

Final report

The Australian AgriFood Data Exchange project

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Abstract

The Australian AgriFood Data Exchange (referred to in this document variably as ‘the AAFDX’, ‘data exchange’, or ‘the project’) is an initiative designed and overseen by the agrifood industry to enable participants to share, discover, merge and re-use data from disparate systems in a secure cloud environment. The data exchange platform would enable the generation of timely and actionable insights while also stimulating sustainable entrepreneurship, consumer assurance, and innovation including enabling the Australian agritech industry.

The final output from this engagement is the business case including cost to deliver, cost benefit analysis and clear identification of benefits to be realised. This business case, developed over the past eighteen months, documents the work completed from 2020 to date to develop a compelling investment case for funding to build and operate a data exchange that will conservatively generate \$70 million net benefit in the first five years (NPV \$FY23) to the Australian agrifood supply chain, and \$422 million over 15 years.

The delivery of this final report constitutes the end of Phase 3 for the Australian AgriFood Data Exchange project. Following the release of the business case, it is envisaged the project will move into the next phase (Phase 4) – which includes fund raising for establishment followed by a procurement process to deliver the foundational data exchange and prioritised applications.

Executive summary

Background

The Australian AgriFood Data Exchange (referred to in this document variably as ‘the AAFDX’, ‘data exchange’, or ‘the project’) is an initiative designed and overseen by the agrifood industry to enable participants to share, re-use and merge data from disparate systems in a secure environment. The data exchange platform would enable a generation of insights while also stimulating sustainable entrepreneurship, consumer assurance, and innovation, including enabling the Australian Agtech industry.

Objectives

The purpose of the AAFDX is to provide a centralised mechanism for the exchange of data between participants in the AgriFood value chain.

Methodology

To meet the project objectives, an end-to-end process of five comprehensive stages was undertaken where high-level ideas were identified and supplemented with research, then validated and defined by a wide range of stakeholders, including leaders and experts across the agrifood sector, supply chain, government and research bodies. A long list of initial use cases was constructed by the project team, which were further co-defined, analysed and prioritised with agrifood industry stakeholders. The options analysed in the business case include:

- Option 1 – Data exchange core digital infrastructure (foundational);
- Option 2 – Foundational data exchange + four priority applications; and
- Option 3 - Transitional Minimum Viable Product (MVP) and phased applications.

The project options in the business case are supported by detailed analysis on five key areas:

1. Commercial strategy;
2. Operating and governance models;
3. Technical requirements;
4. Operating entity legal structures and corporate governance; and
5. Risk identification and management.

Results/key findings

Data sharing has been identified as one of the major barriers holding Australia’s agrifood industry back from reaching full potential, whilst also maintaining domestic and global competitiveness.

Although all major stakeholders have a significant interest in improving the agricultural data ecosystem, the diversity of Australian agriculture and value chain participants has meant that past efforts have been restricted to specific commodities or regions. This resulted in a lack of resources and impetus to address whole of agriculture change.

We know that biosecurity pests and diseases do not organise themselves differently between state, yet many of our plant and animal compliance records do. The lack of interoperability between systems and platforms is significantly hampering widespread adoption of supply chain technology. By contrast, other established and emerging agricultural exporting nations have already made significant investments in data infrastructure to take advantage of the increasing digitisation of farm systems, food safety and export compliance, and logistics planning.

There is no simple single, easy to use data ecosystem in Australia which supports primary producers from across all agricultural industries and other value chain participants in exchanging their data efficiently on agreed terms. Establishing the AAFDX thus, represents an opportunity to break down information silos and boost productivity, innovation, and sector profitability. Deferring this investment will result in the Australian agri-food sector potentially losing its competitive edge in the international market.

Benefits to industry

By enabling agrifood industry data owners to direct and control what data they would like to share and with whom, the AAFDX could support users in unlocking the value from their data, enabling fluid collaboration up and down the supply chain.

Future research and recommendations

It is recommended that the project moves into the fund-raising phase. Prospective funders of the project may have an interest in conducting further analysis prior to progressing the project to the delivery phase, especially regarding the development of data standards and how to best engage technology partners in the AAFDX platform.

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1. Background

The Australian AgriFood Data Exchange (referred to in this document variably as ‘the AAFDX’, ‘data exchange’, or ‘the project’) is an initiative designed and overseen by the agrifood industry to enable participants to share, re-use and merge data from disparate systems in a secure environment. The data exchange platform would enable a generation of insights while also stimulating sustainable entrepreneurship, consumer assurance, and innovation including enabling the Australian Agtech industry.

Currently, the data systems used in Australia’s agrifood sector are recognised as disparate, siloed and proprietary. A lack of a central platform poses a range of challenges to the sector, resulting in market failures in both information and coordination. Furthermore, a lack of data interoperability standards across the sector have resulted in an environment where available datasets are unable to be leveraged, readily accessed, or shared. To address these challenges, implementing the AAFDX presents as an opportunity to form the foundational digital infrastructure for the Australian agrifood industry. Therefore, there is an opportunity for a national data exchange platform to enhance industry collaboration, enable a national utility and service for biosecurity and compliance, and allow Australia to keep pace with other leading international agrifood industries.

The AAFDX would serve to benefit a range of stakeholders across the sector and its supply chain, including government, research institutions, agricultural producers, processors, retailer, agrifood tech vendors and service providers for the sector. An effective data exchange platform would facilitate market access by assisting with creating new export opportunities, benefitting producers, processors, and various other stakeholders across the supply chain. The platform also enables access to more richer and trustworthy data, benefitting research and development (R&D) by allowing the generation of detailed insights and the ability to build further products such as applications, data services and tools. These data collection processes further allow for reductions in compliance burden, where a streamlined reporting process will benefit producers, processors, and other stakeholders across the supply chain.

Overall, the AAFDX is well placed to accelerate agrifood tech innovation and increase agrifood enterprise financial outcomes, in the context of policy and strategic alignment supported by the State and Commonwealth Governments, and industry.

1.1 Challenges addressed by the project

Data sharing has been identified as one of the major barriers currently holding Australia’s agrifood industry back from reaching full potential whilst also maintaining domestic and global competitiveness.

Although all major stakeholders have a significant interest in improving the agricultural data ecosystem, the diversity of Australian agriculture and value chain participants restricted past efforts to specific commodities or regions. In addition, limited resources and narrowly defined incentives further hampered efforts to enable whole of agriculture change. As a result, the agrifood sector currently faces several challenges:

- No single, easy to use platform in Australia which allows producers from across all agricultural industries and other value chain participants to exchange their data efficiently on agreed

terms with trusted service providers, or other interested parties, such as government and researchers.

- Australia’s agrifood sector participants are unable to access and take full advantage of the huge amounts of data they are generating and efficiently transfer their data across the value chain.
- The current disparate, siloed, and proprietary data systems do not enable data owners to easily access and direct the exchange of their data. This leads to costly inefficiencies, poor collaboration, wasteful use of critical managerial time, and loss of opportunities for the sector to deliver superior outcomes for all supply chain stakeholders.

By contrast, other established and emerging agricultural exporting nations have been making significant investments in data infrastructure to take advantage of the increasing digitisation of farm systems, food safety and export compliance, and logistics planning.

1.2 Project Purpose and Opportunity

The Australian AgriFood Data Exchange was initiated to address the challenges outlined above with a vision to establish an interconnected data highway for Australia’s AgriFood value chain. The opportunities harnessed by this project are summarised as:

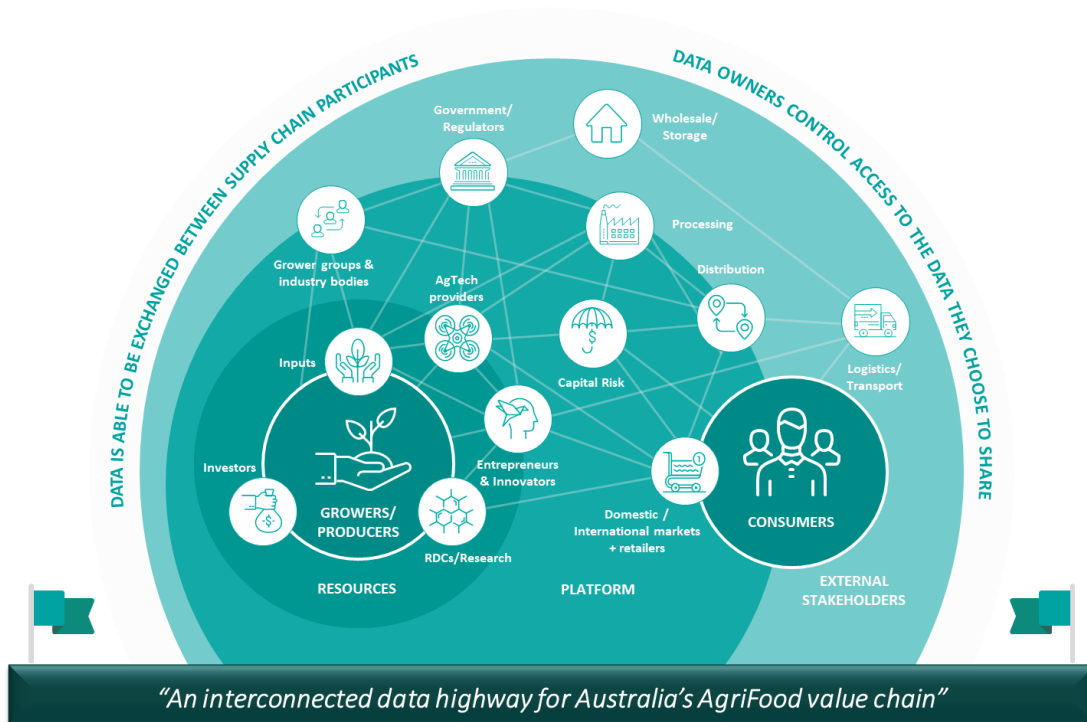
- An Australian Agrifood Data Exchange designed and overseen by the agrifood industry to enable participants to share, reuse and merge data from disparate systems in a secure environment.
- In doing so, the generation of insights can occur, while stimulating sustainable entrepreneurship, consumer assurance and innovation.
- Deliver value for industry, government, and the research community by enabling simple controlled access to external data and reference data sets.
- Enable Australia’s agrifood industry to access data infrastructure that leading agrifood exporting nations are already using to support their industry participants to thrive in today’s digital economies.

2. Objectives

At its core, the Australian AgriFood Data Exchange (AAFDX) project seeks to define and articulate the business case for investment in an industry owned data exchange. The purpose of the AAFDX is to provide a centralised mechanism for the exchange of data between participants in the AgriFood value chain.

2.1 Project vision

Figure 1: Project Vision



Ultimately, the Australian AgriFood Data Exchange seeks to establish a digital platform that enables the following:

- The permitted exchange of data between AgriFood industry participants
- Timely access to information that supports decision making for the AgriFood value chain
- The release of management capacity
- Standardisation and consistency of industry data assets
- The capacity to adapt, incorporating new use cases for data exchange that deliver value and support resilience of AgriFood value chain participants
- Increased transparency of AgriFood industry data to support multiple use cases (e.g. regulatory compliance, collaboration between public & private data sets)
- A mechanism to connect disparate data sources

2.2 Objectives

Recognising this is an ambitious, complex, multi-year, multi-phased program requiring significant investment to bring the vision to life and build confidence for supporters, a program of work has been established with the following objectives. Phases 1, 2 and 3 of the AAFDX project have now been completed as per the objectives agreed upon between MLA and the PMO – see below.

Phase 1:

- Project establishment – To agree on the governance framework for the project, roles and responsibilities, risk management, project policies (including project participant engagement), timeline and scope; and
- Use cases – Identify and define up to 4 use cases to inform the experiments, including specifications, considerations, desired outcomes, and acceptance criteria.

Phase 2:

- Market scan and sourcing strategy - To identify technology vendors in the market that have the capability and resources to design and implement solutions that will inform the development of the AAFDX.
- Request for Information process (RFI) - To evaluate and test shortlisted technology/solutions design and determine best candidates to progress with design and build of experiments.
- Experiments - To test use cases via experiments and proof of concepts to inform a business case and design of the AAFDX.

Phase 3:

- Expression of Interest (EOI) - To test market appetite for a development partner to deliver on the AAFDX and inform technology build and operating cost estimates;
- Detailed use case requirements - To further build on functional and technical requirements detailed in Phase 2 to produce detailed requirements for all use cases;
- Data governance - To develop and form data governance frameworks that will assist in the efficient sharing of data through the AAFDX;
- Operating Model - Develop an operating model for the AAFDX; and
- Business Case - To develop a business case that builds on the work of previous phases to outline the costs and benefits of the project.

3. Methodology

3.1 Approach

Establishing an AAFDX for the agri-food sector faces several challenges such as gaining users' trust, low adoption rates of new technologies in the agrifood sector, data interoperability, bringing together disparate sources of information, working through the value chain from inputs to retail when there is no agrifood system leader to support the bringing together of stakeholders, and demonstrating the value of the exchange to the wider industry.

To address these challenges and achieve the objectives outlined in the previous section, an end-to-end process of five comprehensive stages was undertaken where high-level ideas were identified and supplemented with research, then validated and defined by a wide range of stakeholders, including leaders and experts across the agrifood sector, supply chain, government, and research bodies. A long list of initial use cases was constructed by the project team, which were further co-defined, analysed and prioritised with agrifood industry stakeholders.

3.1.1 Phase 1: Set-Up

The first stage of the project identified pain points experienced throughout the agri-food sector by convening a broad cross-section of stakeholders to gather information on common problems. Stakeholders included state and federal government agencies, industry bodies, Agtech providers, researchers, and primary producers. Industry collaboration spanned 51 individuals and the initial workshop captured thoughts and feedback from 47 participants. The common problems were compiled into a long list of problems for further refinement.

Throughout this early consultation process, key alignment points, challenges, and considerations were identified. Table 1 outlines the relevant outcomes that resulted from industry consultations in Step 1 of the design process.

Table 1: Early industry consultation outcomes

Points of focus for a potential exchange	Challenges to achieving success	Other considerations
Involvement of the end-to-end supply chain, from on-farm through to consumer and ensuring value at the producer level.	Trust - Culture and hesitation of sharing data was raised as a key issue. Although acknowledging that the industry has come a long way, hesitations remain in this space.	Instant gratification - Trust is the first consideration for this initiative. However, adoption and ability to make a decision off the back of it is what is important. Initiatives need to solve industry pain points, but also create immediate value to ensure uptake.
Supporting industry as they adopt digital and data.	Ownership - Ownership of data and IP was raised throughout the consultations. Willingness of large corporations to give up their data, and questions around who will ultimately own the data were prevalent.	Retaining competition - There is a global desire to have transparent data. However, at some point, this will start to impact markets when everyone sees the same data and works the same way, thus impacting competition.
Growth of the Australian export market. Australian has two per cent of the world's exports in agrifood. Traceability, sustainability and provenance is at the heart of repositioning toward a sustainable, strong, growing industry.	Governance - Governance was referenced in the majority of consultations. Who will be leading this? Who should be leading this? However, there was general acknowledgement that it should be industry led.	Communication - Open communication of this project across the whole supply chain will be key to ensure buy-in and trust.
Data security and interoperability, and trade/movement of product in export markets. The potential benefits of bringing value to Australian products that can be sold to trading partners (i.e., real time data).	Quality of data - Quality of data was referenced frequently. The system is only as good as the data that is put into it. How do you control quality of data inputs?	Analytics or highway - Clearly defining the intent of the exchange and the movement of data is critical to the next phases of work.
The ability to unlock the power of what is seen with other	Data use - Data use was another key topic. How will 'my' data be	This is a big vision - The vision as a whole is bold, but stepping it

ecosystems (e.g., the Netherlands). A centralised system with open access that allows all of industry in one central location gives synergies to international successes.	used, and by whom? How do we define this? This ties in with trust.	down into specific use cases makes it more achievable.
	Interoperability - Data interoperability was raised in a number of the consultations. How do we ensure that data from multiple sources and programs is able to be shared and used across the exchange?	Maturity of industry - Maturity of the industry indicates how well this would work. Agriculture is a fragmented system with many different levels of maturity throughout the supply chain. This will make it more challenging for this to be successful.

Once a sufficient understanding of the problems and opportunities surrounding a potential data exchange had been defined, the design process turned to creating and prioritising specific use cases for the project. First, an initial long list of potential use cases was constructed by the project team, drawing from the insights captured in Step 1, which was then workshopped with agrifood experts. This process was guided by key design principles to maintain consistency and standards, including:

- Consumer-centred design;
- Modularity and scalability;
- Alignment with strategic objectives;
- In-flight initiatives alignment;
- Key pain points; and
- Generation of incremental value with high desirability.

The long list of potential use cases was taken into a co-design workshop with agrifood industry stakeholders. This resulted in the definition of eight tangible use cases, shown in Table 2, for the data exchange and applications.

Table 2: Step 2 use cases

Use Case	Definition
Centralised data for compliance and certification	A centralised highway for compliance data to allow rapid response to evolving compliance requirements and get/give access of relevant compliance artefacts to any parties along the supply chain. This would allow an efficient and quick movement of data, including organic status, biosecurity, National Vendor Declarations (NVDs), animal health certificates, weighbridge data, trucking times/routes, through trade non-tariff measures (NTMs), and welfare attributes, along the value chain from a central, single place.
Voluntary benchmarking	Compare data against industry average (or any select producers), as well as generate industry wide KPIs, to improve production systems, make more informed decisions, and also share data with any other parties who may need to see it (i.e., banks when getting a loan).
Logistics and biosecurity	Easily access multiple data points from any logistics operations. (i.e., be able to geo-tag tractor and trailer units to understand where they have been, detect

Use Case	Definition
	any presence of contamination, and cross reference to NVDs/Livestock Production Assurance (LPA)).
Centralised data systems and frictionless movement	Be able to connect, access and aggregate data coming from different systems (machinery, technology etc.) to efficiently leverage data to create needed insights.
Traceability	Be able to better communicate details of each aspect of product (i.e. quality, weight, journey, certifications, origin, welfare, exposure to fertiliser/chemicals etc.) to the consumer and receive feedback from others in the supply chain. This allows greater confidence in supplied products and enables the leverage of Australia's clean, green brand.
Sustainability reporting	Be able to seamlessly report sustainability credentials (industry and producer levels) and draw consolidated sustainability data and insights from various levers (i.e., land, water, CO ₂ , Environmental Social and Governance (ESG)). This would allow a company to check whether it is meeting ESG governance requirements, generate further revenue opportunities and understand climate score and guiding factors for change.
Biosecurity and contamination information	Be able to have a single view of disparate data sources to identify any contamination source or presence of pests (i.e., trucking day/load, paddock stock came from, fertiliser and agricultural chemicals in that paddock, hormone or animal health treatments, any biosecurity issues on farm in recent years, identify and link existing surveillance database and systems).
Genetic profiling	Be able to easily harvest genetic data which can be used to guide decision making across multiple aspects of products (i.e., eating quality, animal health, environmental, seasonal, crop variety performance etc.).

For each of the eight use cases (UC), the key consumers, outputs/outcomes, and high-level benefits were identified. These were analysed by the project team to consider the perceived value, desirability, and applicability of these use cases to the wider supply chain. The project team aimed to capture as broad and as deep of a representative sample as possible and so selected use cases based on relevance, geography, and industry. From this assessment, six core use cases were selected to be taken forward into consults with industry stakeholders. These were:

- UC1 – Centralised data for compliance and certification;
- UC2 – Biosecurity and contamination information;
- UC3 – Voluntary benchmarking;
- UC4 – Sustainability reporting;
- UC5 – Traceability; and
- UC6 – Frictionless data movement.

These core use cases were then brought into a design thinking workshop in which participants were asked to provide constructive challenges and feedback on each case. They were also asked to vote preferentially on which use cases would be most relevant to inform experiment design and initial solution design.

Based on stakeholder feedback, it was agreed that UC6 – frictionless data movement – was an underpinning capability of each of the other use cases and would be absorbed into each use case. In line with industry insights and the value propositions seen, UC1 - centralised data for certification and compliance – was seen as the clear winner. UC5 – supply and origin traceability – ranked a close second, followed by UC2 – biosecurity and contamination information and UC3 – voluntary

benchmarking for comparison and decisions. These four use cases were recommended to be taken forward to Step 3.

At the point of time of validating use cases to prioritise UC4 – sustainability, reporting and insights polled the lowest. However, with heightened government and industry commitments to biodiversity and decarbonisation, any subsequent polling of stakeholders may result in this use case polling higher than previously.

3.1.2 Phase 2: Ideate and develop proof of concepts

Four experiments were developed to test the use cases and validate the establishment of the data exchange as a viable solution for the sector. The purpose of the experiments was to establish the data exchange as a reasonable potential solution to broad challenges across the agrifood sector and, as such, aimed to represent diverse and distinct problems, industries, geographies, and points along the value chain. The final experiments were:

- 1 Compliance - Addressing the cumulative burden of compliance for producers through processors operating in the Victorian and New South Wales sheep sector (meat and wool);
- 2 Biosecurity - Strengthening biosecurity in the viticulture sector through standardised, accurate traceability data (Victoria and South Australia);
- 3 Benchmarking - Benchmarking to identify gaps and opportunities for improved performance pre harvest in Western Australia's grain sector; and
- 4 Traceability - Timely quota accounting and pre-fishing information exchange for western rock lobsters (Western Australia).

Following the identification of the appropriate experiments, a Request for Information (RFI) was undertaken to select vendors to deliver the proof of concept / prototype applications. The RFI received a positive response from the industry which was demonstrated through the total number of respondents, clarifications received, and the depth of the technical solutions provided.

Fifteen data service providers responded to the RFI, and these responses were then subjected to a capability deep dive. The final vendors chosen to run the proof-of-concept experiments were: Rezare Systems, Eratos, AxisTech, and IBM and Telstra.

The experiments were found to have sufficiently demonstrated the viability of the data exchange, as a potential solution to the challenges identified. A Demo Day and Design Workshop was run on 29 – 30 March 2022, to showcase outcomes from the experiments to an audience of representatives across the value chain and provide a platform for project stakeholders to begin shaping the AAFDX - not just as a technology, but as an organisational entity.

Prioritising applications for inclusion in the MVP

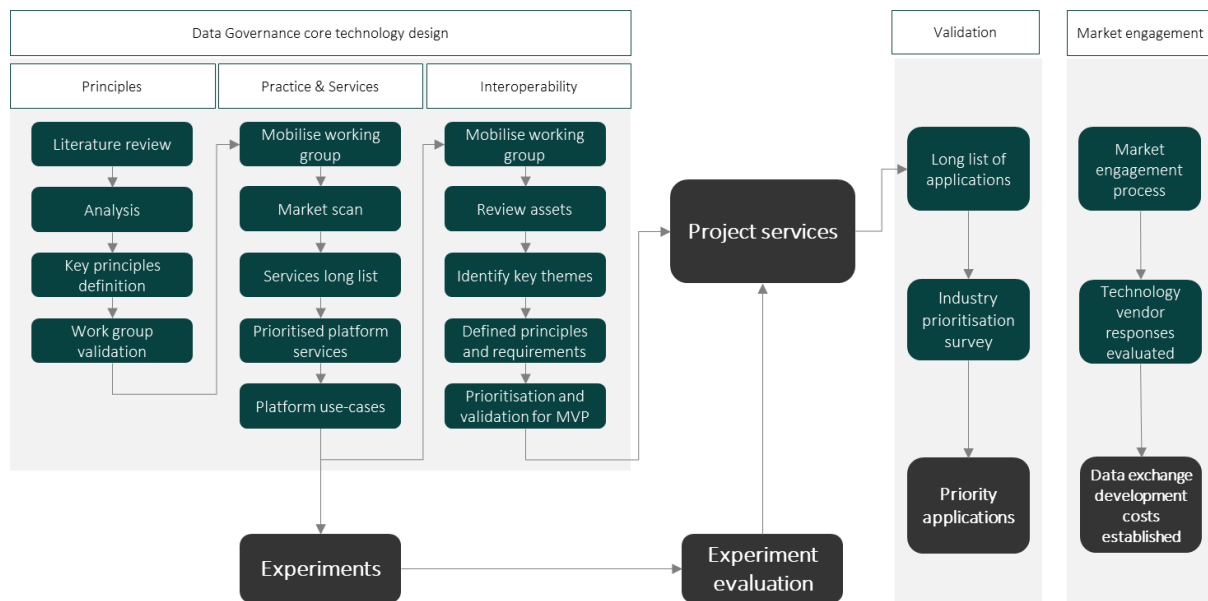
Given experiments were designed to represent as broad a sample as possible for validation, there was a need to ensure that any application was explicitly addressing a relevant and current need. Significant time had elapsed, and new stakeholders became involved between the initial conception of the experiments and the formulation of the applications.

As a result, a series of workshops were conducted to create a long list of potential applications. A survey was released on 26 May 2022 to 31 project stakeholders from various sectors across industry, government, and research facilities to prioritise these applications. This survey resulted in the

prioritisation of two applications that were a further refinement of the proof of concepts - quality assurance and biosecurity, and two new applications, livestock movement and food safety.

All of the priority applications were co-designed with industry bodies that provided insight and expertise from the relevant field. The applications that are not intended for development and launch on day one of the data exchange release, are viewed as applications with significant development potential as the data exchange develops and matures over time.

Figure 2: Overarching application design process



3.1.3 Phase 3: Develop business case

Core data exchange services

A working group was mobilised to understand the potential service mix for the AAFDX on day 1. Working group members included: Integrity Systems Company (ISC), Federation University, AgriFutures Australia, Australian Wool Innovation Limited, National Farmers Federation, Grower Group Alliance, Fisheries Research and Development Corporation (FRDC), Food Agility, Agriculture Victoria and Western Australian Department of Primary Industries and Regional Development (WA DPIRD).

Seven stakeholder workshops were held to work through the following activities:

- Conduct a market scan for global data exchanges.
- Shortlist data exchanges using a classification matrix.
- Analyse shortlisted data exchanges to identify common themes and service offerings.
- Collate a list of services that were currently being used by other data exchanges. Also, designed a data platform architecture with the must have services.
- Identify the must have core platform services required on day 1 for the AAFDX, as well as the services that would be required after the platform has been launched.

The must have core services identified by the working group formed the basis of functional and non-functional requirements of the AAFDX, which were integral to informing both the project options to be analysed in the business case and the market sounding.

Project Options

Stakeholder interviews confirmed general support for the AAFDX, and further incorporated feedback for the platform and market sounding. With input from funding participants and expert stakeholders, the project team developed and proposed three project options, forming the basis for analysis within the business case.

1. **Option 1** – Data exchange core digital infrastructure (foundational);
2. **Option 2** – Foundational data exchange + four priority applications; and
3. **Option 3** - Transitional Minimum Viable Product (MVP) and phased applications.

The options are designed to give flexibility to achieve the vision for a nation building digital infrastructure. The project options are different configurations of a data exchange and four prioritised applications:

1. **Application 1** – Quality assurance reporting tool;
2. **Application 2** – Biosecurity for interstate plant matter;
3. **Application 3** – Nationally consistent domestic livestock movement tool; and
4. **Application 4** – Food safety assurance tool.

Market sounding

An Expression of Interest (EOI) was run to gather pricing information to inform the business case and select preferred (short listed) vendors for reference within the business case.

To this end, the EOI detailed the functional and non-functional requirements for the core platform services prioritised for day 1 and the suite of four prioritised applications. Schedule 1 of the EOI focused on respondent' solutions and whether all functional and non-functional requirements could be met.

An evaluation team (ET) was established to evaluate the EOI responses, collectively review and agree on consensus scoring for the responses and provide commentary on the solutions. Following this evaluation process, the ET put forward a preferred list of respondents for the core platform services and prioritised applications to the Steering Committee for endorsement.

A total of 14 submissions were received, demonstrating a positive response from the market. Table 3 below is a breakdown of the total number of providers surveyed and respondents to the EOI –

Table 3: EOI Results

Category	Number
Pre-EOI release - Total number of service providers PMO identified as part of initial market scan	27 service providers
EOI Release - Total number of service providers that were invited to the EOI, noting that the EOI was run as an open tender process and any service provider was able to download the documents	31 providers

Category	Number
EOI in market - Number of attendees at the industry briefing sessions	49 Attendees
EOI Responses submitted - Total number of respondent applications received	14 Respondents
Number of compliant EOI responses	13 Respondents
Number of respondents proposing to participate to develop the core platform services prioritised for day 1 and the suite of 4 prioritised applications	4 Respondents
Number of respondents proposing to participate to develop the core platform services prioritised for day 1 and some of the prioritised applications	5 Respondents
Number of respondents proposing to participate to develop the core platform services prioritised for day 1	3 Respondents
Number of respondents proposing to participate to develop some of the prioritised applications	1 Respondent

Information received from the preferred vendors, as well research and benchmarking of existing agricultural data exchange providers, helped inform both the economic analysis portion of the business case as well as the commercial strategy.

Economic Analysis

The data exchange was considered from two viability perspectives:

- Economic viability; and
- Financial viability.

Cost Benefit Analysis (CBA) is a systematic approach to analysing the economic, social, and environmental costs and benefits associated with a project.

CBA uses discounted cash flow analysis to compare marginal costs and benefits of the options relative to a Base Case scenario. The framework for the CBA which provides an overview of the economic appraisal approach is illustrated in Figure 3 and involves the following steps:

- Articulating the Base Case and options to be analysed;
- Defining the community of interest;
- Identifying and quantifying (to the extent permitted by data) costs and benefits over the evaluation period; and
- Generating performance measures including Net Present Value (NPV) and Benefit Cost Ratio (BCR), including sensitivity analysis to assess the impacts of changes in key variables on performance measures.

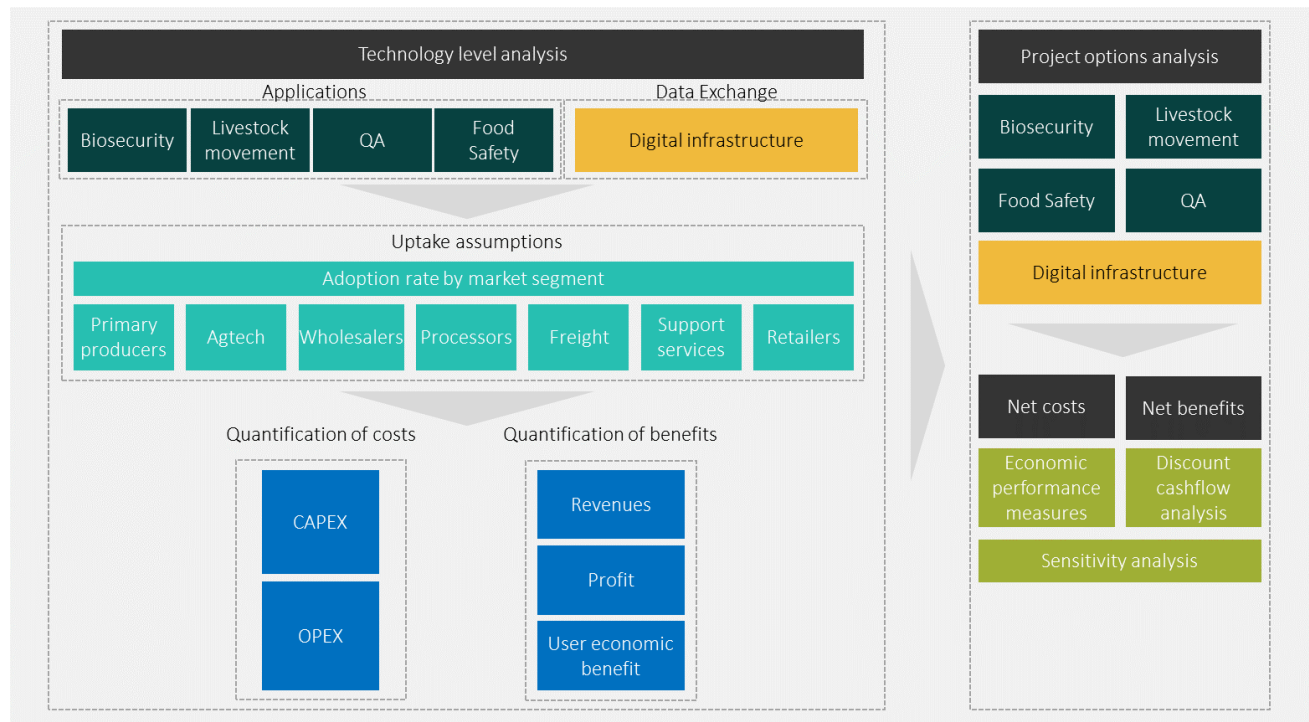
An economic appraisal differs from a financial appraisal, which focuses on revenue flows and capital and operating costs for key stakeholders and excludes externalities and other benefits (such as opportunity cost). An economic appraisal considers the options from a whole-of-community perspective and considers the costs and benefits.

The analysis was undertaken in two stages:

- Foundational data exchange; and

- Prioritised applications.

Figure 3: Economic and financial analysis approach



The following economic performance measures were calculated to estimate the economic viability of the options:

- **NPV** – the difference between the present value of the total incremental benefits and the present value of the total incremental costs; and
- **BCR** – the ratio of the net present value of benefits to costs in a project option.

Projects that yield a positive NPV indicate that the incremental benefits of the project exceed the incremental costs over the evaluation period. The NPV measures the overall economic return in relation to the required capital expenditure (CAPEX) and operational expenditure (OPEX).

The BCR measures the ratio of discounted benefits to discounted costs. A BCR greater than one indicates that project benefits exceed estimated costs. However, a higher BCR is usually favourable to ensure some level of built-in contingency against unforeseen increases in costs, delays, or scope expansion.

Commercial Strategy

A list of products, services and revenue opportunities for the project options were developed with several key commercial and pricing objectives for the AAFDX. Product pricing strategies and models have been identified and compared, such as subscription-based services, fee for service, tiered pricing, and dynamic pricing, for each option.

Operating and governance model

The data governance framework (data sharing principles, core services and interoperability themes and principles) and the target operating model (design principles, value chain and functional model) were developed using an iterative approach that relied heavily on stakeholder participation and

feedback. A summary of stakeholders engaged, and methods of engagements are outlined in section 3.3.1 Stakeholder input opportunities.

Technical requirements

Key themes for data sharing, operating designs and interoperability standards were identified from best practice research and consultations. Guiding principles were validated and prioritised in workshops with expert stakeholders in the sector.

Operating entity legal structure and corporate governance

The AAFDX is an initiative designed and overseen by the agriculture and food industries. The collective values of the project stakeholders and the project strategic objectives guided the development of commercial objectives. The key commercial objectives that are to be taken into account in selecting a legal structure to own and operate the AAFDX are set out as follows:

- The entity should be able to derive a profit for reinvesting back into the business for new products and services.
- The entity should not distribute profits to owners.
- The entity should have an ability to make payments to participants to return their initial contributions (however not in the form of dividends).
- The entity should be able to receive grants from multiple entities.
- The entity should be able to
 - receive concessional loans; and
 - be debt funded from establishment.

Understanding that the AAFDX may be privately managed by its contributing participants or run as a government initiative, the following structures were considered as options when designing the entity that will own and operate the AAFDX:

- Not for Profit – A Not for Profit registered under the Australian Charities and Not for profits Commission Act will be entitled to a wide range of Commonwealth tax concessions (the most significant being an income tax exemption, refund of franking credits, fringe benefit tax concessions along with exemptions & concessions from State taxes – e.g. payroll taxes, land taxes, etc.). It is important to note that the refund of franking credits is not available to non-charitable NFPs.
- Private company – A structure has a predominant purpose of generating a profit to be returned to its investors.
- Government entity – A government entity is established by the Commonwealth and/or State governments. Assuming that there is no private sector ownership the entity could take the form of a joint venture, partnership or interest in other companies. Government entities are tax exempt in most instances or subject to the tax equivalence regime (where they compete with taxable businesses).

Table 4: Summary of various legal structures

Legal structure	High level summary
Unincorporated association	An unincorporated association is not recognised as a separate legal entity to the members associated with it. It is a group of people who agree to act together as an organisation and form an association. The group can remain informal, and its members make their own rules on how the group is managed. The rules may also be referred to as a constitution. An unincorporated association is an entity under tax law and treated as a company for income tax purposes.
Incorporated association	An incorporated association is a legal entity separate from its individual members. Associations are incorporated under state or territory legislation. An incorporated association may operate outside the state and territory in which it is incorporated if the entity is registered with ASIC as a registrable Australian body under the Corporations Act 2001. An incorporated association can continue regardless of changes to membership. It also provides financial protection by usually limiting personal liability to outstanding membership and subscription fees, or to a guarantee.
NFP companies	NFP organisations under the Corporations Act include: <ul style="list-style-type: none"> • Public companies limited by guarantee – the most common structure for NFP organisations; • Proprietary companies limited by shares – including a business wholly owned by a charity that has a similar charitable purpose; and • Incorporated associations under a State / Territory Act of Parliament and registered with ASIC.
Statutory NFPs	Some NFPs are set up under an Act of Parliament – e.g. public universities are established under legislation.
Cooperatives	A cooperative is a type of entity which exists for the benefit of its members. It is only suitable as an NFP legal structure if it has rules to prevent surpluses or profits being distributed to members (referred to as non-distributing or non-trading cooperatives).
Trusts	A trust is an obligation imposed on a person or other entity (the trustee) to hold property for the benefit of beneficiaries or for a particular purpose. In legal terms, a trust is a relationship not a legal entity. The trustee must deal with the trust property in line with the settlor's wishes as set out in the trust deed (or will in the case of a deceased estate). Trusts are widely used for investment and business purposes as well as for the advancement of a charitable purpose. Public and private ancillary funds must be established under an instrument of trust.

Risk identification and management

To manage potential risks for the data exchange, a risk management process was also undertaken to develop a project risk profile which informed the risk adjusted costings in the business case for Options 1 & 2.

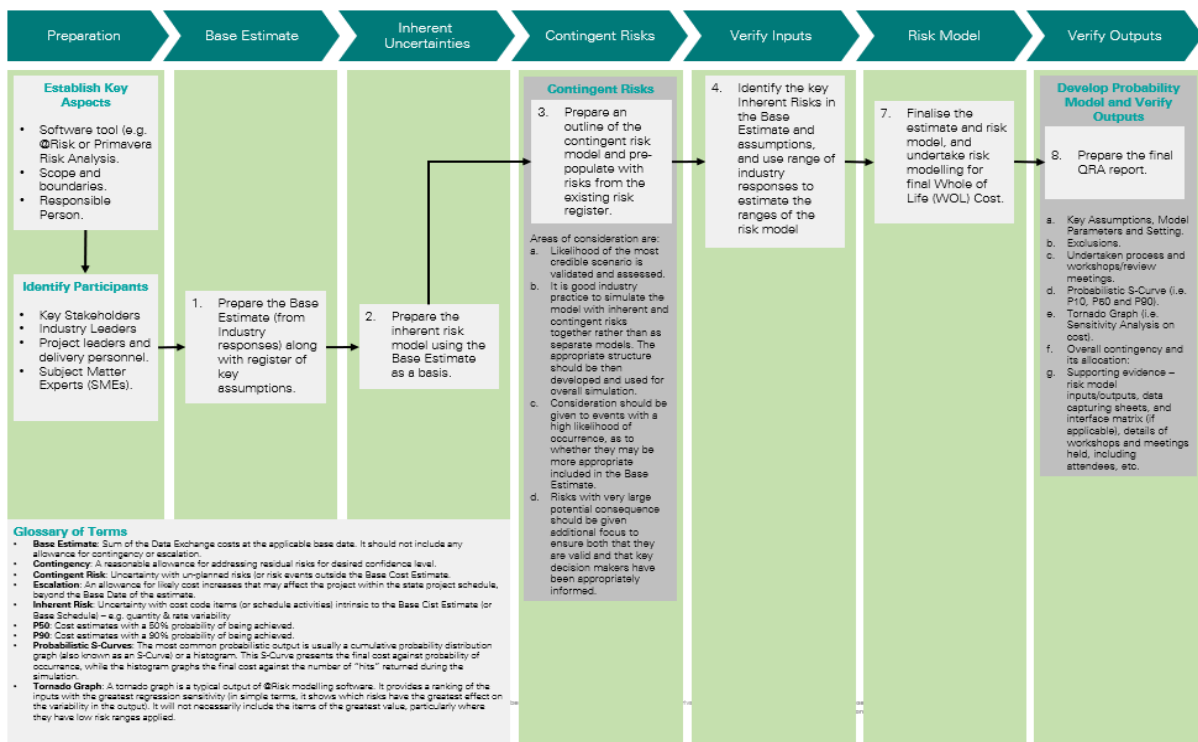
Inherent ranging was based upon the vendor respondent information for data exchange cost items outlined in the EOI. The minimum value from respondents was assumed as the “Best Case” scenario and the maximum value as the “Worst Case”. Where only one respondent had provided pricing information, the risk team has assumed a worst case estimate 40 per cent greater than the base case and a best-case figure of 15 per cent less than the base estimate in line with Risk Engineering Society (RES) Contingency Guidelines ranges.

Internal meetings were also held to assess key contingent risks that may evolve throughout the development of the AAFDX. These risks were then circulated with key stakeholders using a virtual workshoping tool which allowed participants to qualitatively assess the contingent risks in accordance with a Risk Matrix measuring likelihood against impact. A qualitative risk workshop was held with key stakeholders of the data exchange to discuss findings (from the tool) and risks were subsequently re-aligned based on discussions. This process allowed contingent risks to be quantified in the following Quantitative Risk Analysis (QRA).

The QRA process analysed key risks that would have a cost impact on the project and then simulated these risks to make predictions about the outturn cost of the AAFDX.

An analysis of the probability of both inherent and contingent risks occurring under the current risk profile was undertaken using the Risk Matrix (referred to above) and quantifying the potential financial impact on the AAFDX cost estimate. The QRA process conducted is shown below.

Figure 4: Quantitative Risk Analysis process



The inputs, modelling parameters, key assumptions and outputs of the QRA process have been regularly reviewed and validated by the project team and stakeholders. To mitigate an inherent human tendency to be optimistic or overconfident in our assessment of uncertain outcomes, such as setting probabilities and ranges that would result in setting undesirably low contingencies, several control measures were applied including:

- Cross-checking the assumptions made by the wider Project team,
- Using an anonymous virtual workshopping tool to rank risk consequence and likelihood whilst eliminating group think and anchoring bias,
- Using ranges which are appropriately wide and generally biased on the upside, and
- Validating the risk ratings at the risk workshop with key representation across all project stakeholders.

The purpose of the formal risk workshop was to provide an overview of the risk process and risks captured to date and focus on the risk ratings of the key risks. The workshop focused on the contingent risks through identifying the influencing drivers into the QRA modelling process in relation to the Risk Matrix.

The QRA modelling process determines the provision of P50 and P90 cost contingency. As part of the process, the workshop attendees reviewed the risk register, and assessed the overall ranges for contingent risk. These were then used as inputs in the risk model, and a Monte Carlo simulation undertaken using Risk software. Consistent with industry best practice guidelines, the Probabilistic Risk Model was run based on one simulation consisting of 10,000 iterations, with inherent and contingent risks modelled together to report an overall total project outcome.

3.2 Stakeholders

The key stakeholder groups driving the development of the AAFDX project spans from Federal and State Governments, universities, rural research and development (R&D) corporations, industry bodies, researchers, primary producers and growers, agri-businesses, and the wider agrifood supply chain who collectively are the data owners and custodians.

This project would also not be possible without the leadership and financial support of key organisations across government, research and industry including the Australian Government (Department of Agriculture, Fisheries and Forestry), Meat and Livestock Australia, Charles Sturt University, Fisheries Research and Development Corporation, the Victorian Government (Agriculture Victoria), Agrifutures and the Commonwealth Scientific and Industrial Research Organisation (CSIRO), Food Innovation Australia, the Western Australian Government (Department of Primary Industries and Regional Development), the South Australian Government (Department of Primary Industries and Regions), Food Agility Cooperative Research Centre and Australian Wool Innovation.

In-kind supporters who have generously given up their time and expertise to help inform the project include the NSW Government (Department of Primary Industries), Cotton Research Development Corporation, Australian Research Data Commons, Australian Plant Phenomics Facility, Elders, Australian Packaging Covenant Organisation, Grower Group Alliance, Australian Research Data Commons, New South Wales Wine, Indian Ocean Rock Lobster, Paraway Pastoral Co. Western Rock Lobster Council, Federation University, Australian Eggs, Australian Wool Exchange, Ridgehaven, Vinehealth Australia, Aidinville Farms, McBride, Australian Wool Innovation, Treasury Wine Estates, Wine Australia, National Farmers Federation, Bowman Farming, Coolindown Farms, Geraldton Fishermen's Co-operative, TA Fields and Sanderson Farms and GS1.

Stakeholders can be broadly categorised into two groups, as shown in the figure below. This figure also captures key organisations that have demonstrated active support for the data exchange.

Figure 5: Project Stakeholders



For a comprehensive list of all stakeholders involved in the project refer to **Error! Reference source not found.**

There are several challenges to establishing and operating a viable data exchange from a stakeholder perspective, including:

- Building and maintaining trust and support for the project, particularly regarding data permission;
- Platform uptake in a sector with a historically low adoption rate of new technology solutions; and
- Perceptions of transparency undermining businesses' competitive edge in the market.

Despite there being known challenges, industry engagement with over 407 individual stakeholders over the development phase of the project has identified strong support for the project. There is broad stakeholder recognition of the need for better transparency, access, and collaboration in the agrifood sector and that the data exchange will have a positive impact.

3.3 Stakeholder Engagement

Conducted 27 consultations with government, RDCs and industry associations – 27 consultations were conducted with various government agencies, Departments, RDCs, and industry associations to obtain early stage thinking around the concept of the data exchange. These consultations shared the initial thinking and tested key use cases, allowing feedback and insights to refine the use cases.

Conducted two Design-Led Thinking Workshops – Following an initial use case workshop on 15 May 2020 in which stakeholders provided feedback and helped to prioritise relevant use cases, another virtual workshop was held with 37 stakeholders on 18 June 2020 to help shape the thinking around the concept. The agenda covered the opportunities, insights from around the world, the use cases, high level project stages and governance and next steps. It also covered a case study on the New Payments Platform, highlighting the success of a complex, industry-wide digital transformation. This platform was used to further obtain feedback and vote on the six prioritised use cases.

Key insights obtained from Stage 1 consultations and the initial workshop phase included:

- Clear support for the data exchange from the vast majority of parties consulted;
- Acknowledgement that the structure for collaboration and co-ownership of the outcomes will be paramount to signalling to and securing the trust of participants;

- Collective acceptance of fundamental challenges around data that need to be addressed in the coming phases of the project, including data availability, quality, use, and interoperability;
- Willingness and the necessity to collaborate across industry to minimise duplication of effort and funding. Although all parties acknowledged there is no initiative of this scale in the market, there are several smaller projects emerging that align to the vision and overarching principles that the AAFDX is trying to achieve;
- Acknowledgement across all parties that core value propositions will be critical to achieving uptake, particularly at the on-farm producer level. Early value will need to be delivered that outweighs risk of participation;
- Open and ongoing communication across all of the value chains will be key to the continued support and overall success of the initiative;
- Generally acknowledged that this is an ambitious technology-enabling initiative that could connect Australia’s agriculture and food ecosystems; and
- Ensuring that the cost of extraction and integration of data from existing data sources with the AAFDX is not commercially prohibitive.

Socialised with industry leaders – The vision and refined use cases were socialised with 34 leaders on the Australian AgriFood and Internet of Farms Traction Program at Charles Sturt University Global Digital Farm.

Conducted further consultations – A further seven consultations were conducted with researchers and AgTech providers and producers to obtain their feedback and insights on the initiative. These tested the refined, prioritised use cases and sought feedback on the overall vision and concept.

Demonstration day – Four vendors demonstrated four proof-of-concept applications of how the data exchange could work from logging into the platform, interoperability with other data sources, and potential outcomes. This event was attended by representatives of stakeholders across all components of the agrifood value chain.

In addition to the extensive stakeholder engagement throughout the use case design components of the project (outlined above), stakeholders played a critical role in shaping many other aspects of the project. The table below summarises specific stakeholder inputs.

3.3.1 Stakeholder input opportunities

Table 5: Stakeholder input opportunities

Input	Date	Stakeholders	Description
Steering Committee & Advisory Council	Steering Committee: 1/6/2021, 26/7/2021, 7/9/2021, 19/10/2021, 30/11/2021, 21/2/2022, 18/5/2022, 26/7/2022, 14/9/2022 Advisory Council: 25/5/2021, 20/7/2021, 31/8/2021, 12/10/2021, 22/11/2021, 10/5/2022, 19/7/2022, 6/9/2022 Joint Steering Committee and Advisory Council: 1/2/2022, 17/3/2022, 9/11/2022	See Error! Reference s ource not found..	The Steering Committee is responsible for: Project governance and direction; Review and approval of operational plans for the project; Decision making and dispute resolution; Evaluation of project progress; and Industry communication. The Advisory Council act as strategic advisors to the Steering Committee. They are also responsible for; Contribution to and review of project deliverables; Providing sector expertise and insights; Reviewing and challenging activity outputs; and providing subject matter expert (SME) in relation to specific areas.
Agriculture Senior Officials' Committee (AGSOC) briefing	17/2/2022	Department heads and CEOs of Australian/ State/Territory and New Zealand Government agencies	The Agriculture Senior Officials' Committee (AGSOC) comprises all department heads and CEOs of Australian / State / Territory and New Zealand Government agencies responsible for primary industries policy issues. It is chaired by the Secretary of the DAFF.
Demo Day	29/3/2022	For a complete list of stakeholders that attended Demo Day refer to Appendix Error! R eference source not found.	Presentation from each vendor and working group of prototype solutions to stakeholders, including data providers and wider AAFDX project participants.
Design workshop – benefits	30/3/2022	Agriculture Victoria, Cotton Research & Development Corporation (CRDC), Charles Sturt University (CSU), CSIRO, WRLC, WA DPIRD, APPF, Tasmania Government, ExoFlare, Food Innovation Australia Limited (FIAL), AWI, FRDC, Port of Melbourne, MLA, GS1, Hort Innovation, Department of Primary Industries (NSW) (NSW DPI), Safe Food QLD, Department of Agriculture, Water, and Environment (DAWE), GGA, Integrity Systems Company (ISC), Farmers2Founders, GFC, Federation University,	Single day exercise to identify, define, and understand benefits related to the AAFDX project from stakeholders' perspectives.

Input	Date	Stakeholders	Description
		QDAF, AWEX, Food Agility CRC, NFF, IORLC, University of Tasmania, Yarrowalla Vineyards	
Data Governance – Data Sharing Working Group	21/03/2022 – 29/04/2022	ISC, Federation University, AgriFutures, MLA, NFF, GGA, FRDC, FA CRC	Four workshops were conducted to define the data sharing principles.
Data Governance – Best Practices and Services Working Group	21/03/2022 – 29/04/2022	ISC, Federation University, AgriFutures, The Robb Group, AWI, NFF, GGA, FRDC, Food Agility CRC, Agriculture Victoria, WA DPIRD	Seven workshops were conducted to explore best practices and define the core platform services. The Operating Model team also sat in on these workshops to follow the journey.
Data Governance – Interoperability Working Group	21/03/2022 – 29/04/2022	ISC, Federation University, AWI and DAWE	Three workshops were conducted to define interoperability themes and principles.
Executive Briefing to the Australian Agritech Association	7/4/2022	Australian Agritech Association, MLA, ISC, FarmBot, Pairee, CeresTag	A briefing session was held to appraise the executive of the Australian Agritech Association
Core Services Workshop	05/05/2022	CSIRO, MLA, Michele Allan, NSW DPI, Agriculture Victoria, FRDC, WA DPIRD, CSU	A stakeholder workshop was conducted to prioritise core services for inclusion in the project options. The workshop was facilitated by the Data Governance team. The prioritised services then informed the development of the value chain and functional model options developed by the Operating Model team.
Operating Model Workshop	16/05/2022	Andrew Robb, MLA, Agriculture Victoria, FRDC, FIAL, DAWE, WA DPIRD	A workshop, facilitated by the Operating Model team was conducted with Tier 1 and Tier 2 funding participants to inform and validate the value chain and preferred operating model structure.
Impact and Adoption Consultations	9/8/2022 – 24/8/2022	AWEX, Dairy Food Safety Vic, FRDC, AWI, PIRSA, DAFF, Coles, Agriculture Victoria, MLA, TWE, NSW DPI, NFF	A series of direct consultations with a range of stakeholders to leverage their industry knowledge. Specifically to help inform the adoption rate and impact level of the exchange.
Commercial and legal entity model advisory council input	6/09/2022	CSIRO, PIRSA, Agriculture Victoria, FRDC, Agri Futures	A session with the project stakeholders to discuss the principles for the commercial model and legal entity options.
Risk workshop	14/09/2022	Andrew Robb, Michele Allan, DAFF, CSU, PIRSA, AWI, Agriculture Victoria,	A workshop to identify and value project risks for quantification through the risk modelling.

Input	Date	Stakeholders	Description
		CSIRO, WA DPIRD, MLA, ISC	
Research Project	Ongoing	Food Agility CRC, CSU, MLA	CSU is undertaking a research project on behalf of the AAFDX - Potential implications and benefits for the agrifood technology sector from the introduction of the Australian AgriFood Data Exchange

4. Results

The result of Phase 1 was a set of four use cases which informed the development of experiments in the next phase of work.

4.1 Phase 2

4.1.1 Experiments

The experiments were delivered by each of the four technology solution providers in collaboration with industry, government, and research representatives. Each experiment focussed on a specific use case:

- Experiment 1: Rezare - centralised data for compliance and certification for the sheep meat and wool sector, following supply chains in Victoria and NSW.
- Experiment 2: Eratos - biosecurity and contamination information for wine grapes moving across border from NSW and Victoria into South Australia.
- Experiment 3: AxisTech - voluntary benchmarking for comparisons and decisions for grains producers in Western Australia.
- Experiment 4: Telstra / IBM consortium - compliance and traceability for rock lobster quota in Western Australia.

The core objectives, benefits and outcomes for each experiment are outlined below –

Table 6: Experiment objectives, benefits and outcomes

Experiment	Objectives	Benefits	Outcomes
Experiment 1 – Compliance	<ul style="list-style-type: none"> • Demonstrate effective data exchange for compliance and certification in the Australian sheep sector • Identify business benefits • Recommend considerations and learning outcomes 	<ul style="list-style-type: none"> • Time savings and reduced duplication of work • Improved accuracy and timeliness of compliance evidence • Permissioned re-use of data • Standardised data 	<ul style="list-style-type: none"> • Technically feasible to apply a data exchange to solve compliance problems • General support from producers, auditors, processors, and retailers • Lowers cost of compliance • Supports deeper analysis for broader uses • Potential to increase industry trust

Experiment 2 – Biosecurity	<ul style="list-style-type: none"> • Test viability of data exchange in addressing use case • Understand how to strengthen biosecurity through the platform • Understand challenges to participation • Understand additional use cases • Demonstrate benefits 	<ul style="list-style-type: none"> • Common, standardised language around data • Common dataset • Full control over permissions • Improved quality of data and efficiency of gathering and analysis • Easily auditable processes 	<ul style="list-style-type: none"> • There is anxiety around sharing data, there is comfort in existing (manual) processes • Biosecurity alone is not enough of an incentive to change behaviour • Re-use of the same dataset builds trust in the data quality
Experiment 3 – Benchmarking	<ul style="list-style-type: none"> • Validate benefits • Design solution that achieves the objectives • Understand and mitigate risks • Build trust and collaboration between participants and stakeholders • Identify suitable set of requirements 	<ul style="list-style-type: none"> • Time savings • Input cost savings • Productivity growth • Quality improvements • Simplifying compliance and biosecurity • Market access through transparency • Supports sustainability actions • Connects the supply chain 	<ul style="list-style-type: none"> • Importance of grower recruitment and engagement considerations • Sound data governance that reinforces data ownership and control for growers is crucial • Data-driven analysis and benchmarking enable new possibilities • There are multiple returns on investment for growers
Experiment 4 - Traceability	<ul style="list-style-type: none"> • Demonstrate the timely flow and exchange of pre-fishing information, quota and accounting data and product data • Demonstrate viability of end-to-end traceability 	<ul style="list-style-type: none"> • Improved logistics planning • Better capacity management • Better production planning • Transparency and trust amongst participants enable product differentiation • Enables further opportunities for automation and cost reduction 	<ul style="list-style-type: none"> • Trust and transparency among stakeholders • Digital chain of custody • Meets business and consumer demand for information • Enables new operational insights • Improved planning, logistics and activation for all stakeholders

4.2 Phase 3

4.2.1 Core data exchange services

The functional and non-functional requirements for the AAFDX were the result of working group activities to identify the service mix for the exchange on day 1, into the medium term. Figure 5 below summarises the core platform services and applications prioritised for delivery with the platform on day 1.

Figure 6: AAFDX design - core platform and prioritised applications

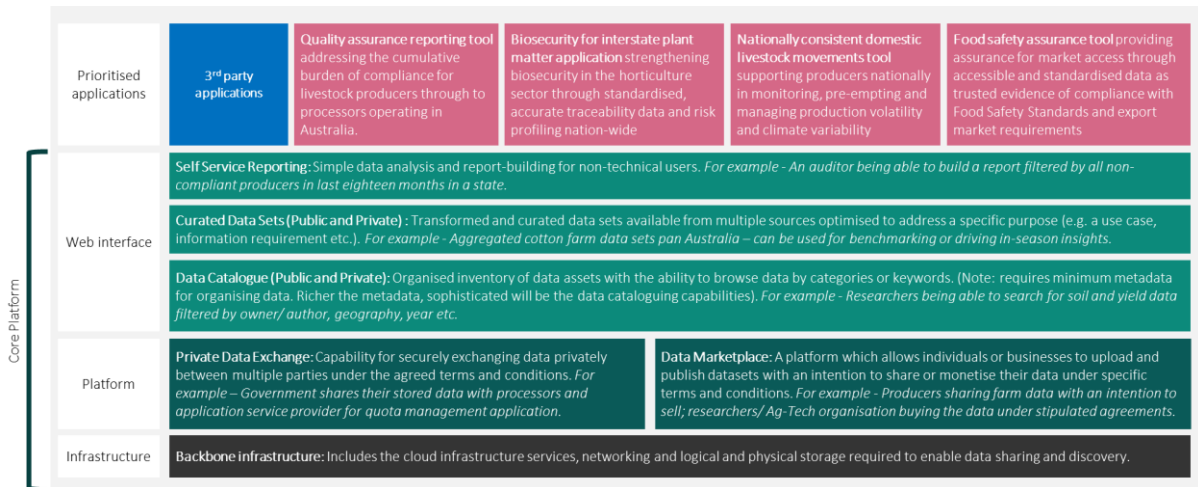
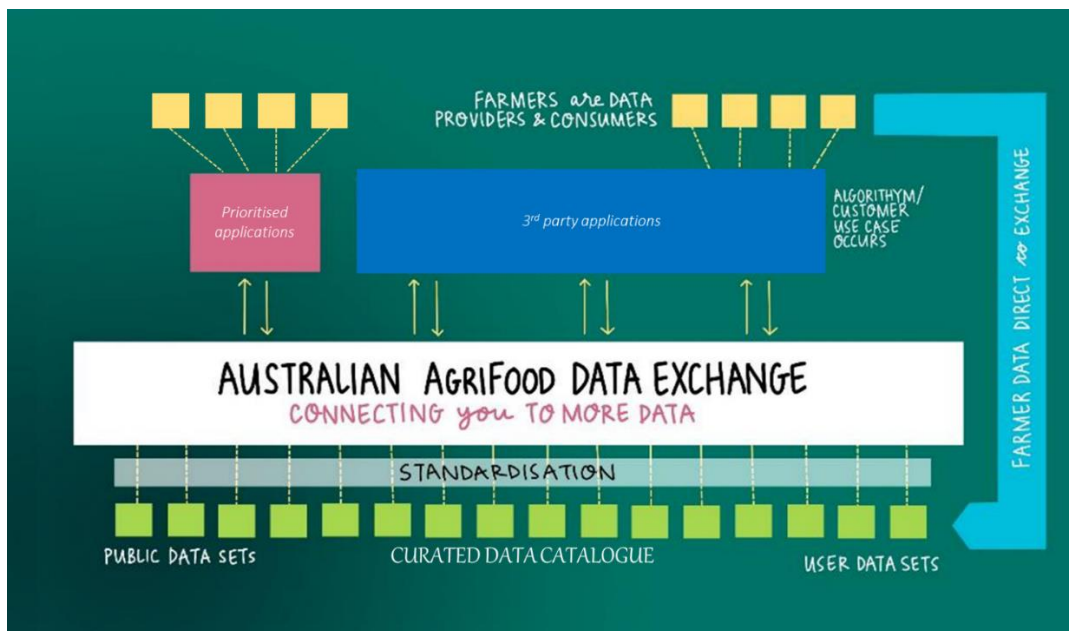


Figure 6 illustrates how the core platform and the applications will co-exist within the wider technology landscape servicing the agrifood sector from day 1.

Figure 7: Data exchange platform and applications structure

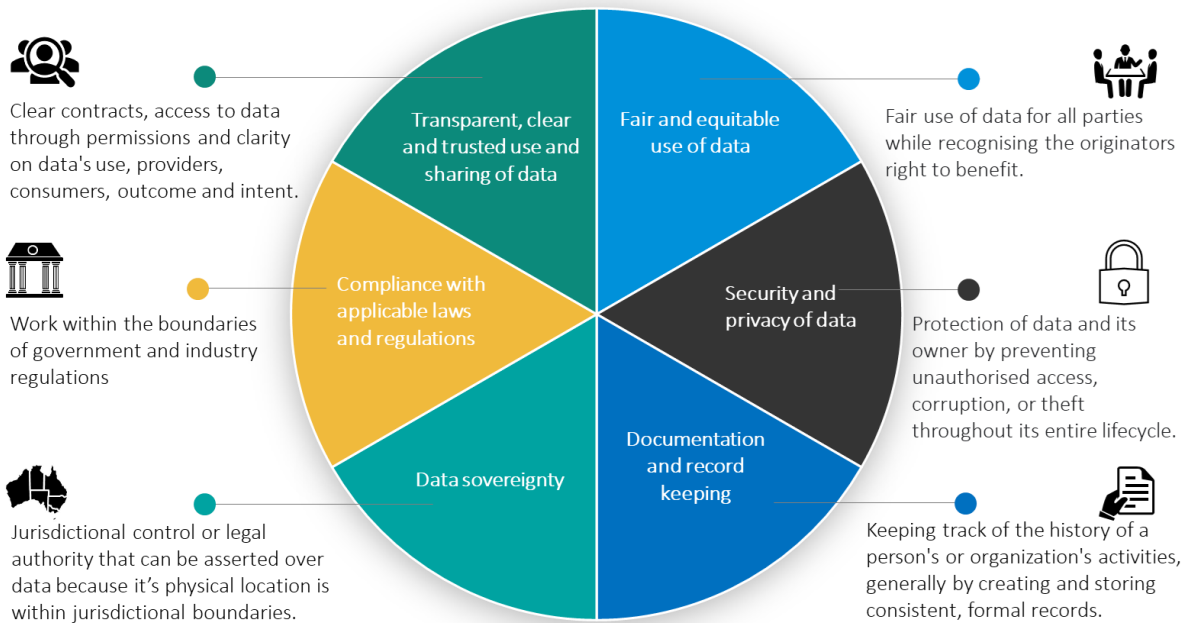


4.2.2 Governance Framework

A working group was also established with the purpose of creating confidence for future users of the Australian Agri-food Data Exchange service to trust and utilise the services and clarify how the service will interoperate with other technologies and exchanges. This included the rules of engagement with the data exchange service to solicit access to data (requesting access to data that users may wish to make available to other users).

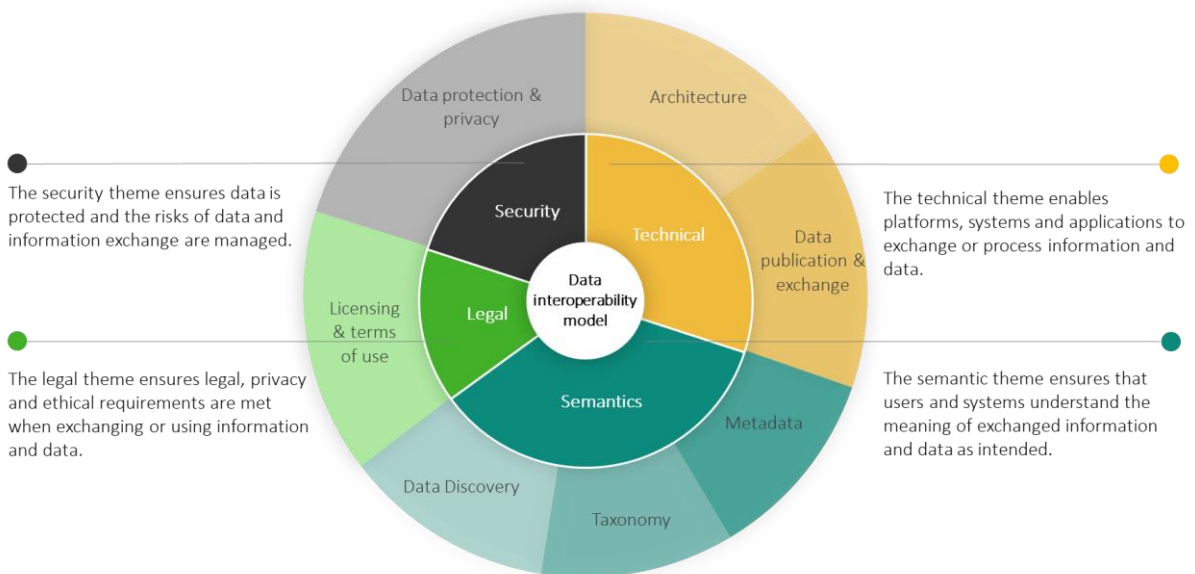
Literature review and framework analyses helped identify core data sharing themes and informed the development of key principles, as outlined in Figure 7 below. These core themes and key principles were further validated with stakeholders and experts in the sector.

Figure 8: Core data sharing principles



Four key themes were also identified as a foundation for the data exchange interoperability model (security, legal, semantic and technical). The technical element to how interoperability is built is informed by security, legal and semantics considerations. These key themes shown in Figure 8 below outline how the Australian Agri-food Data Exchange will maintain interoperable data, and its systems and processes.

Figure 9: Interoperability themes



Within each of the four key interoperability themes, the working group identified a key set of interoperability principles for each theme. The principles include objectives and MVP requirements for each theme, as outlined in Figure 9, to guide the interoperability of the exchange.

4.2.3 Operating Model

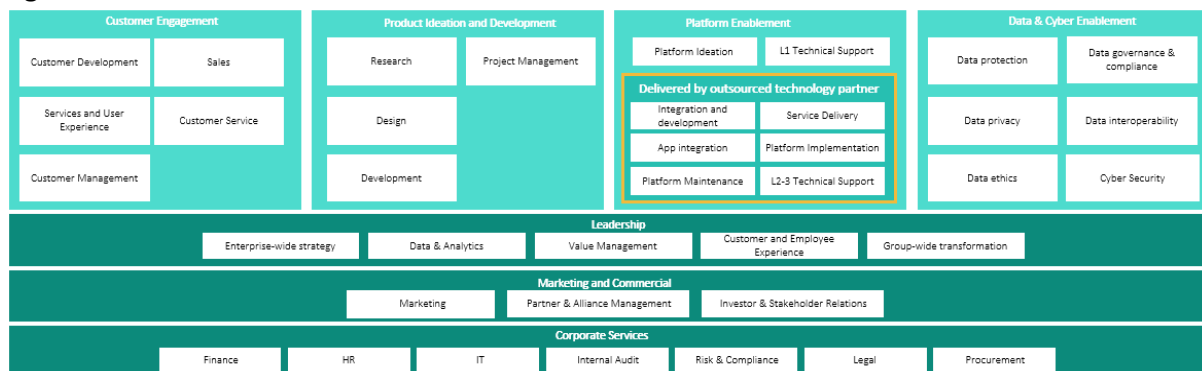
The ‘as a service’ centric model was selected as the recommended functional model for the data exchange to adopt. The functional model incorporates education programs as a sub-function, where although it is costed within the operational models, there is no specific allocation for FTE head counts. This will allow flexibility to deliver the sub-function programs as needed, while avoiding double-counting of costing.

The rationale and recommended functional model selected is outlined below.

Table 7: Proposed functional model design layers and rationale

Design Layer	Considerations and Rationale
People	A total FTE head-count is adopted to support the proposed operating models. FTE numbers are detailed by function to determine specific FTE requirements. The distribution of FTEs for each proposed operating model are used to determine the people costs for each option.
Technology	The Technology service layer was adopted to support the technological costs and requirements for both options. A brief market analysis was conducted to identify vendors who could provide the required technology operations. An indicative cost of enabling technology was obtained through internal resources and contingency applied where there are gaps. Total IT enabling costs are used for final cost calculations for technology requirements.
Governance	The Governance design layer was considered in the context of platform and data security. FTE requirements were identified to set up the governance body and included in the total FTE workforce requirement and final cost calculations.

Figure 10: Recommended functional model



4.2.4 Legal Entity Structure

Examples of NFP structuring options in the agricultural space are summarised below.

Table 8: NFP Structures and Examples

Entity	Description
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Agricultural Innovation Australia (AIA)	<ul style="list-style-type: none"> • AIA is a public company established to facilitate joint investment and collaboration in cross-industry agricultural issues of national importance. • AIA seeks to attract investment from public, private, NFP and global commercial entities to deliver agricultural innovation initiatives. • AIA is a NFP entity however it is not a registered charity and therefore is unable to be endorsed with any income tax or GST exemptions. Further AIA is not a deductible gift recipient (DGR) nor a public benevolent institution (PBI).
Rural Research and Development Corporations (RDC)	<ul style="list-style-type: none"> • There are currently 15 registered RDCs: <ul style="list-style-type: none"> ○ Commonwealth statutory bodies; ○ 10 industry-owned companies (IOC). • All RDCs are NFP. • MLA, Australian Wool Innovation Limited, Dairy Australia Limited, Forest and Wood Products Australia Limited, Horticulture Innovation Australia Limited are charitable NFP public companies which have been endorsed with income tax or GST exemptions.
MLA	<ul style="list-style-type: none"> • MLA's purpose is to foster the long-term prosperity of the Australian red meat and livestock industry. • As noted above, MLA is an industry owned RDC which has been registered as a charitable NFP public company and has been endorsed with GST concessions, income tax exemptions and FBT rebates. • MLA is not a DGR nor a PBI. • MLA receives funding from transaction levies paid on livestock sales, the Australian Government and voluntary contributions from industry partners.

NFP structure options

The most common NFP structure is in the form of a registered charity however there are a wide range of legal structures for which a NFP can operate. A high-level summary of proposed legal structures for NFP operations has been provided earlier in this report (see Table 4).

4.2.5 Business Case

The business case developed for the Australian AgriFood Data Exchange includes the following:

- Investigate and articulate the specific needs for the AAFDX;
- Explore specific challenges and potential solutions;
- Design a foundational solution to establish the data exchange for the agrifood sector;
- Analyse the potential costs and benefits of the data exchange;
- Explore governance, commercial, and operational considerations; and
- Outline a roadmap towards vendor selection and implementation of the foundational data exchange solution.

The business case is structured as follows:

- **Section 2:** outlines the need for investment in the data exchange for the agrifood sector, including problems, needs, untapped opportunities, and benefits;
- **Section 3:** describes how the data exchange aligns to strategies at Federal Government, State/Territory Government, and industry levels, and important regulatory considerations;
- **Section 4:** details the specific objectives and proposed performance indicators for the AAFDX;
- **Section 5:** outlines how the conceptual AAFDX was designed, including experimentation, option development, solution scope, and analysis approach and results;

- **Section 6:** outlines important considerations for the implementation of an AAFDX, including an operating model, commercial model, legal entity considerations, technical requirements, governance considerations, data-sharing considerations, risks, and risk management; and
- **Section 7:** outlines next steps and an implementation plan to progress towards funding and delivery.

The business case is also supported by a series of appendices:

- Appendix A: Stakeholder considerations;
- Appendix B: Policy and strategic alignment
- Appendix C: Experiments and applications;
- Appendix D: Operating model analyses;
- Appendix E: Annual Costs
- Appendix F: Market sounding;
- Appendix G: Economic and financial analysis;
- Appendix H: Technical requirements;
- Appendix I: Risk assessment; and
- Appendix J **Error! Bookmark not defined.Error! Reference source not found.**

5. Conclusion

The business case outlines options to deliver a data exchange and prioritised applications as well as inform key decisions such as the legal entity structure, commercial objectives, and risk adjusted funding quantum required to progress the project to the delivery phase. The following summarises the key points from the business case:

- The project option which best satisfies the project objectives for the Australian Agrifood Data Exchange comprises of core enabling data exchange infrastructure, four prioritised applications, and comprehensive operating model.
- There is a low-cost operating model that leverages in-kind contributions that can be built on to deliver the full vision for the project.
- The preferred project option will conservatively generate a positive net benefit in the first five years (NPV \$FY23) to the Australian agrifood supply chain and increasing net benefit over 15 years.
- The non-risk adjusted net capital and operating costs of the preferred project option have been included for the first 5 years of operations until profitable.
- The preferred legal entity structure is a Not-for-Profit company limited by guarantee.

5.1 Key findings

Establishing the AAFDX represents an opportunity to break down information silos and boost productivity, innovation, and sector profitability. Deferring this investment will result in the Australian agri-food sector potentially losing its competitive edge in the international market. That is if, in its absence, there is no similar concerted effort across industry to implement practice changes, leading to a failure to adopt new ways of generating, using, and learning from data, particularly to support future market access and consumer requirements around ESG reporting. This is consequential

considering the 12 per cent of the total Australian exports comes from agriculture.¹ Deferral will lead to unrealised opportunities that would have benefited the sector and, in the worst case, the consequences of deferral could include loss of on-farm revenue and export market share to competitors.

At a domestic level, actors in the agrifood supply chain who adopt sophisticated, data-driven business models will increase the number of systems with which primary producers are required to interact. Over time, the compliance burden will add significantly to the bottom line of primary producers which will erode their pricing competitiveness. In a worst-case scenario, this disparity could push primary producers out of the market, jeopardising Australia's aspirations to boost productivity and grow output. Deploying the AAFDX sends a clear message to trade partners about Australia's commitment to data enabled quality traceability of produce and ability to comply with QA requirements. It also signals that Australia has a digitally enabled production and processing sector, highlighting the strength of Australia's agrifood tech sector, supporting export demand for home-grown technologies.

5.1.1 Build foundational digital infrastructure

The AAFDX would be a foundational piece of digital infrastructure within Australia's agrifood sector. It is designed to accelerate the take up of digital technologies across the value chain, where the greater the access to data, the greater the level of innovation in the sector. The data exchange will stimulate sustainable entrepreneurship, innovation, and other components of AgriFoodTech and will serve as a basis for meeting various stakeholders' strategic goal of industry growth within Australian agrifood. A recent report² estimated that the unconstrained application of all types of digital technology across the agrifood sector could potentially see savings of \$7.4 billion from automation and labour savings, while gaining almost \$3 billion from genetic enhancements, \$2.3 billion from tailoring inputs to needs, and \$1 billion from improvements to markets access and biosecurity. The lack of data interoperability between governments, research and development corporations (RDCs), technologists, and researchers would be satisfied with infrastructure designed, controlled, and overseen by the industry itself. This would enable participants to share, reuse and merge data from disparate systems in a secure environment, creating more consistent datasets, sophisticated and actionable data insights, reducing compliance costs, and making available more managerial resources for strategic decision making.

Foundational infrastructure, such as private data exchange services, data storage, and a data marketplace, would enable the sector to unlock untapped economic and financial benefits. Complimentary digital infrastructure and applications, such as sandbox environments, data manipulation and transformation tools, ability to query across datasets, linked data explorer, and near real time ingestion and subscription, have the potential to create a versatile platform that can flexibly meet the data needs of industry participants, researchers, and governments now and into the future.

5.1.2 Fostering industry transparency and collaboration

The AAFDX could contribute to increasing, transparency across industries in the agrifood sector. This would precipitate more effective research efforts, reduce duplicated reports, ensure consistent

¹ Australian Bureau of Agricultural and Resource Economics and Sciences (BARES), *Snapshot of Australian Agriculture*, 2022. <https://www.agriculture.gov.au/abares/products/insights/snapshot-of-australian-agriculture-2022>

² Wu, W. et al., 2019. *The Future of Australia's Agricultural Workforce*, Canberra: CSIRO Data

standards and benchmarks, and enable a more effective prioritisation of industry assistance. It should be noted that the project is designed to allow data access on specific terms, meaning that producers can engage with the data exchange to varying extents, managing risk at the individual agent level.

The data exchange could create new options for industry-wide collaborative action on significant issues, such as biosecurity control and climate change monitoring and support. This would contribute both to satisfying broad macro strategies and to generating economic return. For example, agricultural businesses occupy and manage 51 per cent of Australia's land mass and, as such, they are at the frontline in delivering environmental outcomes on behalf of the broader community. While they have already worked to lead the nation in reducing greenhouse gas emissions by 63 per cent in emissions intensity between 1996 and 2018³, further reductions are expected of the industry and will be more difficult to achieve. Data exchange infrastructure could play a substantial role in allowing sophisticated, coordinated efforts. In another example, it has been estimated that a major outbreak of foot-and-mouth disease could cost Australia close to \$80 billion over 10 years. This could be mitigated substantially by data exchange infrastructure to enable closer collaboration and a faster intervention to avoid industry wide quarantines which would have a direct financial benefit to industry. The AAFDX presents an opportunity for effective collaboration on macro challenges through collective action at the industry level.

5.1.3 Keeping pace with leading agrifood-exporting nations

This project represents an opportunity to keep pace with leading agrifood-exporting nations that have already established comparable systems and are also importers of Australian produce. The data exchange could be necessary for Australian producers to service existing markets and access new markets as global regulatory environments shift towards greater transparency regarding product origin, carbon footprint, and sustainability.

5.2 Benefits to industry

By enabling agrifood industry data owners to direct and control what data they share and with whom, the AAFDX could support users in unlocking value from their data, enabling fluid collaboration up and down the supply chain. Stakeholders from various stages of the value chain attended a design workshop on 30 March 2022 to identify immediate and longer-term benefits of the data exchange.

The high-level qualitative benefits identified by stakeholders are outlined in Appendix B: Stakeholder Benefits.

6. Future research and recommendations

It is recommended that the project now move into Phase 4 (fund raising for establishment), followed by Phase 5 (delivery of the AAFDX). At the outset of Phase 5, it is also recommended that prospective funders conduct further analysis prior to establishing a legal entity. These considerations are outlined in figure 10 below and include the following considerations:

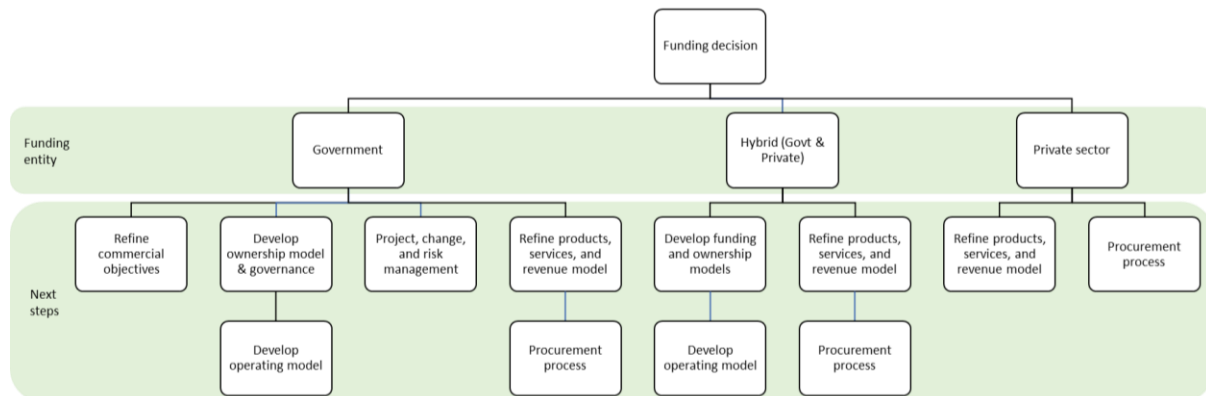
- Secure funding for design and delivery of the core enabling infrastructure and prioritised applications;
- Establish a legal entity and appoint governance and leadership roles;

³ National Farmers Federation, *Farm Facts*, 2018, Available at: <https://nff.org.au/media-centre/farm-facts/>
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- Run procurement process for core enabling infrastructure and prioritised applications;
- Launch data exchange and priority applications into the market.

Prospective funding parties may wish to consider further steps following establishing the operating entity and launching products into the market. Figure 15 below outlines some of the key considerations.

Figure 11: Key next steps



Research projects are currently being conducted by Charles Sturt University (CSU) to determine potential implications and benefits for the agrifood technology sector from the introduction of the Australian AgriFood Data Exchange. These projects are jointly funded by Food Agility Cooperative Research Centre (FACRC), CSU and MLA on behalf of the AAFDX Consortium. Further information is available in Section 6.2.

6.1 Data Standards Considerations

Enabling an interconnected data highway for Australia's agrifood value chains will require the use of global data standards. This section focuses on the existing standards that can be leveraged by the Australian AgriFood Data Exchange to support interoperability, data quality and information security.

Global Data Standards enabling national infrastructure

Given the anticipated scale of uptake of the AAFDX, policies and standards need to be designed with the expectation that they will become 'quasi-national standards', influencing how AgTech vendors design their services and how government interacts with data from the sector.

In this way, building on existing industry-adopted global data standards provides Australian industry and government with an opportunity to 'bootstrap' the data exchange, tapping into a super- highway of data flow and established business processes.

To this end, global data standards must be treated as enabling infrastructure by the AAFDX – with a focus on semantics, core business vocabulary and syntax. Semantic libraries are internationally recognised and aligned with global trade systems and new digital trade agreements.

Developing a system to align with global open data standards is one thing; keeping it aligned is another. It requires specific consideration on the processes and resources used to ensure ongoing alignment. The AAFDX must not only align to existing industry-adopted global data standards but align to selected standards development activity as well. This would ideally involve consultation and

ongoing collaboration with multiple standards bodies that are mostly well aligned – including key agencies not limited to Standards Australia, GS1, ISO/IEC and UNCEFACT.

There are well defined and mature standards development processes that can be leveraged by AAFDX to achieve deeper industry engagement and avoid islands or silos of data or industry practices. The latter needs to be avoided wherever possible to ensure new processes or standards do not impose costs or reduce industry’s ability to adapt to future needs.

Various standards writing bodies have expressed a willingness to assist with the future review and framing of technical requirements to identify existing standards, processes, or systems (semantic or code libraries) as well as registries to avoid duplication of effort or the development of approaches and methods that are not interoperable.

Focus on unique identification

One of the most critical components of data sharing systems and traceability systems is ensuring accurate, global, unambiguous, unique, and perpetual identification of all “things” and “entities”. Any data shared in these types of platforms will always relate to items, locations, shipments, parties, entities, relationships, assets, etc.

Without unambiguous guidance on how unique identification is going to be managed, benefits may never fully be realised. As a result, there is a real need to ensure multiple identifiers are captured and exchanged. The AAFDX will consider how to link the potential variety of identifiers, how this will be managed across multiple systems and who is responsible. For example, potential location identifiers alone may include Property Identification Codes, GS1 Global Location Numbers, GLEIF Legal Entity Identifiers, DUNS numbers, ABNs, NZBNs etc.

It is likely that the AAFDX will need to utilise, or build on, an existing standard which is based on generating a single unique ID for any “thing” or “entity” whilst allowing for additional identifiers to be linked in master data exchanges. This ensures the unique identification required for data capture and data sharing processes.

The same is true across items, shipments, parties, relationships, assets, etc, and whilst close loop platforms can handle this with greater ease, this requirement is particularly important in open sharing platforms as it is the intent with the AAFDX.

Data quality

One of the most important outcomes of any system built around capturing and sharing data is the ability for all users to be able to rely on the quality of this information.

Aspects such as interoperability and data standards help in ensuring quality, but it is not enough. Many projects have shown that to the extent that data capture processes continue to be mainly paper-based and manual, data captured into data sharing systems is not accurate and thus cannot be relied upon by recipients.

During the next phase it is therefore recommended that deep consideration is given to data quality. This should cover all aspects of data quality from standards to unique identification, automatic data capture processes (barcodes, RFID, NFC, IoT, etc.) as well as data validation and checking rules and ongoing reporting and management of data quality and related metrics.

Data categories

The interoperability principles defined by the data governance workstream are provided in the context of Technical, Semantics, Security and Legal. To ensure adequate consideration of interoperability for data passing through the platform, a matrix approach will be used to further refine the interoperability framework.

Matrix analysis would require comparing the existing categories on one axis against the following categories of data, to be assessed in the context of interoperability:

- Unique identification (of items, locations, parties, shipments, consignments, assets, documents, individuals, relationships, etc.).
- Master data (which defines that to which it relates to).
- Transactional data (relating to business transactions and typically production level information).
- Event data (that that defines a physical event in a digital context e.g., a physical delivery, a container loaded on a vessel, etc).
- Linked data to information sources considered outside of the scope of the data exchange however relevant for specific industry applications (i.e., the AAFDX can only do so much).

This further refining of data categories will also facilitate the identification and applicability of appropriate standards to different categories, for example, the GS1 Core Business Vocabulary applies to event data.

6.2 Exploring implications and benefits for the Agrifood Technology sector

A research project is currently being undertaken by CSU, facilitated by the AAFDX, MLA and Food Agility CRC, to inform the design and establishment of the Australian AgriFood Data Exchange (AAFDX). This includes:

- defining the boundaries for core services the AAFDX intends to provide, who will deliver core services (the extent of outsourcing) and how technology vendors engaging in a partner ecosystem may independently leverage DX assets and customer base and data catalogue to stand up new services;
- assessing the impact of the AAFDX may have on agrifood tech adoption by producers and supply chain partners, and the spill over benefits the existence of AAFDX could have to the AgriFood Tech sector; and
- what key lessons from other markets with agrifood data exchange services on how to optimise benefits and input of agrifood tech vendors.

The core purpose of the project is to understand how the AAFDX can best build trust with the Agritech community and address challenges and barriers to this community's participation in the exchange and use of the platform. With this goal in mind, the objectives of the research project is to research the following:

- Priority service benefits for the AgriFood Tech vendor community and the customer service requirements that AAFDX might need to provide to this user group;
- Potential barriers to engagement with the AgriFood Tech sector – including considerations to overcome the identified barriers to engagement / participation that the research may identify;
- Stratification of identified risks to AgriFood Tech vendors that might arise from the existence of Australian AgriFood Data Exchange;

- Designing for maximum benefit and participation opportunities for small, medium and large AgriFood Tech vendors, and exploration of what if any types of incentives for engagement with the Australian AgriFood Data Exchange should be for start-ups;
- Opportunities and challenges that DX presents for AgriFood Tech vendors;
- Models for optimal participation for AgriFood Tech sector;
- Research public DX impact on accelerating adoption rates of AgriFood Tech by agriculture users (i.e. what is the spill over benefit DX public infrastructure has for speeding up adoption); and
- Development of a list of public data sets that should be included in the Australian AgriFood Data Exchange data catalogue.

7. Appendix

7.1 Appendix A: Stakeholder Considerations

Impacted Stakeholder	Relevance to project	Key issues and challenges
Primary producers	Primary producers are the data owners, custodians and data exchange customers. Their support and participation in the project are critical to its success.	<ul style="list-style-type: none"> • Permissioning of data • Industry wide low uptake of AgTech • Poor data literacy and understanding of the enterprise value of data • Cost of participating in the exchange
Service providers	Includes input providers (e.g., fertilisers and seed) and AgTech solution providers integrating with the platform and/or developing new data services.	<ul style="list-style-type: none"> • Price • Product fit • Available data • Data quality
State and Australian Government regulators	Regulators will be a key customer and beneficiary of increased transparency and accessibility to data.	<ul style="list-style-type: none"> • Data quality • Interoperability • Compliance with data standards
Government agencies	State and commonwealth agencies are a potential funding source for the development of the data exchange as well as having significant interest in data for the purposes of evidence-based policy and the wider economic benefits of the exchange.	<ul style="list-style-type: none"> • Funding expectations • Compliance with privacy regulations
Contractors, consultants, transport operators	The data exchange has the potential to improve primary producer on-farm efficiency which could result in a reduction in the need for a wide range of support services. These groups may be detractors from the project.	<ul style="list-style-type: none"> • Transparency and better management decisions may affect demand and price of support services • Winning the support of actors in the supply chain who benefit from poor transparency
Universities and other research bodies	Universities have been a key partner in the development of the data exchange. They have an interest in the development and on-going operation of the exchange and the value of the data sources for research purposes.	<ul style="list-style-type: none"> • Accessibility • Product affordability
Retailers	Retailers have an opportunistic interest in the data exchange to demonstrate the supply chain's compliance with QA, regulation and sustainability credentials that are critical to	<ul style="list-style-type: none"> • Product design and functionality at launch

Impacted Stakeholder	Relevance to project	Key issues and challenges
	market access and product differentiation.	
Re-sellers & Supply chain	Re-sellers and the supply chain have a commercial interest in the project as customers. They have an interest in market access and enabling better measurement of product environmental footprint and provenance claims.	<ul style="list-style-type: none"> Product design and functionality at launch User experience
Finance providers	Finance providers have an interest in the functionality of the data exchange. Finance providers see an opportunity to use the data exchange to support the assessment of credit risk, sharing of information with clients, and the development of new products.	<ul style="list-style-type: none"> Accessibility Foundational data exchange functionality
Regional communities	Regional communities will benefit from the increased productivity and economic output from the agri-food sector contributing to thriving regional communities.	<ul style="list-style-type: none"> Communicating the economic benefits of increased on-farm productivity to regional communities

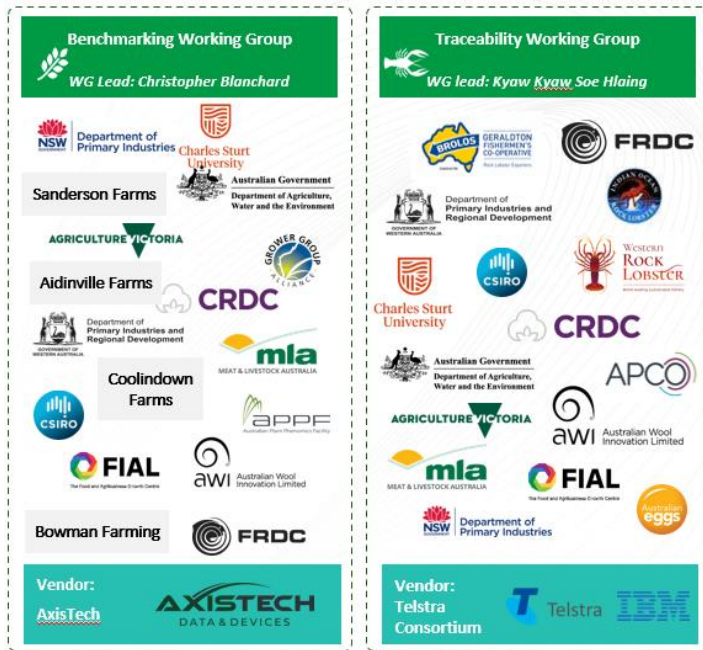
7.1.1 Proof of concept working group stakeholders

Compliance and Certification Working Group
WG lead: Irene Sobotta

Vendor:
Rezare Systems

Biosecurity Working Group
WG lead: Marta Hernandez-Jover

Vendor:
Eratos



7.1.2 Demo day and design workshops attendees

AgVic	Westpac	Grains Research and Development Corporation
AMPC	Wine Victoria	Griffith University
APCO	Yalumba	Horticulture Innovation Australia
APPF	LaTrobe	Horticulture Supply Chain Services
Australian Eggs	ADIC & Dairy Australia	IoTAA
AWEX	Australian AgriTech Association	National Farmers Federation
AWI	CBH	John Deere
CRDC	Digital Ag Collective	LiveCorp
CSIRO	ANU	Meat & Livestock Aust
CSU	Digital Transformation Agency	Meat and Livestock Australia
DAWE	FarmIQ	National Farmers Federation
DPIRD	Australian Bureau of Meteorology	NFF
Elders	Australian Bureau of Statistics	Northern Grower Alliance
Federation University	Australian Dairy Farmers	NSW Farmers
FIAL	Australian Export Grains Innovation Centre (AEGIC)	NT Farmers
FRDC	Australian Farm Institute	Obe Beef
GFC	Australian Forest Products Association	Office of Industry Innovation and Science Australia
GGA	Australian Fresh Produce Alliance	Olam
IORL	Australian Meat Processor Corporation	PayPal Australia / GoannaAg, DiscoveryAg, NNNCo, IoTAA

ISC	Australian Pork	PIRSA
MLA	Australian Pork Limited	PIRSA AgTech Advisory Group
AgriFutures	Australian Trade and Investment Commission (Austrade)	Platform
NSW DPI	Australian Wool Innovation Ltd	Queensland Farmers' Federation
NSW Wine Industry Association	Avocadoes Australia	Red Meat Australian Council
TWE	Birchip Cropping Group	Schulz Livestock
Vinehealth Australia	Canegrowers	Seafood Industry Australia
Wine Australia	Food Agility	Society of Precision Agriculture Australia
WRLC	Central West Farming Systems – New South Wales	South East Wheat Growers Association
ACT Gov	CEO	Southern Farming Systems
ANZ	Consolidated Pastoral Company	SparkLabs Cultiv8
ASVO	Costa	Sugar Research
Aus Pork	Cotton Australia	Sugar Research Australia
Australian Grape & Wine	Cotton Research and Development Corporation	Tasmanian Department of Primary Industries, Parks, Water, and Environment
CBA	Dairy Australia Limited	Tasmanian Farmers and Graziers Association
AgriWebb	Department of Agriculture and Fisheries (QLD)	Teys Australia
Coles	Department of Agriculture, Water and the Environment	University of New England
Dairy Australia	Department of Industry, Science, Energy and Resources	University of Queensland
AIA	Department of Industry, Tourism and Trade (formerly NT Department of Primary Industry and Resources)	UWA
Food Agility	Department of Infrastructure, Transport, Regional Development and Communications	Victorian Farmers Federation
Aus AgriTech Association	Tasmanian Government	WA Farmers
IAG	Department of Jobs, Precincts and Regions (VIC)	WA State Government
Macquarie Bank	Department of Primary Industries and Regional Development (WA)	Wimmera Development Association
NAB	Department of the Prime Minister and Cabinet	Wine Grape Council of South Australia
NT Gov	Fisheries Research and Development Corporation	Woolworths
QLD DAF	Horticulture Innovation Australia Ltd (HIAL)	Port of Melbourne
Rabobank	Forest and Wood Products Australia	Independent
Ridge Partners	Future Food Systems CRC	Geraldton Fisherman's Co-operative
SA Markets	FWPA	GrainGrowers

7.2 Appendix B: Stakeholder Benefits

Stakeholder	Benefits
Government	<p>Immediate benefits</p> <ul style="list-style-type: none"> • Facilitate market access: Around two-thirds of Australia’s agricultural products are exported. The data exchange could help create new, and maintain existing, export market opportunities through supply-chain traceability, evidencing compliance, proving export requirements are met and reducing reliance on manual processes. • Streamline compliance reporting: From an auditing perspective, there will be time and cost savings from collating evidence supporting compliance claims. Access to reports and underlying evidence in a digital format can also allow for fact-checking and identifying gaps prior to compliance checks. • Enable proactive biosecurity and food safety management: Australia continues to face significant and growing biosecurity risks that could have devastating consequences. Risks are also changing and becoming more complex and more difficult to manage. Traceability through the supply chain (and across state boundaries), digitisation of paper-based permits/records and the connection of existing systems for data transfer would enable public and private data to be amalgamated to speed up identification and control. This would allow for earlier detection of biosecurity threats, issues, and food safety incidents, allowing for more informed risk management, as well as a faster response to incidents. • Insight on volumes and throughput: Access to a transparent catalogue of harmonised industry data could support government in understanding the health of the sector to inform planning (e.g. resource allocation), policy and emergency response. A consolidated view of government activities in industry could also better inform funding decisions (target markets, grants, R&D) and in understanding investment performance. • Build trust with industry partners: The data exchange could facilitate government collaboration with industry around specific use cases (e.g., quota management). There is an opportunity for the exchange to provide a platform supporting industry advocacy and improving government’s ability to understand industry/producer needs and better support them through sharing data insights. There is additional ability to call for data to inform specific planned responses in situations such as biosecurity or disaster recovery. • Improve sustainability: Collating and harmonising environmental data with natural capital accounting can provide insights for improved natural resource management – which has flow-on benefits to industry. <p>Medium/long term benefits</p> <ul style="list-style-type: none"> • Growth in the export economy • Drought resilience • Regulatory compliance with more efficient use of data • Food security-productivity improvement • Potential for learning trends/influences, and understanding drivers of risks to food safety • New value creation opportunities • Reduction of regulatory burden enabling access to markets • Ease in ensuring international market access • Improves transparency for market access • Understand opportunities to improve efficiency and productivity • Decrease operational and economic burdens

Stakeholder	Benefits
Research and Development	<p>Immediate benefits</p> <ul style="list-style-type: none"> • Improved access to more data: Participation in the partner ecosystem and the development of the agrifood data catalogue will provide researchers with a larger pool of potential data sources from which to draw. This enables RDC-funded datasets to be more accessible and allows for leveraging in more investments in data. • Richer and more trustworthy data: The AAFDX seeks to ensure that all data provisioned through the marketplace goes through a data validation and enrichment process and aligns to defined sharing and interoperability standards. Increased clarity around data use, as well as data integrity, is expected to reduce the burden of managing and merging third-party datasets and allow more time for R&D. Building on this, researchers can have more confidence in the datasets they are using, as a result of pre-validation and alignment to pre-defined standards. • Generate valuable new insights: Access to harmonised, ‘pre-prepared’ datasets and a broad range of partners with which to collaborate can support researchers in both finding the data they need and in ensuring insights and solutions are developed in an informed way, with more frequent input from relevant stakeholders. • Enable re-use in a permissioned way: The ability to build products (applications, data services, tools etc.) in addition to unifying core infrastructure and monetising insights generated using available on-platform data will allow for more rapid commercialisation of R&D activities. The data governance framework encompassing re-use of datasets to develop data services and products will be prioritised during establishment, to ensure data originators remain in control around what use cases their data is being contributed to and for what purpose. • Enhance efficiency of resources: Allows for research data to be leveraged multiple times, reducing the number of animals needed for research by allowing data to be accessed by multiple researchers. • Supporting a carbon-neutral economy: Supporting the industry with data collation needed to achieve carbon neutrality transitions. <p>Medium/long term benefits</p> <ul style="list-style-type: none"> • Support connectivity through chains to market • Allow choices to be made with confidence in accuracy of claims • Support consumer values-based decision making • Richer data for better insights • Reduce the burden of heavy auditing
Producers	<p>Immediate benefits</p> <ul style="list-style-type: none"> • Reduce compliance burden: The costs of compliance include time, paperwork, capital outlays, and deflection from core business activities. The data exchange can help streamline the collection of data as well as the compliance reporting process. For example, a single data stream can be created (e.g. for treatment records) and used to evidence claims made for multiple compliance programs, allowing for a ‘measure once, publish to many’ approach. • Facilitate market access: The data exchange could help create new, and maintain existing, market opportunities through supply-chain traceability, demonstrating compliance with regulators and retailer QA schemes and reducing reliance on manual processes. The platform can also facilitate direct communication between producers and customers, providing more control over messaging and greater transparency over operations. • Generate valuable new insights: Access to harmonised, ‘pre-prepared’ datasets across the value chain can unlock the potential of farm data for producers and support more informed decision-making. Through the partner ecosystem, producers can also leverage the expertise of researchers and technology vendors to model data

Stakeholder	Benefits
	<p>and build applications that can look at data in new ways. Experiments and workshops have already begun to uncover potentially valuable use cases in biosecurity, benchmarking, compliance, traceability, and sustainability.</p> <ul style="list-style-type: none"> • Establish trust: The AAFDX seeks to ensure that all data provisioned through the marketplace is validated to align to defined sharing and interoperability standards – increasing clarity around data use, as well as data integrity. Data providers (such as producers) will be able to control how their data is used, who has access to the data and the underlying messaging. • Enable re-use in a permissioned way: As data providers, producers will have the option to monetise access and use of datasets, potentially generating a new revenue stream and an avenue for creating secondary benefits to data providers from sharing data. For example, a producer might provide data from operations on-farm to a benchmarking tool which, in turn, provides the producer with more accurate benchmarking insights. The data governance framework encompassing re-use of datasets to develop data services and products will be prioritised during establishment, to ensure data originators remain in control around what use cases their data is being contributed to and for what purpose. <p>Medium/long term benefits</p> <ul style="list-style-type: none"> • Monetise data as an incentive to share data • Insights developed from benchmarking - ability to change/modify program/inputs to increase yields, reduce costs etc. • Real-time data • Real-time reporting • Biosecurity to drive market access and premium reputation • Reducing risk to products entering supply chain • Real-time visibility of demand of inputs • Identify gaps in production, understanding links between timing and demand • Increase profitability
Processors	<p>Immediate benefits</p> <ul style="list-style-type: none"> • Streamline QA and compliance reporting: From a processor perspective, there will be time and cost savings from collating evidence backing QA claims. Access to compliance and certification information in a digital format can also allow for fact-checking and identifying gaps earlier in the QA process. • Facilitate market access: The data exchange could help create new, and maintain existing, market opportunities through supply-chain traceability, demonstrating compliance with regulators and retailer QA schemes and reducing reliance on manual processes. By sharing data in a timely way along the supply chain, processors can more easily build a brand story by improving visibility of processing key performance indicators (KPIs), tracing provenance across production, assessing and ‘proving’ product quality and gaining feedback from a broader stakeholder base. • Support supply planning: Processors play an important role as both potential data providers and consumers. Raw materials from producers are used as inputs by processors, retailers depend on the value-added during processing and regulators place compliance requirements on these activities. As a result, the ability to provide time relevant access to data and to trace product as it moves along the value chain will be of significant benefit to processors. This capability could help processors not only optimise logistics planning (based on up-to-date information from producers, transporters and buyers) but also in understanding product history to investigate events (e.g., mortality events) and trace product more quickly if a recall is needed. • Generate valuable new insights: Access to harmonised, ‘pre-prepared’ datasets across the value chain can unlock the potential of data for processors and support

Stakeholder	Benefits
	<p>more informed decision-making. Through the partner ecosystem, processors can also leverage the expertise of researchers and technology vendors to model data and build applications that can look at data in new ways. Experiments and workshops have already begun to uncover potentially valuable use cases in biosecurity, compliance and traceability with relevance to processors.</p> <p>Medium/long term benefits</p> <ul style="list-style-type: none"> • Market access • Consumer trust and brand equity • Complete animal performance history • Flexible, agile decision making
Retailers	<p>Immediate benefits</p> <ul style="list-style-type: none"> • Support brand building: The ability to trace product through the supply chain can support retailers in selling the provenance story to customers at point of sale. The AAFDX can also work with retailers and their suppliers to verify that products meet the claims made to consumers. Ensuring product credentials are known and verified (especially around animal welfare, sustainability, provenance, and biosecurity) can help build customer trust with the retailer and brand loyalty by addressing consumer needs and concerns around product source and quality. • Improve business outcomes: Enabling supply chain traceability and validating product claims can also ensure retailers achieve premium prices at sale. Having a consolidated view of the journey taken by each product will also help retailers more quickly respond to issues in the supply chain, reducing the cost of response. For example, giving retailers the ability to trace product quickly if a recall is needed. Alternately, understanding the impact on supply if a biosecurity issue is detected by a producer. • Insight on volumes and throughputs: The ability to provide time relevant access to data and to trace product as it moves along the value chain will be of significant benefit to retailers in supply planning. Not only can product tracing allow retailers to gain early information on future yields and bottlenecks affecting supply upstream – from processors and producers – but also the loss of perishable items increasing the cost of supply downstream to consumers. • Insight on environmental footprints: The ability to collect data for product environment footprints, from supply chain partners and product custodians, through the journey to retail. <p>Medium/long term benefits</p> <ul style="list-style-type: none"> • Provenance for their product • Significant savings across supply chain • Planning and forecasting • Eliminate reliance on Coles, Woolworths, ALDI, Metcash (IGA) and Costco for data upstream
Service Providers (including AgTech providers)	<p>Service providers refers to all service providers to the agriculture and food industries, including input providers (e.g., fertilisers, seed) and Agtech solution providers integrating with the platform and/or developing new data services in collaboration with the Australian AgriFood Data Exchange’s partner ecosystem.</p> <p>Immediate benefits</p> <ul style="list-style-type: none"> • Connect with foundational datasets, as well as new sources of data, via a comprehensive data catalogue to improve efficiency of data collection enabling increased focus on improving and expanding current service offerings and the customer base.

Stakeholder	Benefits
	<ul style="list-style-type: none"> • Prioritise resources on improving the richness of algorithms and services offered to customers, by requiring less capital and human resource focused on exchanging data. • Easily find and connect to more data sources. • Reach more customers through exposure to AAFDX users, and potential additional revenue streams for publishing data. • Frictionless ingestion of permissioned shared data by accounting and financial service providers. • Support risk adjusted pricing of financial services and introduction of natural capital ecosystem services. • Innovate and release applications to the wider market via account holders of AAFDX. • Benefit from accelerated participation of producers in digital agriculture (growing market for AgriFood Tech vendors). • Discover, connect with, and explore foundational harmonised datasets, as well as new sources of data. Innovate and release applications to the wider market via account holders of AAFDX. Benefit from accelerated participation of producers in digital agriculture. <p>Medium/long term benefits</p> <ul style="list-style-type: none"> • Creating a value add for products • Environmental, social, labour information is robust and transparent • Create contingent data sharing across producers through to retailer and open sharing of data
Freight	<p>Immediate benefits</p> <ul style="list-style-type: none"> • Increased ability forecast and plan for service demand from agrifood supply chain customers • Operational insights and visibility of the movement of fleet vehicles • Reduced friction of consignment information through the agrifood supply chain <p>Medium/long term benefits</p> <ul style="list-style-type: none"> • Greater decision confidence in business investments • Decreased operating costs due to insights and supply chain integration