

FAIS System Redevelopment

End Project Report

June 2014

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DAF RTI DL Release

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| Owner: | Tim Pluples, Project Manager (Information Services) |
| Contact details: | Telephone: (07) 3087 8141 Email: tim.pluples@daff.qld.gov.au |
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| 11/06/2014 | 0.1 | Tim Pluples | Initial document developed |
| 21/06/2014 | 1.0 | Tim Pluples | Final document submitted to the project board |
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| | | | |

Approvals

| Project management team | Name | Signature | Date |
|-------------------------|------------------------------|-----------|------|
| Project Executive | Mike Ashton | | |
| Senior User | Barry Cooper | | |
| Senior User | Ross Dorward | | |
| Senior Supplier | Andrew Harcourt (Readify) | | |
| Project Manager | Tim Pluples | | |

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1 Project Manager's report

The redevelopment of the Fire Ant Information System (FAIS) and its supporting systems commenced in January 2012 after many years of planning and various system reviews. Lasting approximately 2.5 years, the project has delivered:

| Measurement Item | Metric |
|--------------------------------------|---------|
| Lines of Code | 209,708 |
| Number of Unit Tests | 8075 |
| Number of Integration Tests | 397 |
| Number of User Stories Delivered | 522 |
| Number of Story Points Delivered | 2407 |
| Number of Individual Tasks Delivered | 1977 |
| Number of Development Hours Spent | 5000 |

1.1 Major Achievements

The development of the Fire Ant Management System (FAMS) has had the privilege of delivering on major achievements that have resulted in quantifiable savings to the Fire Ant program. Some of these major achievements are summarised below.

500% Productivity Improvement to Remote Sensing Manual Analysis

With the implementation of the distributed processing functionality and changes to the overall system architecture, productivity for the manual analysis team was able to increase by more than 500%. A team of 19, including 16 contractors, were engaged to remove the remote sensing point of interest backlog in mid-2013. Releasing the new manual analysis tool in FAMS, supported by the Queen and Worker Ant processes, saw a reduction in the number of staff required to sustain the output from the algorithm for potential fire ant mounds that required manual analysis. 16 contractors were no longer required, resulting in the Fire Ant program saving approximately \$900,000 per year and the complete removal of the manual analysis process ever being a backlog in the overall remote sensing business process.

Improvements to the Boundary Release Process

The previous boundary release process undertaken in the Fire Ant Information System took approximately 6 weeks of human effort from start-to-finish. A process that is undertaken each quarter with 6 weeks of preparation time resulted in a 6 week gap before the next boundary release process would commence. This is effectively the work of 0.5 of an FTE employed specifically to manage the boundary release process.

The introduction of the Fire Ant Management System saw an opportunity to change the way that spatial data is used within the core database. By removing the reliance on textual relationships and

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querying spatial data in real-time without any impact on system performance, an opportunity was presented to overhaul the entire boundary release process. Preparation time is now less than 2 weeks and the actual release of the new restricted area boundary that previously required a system outage of greater than 4 hours can now be completed in real-time in less than 2 minutes.

This functionality has also extended into other areas that are spatially dependent including the IPQ area and treatment scope. Sites within FAMS now have the ability to be a part of many zones which is visible on the site summary screen.

Distributed Processing Architecture

With the Queen and Worker Ant processes, the Fire Ant program now has the system architecture in place to take any large processing requirement where the result is not required immediately and “farm” this out to many computers. This is a scalable solution that is focused on scaling-out instead of scaling-up. It is designed to take advantage of hundreds, if not thousands, of standard computers to be commissioned into processing information on behalf of the Fire Ant program. All this can be achieved while staff continue with their normal duties while their computer works busily behind the scenes processing a significant amount of information.

1.2 Project Approach

When the FAIS redevelopment project first commenced, it was one of the few projects within the former DEEDI and Queensland Government that was being managed under PRINCE2 with agile software development methodologies. Since this time, many other projects have adopted a similar approach with differing results.

The combination of PRINCE2 and Agile has worked extremely well for the Fire Ant program and the FAIS redevelopment project. The combination has provided clearly defined boundaries for a staged delivery of modules coupled with flexibility with the scope and development of those modules. It is believed that part of the success of the use of the PRINCE2/Agile combination is that the project manager performs the delegated role of the product owner to ensure that the project remains in-scope and therefore within the project timeframes and budgets. The Senior Users must remain actively involved in the backlog grooming process, however are not responsible for its ongoing maintenance.

1.3 Decision to Outsource

In November 2012 the project board was presented with an exception report highlighting that the project was forecasted to grossly exceed its allocated tolerances by an estimated \$1.8 million. This prompted a series of options to be put forward to the project board for their consideration and included the decision to overhaul the project approach and move from an internal development team to an external vendor to deliver the remaining functionality.

The Fire Ant Program partnered with Readify Pty Ltd to deliver the remainder of the FAIS redevelopment project which presented itself with significant benefits over using an internal team. Having access to such a skilled resource base provided the Fire Ant program with the ability to scale the size of the project team and interchange with skilled staff are required. The advice Readify have provided to the Fire Ant program has resulted in substantial business efficiencies and

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have developed a quality product that has a lot of potential for further development and additional enhancements.

1.4 FAMS as a Foundation and Future Ongoing Development

The Fire Ant Management System (FAMS) is leveraging off a modern technology stack that provides a lot of opportunities for future enhancements. The redevelopment project concentrated on delivering FAMS as a foundation by migrating and consolidating the Fire Ant program's information systems. The intention was then to continue with enhancements following the project that delivers real business efficiencies through continuous improvement.

The upgrade path for FAMS should continue to use the latest technology trends and versions of the FAMS technology stack to ensure that any solutions being implemented are not limited by technology. It also provides a platform for incremental upgrades as opposed to an overhaul which will cost less in the longer term. In addition to this, it also ensures that "band-aids" are prevented from being used to keep a system together and will avoid a situation that the Fire Ant program experienced with the legacy Fire Ant Information System.

2 Review of the Project Business Case

2.1 Alignment to agency/program strategies and objectives

The FAIS redevelopment project related to the following agency strategies and objectives which remained constant throughout the life of the project:

DAFF Strategic Plan 2012 – 2016

The Strategic Plan 2012 – 2016 for the Queensland Department of Agriculture, Fisheries and Forestry outlines the Queensland Government's approach to strengthen the agriculture pillar of Queensland's economy.

Particularly relevant to this proposal are the underlying principles of:

- **Objective 1:** Increase productivity of natural and biological assets with a focus on the "increased resilience to natural disasters and biosecurity events" by improving biosecurity systems, surveillance and systems.
- **Objective 3:** Increase productivity within our organisation with a focus on "high-value services are provided to producers and customers" by using technologies to widen availability and efficiency of service delivery.

The Fire Ant threat poses an immediate health risk to humans (and potential death through anaphylactic shock and allergic reactions), but also threatens native wildlife and agricultural industries due to ability to invade sensitive ecosystems.

Failing to control the spread of Fire Ants poses significant physical risk to humans, and economic harm to the entire Australian economy and way of life. BQCC's ability to contain the pest is heavily reliant on access to timely and accurate information to plan and monitor all eradication activities, which is impacted by the efficiency and functionality of FAIS.

Queensland Biosecurity Strategy 2009-2014

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The Queensland Biosecurity Strategy 2009-2014 produced by the Department of Primary Industries and Fisheries sets out the requirement for enhanced systems.

The following statements support evolution of the FAIS system redevelopment:

“Building capability and enhancing services

- Underpinning any biosecurity system is the need for a good skills base, **quality systems, infrastructure** and other resources.
- There is also a need to develop capability in new skills to reflect the contemporary biosecurity system
- Biosecurity services are changing... Today, the main focus is on **traceability systems**, certification services, disease and pest surveillance, planning, building capacity of others to deliver biosecurity services, **management tools**, and emergency response
- Changes in **technology and communication techniques** have opened up many channels for providing information or services to clients. It has also fundamentally changed the way business operates, with **more transactions being done online and an increased need for access to ‘just-in-time, just-for-me’ information and services.**
- The needs of diverse biosecurity stakeholders must be understood.

In the future, biosecurity services will be more client-focussed, aim to **foster greater self-reliance**, be viable, provide value for money and focus on areas of high biosecurity risk.

Stakeholder feedback must drive the continual improvement of biosecurity tools and services.

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2.1.1 Benefits achieved to date

| Benefits No. | Description | Baseline performance | Target performance | Description of the measure | Performance achieved | Reason for Variance | Product/s |
|--------------|--|--|---|--|---|--|---|
| 1 | Minimise or eliminate critical system outages | Erratic system availability following major system releases due to system resource usage and processing load | 99.9% uptime | Measure occurrences of downtime | The system has been subject to multiple upgrades due to enhancements and bug fixes as part of the project. There has been no critical system or unplanned outages since the beginning of the project. | There have been no unscheduled outages, however the system has been taken offline on numerous occasions for upgrades | All products have contributed to the realisation of this benefit. |
| 2 | Achieve a supported applications technology platform | Unsupported programming language | Currency of all Microsoft technologies deployed | Vendor support agreement, alignment with departmental ICT policy and support | The new Fire Ant Management System is on the latest version of Microsoft technologies and provides an easy migration and upgrade path for future version updates | Not applicable – This benefit has been 100% realised | All products have contributed to the realisation of this benefit. |

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| Benefits No. | Description | Baseline performance | Target performance | Description of the measure | Performance achieved | Reason for Variance | Product/s |
|--------------|--|--|--|---|---|--|---|
| 3 | Replicate core existing functionality on a more modern codebase | Base functionality operational with questionable stability | Replicate and improve functionality on a modern high-performing platform | Compare functionality in new system release to detailed functional specifications | FAMS is using the latest technology stack and continues to be upgraded as new versions are available | Not applicable – This benefit has been 100% realised | All products have contributed to the realisation of this benefit. |
| 4 | Incorporate critical awaited functionality which currently cannot be delivered | Desired modifications cannot be delivered due to limitations within the existing system. | All awaited functionality available in new system | Deliver all currently awaited enhancements on new platform | Some improvements have been made however there is a large list of enhancements that can be delivered as part of support and maintenance activities. | The project scope was restricted to like-for-like which has been achieved. | All products have contributed to the realisation of this benefit. |
| 5 | Provide a platform for agile development as required | Very time-consuming hand-coding and manual testing | Modern development environment with relevant supporting processes | Ability for rapid deployment of added functionality | FAMS has the capacity to deliver daily production releases due to the automated deployment and continuous integration processes used | Not applicable – This benefit has been 100% realised. | All products have contributed to the realisation of this benefit. |

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| Benefits No. | Description | Baseline performance | Target performance | Description of the measure | Performance achieved | Reason for Variance | Product/s |
|--------------|---|--|---|---|--|---|---|
| 6 | Access a larger pool of programming skills in marketplace | Limited availability of staff with appropriate skills and experience | Ability to draw on large pool of potential candidates | Number of applicable candidates sourced for vacant positions | With the technology stack used by FAMS, it now has access to a larger pool of programming skills through various vendors | Not applicable – This benefit has been 100% realised. | All products have contributed to the realisation of this benefit. |
| 7 | Provide operational benefits through improved applications performance | Degradation of response times particularly in peak demand and following major releases | Ability to prioritise applications and a more resource-efficient platform | Response times for queries improved, lack of outages and delays | The FAMS database is now supporting 74 million records with no performance issues identified. | Not applicable – This benefit has been 100% realised. | All products have contributed to the realisation of this benefit. |
| 9 | Minimise reliance on individuals and the risks of staff attrition | Reliance on outdated code and inefficiencies | Well documented system in standard language, using proven 3 rd party plug-in where necessary | Develop in modern and mainstream technologies | FAMS was built by a vendor who will now be responsible for supporting and maintaining this system in the future | Not applicable – This benefit has been 100% realised. | All products have contributed to the realisation of this benefit. |
| 11 | Allow update of business systems while adhering to current accepted systems practices | Some areas of system have been documented in a recent SQL | Full system documentation including Data Dictionary, robust test and | Follow versioning control and multiple environments | FAMS has the capacity to deliver daily production releases due to | Not applicable – This benefit has been 100% realised. | All products have contributed to the realisation of this benefit. |

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| Benefits No. | Description | Baseline performance | Target performance | Description of the measure | Performance achieved | Reason for Variance | Product/s |
|--------------|---|--|--|----------------------------|--|---------------------|-----------|
| | (documentation, release and version control, etc) | Server migration, test/dev/live environments implemented | development platform, seamless migration to live | through release management | the automated deployment and continuous integration processes used | | |

2.1.2 Benefits expected

| Benefits No. | Description | Baseline performance | Target performance | Target date | Description of the measure | Responsibility for measuring | Benefit Owner |
|--------------|---|---|---|--|---|---|---|
| 8 | Provide richer reporting and Business Intelligence toolset to users | Hard-coded reports are available, limited interaction and drill-down ability in reports | Business Intelligence toolset to authorised users allowing use of and modern BI techniques and benefits | 30 June 2016 | Remove reliance on programming personnel for reports and Management Information | Project Coordinator (Information Services), Biosecurity Queensland Control Centre | Director, Biosecurity Queensland Control Centre |
| 10 | Better protect BQCC Intellectual Property | System suited to Fire Ant threat only | Develop business processes and variables that provide potential to apply to other tramp ant | Pending decision until future tramp ant threat whilst taking into consideration the delivery | BQCC retains full ownership of IP and potentially apply system to manage additional threats | Project Coordinator (Information Services), Biosecurity Queensland Control Centre | Director, Biosecurity Queensland Control Centre |

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| Benefits No. | Description | Baseline performance | Target performance | Target date | Description of the measure | Responsibility for measuring | Benefit Owner |
|--------------|-------------|----------------------|--------------------|---------------------|----------------------------|------------------------------|---------------|
| | | | threats | of the BIMS program | | | |

3 Review of project objectives

3.1 Project performance

| Project parameter | Target | Tolerance | Actual deviation | Reasons for Deviation | Effectiveness of the project's strategies and controls |
|-------------------|----------------|---------------|-----------------------------------|---|--|
| Budget | \$1,138,319.90 | +\$360,209.85 | \$1,477,015.55 (+\$338,695.65) | The project was delivered within its original budget tolerance, however the project budget changed on several occasions due to fluctuations with the Fire Ant and greater DAFF budget as a result of the machinery of government. | The project's strategies and controls remain effective throughout the life of the project. All changes in the budget are documented and approved by the project board. |

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| Project parameter | Target | Tolerance | Actual deviation | Reasons for Deviation | Effectiveness of the project's strategies and controls |
|-------------------|--|---|--|--|---|
| Quality | Achieve a supportable technology platform that delivers all must and should-have functionality | Not applicable | Not applicable | The Fire Ant Management System (FAMS) is on a modern technology stack that is supportable and maintainable with all must and should-have functionality delivered | The decision to outsource the development to Readify contributed to the effective delivery of this project performance indicator. The project scope was determined by the product backlog which was actively managed by the project manager after consultation with the senior users. |
| Completion Date | 12 th July 2013 | 1 st November 2013 (+16 weeks) | 20 th June 2014 (+49 weeks) | The project was temporarily suspended on two separate occasions in June 2012 for 7 weeks and again in June 2013 for 11 weeks totalling 18 weeks of suspension. | The project was put into exception on multiple occasions with the forecast expecting to exceed the project's time and budget tolerances. This resulted in a change in project approach in December 2012 to outsource the software development activities to an external vendor. |

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3.2 Change and Issue Impact

The following issues were experienced during the life of the project. The issues are outlined below to provide a clear understanding on their impact on the project performance targets.

| Issue No. | Issue type | Issue description | Severity | Impact on Project Plan | Impact on quality criteria | Impact on Project Business Case |
|-----------|-----------------|---|-------------|------------------------|----------------------------|---------------------------------|
| 1 | Problem/concern | After discussing the requirements of the Community Engagement team it is a significant amount of work that will be difficult to deliver useful functional requirements within the specified timeframe. | Significant | High | High | None |
| 2 | Problem/concern | No time has been spent focusing on the user experience component of the application. So far the user interface is based upon functionality and not necessarily the business workflow. | Moderate | Medium | High | None |
| 3 | Problem/concern | During the first few sprints it was identified that the developers were not taking advantage of the business analysts available to the project. A lot of assumptions were made due to poorly documented acceptance criteria that could have been avoided. | Minor | Medium | High | None |

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| Issue No. | Issue type | Issue description | Severity | Impact on Project Plan | Impact on quality criteria | Impact on Project Business Case |
|-----------|-----------------|--|-------------|------------------------|----------------------------|---------------------------------|
| 4 | Problem/Concern | Delays experienced with the configuration of architecture and the developers becoming familiar with the new technology has resulted in delays to the delivery schedule for the stage | Significant | High | Medium | None |
| 5 | Problem/Concern | There is a strong reliance on Tim Pluples as the Project Manager within the project team to provide the overall vision for the products being developed. The vision and overall conceptual and logical design should be clearly documented to ensure everyone is on the same page. | Significant | High | High | None |
| 6 | Problem/concern | The current direction of the options analysis does not accurately reflect the true process of undertaking an options analysis. I&TS advise that a Business Analyst with approximately 10 years experience is required to complete this document given its scope and complexity. | Moderate | High | High | Low |
| 7 | Problem/concern | Andreas Neudecker, Business Analyst for the project, is currently on secondment that will | Critical | High | High | None |

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| Issue No. | Issue type | Issue description | Severity | Impact on Project Plan | Impact on quality criteria | Impact on Project Business Case |
|-----------|-----------------|--|----------|------------------------|----------------------------|---------------------------------|
| | | not extended past 27 April 2012. With the current Queensland Government policies, no new positions can be advertised resulting in the inability to fill this position. | | | | |
| 8 | Problem/concern | Development tasks that require complex problem solving are taking too long to complete resulting in delays to the sprint schedule. | Moderate | High | High | None |
| 9 | Problem/concern | Developers are not taking ownership for the product being developed and are therefore relying too heavily on advice from the product owner and business analyst | Moderate | High | High | None |
| 10 | Problem/concern | The new technology stack coupled with a new development process has resulted in a steep learning curve for all project team members. This has contributed to several delays with the development schedule resulting in an inability to deliver all must and should-have functionality for the Staff Management module. | Critical | High | High | None |

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| Issue No. | Issue type | Issue description | Severity | Impact on Project Plan | Impact on quality criteria | Impact on Project Business Case |
|-----------|--------------------|--|-------------|------------------------|----------------------------|---------------------------------|
| 11 | Problem/concern | The project has not had a staff member filling the role of a Business Analyst since 27 April 2012. (Refer to Issue #7). Approval was provided to fill the position however no suitable candidates were identified. The lack of a business analyst has resulted in a degradation of quality for the products being delivered. | Critical | High | High | None |
| 12 | Request for change | Changes to the legislation scheduled in November require work to be reprioritised for the FAIS redevelopment project. Risk Management was not intended to be started until Stage 4 of the project however this component will now need to be delivered as part of Stage 3 in order to meet the legislation deadlines | Significant | High | Medium | Low |
| 13 | Problem/concern | The Staff Management module has not undergone any form of quality review process as no user acceptance testing has occurred. The quality of the product being delivered is unknown at this stage | Significant | High | High | None |

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| Issue No. | Issue type | Issue description | Severity | Impact on Project Plan | Impact on quality criteria | Impact on Project Business Case |
|-----------|--------------------|---|-------------|------------------------|----------------------------|---------------------------------|
| 14 | Problem/concern | The performance of the existing functionality built is poor and is not meeting the expectations of the business | Significant | Medium | High | None |
| 15 | Problem/concern | The scrum process is not being followed correctly as functional testing should be performed during each sprint in order to remain confident that the functionality developed during the sprint is production ready by the Sprint Review | Significant | High | High | None |
| 16 | Request for change | Automated testing will need to be configured to reduce the impact on the business to conduct user acceptance testing. This should be a form of quality review which will be conducted during each sprint. | Moderate | Medium | High | None |
| 17 | Request for change | A new development environment is required to act as an unstable environment for the developers to perform prototyping, proof of concepts and conduct the automated testing mentioned in Issue #16. | Moderate | Medium | High | None |
| 18 | Problem/concern | The corporate ArcSDE 10 server | Significant | Medium | Medium | None |

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| Issue No. | Issue type | Issue description | Severity | Impact on Project Plan | Impact on quality criteria | Impact on Project Business Case |
|-----------|--------------------|--|-------------|------------------------|----------------------------|---------------------------------|
| | | has not been delivered resulting in an inability to release any products that rely on spatial technology into the test environment. | | | | |
| 19 | Request for change | The new version of FAIS needs a new name that can be used by the business so there is no confusion when referring to new and legacy systems | Moderate | Low | None | None |
| 20 | Request for change | The security of the application is using a database account rather than an application service account in active directory. While this method was previously used for the legacy applications, it is no longer best practice and represents a potential security flaw. | Moderate | Medium | High | None |
| 21 | Request for change | Development is being targeted to Internet Explorer 8 as it renders the web page more consistently than previous versions. This will reduce the development time to deal with display issues in Internet Explorer 6 and 7. | Significant | Low | High | None |
| 22 | Problem/concern | The requirements for some user stories for the Property and | Critical | Medium | High | None |

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| Issue No. | Issue type | Issue description | Severity | Impact on Project Plan | Impact on quality criteria | Impact on Project Business Case |
|-----------|--------------------|--|-------------|------------------------|----------------------------|---------------------------------|
| | | Stakeholder Management module are not clearly defined resulting in ambiguity for the developers. | | | | |
| 23 | Problem/concern | The existing integration between the Fire Ant Staff Information System (FSIS) and the Fire Ant Information System (FAIS) has not been updated with the new Staff Management module. It is intended that some sections within FSIS will be decommissioned when the Staff Management module is released into production. | Moderate | Low | Low | None |
| 24 | Request for change | Annette Evans highlighted that Information and Technology Partners are not fulfilling the role of Senior Supplier as they have no control over the project resources. Annette has requested that a new Senior Supplier be found. | Significant | High | High | Low |
| 25 | Problem/concern | The hours completed for tasks for a given user story have not always been entirely accurate due to a misunderstanding with what should be recorded and | Significant | Low | Low | None |

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| Issue No. | Issue type | Issue description | Severity | Impact on Project Plan | Impact on quality criteria | Impact on Project Business Case |
|-----------|--------------------|--|-------------|------------------------|----------------------------|---------------------------------|
| | | how hours are calculated. | | | | |
| 26 | Problem/concern | There was significant conflict between team members while the project manager was away on annual leave | Significant | High | High | None |
| 27 | Problem/concern | Project staff attrition due to departmental budget cuts | Significant | High | High | Low |
| 28 | Request for change | Limitations with the agile template used in Team Foundation Server for managing work items makes it difficult to understand what items must be delivered | Moderate | Low | Low | None |
| 29 | Problem/concern | The results of a quality review undertaken by Readify showed a poor quality of code output | Critical | Low | Medium | None |
| 30 | Problem/concern | The team performance is approximately half of what it should be in order to deliver the project on time and on budget | Critical | High | High | Low |
| 31 | Problem/concern | The current implementation of how addresses are recorded against a company does not support adding PO Boxes | Significant | Low | High | None |
| 32 | Request for change | Recording Staff Leave in the existing FSIS solution has not | Moderate | Low | High | None |

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| Issue No. | Issue type | Issue description | Severity | Impact on Project Plan | Impact on quality criteria | Impact on Project Business Case |
|-----------|--------------------|---|-------------|------------------------|----------------------------|---------------------------------|
| | | been developed in the Staff Management module as the functionality was never documented | | | | |
| 33 | Request for change | Request to de-scope unused functionality for recording surveillance against difficult sites | Moderate | High | High | Low |
| 34 | Request for change | Request to de-scope unused functionality for recording power of entry against sites | Moderate | High | High | Low |
| 35 | Request for change | Request to de-scope unused functionality for recording quality assurance activities by the Program Compliance Monitoring Team (PCMT) | Moderate | High | High | Low |
| 36 | Request for change | A number of reports for FSIS were not identified during the initial workshops. Some reports have been created to assist with the attendance of staff however a large number of them have not been integrated into the new system. | Moderate | Low | High | None |
| 37 | Problem/concern | Code conventions not enforced by test suite. | Moderate | Low | Medium | None |
| 38 | Problem/concern | Existing test harness (MSTest) does not support required testing | Significant | Low | Medium | None |

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| Issue No. | Issue type | Issue description | Severity | Impact on Project Plan | Impact on quality criteria | Impact on Project Business Case |
|-----------|-----------------|---|-------------|------------------------|----------------------------|---------------------------------|
| | | features (notable data-driven tests) | | | | |
| 39 | Problem/concern | Existing automated tests are failing | Significant | Low | Medium | None |
| 40 | Problem/concern | Auditing functionality is ad-hoc and must be added to every new feature manually. | Significant | Low | Medium | None |
| 41 | Problem/concern | No automated build of the code exists in the current solution | Significant | Low | Low | None |
| 42 | Problem/concern | Third-party libraries are out of date and referenced incorrectly. | Moderate | Low | Low | None |
| 43 | Problem/concern | Legacy code is of very poor quality and difficult to maintain. | Significant | Low | Low | None |
| 44 | Problem/concern | Extremely inefficient database access | Significant | Low | Medium | None |
| 45 | Problem/concern | Business rules encapsulated in the wrong location within the application. | Moderate | Low | Medium | None |
| 46 | Problem/concern | Local Administrator Access to Development Servers | Significant | Low | Low | None |
| 47 | Problem/concern | Project burndown charts not working in TFS 2010 | Significant | Low | Low | None |
| 48 | Problem/concern | Staff absences and illness resulting in delays to the project | Critical | High | High | None |

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| Issue No. | Issue type | Issue description | Severity | Impact on Project Plan | Impact on quality criteria | Impact on Project Business Case |
|-----------|-----------------|--|-------------|------------------------|----------------------------|---------------------------------|
| | | schedule | | | | |
| 49 | Problem/concern | Significant amount of bug fixing and improvements required to the Staff Management module prior to the production release | Significant | High | High | None |
| 50 | Problem/concern | Remote Sensing Improvements project interfering with the redevelopment project schedule | Critical | High | High | None |
| 51 | Problem/concern | BQCC has raised concerns with some Readify developers having insufficient skills to deliver ArcGIS programming functionality | Critical | High | High | None |
| 52 | Problem/concern | Data migration scripts are struggling with the amount of data that needs to be migrated causing delays to the continuous integration process | Significant | High | High | None |
| 53 | Problem/concern | Insufficient hardware on developer workstations to sustain software development activities | Significant | Low | Low | None |
| 54 | Problem/concern | Support and Maintenance Capabilities for Python Scripting | Significant | Low | Low | None |
| 55 | Problem/concern | Delays associated with a production deployment for the Remote Sensing Improvements | Significant | Medium | Medium | None |

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| Issue No. | Issue type | Issue description | Severity | Impact on Project Plan | Impact on quality criteria | Impact on Project Business Case |
|-----------|--------------------|--|-------------|------------------------|----------------------------|---------------------------------|
| | | project | | | | |
| 56 | Request for change | Changes to the Power of Entry process and reporting requirements undertaken by operational field staff | Moderate | Low | Low | None |
| 57 | Request for change | Request for a new mobile GPS tracking functionality to improve the quality assurance process | Moderate | Low | Low | None |
| 58 | Request for change | Request for a new point of interest layer showing all points analysed as "No" by the Manual Analysis team | Minor | Low | Low | None |
| 59 | Request for change | Request from Readify to transition Shingi Mutandwa out and replace with Daniel Janczak | Significant | Low | Low | None |
| 60 | Request for change | Request from Readify to transition Chris Gilbert out and replace with Steve Townsend | Significant | High | High | None |
| 61 | Request for change | Request to decommission unused features in the legacy Fire Ant Staff Information System (FSIS) due to corporate applications being available | Moderate | Low | Low | None |
| 62 | Request for change | Using Octopus Deploy cannot update the FAMS Background Service without having a | Minor | Low | Low | None |

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| Issue No. | Issue type | Issue description | Severity | Impact on Project Plan | Impact on quality criteria | Impact on Project Business Case |
|-----------|--------------------|--|-------------|------------------------|----------------------------|---------------------------------|
| | | "tentacle" installed on all application servers | | | | |
| 63 | Problem/concern | The FAMS Error Log Table is consuming approximately 55GB of Storage as it is recording all warning messages (not just error messages) | Minor | Low | Low | None |
| 64 | Request for change | Request to increase the voting threshold for the manual analysis tool so that the information can be used to assist with the development of the algorithm | Minor | Low | Low | None |
| 65 | Request for change | Request to modify the manual analysis tool within FAMS to display surrounding POI's to give the manual analysis team additional context when voting on POI's | Minor | Low | Low | None |
| 66 | Request for change | Request to de-scope all community engagement functionality from the FAIS redevelopment project pending the implementation of a DAFF CRM using Microsoft Dynamics | Significant | High | High | Low |
| 67 | Request for change | Request to de-scope all Tracing functionality from the FAIS redevelopment project as this | Moderate | High | High | Low |

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| Issue No. | Issue type | Issue description | Severity | Impact on Project Plan | Impact on quality criteria | Impact on Project Business Case |
|-----------|--------------------|--|-------------|------------------------|----------------------------|---------------------------------|
| | | functionality is not required at the moment | | | | |
| 68 | Off-specification | Some existing functionality for Bookings in FAIS was not captured in the FAIS redevelopment product backlog and was therefore not budgeted for in terms of time and money | Moderate | Medium | Medium | None |
| 69 | Request for change | Request to add an additional Readify developer for 55 days starting January 2014 to speed up the development process | Significant | Low | Medium | None |
| 70 | Request for change | Request to remove the cost of the project manager from the forecasted project budget | Moderate | Low | Low | None |
| 71 | Request for change | Request to migrate data from the Sample Submission Register into the Fire Ant Management System (FAMS) due to the complexity and timeframes required to enhance SSR and FAMS so that the systems can communicate with each other | Significant | Medium | Medium | None |
| 72 | Problem/concern | There is a substantial amount of testing required over the next month if the project is able to achieve all of its objectives. This | Significant | Medium | High | None |

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| Issue No. | Issue type | Issue description | Severity | Impact on Project Plan | Impact on quality criteria | Impact on Project Business Case |
|-----------|------------|---|----------|------------------------|----------------------------|---------------------------------|
| | | will place a significant load on the business unless additional resources are provided to conduct system testing. The Fire Ant program has multiple competing priorities including a boundary release and remote sensing season | | | | |

4 Review of the project's products

| Product No. | Product name | Quality activities planned | Quality activities completed | Approval Records | Off-Specifications | Follow-on actions |
|-------------|------------------------|---------------------------------------|-----------------------------------|---|------------------------|--|
| 1 | Workshops and Planning | Requirements and User Story gathering | Backlog of User Stories developed | List of User Stories and associated tasks recorded in TFS | Agile project approach | Recording and updating of user storied in TFS |
| 2 | Staff Management | Internal Walkthrough | Internal Walkthrough | \\oxlsrvpr01\CorpData\Biosecurity\BQCC\Information Services\Projects\FAIS System Redevelopment\Correspondence\Sprint Review | Agile project approach | Refer to Quality Records – List of User Stories and associated tasks recorded in TFS |
| 3 | Property Management | Internal Walkthrough | Internal Walkthrough | \\oxlsrvpr01\CorpData\Biosecurity\BQCC\Information | Agile project approach | Refer to Quality Records – List of User Stories and |

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| | | | | Services\Projects\FAIS System Redevelopment\Correspondence\Sprint Review | | associated tasks recorded in TFS |
| 4 | Risk Management | Internal Walkthrough | Internal Walkthrough | \\oxlsrvpr01\CorpData\Biosecurity\BQCC\Information Services\Projects\FAIS System Redevelopment\Correspondence\Sprint Review | Agile project approach | Refer to Quality Records – List of User Stories and associated tasks recorded in TFS |
| 5 | Zones | Internal Walkthrough | Internal Walkthrough | \\oxlsrvpr01\CorpData\Biosecurity\BQCC\Information Services\Projects\FAIS System Redevelopment\Correspondence\Sprint Review | Agile project approach | Refer to Quality Records – List of User Stories and associated tasks recorded in TFS |
| 6 | Infested Properties | Internal Walkthrough | Internal Walkthrough | \\oxlsrvpr01\CorpData\Biosecurity\BQCC\Information Services\Projects\FAIS System Redevelopment\Correspondence\Sprint Review | Agile project approach | Refer to Quality Records – List of User Stories and associated tasks recorded in TFS |
| 7 | Sample Management | Internal Walkthrough | Internal Walkthrough | \\oxlsrvpr01\CorpData\Biosecurity\BQCC\Information Services\Projects\FAIS | Agile project approach | Refer to Quality Records – List of User Stories and |

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| | | | | System Redevelopment\Correspondence\Sprint Review | | associated tasks recorded in TFS |
| 8 | Jobs Management | Internal Walkthrough | Internal Walkthrough | \\oxlsrvpr01\CorpData\Biosecurity\BQCC\Information Services\Projects\FAIS System Redevelopment\Correspondence\Sprint Review | Agile project approach | Refer to Quality Records – List of User Stories and associated tasks recorded in TFS |
| 9 | Events | De-scoped | De-scoped by project board pending | | | |
| 10 | Training | De-scoped | De-scoped | | | |
| 11 | Media | De-scoped | De-scoped | | | |
| 12 | Tracing | De-scoped | De-scoped | | | |
| 13 | Asset Management | De-scoped | De-scoped | | | |
| 14 | Product Backlog Closure | Planning and prioritisation session with Management | Planning and prioritisation session with Management | Planned for 18 th June 2014 | Backlog in order of priority | Re-prioritise and triage backlog ongoing |

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5 Review of team performance

The performance of the project is determined by the performance of the team. This project would not have been successful without the enthusiasm provided by all staff involved in the project. This is explained further in each subsequent section, however it's important to note that each person played their part in the greater project and should be proud of what has been accomplished.

5.1 Internal Project Team

The initial internal project team involved were enthusiastic and motivated but the technical developers lacked appropriate skills to deliver the project efficiently. That being said, some of the staff were transitioned to other activities including the ongoing support and maintenance of legacy systems and were responsible for providing advice to Readify in relation to the current business environment, processes imposed by Information and Technology Partners (ITP).

Members of the team were mostly funded out of the core Information Services budget as they were performing duties across the entire Biosecurity Queensland Control Centre business. Several staff should be recognised for their ongoing support of the FAIS redevelopment project and overall enthusiasm and motivation to see it succeed, often staying back late after business hours or working over weekends to assist with production releases. These staff include Tejinder Pingal (Database Administrator), Khanh Truong (Lead Developer), Hardik Patel (Senior Developer) and Jonathan Seeto (Junior Developer).

5.2 Readify Staff

All Readify staff involved in the project have been instrumental in the success of the project. Their knowledge of agile methodologies, high quality development standards, problem solving skills, communication skills and overall attention-to-detail has been greatly appreciated. The engagement from Readify as senior supplier has been extremely positive. The main staff involved from Readify included:

- Rosemary Black (Qld State Manager)
- Andrew Harcourt (Principal Consultant)
- Steve Townsend (Senior Consultant)
- Shingi Mutandwa (Senior Developer)
- Chris Gilbert (Senior Developer)
- Daniel Janczak (Senior Developer)

The Fire Ant program has benefited from a time and materials engagement with Readify only charging a daily rate. The development staff involved in the project consistently put in the extra effort to ensure the project was meeting its expected deliverables, often staying back late for production releases or resolving issues on weekends to ensure their productivity during business hours was not impacted.

It was clear from working with Readify that they are committed to the successful delivery of a project whilst maintaining a high standard and quality of service. Their commitment, motivation and dedication to assist the Fire Ant program is greatly appreciated.

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5.3 Key Business Stakeholders

Although not necessarily a part of the project team, there were many key business stakeholders that were involved in the project and should be recognised for their efforts. The senior users remained actively engaged in the project and were excellent advocates for both the business and the project. The list of senior users throughout the project included Jason Haffenden, Craig Jennings, Ross Dorward and Cara McNicol.

Several staff from various business units also attended many sprint review meetings providing critical feedback on a regular basis and displaying patience in the entire development process. These staff were also involved in the user acceptance testing process and saw FAMS evolve from nothing into a fully-functioning system. Without this level of engagement and buy-in from the business, the project would not have succeeded. The list of staff include Michelle Fooks, Tracy Buxton, Allison Hoskin-Kain, Alex Fulton, Barry Cooper and Elaine Fleming.

One final comment on the review of the team performance involves the role of the project executive. This role was fulfilled by Neil O'Brien until June 2013 followed by Mike Ashton until June 2014. Both executives performed their roles and responsibilities under PRINCE2 and remained supportive of the project whilst ensuring it remained viable, achievable and desirable. They provided timely advice to the project manager and were quick to remove impediments that required their escalation.

6 Project product handover

6.1 Customer acceptance

As this followed a staged implementation of modules, customer acceptance occurred throughout the project in the form of multiple sprint reviews and user acceptance testing processes. An end project retrospective was held with the key business users and included an opportunity for them to discuss what worked well, what didn't work so well and what could be done better if the Fire Ant program was to undertake a similar project in the future. This retrospective formed part of the lessons learned of the project.

The summary of this retrospective was that the business is happy with the Fire Ant Management System and sees its potential for further development. They agreed that there is still a bit of work to go to improve its overall user experience and make it a nice integrated solution which will form part of the support and maintenance work in the future.

The business also agreed that daily production releases are preferred in the future as it shows progress is being made and allows them to see that bugs are being resolved or enhancements made on a regular basis. This provides little impact to them as the majority of production releases occur outside of business hours.

6.2 Operations and maintenance acceptance

All core functionality within the Fire Ant Management System has been delivered and all targeted systems are completely decommissioned, or in the process of being decommissioned. The project team collected a large number of user stories throughout the project which included multiple enhancement requests. As this was deemed out-of-scope for the project, they were placed on the backlog with the objectives that they would be handed over at the end of the project to be treated

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as part of support and maintenance activities. This list comprises of approximately 300 user stories and it is recommended that the business now undertakes a process to cleanse this list to determine what enhancement requests are still required and prioritise accordingly.

The list will not be included as part of this document due to its sheer size. Instead, all remaining user stories will be transferred to the support and maintenance backlog contained within the BQCC instance of Team Foundation Server. A list was already distributed to the BQCC management team prior to project closure to facilitate a prioritisation workshop for the remaining work items that will be delivered from 1 July 2014 onwards.

The project has delivered a business information system using a solid technology stack as its core foundation. With the completion of the project, it is now being handed over to Information and Technology Partners to support and maintain, who will act as service brokers to ensure the Fire Ant program and its information systems are maintained by vendors with appropriate skills.

6.3 File archiving

All project documentation will be moved to the departmental electronic document records management system, eDOCS and removed from the Oxley file server so that there is only one copy of the documents available. A workspace has been created for all BQCC Information Services projects which can be made available to any staff member by contacting the Project Coordinator (Information Services) for the Biosecurity Queensland Control Centre.

7 Lessons

Due to the number of lessons incorporated prior to the project and during the project, these lessons will be divided into various categories to assist with determining what is relevant for the audience of this report.

7.1 Project Methodologies

- Agile has a very specific toolkit and set of terms which are not always obvious to understand at the beginning.
- Agile can be quite chaotic for some developers who do not work well with ambiguity or shades of grey which can impact on the quality and delivery of the project.
- Getting an overall vision for the project objectives is important for programmers as they are often only focused on an individual task during a sprint.
- Small user stories are more effective as they provide greater clarity for developers and the acceptance criteria is easier to document.
- Agile places equal responsibility on everyone in the team and is therefore more demanding. Team members working in close proximity together assists with communication.
- Decisions at the project level need to be made quickly in order for work from the development and business analysis team to continue.

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- It is easy to fall into the trap of scope-creep and delivering more than what is required. Stick to the bare minimum that is defined in the user story.
- Future software development activities that are closely related to other major initiatives being undertaken by the Fire Ant program should be more closely aligned to allow a more focused development effort.
- Use vendors right from the beginning as opposed to using an internal project team to be able to tap into a much wider skill base.
- Provide the business with access to the work item tracking software and encourage them to view it and run reports to track the progress of the project as well as see the upcoming schedule.
- Adopt a ubiquitous language - Business Language First, IT Language Second.
- Using PRINCE2 and Agile are mutually beneficial - PRINCE2 provides structure and governance around pre-determined timeframes and costs. If a stage is about delivering a module or component of a system, utilise agile methodologies to determine what is the must, should and could have functionality to provide the flexibility underneath.
- Having the project manager fulfil the role of the product owner helped keep the project in scope and in budget.
- Look at building in flexibility within the terms and conditions of a contract with vendors so that the business can still have ultimate control over scope without needing variations, but also hold the vendors accountable for delivery.
- Concentrate on removing impediments as the absolute priority. Vendors are expensive and with a rapid development project, even the little impediments can add up (i.e. death by 1000 papercuts).

7.2 Information Technology

- Acceptance criteria on user stories can be used for both a design resource and for testing purposes.
- ESRI Advised that on average a new connection to ArcSDE for an individual user consumes approximately 25MB of memory.
- Limitations with the JavaScript API for ArcGIS 10 prevent maps being printed from PDF. This issue has been resolved in version 10.1 which is scheduled to be release in 2012.
- ArcGIS map services published as an MSD file have greater performance however also have basic symbology.
- Real time antivirus monitoring running on the ArcGIS server could be causing map services to stop functioning correctly.

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- In agile, sometimes developers can become quite consumed with their own tasks in order to deliver it on time. Developers should not be afraid to use paired programming to resolve complex problems.
- With a complex data migration task, it is important to analyse the data migration strategy at the same time as developing the new database schema.
- Business process workflows that accompany each user story gives the developers a better understanding of how that user story fits into the bigger picture.
- Take the time up front in the project to configure the continuous integration and automated deployment process and treat this as a high priority to resolve any issues. It is instrumental in keeping the products to a high quality and streamlines the entire deployment process so that releases can be targeted on a daily basis.
- Distributed processing of imagery using normal workstations is reliable and efficient and should be explored in more detail for widespread implementation across the Fire Ant program.
- It is not practical for spatial layers in ArcMap to display a substantial amount of information that is stored across various tables. A process must be implemented that flattens the table structure to provide performance improvements and reduce the overhead of displaying data spatially.
- The use of ESRI's ArcSDE and ArcGIS server products can be limited by extending spatial data types in SQL Server 2008 R2 and beyond.
- ArcMap is now capable of linking directly to a SQL Server 2008 R2 spatial view, reducing the need and reliance on using ESRI's ArcSDE feature class tables. The Fire Ant program now has no need to host data on the corporate ArcSDE server.

7.3 Recommendations for Distribution

It is recommended that the lessons listed above be passed onto the following people/groups:

- Biosecurity Queensland Control Centre Management Team;
- Project Coordinator (Information Services), Biosecurity Queensland Control Centre;
- Account Manager (DAFF), Information and Technology Partners;
- Software A and B Managers, Information and Technology Partners;
- Initiatives, Information and Technology Partners;
- Portfolio Investment, Information and Technology Partners;
- Director, Engagement, Information and Technology Partners; and
- Biosecurity Information Management System (BIMS) Program, Biosecurity Queensland.

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8 Project closure notification

The following draft project closure notification is provided for Project Board review:

In January 2012, the Biosecurity Queensland Control Centre commenced a project to redevelop the Fire Ant Information System and its supporting systems. It was believed at the time that the information systems used were not capable of supporting the operational activities and management reporting for the National Red Imported Fire Ant Eradication Program (NRIFAEP). The decision to commence this project was to mitigate the risk of critical system failure and refresh the technology that underpins the Fire Ant program and use this as an opportunity to improve business processes and find efficiencies wherever possible.

In June 2014, the project has now been completed successfully. The project has experienced many hurdles throughout the last 2.5 years and was temporarily suspended for a total of 18 weeks while the project team was redirected to deal with other higher priority projects (i.e. remote sensing). With over 200,000 lines of code written across 5000 hours of development time, the Fire Ant Management System has successfully replaced 7 systems and migrated approximately 74 million records.

The Fire Ant Management System is now on a modern platform that is flexible to support the Fire Ant program well into the future. Some of its benefits include a 500% productivity improvement in remote sensing processes resulting in \$900,000 a year in savings and a reduction in the time and effort required to undertake a boundary release process, with the potential to save approximately 2 months of human effort each year.

The project would not have been possible without the support from all staff, especially those who were actively involved in providing feedback by regularly attending the sprint reviews every second Friday and participating in user acceptance testing prior to the major production releases. The enthusiasm and support from these staff members have been instrumental in the successful delivery of FAMS and the realisation of all of its original benefits.

The Information Services team will now be actively working on the list of enhancements to improve the overall user experience and provide the users with functionality that was requested throughout the project but could not be delivered due to project time and budget pressures.

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If approved, this notification will be distributed to:

- Fire Ant Program Staff Members;
- Portfolio Investment, Information and Technology Partners;
- Account Manager (DAFF), Information and Technology Partners;
- Qld State Manager and Account Manager, Readify Pty Ltd;
- Director, Engagement, Information and Technology Partners;
- Chief Information Officer, Information and Technology Partners; and
- Chief Biosecurity Officer, Biosecurity Queensland.

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