

# final report

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## Farm Map Australia – Business Planning & Setup (Stage 1)

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## Executive summary

The NRM Spatial Hub (the Hub) Initiative commenced in April 2014 and was completed in June 2016 with support from the National Landcare Programme. Coordinated and managed by the CRCSI and the Australian Rangeland NRM Alliance, the initiative involved more than 20 organisations (including 14 NRM Regional bodies, State agencies and universities), and brought together more than a decade of R&D in grazing management, remote sensing and geospatial technologies.

Following the completion of the initial build and demonstration phase MLA, AWI, Rangelands NRM Alliance, and the CRC for Spatial Information (CRCSI) initiated an intensive program of work to: consolidate the platform; extend demonstrations to southern pasture systems; consult with users, and develop a unique business model aimed at underpinning the MLA Digital Strategy and driving the adoption of AgTech in the grazing industry. This stage confirmed the demand for the Spatial Hub capabilities and the opportunity to establish a self-sustaining platform to support the industry.

With financial support from the MLA Donor Company (MDC) and the CRCSI, along with substantial in-kind support from the original project partners, the primary objectives of this stage of the Hub initiative were to: finalise the Business Plan for approval to proceed; establish the Board and Governance structures; establish the commercial entity ready for launch in July 2017; establish the not-for-profit by March 2018; develop the business and technology roadmaps; and secure 500 financial memberships from redmeat producers by December 2017.

Our vision is to provide the opportunity for every agricultural property in Australia to have a trusted environment for creating, managing, analysing, accessing and sharing their digital farm map to help improve productivity and sustainability.

On 28 April 2017 the CRCSI and the MLA agreed to revise the Business Plan. This revision and change in timing required FarmMap4D to: immediately commence charging producers to validate commercial demand and over the next 6 months develop a real world understanding (rather than a desk top understanding based on previous assumptions) of what producer were willing to pay. The change timing required a significant re-allocation of resources and priorities.

On the 1<sup>st</sup> of July, 2017 the NRM Spatial Hub Demonstrator Initiative became Farm-Map Analytics Pty Ltd – Trading as FarmMap4D.

In only 6 months (December 2017) approximately 500 properties have taken up paid subscriptions; including more than 250 individual family properties. This includes a partnership agreement with Fitzroy Basin Association to put 200 family properties through the Grazing BMP Program over the next 2 years, and 50 family properties have joined in partnership with Resource Consulting Services under the Reef Program. Adoption by corporate pastoral companies has been the focus of the FarmMap4D's adoption strategy.

At the date of this report 6 of Australia's largest cattle companies had taken up subscriptions and it is expected that by late February 2018, there will be 10 corporates managing ~150 properties covering over 42 million hectares, with more than 2 million cattle under management using the FarmMap4D commercial service. Several other corporates are also undertaking trials, with a focus now on Western Australia.

The first 6 months of providing commercial services has confirmed the demand for an industry platform; demonstrated significant opportunities to drive greater adoption of R&D investments through a common platform, and the industry-wide benefits that will be delivered through the MDC-FarmMap4D partnership. It has also accelerated the identification of numerous opportunities and challenges (known and new) that are essential to be addressed to support MLA's Digital Strategy going forward.

FarmMap4D – Stage 2 will address a number of key priorities over the coming 6 months to June 2018. These priorities include:

- Establishing Farm Map Networks (FMN) – non-commercial data cooperative that will be the repository for farm map data under an NFP or Cooperative model.
- Addressing platform scalability as the number of regular users exceeds 1000, including isolating students and researchers from paying clients to avoid the chance of researchers/students “breaking the system”, while providing greater opportunities to leverage the platform for R&D.
- Improving system administration to allow users to only pay for what that need, and potentially integrate seamlessly with MyMLA.
- Application Programming Interface (API) development that will allow trusted third-party “Agtech” providers to plug directly into the platform. The first phase of API development will include plugins for Hitachi, Maia, Sapien and others, providing direct access to paddock and imagery outputs from subscribed users.
- Assessment of Platform use and exploration of New Functionality including further consultation, user surveys and discussions with AgTech Service Providers and researchers to validate current use of the FarmMap4D and explore new application development priorities and opportunities for accelerating RD&A.
- Putting in place the strategy for the next phase post July 2018.

FarmMap4D is realising its vision of providing the opportunity for every agricultural property in Australia to have a trusted environment for creating, managing, analysing, accessing and sharing their digital farm data. The realisation of this vision, by necessity, requires ongoing development of both technology platforms and business models that facilitate collaboration with producers, and third-party service and application providers, and researchers.

By 2020 FarmMap4D aims to be directly supporting approximately 4,000 grazing enterprises and continue to evolve as a foundation platform for MLA's Digital Strategy. Already, after only six months of operation, FarmMap4D is supporting producers managing 5-10 percent of Australia's cattle herd.

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# 1 Background

The NRM Spatial Hub (the Hub) Initiative commenced in April 2014 and was completed in June 2016 with support from the National Landcare Programme. Coordinated and managed by the CRCSI and the Australian Rangeland NRM Alliance, the initiative involved more than 20 organisations (including 14 NRM Regional bodies, State agencies and universities), and brought together more than a decade of R&D in grazing management, remote sensing and geospatial technologies.

The aim of Stage 1 of the Hub Initiative was to build and demonstrate the latest science in cloud computing, web-based geospatial mapping technologies, time-series satellite remote sensing across extensive grazing enterprises. The key objectives were to: dramatically improve access to information on-farm; bring the latest science into the paddock; and to demonstrate practical tools for producers. These tools are used to map, plan, analyse and monitor property infrastructure, land resources, ground cover, land condition and safe carrying capacity. The Hub Initiative also demonstrated opportunities for managers to engage more effectively with financial institutions and government agencies in relation to finance, property valuation and regulatory requirements.

By June 2016, ~300 properties were using the platform (original target of 40) and Hub was being recognised nationally and internationally as being a world-leading application for the grazing industry. More importantly, Australian producers provided positive feedback:

- more than 50% felt the Hub would save them between 10 and 30 labour days a year;
- 75% said it would measurably increase paddock carrying capacity and live weight gain through improved pasture utilization, with further increases available through efficient and targeted property development;
- 72 % rated this type of technology as important to making their business both viable and sustainable in the future.

Information collected suggested that many producers using the Hub to guide their future investment in infrastructure development, could conservatively increase annual revenue by more than 35% through increased pasture utilisation and improved land condition. Other applications were also identified by producers including: biosecurity plans; drought assessment; regional and national monitoring and reporting; biodiversity management; fire management; pest and weed management; emergency management; and carbon markets.

In June 2017, the Hub platform had 800 registered users and was being regularly used by approximately 500 (family and corporate) grazing properties covering more than 60 million hectares on a trial (non-commercial and free) basis.

In March 2017, the CRCSI and MLA co-funded the Farm Map Australia – Business Planning & Setup (Stage 1) project (this project). This followed an intensive 12-month phase working with the support of MLA, AWI, Rangelands NRM Alliance, and the CRC for Spatial Information (CRCSI) to: consolidate the platform; extend demonstrations to southern pasture systems; consulting with users, and developing a unique business model aimed at underpinning the MLA Digital Strategy and driving the adoption of AgTech in the grazing industry.

## 2 Project objectives

The primary objectives of this stage of the Hub initiative were to: finalise the Business Plan for approval to proceed; establish the Board and Governance structures; establish the commercial entity ready for launch in July 2017; establish the not-for-profit by March 2018; develop the business and technology roadmaps; and secure 500 memberships from redmeat producers by December 2017.

Our vision is to provide the opportunity for every new digital farm map created by a producer, or on their behalf by commercial providers, will be stored in a private and secure, single consistent national database within the not-for-profit entity, and be accessible (on-line in real-time) to third parties and service providers with the permission of the owner, through a commercially viable entity.

The specific objectives of this stage of the project were to:

1. Finalise the Business Plan and gain approval to proceed via a go/no go milestone
  - Business plan to consider all options as regards not-for-profit/commercial business structures, including possible incorporation in the MLA Digital structure.
2. Establishment of the Project Board and Governance arrangements defined
  - Board or other agreed representatives from MLA and CRC SI, with likely membership of AWI, Rangelands Alliance and an independent chair
3. Submit and secure \$430,000 in additional grants for assistance in 2017/18
4. Submit Stage 2 MDC Application
5. Establish the not-for-profit and/or commercial entities ready for launch in July 2017 as evidenced by MDC and CRC SI Board support for governance structures and Stage 2, legal entities having been created and team in place for July commencement

On 28 April 2017 the CRCSI and the MLA agreed to revise the Business Plan. The revision and change in timing required FarmMap4D to: immediately commence charging producers to validate commercial demand and over the next 6 months develop a real world understanding (rather than a desk top understanding based on previous assumptions) of what producer were willing to pay. The change timing required a significant re-allocation of resources and priorities.

This milestone/final report details the:

- Outputs of previous milestone reports prepared in accordance with MLS's final reporting requirements, and
- Summarises the current status of the business model implementation.

Appendix 1 (commercial in confidence) presents the business plan (ie output of previous milestones).

Appendix 2 (commercial in confidence) presents the MDC application.

## 3 Results

On the 1<sup>st</sup> of July, 2017 the highly successful NRM Spatial Hub Demonstrator Initiative became Farm-Map Analytics Pty Ltd – Trading as FarmMap4D.

In only 6 months (December 2017) approximately 500 properties have taken up paid subscriptions; including more than 250 individual family properties. This includes a partnership agreement with Fitzroy Basin Association to put 200 family properties through the Grazing BMP Program over the next

2 years, and 50 family properties have joined in partnership with Resource Consulting Services under the Reef Program. Adoption by corporate pastoral companies has been the focus of the FarmMap4D's adoption strategy.

At the date of this report 6 of Australia's largest cattle companies had taken up subscriptions and it is expected that by February 2018 there will be 10 corporates managing ~150 properties covering over 42 million hectares with more than 2 million cattle under management using the FarmMap4D commercial service. Several other corporates are also undertaking trials, with a focus now on Western Australia.

Unfortunately we were not successful with our Farming Together grant application. While the Commonwealth funding body saw significant merit in our initiative, the proposed model did not neatly fit the funding criteria that was heavily weighted towards large farmer groups forming cooperatives. A much smaller data cooperative demonstrator project submitted by Birchip Cropping Group (BCG) was successful that will inform stakeholders in the future.

Producers are currently using FarmMap4D for property development planning, land condition assessment and safe carrying capacity estimation, drought assessment and applications, Grazing BMP accreditation, biosecurity plans, carbon accounting, re-financing, and Natural Capital Accounting trials. More advanced users are developing infrastructure maintenance programs and comprehensive asset registers. Previous user surveys focused on Northern cattle producers suggest that average family enterprises could conservatively save 10-20 days labour, and increase annual revenue by more than 35% through increased pasture utilisation and improved land condition derived from using the Hub property development optimisation.

At a recent public meeting, the CEO of one of Australia's largest corporate producers stated that in a few weeks the Hub saved them hundreds of thousands of dollars through optimising development, and will make the company much more in improved safe carrying capacity.

With annual subscription rates for individual family properties ranging from \$300-\$750, and Corporates around \$1200 per year, the benefits to each producer could be 10-fold the annual subscription. At the industry level there are benefits through: support for the industry becoming carbon neutral by 2030; underpinning the Beef Sustainability Framework through world-leading use of remote sensing; supporting R&D programs; and collaborating with technology providers to accelerate innovation and adoption.

The lessee of a property in northern NSW recently died in a car accident. With poor seasonal conditions, and a complicated breeding program, Rabobank had major concerns for the business. The bank manager and a consultant were provided access to the property information stored in the Hub. The property lessor sent FarmMap4D an email stating "In a few days they were able to familiarize themselves with the property and seasonal pasture condition, and revise the grazing plan to keep the show on the road...The NRM Hub has proved to be invaluable as a centralised data tool..thank you for your help".

In addition to newly subscribed users we also have a number of other initiatives in the pipeline. An MOU and agreements are being finalised with the Soils for Life Program to bring an initial 100

properties on board and to train mentors. A range of developments are also being planned to deliver the initial 18-month program, and to support a 10-year program.

Following extensive consultation with SA government, a draft proposal has been submitted to provide a shared service model to northern Pastoral Leases. This would likely be a world-first partnership providing producers and regulators with a common platform, and may establish a model for NT, western NSW and WA going forward.

Two collaborative proposals have been submitted to the CRC for Developing Northern Australia. The first entitled *“Developing the new generation of experts and innovators in agri-food technologies”* in partnership with CQU. The second entitled *“Diversified North Australia land sector development Project”* in partnership with the North Australian Indigenous Land and Sea Management Alliance Ltd. These projects are in addition to supporting the SMARTFARM Learning Hub in collaboration with CQU, UNE and others. Currently UNE and CQU students are using FarmMap4D on the “Kirby-Newholme” and “Belmont Station” research farms. Queensland DAF are using FarmMap4D as part of the BMP Accreditation Program, delivering training on 4 demonstration properties. NSW Local Land Services have been funding producer training and several consulting companies are expressing interest in integrating FarmMap4D into their business.

The Business Plan requires the creation of two entities: (1) Farm Map Analytics (FMA) and (2) Farm Map Networks (FMN) – non-commercial data cooperative which would be the repository for farm map data under an NFP or Co-operative model. In December 2017 the FMA Board approved a “data cooperative” structure limited to members of FMA.

FMN supports FMA activities to grow and retain subscribers. FMN will be a data cooperative with members, a governing body, supporting technology with a data-as-a-service platform and community portal to facilitate cost effective member on-boarding and support. The technology platform will conform to a data-as-a-service model with industry standards, capable of supporting and enforcing privacy and governance rules consistent with member needs. The initial implementation will be a back-up copy of FMA data, moving to a real-time link between the Hub system and the FMN data service. It is recommended that, in time, the FMN data service will hold the live data for the Hub system supported by web service standards and techniques.

FMA will set up FMN and it is proposed that FMA can nominate one FMN Director out of a Board of 3 to 5. The existing FMA subscribers will become FMN members with one property one vote. FMN will address a key requirement of farming groups for trusted data management in order to facilitate the on-going growth of subscribers for FMA. FMN Members can modify the FMN Constitution allowing them to address any concerns on data security. FMN will address the new data privacy legislation requirements for reporting and notification of FMA members.

## 4 Discussion

The first 6 months of providing commercial services has confirmed the demand for an industry platform; demonstrated significant opportunities to drive greater adoption of R&D investments through a common platform, and the industry-wide benefits that will be delivered through the MDC-FarmMap4D partnership. It has also accelerated the identification of numerous opportunities and



challenges (known and new) that are essential to be addressed to support MLA’s Digital Strategy going forward.

It is hoped that when fully developed and exploited the not-for-profit entity may become a key component for the MLA’s digital value chain initiative, as well as a national resource to support the outcomes for the industry as detailed in the Meat Industry Strategic Plan 2020. Furthermore, it may become the national digital farm mapping standard for the agricultural and services sector; generating benefits in production, profitability, sustainability and efficiency across the entire value chain.

Raising awareness and technology literacy are the major barriers to adoption. The next phase of adoption and extension will require a planned, coordinated and resourced strategy to ensure gaps in adoption are addressed and momentum is maintained in current regions of high adoption. To date, most resources have been focused on QLD, NT, NSW and to a lesser extent SA. In particular, the northern pastoral zone of WA, requires channel and extension development. This has recently commenced with the consultants Grazing Innovation, but will require greater resourcing, tight coordination and strong collaboration with both extension programs and other commercial providers.

Southern WA, VIC and TAS will require a greater focus on the timely estimation of feed on offer to meet requirements. There is also an opportunity to integrate the MLA/CRCSI funded “Real time pasture biomass” application into FarmMap4D. This is particularly important given the de-commissioning of Pastures from Space.

Collaboration with other technology service providers is crucial for driving adoption, and accelerating innovation across the Agtech sector. FarmMap4D will be a catalyst in this area by providing third-party “Agtech” providers with APIs to plug directly into the FarmMap4D system.

## 5 Conclusions and recommendations

FarmMap4D is realising its vision of providing the opportunity for every agricultural property in Australia to have a trusted environment for creating, managing, analysing, accessing and sharing their digital farm data. The realisation of this vision, by necessity, requires ongoing development of both technology platforms and business models that facilitate collaboration with producers, and third-party service and application providers, and researchers.

By 2020 FarmMap4D aims to be directly supporting approximately 4,000 grazing enterprises and continue to evolve as a foundation platform for MLA’s Digital Strategy. Already, after six months of operation, FarmMap4D is supporting producers managing 5-10 percent of Australia’s cattle herd.

The following key areas will need to be a major focus of investment over the next 12 months.

### 5.1 Establishment of Farm Map Networks

The Business Plan requires the creation of two entities: (1) Farm Map Analytics (FMA) and (2) Farm Map Networks (FMN) – non-commercial data cooperative which would be the repository for farm map data under an NFP or Co-operative model.

FMA will provide services to both the members of FMN and to 3rd parties such as consultants, service providers and the financial institutions. Market research with Hub farmers (and other initiatives) has confirmed that trust issues around the use and management of on-farm data is of prime concern within the “AgTech” industry. Addressing these trust issues has been central to the Hub’s success to date and crucial to the “low-cost, volume-based” business model adopted. The commencement of FMN supported by MDC funds, producer memberships, and access to advanced tools will facilitate the reduction of key barriers to digital technology adoption. FMN will simplify producer interactions and extend opportunities for existing software service providers, extension officers and consultants to drive adoption of these digital technologies deeper into the livestock industry.

## 5.2 Product Innovation and Services Development

The Hub is fit for purpose and designed for scalability, however as subscriptions increase specific implementations to scale the Hub for projected usage levels must now be enacted. Based on early analysis of the existing platform, scaling issues include the handling of large numbers of concurrent users as the regular user-base grows past 1,000. The Hub will be further stressed with increased use of the analytics, and FarmMap4D becoming the de facto standard for property mapping.


Key developments have been identified that are critical to maintaining a positive user experience; facilitating collaborative R&D; providing greater opportunities for adoption of R&D through a common “spatial platform”; and assisting with the training of, and collaboration with, channel partners.

These future-proofing developments have been scoped for investment in the coming 6 months:

- Production Instance – Partitioning paying subscribers into a high performance and fully redundant cloud server environment.
- Training, Education and Research environments – Partitioning to separate students and researchers from paying clients to remove the possibility of researchers and students “breaking the system”. It will also provide the SMARTFARM Learning Hub universities with controlled access to the research and teaching resources.
- System Administration – Integration of user registration, authentication and payment systems to provide the ability for users to subscribe for only what they need. This may, pending MLA agreement, also include integration with
- Application Programming Interface (API) – Providing third-party “Agtech” providers to plug directly into the system. While a number of “smart APIs” are planned, this initial phase will focus only on providing trusted collaborators (including Hitachi, Maia, Sapien) with direct access to paddock and imagery outputs from subscribed users.

## 5.3 Assessment of Platform use and exploration of New Functionality

A formal user survey should be conducted on existing system users to examine how they are using the service, the benefits being generated, and any barriers in achieving the desired benefits. Suggestions for improvement and priorities for R&D will also be examined. This is intended to assess the current usage of FarmMap4D, to explore new application development priorities, and to identify opportunities for accelerating R&D including:

- Deeper integration with  and other Farm Management and Accounting Software.
- Ability for mixed farming systems to map and record crop and pasture rotations and management practices.
- Estimation of current pasture biomass and pasture growth forecasting.
- Creation of paddock diaries to support MLA/LPA Biosecurity Plan Requirements.

**6 Appendix 1 (commercial in confidence) business plan.**

**7 Appendix 2 (commercial in confidence) presents the MDC application.**