The data schemas for these products would require standardisation. Fortunately, this is work that has significant overlap with the CDR 1.0 specifications undertaken by the Data Standards Body led by Data61. These schemas now conveniently form a basis for developing smart-contract-based transaction and lending products that will enjoy full solubility between participating financial services companies. In the same way that Australian mobile phone numbers were disassociated from telecommunication companies to provide consumer data portability, the same can be achieved with simple financial products, with more sophistication and functionality added over time.

We also note the immense portability benefits of cloud-based services and the associated common recovery patterns for forgotten credentials or lost or destroyed hardware. The tradeoff between control and convenience has manifested for most as *full trust* (i.e. no control or transparency in current approaches) and full convenience, as our digital lives are entirely stored on remote servers managed by others.

Our consumer-centric model however does not relinquish convenience, but it does recognise the need for introducing a reliable data custody layer as shown in the next diagram.

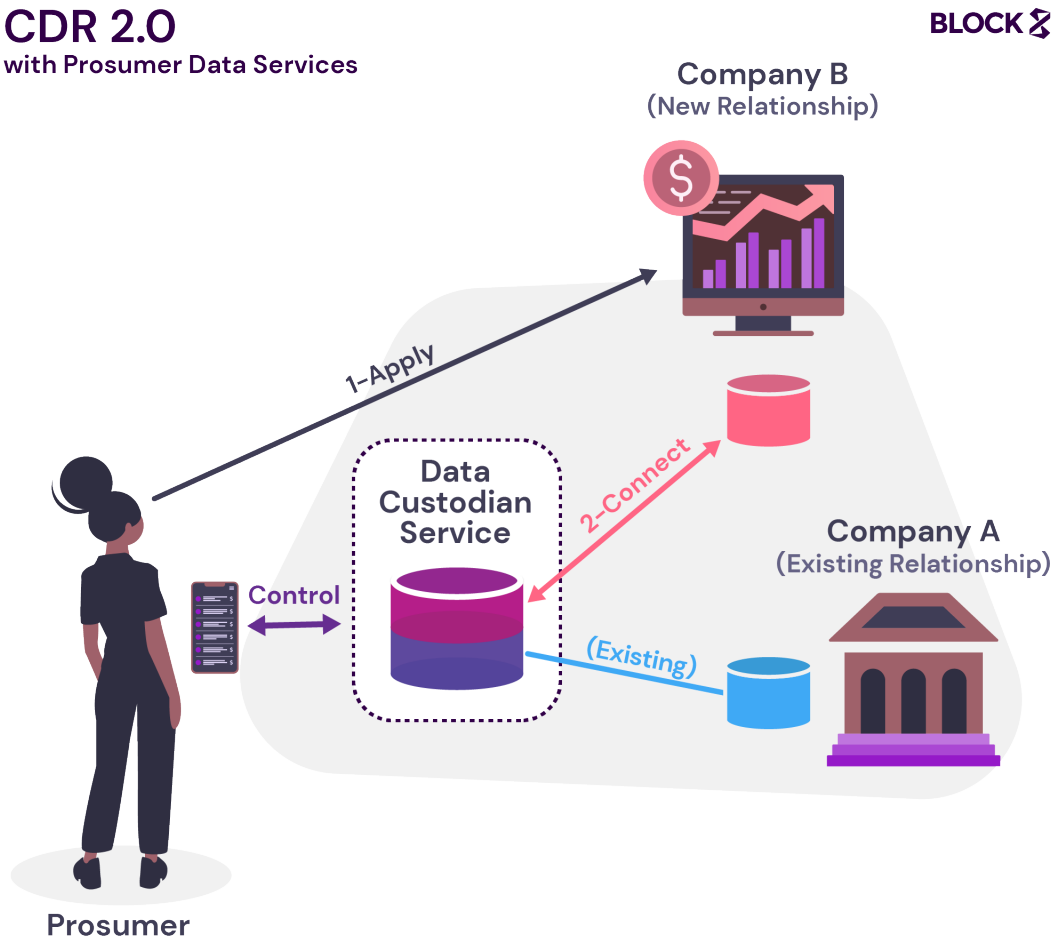

Figure 3: Conceptual model of a future implementation of the Consumer Data Right including third party data management services.

DLT remains keeping data completely synchronised, but there is a convenience services layer that operates on *behalf of the prosumer*. This is a critical distinction, as previously these sorts of tools of convenience could only be offered by the company itself, meaning the market for these tools was a market-of-one, and there was extremely limited opportunity for third party innovation.

These data custodians - businesses working on behalf of the Prosumer - were envisioned in the Open Banking Review: "[The CDR] should provide a framework from which new ideas and business can emerge and grow, establishing a vibrant and creative data sector that supports better services enhanced by personalised data."[8]

Block8 anticipates that these new businesses will specialise not only in the management of economic data, but also the *economic identities* of Prosumers as they connect and disconnect from service providers with more frequency (liquidity) than ever before. These companies would also be able to enforce standards with connected businesses on behalf of Prosumers. Furthermore, the opportunity to provide a full view of the Prosumer's economic profile across industries, including financial services, telecommunications and energy, but also ultimately other key functions such as employment agreements, government licencing, rights and status, is extremely compelling. Block8 sees a future where companies within this industry continuously compete by innovating both on their user experience as well as their ability to interface to the greatest number of well-featured connected businesses.

By truly shifting the consumer to the centre of our information systems, we make our economic and civic processes extremely efficient and maximally consumer-centric.

In the next section, we build on the previous sections to provide specific answers to the Issues Paper questions.

[8] *Review into Open Banking*, The Australian Government the Treasury, December 2017 ("The Farrell Report")

Future Directions for the Consumer Data Right

Block8 is excited by the forward-looking nature of this Review and the possibilities that emerge, in particular, how the Consumer Data Right:

- **"can be built upon to support a thriving digital economy with consumers at its centre,"**
- **"could be enhanced and leveraged to boost innovation and competition, and support the development of a safe and efficient digital economy, benefiting Australians and Australia," and,**
- **can "promote a consumer-centric data sector," improve "the flow of information in the economy," and encourage "the development of new products and applications."[9]**

Below we build upon the context of previous sections and offer more specific responses to the questions raised in the issues paper.

Future role and outcomes of the CDR

The scope of data for Open Banking covers the records for transaction accounts and lending products. A future implementation however should take a scope-maximising approach for consumer-related data, and seek to expand the scope to the point that proprietary, or enriched data, is encountered. Achieving this will fully support a market-driven approach for innovative use of that data in the development of new products and services. Indeed, the best way to maximise innovation potential is to ensure the maximum amount of data is available and accessible in order for the market to develop novel, valuable solutions.

There is also the issue of an ever-increasing number of connection points in order to gain a full picture of a single Consumer's economic profile. This is in stark contrast to a mere single integration point for a Prosumer under a DLT regime, with guarantees on data veracity. In order to tailor products and services to an individual, all relevant information needs to be conveniently accessible. With the current CDR implementation, this will necessitate a third party generating multiple requests to each data holder for a given Consumer, themselves being required to approve each in turn. With a future implementation, using a distributed ledger to manage each relationship and record the salient user-specific data, a third party need only contact the Prosumer directly, and have the Prosumer approve access only once to supply the information.

Future banking services can become modularised, with raw functionality being provided by one layer, and front-end customer services being provided by another. This would allow the composability of financial services in a market where Prosumers could select their product, select their product vendor, and select their user experience supplier all separately - or select a pre-

[9] Inquiry into Future Directions for the Consumer Data Right, Issues Paper, March 2020

packaged product stack by yet another company doing the leg work of composing the best deal in the market. Currently, those components are all tightly coupled at an institutional level. At a product level, banking products are overwhelmingly designed as 'buckets'; banks typically only offer a small number of course-grained flavours of a certain product type (e.g. a Home Loan), designed for ease of management by the Bank. With a liquid market, not only could the components of these offerings be broken down, but Prosumer-specific features can be developed, such as unique interest rates based on your specific risk profile, rather than qualifying for one or another product flavour.

While these kinds of "monoline" products are available today with some neolenders (customised products), the ability for all suppliers in this market to use the same information and compete for the best rate can be facilitated if these companies were able to access, with permission, the Prosumer's "data wallet" or "economic profile" in order to apply their risk assessment engine. When a Prosumer was looking for a new product, this could be an invite-only event where the Prosumer could charge a fee for those specified lenders to access the Prosumer's information, or, because the market would be fully-connected in such a scenario, allowing the Prosumer to browse those lenders currently offering discounts or promotions for new customers.

With applying this concept across industries, the concept of an integrated economic dashboard emerges, wherein a single-page view can be constructed from the collection of products and services a Prosumer is connected to via multiple distributed ledger instances, all aggregated in their economic profile or data wallet. Payment information can be linked to other services such as telecommunications and energy expenditures directly, and enhanced insights can be generated for better management of personal finances.

The Government has a desire to "lift the lid on competition in consumer services and technology is the enabler," and "it won't be far down the track when you can simply tap your smartphone to switch from one bank to another."[10] However, switching providers as easily as 'tapping your phone' involves more than simply providing third parties access to your transaction histories with the current CDR API-based architecture; it requires a restructuring of the way our economic information is managed and the true digitisation of the economic identity of the consumer.

Linkages and interoperability with existing frameworks and infrastructure

Block8's vision for the application of distributed ledger technology is thus: advanced digital economies around the world will be powered by national public blockchains, running nationally-specific applications. There is a clear opportunity for Australia to broaden the CDR to underpin the development of such a whole-of-economy data infrastructure.

We briefly cover three key areas:

- **Government Registers**
- **Identity**
- **Payments**

[10] Turnbull Government Assistant Minister for Digital Transformation Angus Taylor, November 2017 - https://ministers.pmc.gov.au/taylor/2017/australians-own-their-own-banking-energy-phone-and-internet-data

Government Registers

CSIRO's response to the consultation on the revamped Digital Economy Strategy clearly indicated that "Australian governments need consistent registries. Consistent, reliable, accurate and secure registers of information about citizens, licences, businesses and entitlements is needed to improve the effectiveness of government service delivery. At the current time, registers are maintained by numerous agencies and there are substantial costs in ensuring consistency and lengthy remediation activities when this consistency is not successfully maintained."[11]

Consistency of data held between multiple locations is precisely the functionality that a *distributed* ledger offers.

The cost of data remediation and other issues associated with inconsistent versions of the truth - particularly with fundamental public information managed by the Government - is unavoidably significant when using a loose collection of disconnected computer systems. This situation is well-suited to a wholesale redesign in the current context of a superior technological alternative. The immediate opportunity for Government then is to use distributed ledger technology to provide the optimal means of delivering an infrastructure for public information, starting with the delivery and maintenance of public registers.

Critically, such a method of managing information develops a 'single key view' for individuals and companies that integrates all government and other public information, such as:

- Incorporation, licencing, and public notices for corporate Australia;
- Emissions trading schemes such as carbon and salinity; and,
- Other civic affairs, such as land titles, births, deaths and marriages, licencing and electoral rolls.

Such a 'single key view' allows all companies and Government agencies to agree on a single source of truth for the particular data in question, completely eliminating redundant, erroneous, and incomplete data within centralised databases.

Furthermore, recommendation 2.9 of the Review into Open Banking explicitly captures the need for a universal system for managing *addressable entities*, known as the "Address Book." This is of course another ideal use case for a distributed ledger system as it ensures that all connected systems refer to the same system of record; again, a centralised API-based system copies the information, ultimately leading to the propagation of errors and omissions.

Identity

In addition to the need for an agreed source of truth for accredited data holders (the Address Book), an agreed system of identity for Prosumers is also an important component in our proposed model for a national digital infrastructure. In our view, the Trusted Digital Identity Framework (TDIF), established by the Digital Transformation Agency, is currently the ideal framework to be leveraged for this purpose.

Critically, we note that other distributed ledger or blockchain-based identity approaches are based on the requirement for end-users to manage public keys, introducing the need for very complex user interfaces (and the need to actually understand how cryptographic keys work), as well as, in our view, the untenable risk of loss of keys, allowing identity theft to be a simple matter of possession of the private keyfile.

The TDIF should be considered for extension, converging with the goals of the future of the Consumer Data Right, and incorporating a new notion of self-managed economic data wallets for Australian citizens.

Having existing technology to support such an extension, Block8 can supply additional information under commercial confidence as desired.

[11] THE DIGITAL ECONOMY: OPENING THE CONVERSATION - CSIRO Response to the National Digital Economy Consultation Paper, November 2017

Payments

Completing the ecosystem requires a programmable payment component, as most consumer functions require, or manage, the movement of money. Fortunately, Australia has already invested significant energy into a state-of-the-art fast-payments network under the leadership of the Reserve Bank of Australia.

The New Payments Platform (NPP) should be considered for extension, converging with the goals of the future of the Consumer Data Right, and support functionality to interface with a distributed-ledger-based business and citizen national data infrastructure in order to facilitate programmable settlement functions.

Having existing technology to support such an extension, Block8 can supply additional information under commercial confidence as desired.

Switching

"The Consumer Data Right will give consumers the right to safely access certain data about them held by businesses."[12] This very first sentence of Treasury's summary of the CDR reveals an embedded assumption - that data about consumers can only be exclusively held by the business. While historically this has been true, we now have the technology to reliably maintain data in more than one location, in this case, both with the business and the consumer at the same time using a distributed ledger.

Thus, any future implementation of the CDR should seek to identify common industry products and processes; the standardisation of basic financial services will maximise the opportunity for innovation by providing a digital environment which encourages commoditisation of simple products, features and offerings, and increases competitive pressure to develop higher-value offerings. By continuing to leverage technology to standardise and automate a baseline of industry offerings, we reduce the cost of delivery across that industry and improve the value delivered for every consumer dollar spent, and ultimately drive industry innovation forward.

We note again that the CDR is a joint right for use by both parties - best implemented using a shared or distributed database (ledger). But beyond merely the data being shared is a greater possibility: there will always be an inherent weakness in a DLT-based system used only to record data generated elsewhere. We refer to this as "the Oracle problem," wherein the source of truth sits behind an opaque 'oracle' injecting information about the operation of the product into that shared database. A superior alternative would in fact be a smart contract that does not just operate the recording of product events, but one that ***is*** the core product, so that the source of truth for both the history of product-related transactions, and the product itself, are sharable, rather than simply a report of the product history provisioned via an API.

This convergence of product and technology not only provides full data liquidity as is the intention of the CDR, but also maximal *product* liquidity, in which the "owner" of a given financial product in the case of Open Banking can be modified, effectively moving it from one provider to another. This re-pointing of the "owner" or "provider" of a smart-contract-based financial product, based on an open market of offers, is the only way to achieve the business process speed necessary to enable the kinds of fast data and product liquidity possible "at the tap of a smartphone".

This would also enable compound owners, product fractionalisation, and enhanced liquidity via specialised and micro-offerings. This is a common byproduct of a "tokenised" environment.[13]

[12] Consumer Data Right Overview, The Australian Government the Treasury, September 2019

[13] The word 'tokenised' is, in general, under-defined within the blockchain industry. In this context we mean it as 'programmable', rather than referring to the ability to create a bearer instrument.

Read and Write Access

With the appropriate design and application of distributed ledgers, read access for data under the Consumer Data Right is a simple matter. As with the current implementation, permissioning is still necessary and appropriate, however the permissioning of third parties to read a Prosumer's combined ledger is managed by the Prosumer themselves or by their nominated data custodian / data holder service provider. The underlying technology is designed to ensure that the information being relied upon by the third party is always correct and always current.

We would also reiterate the practical issue of the linear increase in the number of integrations and requests for data that would be precipitated by the current API-based approach. Let us take an Open Banking example: a neo-lender attempting to gain a full picture of a consumer's financial profile would require numerous pairwise connections to the various institutions holding relevant data on that customer, each request requiring the express permission of the consumer for its release. A distributed-ledger based approach reduces this process to a *single request and approval* that is made directly between the neolender and Prosumer. This has the added benefit of maintaining the privacy of the Prosumer to the fact this information is being requested in the first instance.

In terms of write access, this is a similarly trivial process if the financial product in question has also been deployed as a smart contract (as opposed to the simple recording of data associated with the product operating on the business' computer system). In this example, certain functions within the shared program between the Prosumer and the business can be operated directly by the Prosumer, or optionally, by a party that the Prosumer delegates. In this way, a Prosumer can delegate the operation of their product to a competitor, broker, or financial planner in order to perform actions on their behalf. The integrated identity system also means that those delegated parties are known (because they are also recorded on the same distributed source of truth), as well as records of their compliance and certification, enabling the relevant bank audit functions to be automatic.

Specifically on the topic of payment initiation, we note that 'mandated payments' is a feature due to be implemented by the majority of Australian banks by the end of 2021 in accordance with the New Payments Platform (NPP) roadmap. We see the NPP as an important integration to these distributed-ledger-based systems in order to request, authorise, and execute payments in an expanded Consumer Data Right infrastructure.

Final Words

The future direction for the Consumer Data Right must consider the benefits offered by distributed ledger technology.

A DLT-based data framework is the simplest solution for providing the means for the consumers of today to become the digital Prosumers of tomorrow. Our vision of the Prosumer is an individual or business who has the ability to manifest their whole-of-economy digital footprint in a way that provides maximum ***consumer agency***. Our current condition is such that a consumer's economic profile is limited to their current supplier, siloed across suppliers, siloed across industries, and comes with the forced disconnection from their economic identity information if they choose to switch. While CDR 1.0 addresses this issue to a degree, it does so without apparent consideration to the role new technologies can play, ultimately retaining data silos and where information is still held with point-in-time providers, continuing to fragment their data as the consumer moves through the digital economy over time.

Centralised information systems work very well when they operate in isolation, but when there is a requirement to share information of value across multiple actors in a network, their deficiencies are revealed to us.

Block8 would be happy to further discuss our thinking on any of the topics covered above, including specific detail on solution architectures and demonstrations of currently working distributed ledger systems developed to address the challenges and opportunities outlined in the Issues Paper and our Response.

Our experts are also available to assist with research mapping the value chains for centralised and decentralised approaches, the identification of the highest-value areas for a consumer-centric data infrastructure, or working with the Government and other members of industry in the development of pilot programs.

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