

Acting Manager Medical Imaging

Mobile: [REDACTED]

Sent from my iPhone

On 19 Oct 2017, at 4:39 pm, Norton, Sarah (Health) <Sarah.Norton@act.gov.au> wrote:

Dear [REDACTED]

1. Yes, 1 November is the next Project Control meeting where the Schedule must be baselined.
2. Yes. Product description, package description, whatever is going to be build and tested and delivered in each sprint please.
3. Thank you. I will also follow up with the team about status.
4. Thank you. Recruiting the right candidate is important for the success of the role.
5. Yes, this feedback is related to the IPS related to Integration. I will review the updated version tonight and provide feedback. Thank you.

Sarah

Sarah Norton | Program Manager - UCPH Digital Solutions Program
 Phone: 02 6205 0412 | Email: sarah.norton@act.gov.au
 Future Capability & Governance | Digital Solutions Division | Health Directorate | ACT Government
 Level 2, 2-6 Bowes Street, Phillip ACT 2606 | GPO Box 825, Canberra ACT 2601 | act.gov.au

From: [REDACTED] [mailto:[REDACTED]]
Sent: Thursday, 19 October 2017 2:02 PM
To: Norton, Sarah (Health) <Sarah.Norton@act.gov.au>
Cc: [REDACTED] <[REDACTED]> <[REDACTED]> <[REDACTED]> (Health)
 <[REDACTED]@act.gov.au>
Subject: Re: List of concerns [SEC=UNCLASSIFIED]

Hi Sarah

I have reviewed your concerns with [REDACTED] this afternoon. I am just going to jump on plane back to Brisbane so below is a brief response. Happy to discuss in more detail tomorrow if you wish.

1. We will provide a draft resource schedule no later than next Friday (possibly sooner) . As I believe the intent of the contract was a to have a blended project approach, of course we will need details from ACT Health as well in regards to those Customer supplied resources and sync these into the resource schedule and the project schedule. I believe [REDACTED] was asked for options in regards to shortening the build phase, and a variation to approach and Agfa resourcing (ie utilising and Agfa resource to assist in this work) was only an option put forward. We can commit to providing the base line schedule no later than Nov 1 which I believe is at the end of your next sprint cycle. Please advise if you are agreeable to this.
2. [REDACTED] will provide sample items for functional testing to [REDACTED] this week or early next. Is there a particular format you would like the final plan in? eg a project product description
3. We did receive an migration options document from HQ but it would appear to be an oversight it was not socialised with your teams. [REDACTED] will follow up. However, [REDACTED] did indicate options have been discussed with ACT technical teams. It is important to note the Agfa is still awaiting the information regarding PAP (image) migration from Siemens to complete the migration plan and we an progress asap when this is provided.
4. I will continue to provide updates directly. I don't believe this is a project specific risk however.
5. I am not sure if your feedback is in relation to the IPS prior to it being recently updated (as late as last week). [REDACTED] sent an updated version only yesterday and I suggest maybe some of your concerns are addressed in this. Can you please confirm for me please Sarah.

6.

6.

6.

Happy to give you a ring tomorrow with more detail. Let me know.

1.

1.

Kind Regards,

F +61 7 3356 6683 | M [REDACTED]

<http://www.agfahealthcare.com>
<http://blog.agfahealthcare.com>

<image001.jpg>

Click on link to read important disclaimer: <http://www.agfahealthcare.com/maildisclaimer>

From: "Norton, Sarah (Health)" <Sarah.Norton@act.gov.au>
 To: [REDACTED]
 Cc: [REDACTED] (Health)" <[REDACTED]@act.gov.au>
 Date: 18/10/2017 06:35 PM
 Subject: List of concerns [SEC=UNCLASSIFIED]

Hi gentlemen,

Thanks again for the conversation this morning.

Some of our dot points of concern relate to the depth of forward planning required to ensure project success according to the delivery milestones agreed:

[REDACTED] asked me yesterday if he could bring in an extra team member at my cost, however, we asked on the 21 of September for a resource plan or make up to show ACT Health what resources are working on the project when, and the makeup of the 'build' team. We need to understand the team/skills required for the build team. We did receive a reply of an offer to discuss but no document/information. From my point of view, changes to the current contract and purchase order are not something we are willing to seek regarding additional AGFA resources.

2. Agfa agreed to an 'iterative approach' in the Statement of Work, however, our confidence in the approach is wavering. The Agfa team are currently unable to produce a plan for [REDACTED] to forward plan testing and release activities related to their 2 week sprint cycles as part of the iterative build approach. This is impacting end user resourcing and test planning activities that are required for the build, test, release cycles. This is what [REDACTED] calls the "Packets" in the 2 week sprints. I understand that there are some constraints related to Agfa resources that need to do this work are currently training the System Admin team. However, it is severely impacting our ability to resource the build team including the MI staff required to be participants in the cycles.

3. Data Migration Plan is yet to be provide to ACT Health for approval. There is a mention in the IPS of 'options', however, the options are not present. Yesterday they estimated the initial 10 days for RIS data migration will take 25. ACT Health has significantly prepared for data migration and have a THOROUGH understanding of the data. We are very concerned in this component as the system cant go live without RIS data. And 25 days of data migration into TEST and then PROD brings an extra 2.5 months to the project timelines. This is currently outside executive expectations.

4. There is yet to be a resource employed to be onsite full time. We received an update on this today.

5. Integration: By now we should have at least drafted high level integration specs based on our current state integration specs we have provided . ACT Health have a thorough understanding of integration. Integration needs to be up and running in draft before the build, test, release cycle as we cannot test E2E without integration. We requested AGFA redo this section of the IPS as it was extremely light on.

- ACT Health provided them with all the work previous conducted, this is mentioned on page 19, However is doesn't say what they are going to do/or have done with this document and information?
- Section 6.1.8 states there are no risks for integration?
- There is no process or approach mentioned in IPS?

We are in constant discussions with [REDACTED] on a daily basis, and he is attending the daily stand-ups and sprint planning as part of the team. The team are working together extremely well, they are a high functioning team. ACT Health has provided considerable effort in this space. The feedback related to training is positive at this point.

Many thanks,
Sarah

Sarah Norton | Program Manager - UCPH Digital Solutions Program
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----- [attachment "image001.jpg" deleted by [REDACTED]

[REDACTED] AXQFZ/AGFA]

Heland, Rebecca (Health)

From: Norton, Sarah (Health)
Sent: Wednesday, 18 October 2017 5:15 PM
To: [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]
Cc: Duggan, Mark (Health); Cook, Sandra (Health); [REDACTED] [REDACTED] (Health); O'Halloran, Peter (Health)
Subject: Minutes from todays meeting [SEC=UNCLASSIFIED]
Attachments: ACTH - AGFA Discussion 18.10.17.docx

Dear [REDACTED] [REDACTED] & [REDACTED]

Please find attached notes from today's discussion.

I will co-ordinate a weekly contract management meeting. My suggested timeframe is Tuesday afternoon, giving the teams Mondays to submit information to discuss.

Thanks,

Sarah Norton

Sarah Norton | Program Manager - UCPH Digital Solutions Program
Phone: 02 6205 0412 | Email: sarah.norton@act.gov.au
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Heland, Rebecca (Health)

From: Norton, Sarah (Health)
Sent: Wednesday, 18 October 2017 7:07 AM
To: Duggan, Mark (Health); O'Halloran, Peter (Health); Cook, Sandra (Health); [REDACTED] (Health)
Cc: Devries, Melissa (Health)
Subject: RE: Urgent meeting with AGFA - Wednesday morning 9am [SEC=UNCLASSIFIED]

Hi Mark

Thank you for yesterday. Some of the issues had only arisen at 3pm yesterday afternoon, so Agfa may not have had time to investigate yet. I agree it is timely to discuss with Agfa, and to include a regular contract management meeting as [REDACTED] mentioned. [REDACTED] & I will arrange for this, and we'll get Suri to help us with the logistics related to contract management.

My list of dot points include:

- [REDACTED] asked me yesterday if he could bring in an extra team member at my cost, however, they are yet to produce their 'resource plan' (as per contract in Milestone 2) to show ACT Health what resources are working on the project when. And they didn't give us a project plan that identified what the \$400K for 'implementation costs' were attributed to, so therefore we do not agree with paying for extra resources. Agfa need to be committed to do whatever they need to do to meet the timelines they agreed to.
- Agfa agreed to an 'iterative approach' in the Statement of Work, however, they are asking for training from our staff to undertake this. They are unable to produce a plan for [REDACTED] to forward plan testing and release activities related to their 2 week sprint cycles as part of the iterative approach. This is impacting end user resourcing and test planning activities that are required for the build, test, release cycles. This is what [REDACTED] calls the "Packets" in the sausage.
- Data Migration Plan is yet to be provide to ACT Health for approval. There is a mention in the IPS of 'options', however, the options are not present. Yesterday they determined their initial 10 days for RIS data migration will take 25. ACT Health has SIGNIFICANTLY prepared for data migration and have a THOROUGH understanding of the data. We are very concerned in this component as the system CANNOT go live without RIS data. And 25 days of data migration into TEST and then PROD brings an extra 2.5 months to the project timelines
- There is yet to be a resource employed to be onsite full time
- The Application resource undertaking prototyping (this activity is an activity we see as being significantly tied to the success of the reduced timelines and end user adoption) is going to Belgium for training – this is contributing to timeline changes. There is no fat in the schedule to undertake this.
- There are proposed licence changes in the IPS with no evidence, science contributed to this for ACT Health to understand.
- Agfa keep flagging 'integration' as an issue. By now they should have written their integration specs based on our current state integration specs we have provided them. Again, ACT HEALTH have a Thorough understanding of integration, but Agfa seem to be making more excuses as to why integration is a problem for them. Again, Integration needs to be up and running before the build, test, release cycle as we cannot test E2E without integration

[REDACTED] can you please review and provide comment/updates/additions?

Sarah Norton | Program Manager - UCPH Digital Solutions Program
 Phone: 02 6205 0412 | Email: sarah.norton@act.gov.au
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From: Duggan, Mark (Health)

Sent: Tuesday, 17 October 2017 9:09 PM

To: O'Halloran, Peter (Health) <Peter.O'Halloran@act.gov.au>; Cook, Sandra (Health) <Sandra.Cook@act.gov.au>; [REDACTED] (Health) <[REDACTED]@act.gov.au>; Norton, Sarah (Health) <Sarah.Norton@act.gov.au>

Cc: Devries, Melissa (Health) <Melissa.Devries@act.gov.au>

Subject: Urgent meeting with AGFA - Wednesday morning 9am

Dear All,

During this afternoons fortnightly IDIS catch up meeting a number of matters were discussed, as flagged by me during the meeting I have a number of concerns regarding AGFA's current performance in delivering on actions and documents as agreed during the contract discussions. As a result I proposed an urgent meeting with senior AGFA executives so that ACT Health's concerns are escalated as soon as possible. Following the meeting this afternoon I spoke with [REDACTED] and have confirmed a meeting at 9am tomorrow.

To ensure we are clear as to the matters to be raised in the morning could I please have these sent to me as bullet points. I will be up in the IDIS offices on level 10 by 8:30am if you wish to discuss and plan our discussion.

I will chair the meeting and have asked my PA, Melissa Devries to attend to take notes so that I can circle back to AGFA shortly after the meeting.

I am concerned that AGFA are not delivering as agreed and that these matters have not been escalated to [REDACTED] and [REDACTED]. As I shared today AGFA accepted to and agreed to the terms of the contract, how they get there is not our responsibility it is clearly there's.

Peter, apologies for emailing you when overseas.

I look forward to escalating these matters to AGFA tomorrow and ensuring we continue to move forward with success.

Thank you,

Mark.

Mark Duggan

Ag Manager

Medical Imaging

Canberra Hospital & Health Services

mark.duggan@act.gov.au

Phone: 6174 7254

Mobile: [REDACTED]

Heland, Rebecca (Health)

From: Evans, John (Health)
Sent: Friday, 12 May 2017 10:48 AM
To: [REDACTED] (Health) [REDACTED]
Subject: [REDACTED] Data Migration Approach.pdf [SEC=UNCLASSIFIED]

Hi [REDACTED]

[REDACTED] provided a copy of "[REDACTED] Data Migration Approach.pdf". The migration AGFA describes precludes much of what we discussed at the white-board the other day. Happy to discuss.

Regards

John

John Evans | Data Analyst - UCPH Digital Solutions Program

Phone: 02 6205 4354 | Email: John.Evans@act.gov.au | [REDACTED]

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Heland, Rebecca (Health)

From: Duggan, Mark (Health)
Sent: Thursday, 22 September 2016 3:11 PM
To: Norton, Sarah (Health)
Cc: OHalloran, Peter (Health); Cook, Sandra
Subject: RE: RISPACS [SEC=UNCLASSIFIED]

Agreed.

Mark Duggan
 Ag Manager
 Medical Imaging
 Canberra Hospital & Health Services
mark.duggan@act.gov.au
 Phone: 6174 7254
 Mobile: [REDACTED]

From: Norton, Sarah (Health)
Sent: Thursday, 22 September 2016 3:10 PM
To: Duggan, Mark (Health)
Cc: OHalloran, Peter (Health); Cook, Sandra
Subject: RE: RISPACS [SEC=UNCLASSIFIED]

Hi Mark,

I look forward to the response from Siemens. Am I correct in noting the spreadsheet has 1780 data fields?

The migration strategy does need to be documented (regardless of the data dictionary) that would refer to (I believe – but would refer to a migration specialist!):

- 1) Siemens's Data Dictionary (if they provide it)
- 2) A plan to work with the new vendor to map the fields from Siemens's to the new system
- 3) A plan to review the data and cleanse as required to ensure mapping is consistent and works
- 4) A test plan including trial migrations and proven confidence in the process.
- 5) All the technical details of the databases both existing and future to ensure consistency, growth as required etc.

This is a large body of work that is of high risk to ACT Health, and I do understand the DDG's request, however, I would still encourage to plan to have a data migration body of work including specialist resources (as we do not have capability in ACT Health or SSICT).

Cheers,

Sarah

From: Duggan, Mark (Health)
Sent: Thursday, 22 September 2016 10:56 AM
To: Norton, Sarah (Health)
Cc: OHalloran, Peter (Health); Cook, Sandra
Subject: RISPACS [SEC=UNCLASSIFIED]
Importance: High

Dear Sarah,

Following on from yesterdays discussion re data please find results of the work Chris and the team have undertaken.

Chris ran a query on the PACS from a simple freeware dB tool Siemens have on it and got that 'version' of a Data Dictionary (attached). It can provide the Tables and Descriptions, but nowhere as complete as the Data Dictionary provided by the Siemens US SLR team for the RIS.

Chris will now request a complete Data Dictionary for the PACS from Siemens.

If you are ok I will share this with Jay and the team.

RIS

Version: syngo Workflow SLR VB20A
Database: Microsoft SQL 2008 R2 Enterprise
dB Size: 600GB (replicated)
Storage H/W: HP 3-PAR
No. Patients: 1,500,000
No. Procs: 3,050,000
No. Reports: 3,000,000

PACS

Version: syngo Imaging VB36D
Database: Oracle 11g Enterprise Edition Ver 11.2.0.3.0
Schema size: 183GB (replicated)
No Studies: 1,900,000
Tot. Data Size: 132TB (images)
Archive (LTS): Shared Service ICT - EMC Centera (Open archive system for ACT WOG).

Cheers,

Mark.

Mark Duggan
Ag Manager
Medical Imaging
Canberra Hospital & Health Services
mark.duggan@act.gov.au
Phone: 6174 7254
Mobile: [REDACTED]



CORRESPONDENCE COVER SHEET

Correspondent:

Record Number: COR17/16316 DGC17/1844 **Date Due:** 25 Sept

Topic: Specialist Consultancy to develop a project plan for phase 2 of the Integrated Diagnostic Imaging Solution Project for vendor neutral archive (VNA) implementation

Action Required:	Draft Response	No	Info Only	No	Brief to Minister	No
	Reply Directly	No	Action as Necessary	No	Comments to D-G	No
	Brief to D-G	No	For Discussion	No	Coordinate Response	No
	Action by Group	No	Advice	No	Full Speech	No
	Ministerial Response	No				

Assignee: Kirkpatrick, Philippa since 13/09/2017 at 10:36 AM

Comments for Cover Sheet:

15.9.17: Forwarded to Trevor Vivion for clearance.

18.9.17: Forwarded to DDG Corporate for clearance. Hard copy walked down and placed in the in-tray

19.9.17 - Corporate BM for review

21.9.17. To DGS office for signature

22/9/17 - A/BM to DG

26/9/17 - Corporate.



CORRESPONDENCE CLEARANCE

SUBJECT: Specialist Consultancy to develop a project plan for phase 2 of the Integrated Diagnostic Imaging Solution Project for vendor neutral archive (VNA) implementation

NUMBER: COR17/16316

DATE DUE:

Director-General - ACT Health: Date:

Deputy Director-General - Corporate: Date: 20.9.

Deputy Director-General - Canberra Hospital & Health Services: Date:

Deputy Director-General - Innovation: Date:

Deputy Director-General - Quality, Governance and Risk: Date:

Deputy Director-General - Population Health Protection & Prevention: Date:

Contextually Correct <input checked="" type="checkbox"/>	Grammatically Correct <input checked="" type="checkbox"/>	Spell Checked <input checked="" type="checkbox"/>
Executive Director - Area name <u>DIGITAL SOLUTIONS</u>	<u>[Signature]</u>	Date: <u>14 Sep 2017</u>

Chief Financial Officer
Senior Manager - Area name Strategic Finance [Signature] Date: 15/09/2017

Senior Manager, Ministerial and Government: Date:

Senior Manager - Media and Strategic Communications: Date:

Executive - Area name Date:

Manager - Area name Date:

Professional Leads: Date:

Other: Date:

DIGITAL SOLUTIONS DIVISION

Chief Information Officer
Clearance Form



TRIM Reference No. (if applicable)
COR17/16316

Subject/Title IDIS Phase 2

Action requested FOR CLEARANCE FOR SIGNATURE
 FOR ACTION FOR INFORMATION

Action officer Sarah Norton

Date submitted 13 September 2017 **Due date:** 25 September 2017

Reason for urgency
(if applicable)

Background Information (if required)

Senior Manager clearance APPROVED **Name:** **Signature:** **Date:**

By approving this document you are approving that the document is complete, that you support the recommendations and that it is contextually correct, grammatically correct and spell checked

Finance Manager clearance APPROVED **Name:** Sharon Lee **Signature:** [Signature] **Date:** 14/9/17
(if financial implications)

Executive Officer clearance APPROVED **Name:** Philippa Kirkpatrick **Signature:** [Signature] **Date:** 13 Sept 2017

CIO clearance APPROVED APPROVED WITH CHANGES PLEASE DISCUSS RESUBMIT
Peter O'Halloran **Signature:** [Signature] **Date:** 14 Sep 2017

Comments As per recd - flags at top of pages.

CFO clearance APPROVED PLEASE DISCUSS RESUBMIT
(if financial implications) APPROVED WITH CHANGES
(if an invoice, complete the table) Trevor Vivian **Signature:** [Signature] **Date:** 15/9/2017

Date resubmitted **Comments:**


When the Executive Officer has cleared this request please allow up to 5 business days for CIO comments.



RECEIVED
by
22 SEP 2017
Office of the Director-General
ACT Health

DIRECTOR-GENERAL MINUTE

TRIM Reference No. COR17/16316

SUBJECT:	Specialist Consultancy to develop a project plan for phase 2 of the Integrated Diagnostic Imaging Solution Project for vendor neutral archive (VNA) implementation
From:	Shaun Strachan, Deputy Director-General, Corporate 
Through:	Peter O'Halloran, Chief Information Officer Trevor Vivian, Chief Finance Officer
Critical Date:	25 September 2017
Reason:	To ensure the project progresses according to the schedule.

Recommendations

That you:

Approve the appointment of Oakton Pty Ltd to provide project plan for phase 2 of the Integrated Diagnostic Imaging Solution Project (for VNA implementation) at a total cost of \$150,000 (GST exclusive).	<input checked="" type="radio"/> AGREED <input type="radio"/> NOT AGREED <input type="radio"/> PLEASE DISCUSS
Agree to Sign the Schedule 5 - Work Order Form, provided at <u>Attachment A</u> .	<input checked="" type="radio"/> AGREED <input type="radio"/> NOT AGREED <input type="radio"/> PLEASE DISCUSS
Agree to Sign the Register of Purchasing Decision Form and Non Stock Request Forms provided at <u>Attachment B1 & B2</u> .	<input checked="" type="radio"/> AGREED <input type="radio"/> NOT AGREED <input type="radio"/> PLEASE DISCUSS

David Nicol
A/g Director-General
ACT Health

22 September 2017



DIRECTOR-GENERAL MINUTE

Purpose

To seek your approval to engage Oakton via the ACT Government SS-ICT Consult IT Panel to support specialist planning activities for Phase 2 of the Integrated Diagnostic Imaging Solution Project for VNA implementation.

Background

Currently, clinicians require access to a multitude of solutions to view results and images for patients that have attended multiple services (for example: Cardiology, Dental, Breast Screening, and Fetal Medicine Unit) undertaking digital imaging.

ACT Health has procured a new integrated Radiology Information System- Picture Archival System (RIS-PACS), signing an implementation, support & maintenance contract in July 2017 for an Integrated Diagnostic Imaging Solution (IDIS) from [REDACTED] Australia. This new solution allows ACT Health to leverage the use of the technology across the Enterprise to support multiple other business units who currently manage digital imaging in disparate systems.

Phase 1 of the IDIS Project is in the planning stage, and will see the new solution implemented to ACT Health across the Medical Imaging services for the public hospitals (Canberra Hospital, Calvary Public Hospital and UCPH) by the end of Quarter 1 2018. Phase 2 is not yet planned in detail.

Issues

Specialist expertise is required to plan for Phase 2 of the IDIS project. This will allow Phase 1 of the project to continue on current trajectory without distraction and delay, and make way for rapid delivery of Phase 2 when resourcing and technical dependencies allow. There are up to an estimated 10 business areas within ACT Health capturing diagnostic digital imaging on disparate siloed purpose built standalone solutions, often exposing ACT Health to risks of increased costs and missed clinical information. All of these business areas need to have detailed business and technical analysis undertaken and documented, as well as planning for data migration and change management associated with Phase 2 delivery.

In June 2017, a Request for Quotation - Schedule 4 was provided to five potential vendors. The requirements outlined in the Request for Quotation included:

- A detailed analysis of business processes for all imaging capture business areas and an assessment of the possibility to use the new IDIS to meet those processes;
- The strategic transformation of the PACS into a Vendor Neutral Archive (VNA) to facilitate the storage, sharing and security of imaging health care data across ACT Health including various technical requirements such as:
 - Integration with the existing Patient Master Index (PMI) and the Clinical Patient Folder,
 - Standards versioning and technical compatibility including the ability to store non-DICOM objects and interact using set Integrating Healthcare Enterprise (IHE) profiles,
 - Direct interface with the digital imaging modalities,
 - Addressing long term data archiving and storage requirements.
- Detailed Execution roadmap to implement Phase 2;



DIRECTOR-GENERAL MINUTE

- Project plan for *implementation phase 2* including providing advice around priority and sequencing of systems for implementation into the new solution.

Responses are analysed in the table below.

Potential Vendor	Response
Cogent Business Solutions P/L	Advised they did not have the personnel available to fulfil the request
Ajilon Australia	Responded with three CVs for Project Managers and did not outline how they would approach the deliverables, nor where technical expertise submitted.
SMS Management and Technology	Did not respond
IMA Management and Technology	Did not respond
Oakton	Submitted a detailed proposal (<u>Attachment C</u>) outlining how they would undertake the deliverables with a Time and Material (T&M) pricing model with a multitude of technical and project management expertise up to a fixed total value of \$150,000 (ex. GST) utilising a rate card (estimated 88 working days of combined effort).

Only the proposal from Oakton was considered to meet the requirements, and was therefore assessed for value for money. The assessment was that the Oakton proposal included a breadth of expertise and ACT Health is able to utilise specified resources as required to achieve the deliverables, which is deemed to provide the highest opportunity of benefit for ACT Health. The rates quoted were assessed against quotes from both Oakton and other vendors received in relation to different but similar projects and were considered to be appropriate for this project. Therefore it is recommended that Oakton is engaged to provide the required services.

Benefits/Sensitivities

Benefits of the IDIS Phase 2 include a reduction in storage, support and maintenance costs, single vendor to manage, single point of access for all Imaging for clinicians at ACT Health.

Undertaking the IDIS Phase 2 planning now, allows for the rapid alignment of the Phase 1 and Phase 2 work packages to be completed in parallel if possible, reducing timeframes for the overall scope agreed against the project.

Purchasing via the Consult IT Panel allows ACT Health to achieve considerable cost savings due to the combined purchase power of the Territory. It offers value for money including competitive rates and a quality range of services.

All artefacts and strategies delivered through this consultancy will be explicitly aligned with ACT Health's current and future digital, ICT and corporate strategies, and guided by established ACT Health UCPH Digital Solutions Program, Digital Solutions Division Enterprise Architecture Office and governance principles.



DIRECTOR-GENERAL MINUTE

Financial

The Schedule 5 Work Order is for \$150,000 (GST exclusive) which is budgeted from the IDIS Project Budget (\$12M).

2017/2018 Digital Solutions Division /66808 UCPH Digital Solutions Program Budget (\$28M)

Where money is coming from i.e. cost centre, project etc	Cost Centre 66806 Project Code 21437	IDIS Project (\$12M)
Whole of Life Project		
Total Project Expenditure	Total	\$1,136,962
Revised Project Value	Budget	\$12,000,000
Balance Remaining of Total Project		\$10,863,038
2017-18 Details		
Total 2017-18 Budget		\$7,968,942
YTD Expenditure Aug 17 YTD		\$277,230
Committed Funds (vendor costs)		\$4,553,202
Budget Remaining		\$3,415,740
Invoice		
Invoiced Amount		N.a.

Signed off by:	Peter O'Halloran	Phone:	51100
Title:	Chief Information Officer		
Branch/Division	Digital Solutions Division		
Date:	13 September 2017		

Action Officer:	Sarah Norton	Phone:	50412
Unit:	UCPH Digital Solutions Program		



ACT
Government

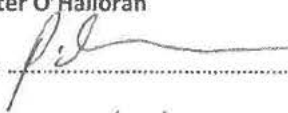
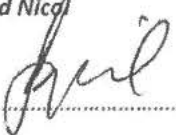
Chief Minister, Treasury and
Economic Development

Consult IT Panel

SCHEDULE 5 - Work Order

WORK ORDER FOR SME SPECIALIST CONSULTANCY IDIS PHASE 2								
NOTE: This Work Order is issued by the Territory in accordance with the terms and conditions of the ICT Consulting and related Business Services Agreement Ref C2010.15098.234 which the Territory and the Contractor entered into on 24- Nov -2009 and any additional terms and conditions specified in this Work Order.								
1	Date:	12/09/2017						
2	ID of Work Order:	SN12092017						
3	Contractor Name:	Oakton						
4	Specified Personnel Name:	Multiple						
5	Specified Services: (Scope of Work, designated role and specific tasks to be performed)	Specialist Consultancy under 'ICT Strategic Planning', 'Business Analysis, Process Re-Engineering & Organisational Change' and 'Program and Project Management' to develop a project plan for phase 2 of the Integrated Diagnostic Imaging Solution Project (for VNA implementation).						
6	Services: (details of the relevant Services to be delivered)	ACT Health requires specialist Subject Matter Expertise (SME) to assist with a strategic initiative surrounding varying Digital Imaging requirements including capabilities, approaches, processes, and technologies for the ongoing management of digital imaging and digital imaging data. The ACT Health Directorate has procured a new integrated RISPACS solution. ACT Health is seeking the provision of project management and technical SME to plan for phase 2 of the IDIS project as per deliverables outlined below.						
7	Limitation of Contractor's Liability for this Work Order: (if applicable)	N/A						
8	Additional Terms and Conditions applicable to this Work Order:	Contract duration - 12 weeks from the date of engagement						
9	Applicable Third Party Warranties:	N/A						
10	Warranty Period:	N/A						
11	Remote Vendor Access Policy: (if applicable)	N/A						
12	Delivery Location:	ACT Health Sites including Bowes Street, The Canberra Hospital, Health Centres and Calvary Public Hospital Bruce						
13	Total Cost:	\$165,000 inclusive of GST/ \$150,000 ex GST						
14	Breakdown costs associated with total cost:	<table border="1"> <thead> <tr> <th>Roles</th> <th>Daily Rate (ex GST)</th> </tr> </thead> <tbody> <tr> <td>Engagement Lead – Quality Auditing – [REDACTED]</td> <td>[REDACTED]</td> </tr> <tr> <td>[REDACTED]</td> <td>[REDACTED]</td> </tr> </tbody> </table>	Roles	Daily Rate (ex GST)	Engagement Lead – Quality Auditing – [REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Roles	Daily Rate (ex GST)							
Engagement Lead – Quality Auditing – [REDACTED]	[REDACTED]							
[REDACTED]	[REDACTED]							

		Architecture Lead – ██████████ ██████ Health Domain Lead – ██████████ ██████ Data Architect – ██████████ ██████ Senior Data Scientist – ██████████ ██████ Senior Database Developer – ██████████ ██████ ██████ Data Migration & Cleansing SME – ██████████ ██████ ██████ Accommodation (ex GST)\$n/a Meals Included (ex GST)\$n/a Travel Expenses (ex GST)\$n/a
15	Additional Service Levels: (if applicable)	N/A
16	Other Requirements: (if applicable) <p>SME – A regional SME is defined as a small to medium enterprise with up to 200 FTE employees based within the South East Region of Councils (SEROC)</p> <p>The ACT Government Regional SME Policy as follows: To support regional SME's the Territory will weight regional SME's or respondents who subcontract to regional SME's through an evaluation criterion. A regional SME is defined as a small to medium enterprise with up to 200 Full Time Employees (FTE) based within the SEROC.</p> <p>The RFQ asked respondents to confirm whether they are a regional SME or, alternatively, if not a regional SME, whether or not the respondent intends to subcontract a component of the contract to a regional SME in the event they are selected as the preferred supplier.</p> <p>It is anticipated that no subcontracting will be necessary to meet the requirements of the RFQ.</p> <p>When the responses to the RFQ were evaluated, the following applied: A 5% weighting if the respondent is a regional SME.</p>	N/A
17	Work Order Term:	12 weeks from date of engagement.
18	Deliverables by Specified Personnel:	A detailed analysis of business processes for all imaging capture and an assessment of the possibility to use the new IDIS Solution to meet those processes The strategic transformation of the PACS into a VNA to facilitate the storage, sharing and security of imaging health

		<p>care data across the enterprise including various technical requirements such as:</p> <ul style="list-style-type: none"> ○ Integration with the existing PMI and the clinical records ○ Standards versioning and technical compatibility including the ability to store non-DICOM objects and interact using set IHE profiles ○ Direct interface with the modalities. ○ Addressing long term data archiving and storage requirements <p>Detailed Execution roadmap to implement Phase 2 Project plan for implementation phase 2 including providing advice around priority and sequencing of systems for implementation into the new solution</p>
19	Directorate Contact:	<p>Sarah Norton Sarah.norton@act.gov.au 02 6205 0412</p>
20	Approvals for Insurance (and communications) costs: <i>(as applicable)</i>	Not Used
	<p>Approved by Contractor:</p> <p>Name:</p> <p>Signature:</p> <p>Date:</p>	<p>Approved by Chief Information Officer:</p> <p>Name: Peter O'Halloran</p> <p>Signature: </p> <p>Date: 14 September 2017</p>
	<p>Approved by SS ICT – Contracts and Licensing Manager:</p> <p>Name:</p> <p>Signature:</p> <p>Date:</p>	<p>Approved by Director General, ACT Health</p> <p>Name: A/g David Nicol</p> <p>Signature: </p> <p>Date: 22/9/17</p>

Contractor **must not** commence the provision of these Services until both the Financial Delegate **AND** SS ICT- Contracts and Licensing Manager has signed a copy of this Schedule 5, and has been provided to the Contractor



REGISTER OF PURCHASING DECISION (ROPD)

NonStock Requisition (REF No.):

1. General description of what is to be purchased: Specialist ICT Technical and Project Management SME via ACT Gov Consult IT Panel for IDIS Phase 2	
2. Purchases under \$25K only require one written quotation, once obtained please proceed to <u>box 3</u>. If over \$25K (3) written quotes must be obtained. If three quotes were obtained please proceed to <u>box 3</u>. If not please identify justification for not obtaining required number of quotes below {please tick or check appropriate box}	
NOTE: Chief Executive Authorisation is required for orders over \$25K where less than three (3) quotes have been sourced	
i. <input type="checkbox"/>	The required supplies are only available from the one supplier in Australia or only one supplier has the necessary technical expertise to supply and provide satisfactory back-up, spare parts, maintenance, support or warranty.
ii. <input type="checkbox"/>	For reasons of overall economy the requirement must be compatible with existing equipment or the area has standardised on a particular item after inviting tenders/quotations for the original equipment.
Other: Procurement via the Consult IT Panel – As outlined in the <i>Consult IT Panel User Guide</i> , the companies approved to be on this panel have gained membership via a formal Request for Tender evaluation process, in accordance with ACT Government Procurement Legislation and process, including financial viability, and have individual contracts to the Territory to provide the nominated services. The Panel Arrangement does not specify the minimum or maximum number of Panel members that must be approached. If only one Panel member is approached, this is <i>not</i> considered to be a single or select procurement.	
3. Outline quotes obtained and justification for purchasing decision:	
Supplier: <u>Oakton Services Pty Ltd</u> Quote: <u>\$165,000 (GST inclusive) \$150,000 (excl. GST)</u>	
Supplier: <u>Ajilon Australia</u> Quote: <u>unclear</u>	
Supplier: <u>Cogent Business Solutions</u> Quote: <u>did not respond</u>	
Supplier: <u>IMA M&T</u> Quote: <u>did not respond</u>	
Supplier: <u>SMS M&T</u> Quote: <u>did not respond</u>	
Contract awarded to Supplier: <u>Oakton Services Pty Ltd</u>	
Comments in support of purchasing decision: <u>Oakton Pty Ltd was the preferred Shortlisted respondent due to its value for money outcome, detailed proposal in the response and previous ACT Health experience.</u>	
4. Source of Funding:	
1. Recurrent Expense <input type="checkbox"/>	2. P&E Program <input type="checkbox"/>
Budget	3. Donation <input type="checkbox"/>
	4. Special Purpose <input type="checkbox"/>
	Funding
Other: <u>UCPH Digital Solutions Program CC66806 (Capital)</u>	
5. Endorsements: Purchase Requests must be endorsed by relevant delegates (as appropriate). Refer to ACT Health Procurement Guideline for specific guidance on endorsements required:	
Biomedical Engineering: _____	Injury Prevention Management: _____
Information Management (IT): <u>Peter O'Halloran CIO</u>	Sterilising Services: _____
Property Management & Maintenance: _____	Infection Control: _____
Product Manager: _____	Other: _____

NOTE: Source Funding and Endorsements MUST be completed, otherwise the Purchase Request may not be processed.

6. Purchasing Approval:

Requesting Officer: Peter O'Halloran, CIO Signature:  Date: 14/11/2017

Authorising Officer: David Nicol A/g D-G Signature:  Date: 22/11/17



REGISTER OF PURCHASING DECISION (ROPD)

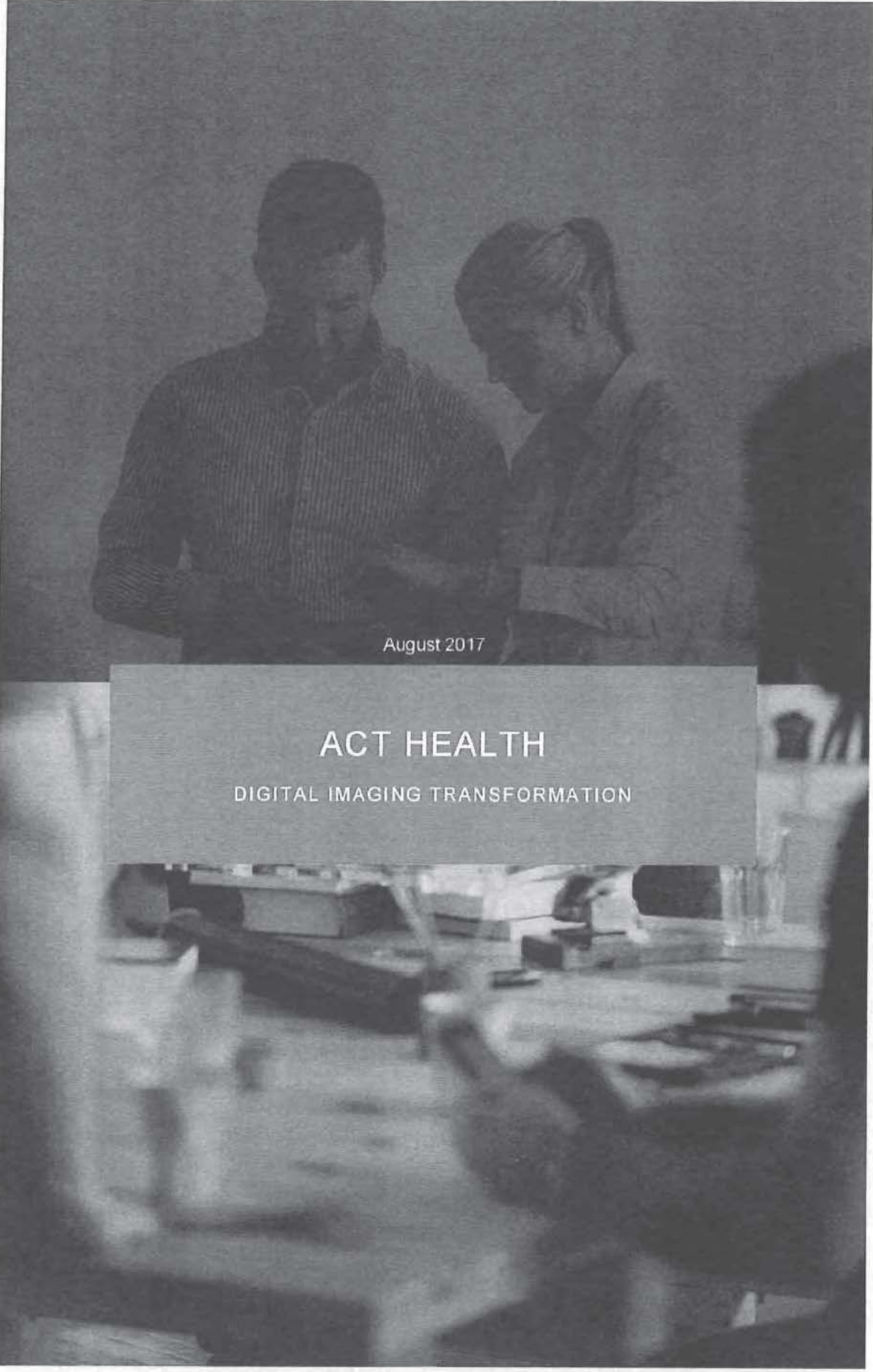
NonStock Requisition (REF No.):

NOTE: Chief Executive Authorisation is required for orders over \$25K where less than three (3) quotes have been sourced

ACT Health Supply Services USE ONLY

Purchasing Officer: _____ Signature: _____ Date: ____ / ____ / ____

NOTE: This document is to be attached to the supplier quotations and a non-stock requisition before being sent to the Authorising Officer and ACT Health Supply Services



August 2017

ACT HEALTH

DIGITAL IMAGING TRANSFORMATION

oakton

A DIMENSION DATA COMPANY

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1. EXECUTIVE SUMMARY

1.1. Introduction

Oakton Services Pty Ltd (Oakton) is delighted to provide this proposal to assist the ACT Health Directorate (ACT Health, the Directorate) mature its Digital Imaging capability through:

- undertaking a comprehensive review of its current digital imaging landscape;
- developing a pragmatic medium- and long-term Digital Imaging Strategy;
- developing an implementation roadmap for digital imaging transformation;
- *developing a high level digital imaging architecture to support transformation;*
- *developing a comprehensive plan for the implementation of IDIS phase 2 and the transformation of the newly procured Agfa RIS-PACS solution to an enterprise-wide imaging source of truth utilising a vendor-neutral archiving (VNA) approach; and*
- providing management, SME, and advisory assistance throughout the implementation of IDIS Phase 2.

Oakton has significant capability and subject matter expertise in health informatics, enterprise imaging management, imaging standards, imaging and patient master data management and indexing, enterprise data management and warehousing, imaging data migration, and enterprise imaging interrogation and data science.

This expertise, combined with our deep knowledge of the ACT Health data and imaging landscape and close rapport with key Health stakeholders, facilitates the rapid development of strategies, roadmaps, and *implementation plans*. It *also enables us to deliver* comprehensive management and advisory services best suited to the Directorate's needs.

In preparing this proposal, we have carefully considered our knowledge of the Directorate's current imaging landscape, information management (IM) requirements, business-driven imaging needs, and existing infrastructure. Consequently, Oakton proposes to support ACT Health in transforming its digital imaging landscape through a combination of a focused initial consultancy and ongoing resourcing support.

The initial consultancy will extend and enhance the work done to date delivering a Digital Imaging Strategy, focusing on the incorporation of the ACT Health Services Framework and the rapid creation of a transformation program roadmap. This roadmap will detail the projects and resources necessary to deliver transformation of the ACT digital imaging landscape, *their dependencies*, business rationale, and underlying assumptions.

It will also focus on providing a strategy and set of actionable project activities and recommendations to support the transition from IDIS project Phase 1 – where the Agfa solution is implemented as an MVP RIS-PACS solution supporting several Territory hospitals – to Phase 2. Phase 2 will see the integration of the significant majority of imaging systems with the Agfa solution, including those which currently operate independently of the existing Siemens RIS-PACS. *This transition*, and the extension of the solution and its supporting data providers to ensure compliance with best practice architectural approaches, will ensure the delivery of an effective VNA imaging management solution.

All artefacts and strategies delivered through this consultancy will be explicitly aligned with ACT Health's current ICT and corporate strategies, and guided by established ACT Health program, architectural, and governance principles.

Alongside this consultancy, Oakton will provide ongoing resourcing as a component of the existing blended ACT Health-Oakton IDIS team, to ensure the successful delivery of IDIS Phase 2, imaging business process reform, and other digital imaging transformation activities. Resources provided will include health informatics SMEs, health project and program management personnel, health digital and data science experts, solution implementers, and data management professionals.

We have proposed our most experienced Analytics and Information Services (AIS) team, led by Mr Julien Lefebvre, Oakton's ACT AIS Principal, to deliver this key strategic engagement. The team has a significant and established reputation in the Information Technology (IT) industry including business intelligence, analytics, data and information modelling, and is well known to the Directorate.

Importantly, our team understands the significance of this work as it will shape and focus the management of patient data and imaging process across the Directorate. It will facilitate the delivery of automated clinical decision support, quality assurance and image processing, and business intelligence reporting.

We believe that this proposal represents outstanding value for money and we strongly believe the combination of our practical and informed expertise, our extensive corporate and individual talents, and relevant knowledge and detailed understanding of ACT Health's ICT landscape uniquely positions Oakton to successfully deliver this engagement.

1.2. Our Capability

Oakton is an Australian consulting and technology firm, working with global leaders in business and government. With a team of 1,300 professionals and offices in Brisbane, Sydney, Melbourne, Adelaide, Perth and Hyderabad, Oakton has been delivering consulting and technology services for over 25 years.

Oakton is one of the leading firms delivering services to the Federal and ACT Governments in Canberra, with an office of more than 150 local staff. This strong local presence has been recently bolstered financially and in terms of capability by the acquisition of Oakton by Dimension Data, a global ICT organisation owned by NTT - the world's largest digital organisation.

Oakton's Analytics and Information Services practice specialises in the delivery of complex health informatics, health data management, ICT landscape transformations, and health data science. Our strategists, architects, and database developers have delivered sophisticated data management solutions over more than one hundred and fifty engagements.

We have a demonstrated track record in providing innovative information management services, large digital project implementations, analytics and business intelligence, service integration, managed services and internal audit services across federal and state governments, and health, education, banking, property, utilities, mining and finance industries.

Our data specialists locally, are currently involved delivering capability to the Directorate, Civil Aviation Safety Authority, Grains Research and Development Corporation, Australian Pesticides and Veterinary Medicines Authority, Australian Securities and Investments Commission, Australian Sports Commission, and the Department of Foreign Affairs and Trade.

2. OUR UNDERSTANDING OF THE REQUIREMENTS

Oakton understands that the Directorate's current digital imaging landscape services external and internal IT requirements through a large number of disparate applications and systems. Resultantly, we note that the organisation has been hampered in efficiently delivering the full range of digital imaging services and in maturing its patient data management, process automation, and data analysis capabilities. Until very recently, due to long-term unstructured development of hospital and patient care services, these systems appear to have grown organically, with the majority of data holdings captured through disintegrated processing systems.

As a result, data from these systems is unfortunately held in silos that have evolved over time in a fragmented and unsystematic way. This has led to duplication in work and data, and most importantly, there is currently no single operational system, system of record or technology with a complete view of patient data. Moreover, the same data also appears to be available in multiple systems but with different values leading to significant data accuracy issues.

To make matters worse, there also appears to be limited understanding or application of terms and field names used between systems. This makes understanding how users see and think about the data very difficult. It also blurs the communication between systems, and makes understanding of data and systemic structures between business units problematic. Further, given the limited validation on interfaces and the lack of standardised business processes surrounding data capture and entry, the quality of data obtained from source systems is generally poor.

Additionally, we understand the lack of integrated systems and business processes had led to redundant replication in quality assurance and image assessment activities. Different staff undertake quality management processes differently across the organisation and no holistic picture of image quality, fragmentation, error rate, or overall data quality is achievable.

Developing a sustainable, efficient, insightful, and innovative imaging management capability within ACT Health will require significant change. This change will encompass all areas of the Directorate – from business model to technology, process to resourcing, and data management to governance. As a result, any strategy aimed at resolving these issues needs to encompass an enterprise-wide program of transformation. Oakton's Analytics and Information Services team has significant recent experience within Federal and Territory Government delivering whole-of-organisation transformation, driven by a critical need to improve data quality and management. This will assist in accelerating delivery of the strategy and transformation plan, and ensuring delivery of enterprise imaging architecture aligned with government standards and approaches.

In turn, this will deliver a sustainable, fit for purpose imaging management ecology, which facilitates data centricity, enables a single view of patient imaging, and accelerates the Directorate's journey toward data drivenness. A data-centric organisation is characterised by having a strong understanding of its data and information, management of this information through unified single-source-of-truth systems, and analytic insights (modern, standardised, flexible and integrated data science and BI & A capability). Data driven organisations use this insight to inform and guide the direction of the organisation.

Oakton understands a key recommendation of a number of reports commissioned by the Directorate has been the development of a single view of patient data. The transformation of the digital imaging landscape is the first step on the road to this capability. With the unification of the imaging ecosystem, the development of a single view becomes a true possibility, as disparate patient data management systems can leverage the uniform information delivered through the newly matured imaging API economy. Further, data science and analytical platforms can take advantage of the data and create diagnostic, predictive, and prescriptive models to improve public health and patient care outcomes in the longer term.

In order to deliver the strategy and roadmap, Oakton appreciates the Directorate will require resource augmentation and outcome-driven project delivery. This will include Portfolio, Program and Project management (P3M) support, technical SME, implementation and development resourcing, testing and data migration capability, and business process and change management.

We understand that the Directorate has taken the first steps toward transformation through the procurement of the Agfa RIS-PACS solution and the retention of Oakton to deliver the primary phases of a Digital Imaging Strategy. As such this proposal represents a recommendation for the continuation, extension, coordination, and support of this activity.

[Redacted]

[Redacted]

[Redacted]

Stakeholder(s)	Communication Intent
[Redacted]	[Redacted]
[Redacted]	[Redacted]
[Redacted]	[Redacted]
[Redacted]	[Redacted]
[Redacted]	[Redacted]
[Redacted]	[Redacted]
[Redacted]	[Redacted]

[Redacted]

enhancement.



[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

• [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

6. SERVICE CHARGES

We believe this proposal demonstrates value by providing the necessary experience, expertise and technical proficiency across all the requirements discussed with the Directorate.

We are pleased to offer a Time and Material (T&M) pricing model for this proposal to a total value of [REDACTED] (ex. GST) utilising the following rate card (estimated 88 working days of combined effort), in order to ensure ACT Health is able to utilise specified resources as required.

Oakton will invoice the Directorate monthly, based on work performed.

6.1. Rate Card

Roles	Daily Rate (ex GST)
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]

Table 1 – Rate Card

6.2. Assumptions

- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]

- [REDACTED]
- [REDACTED]

CONTACT

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Heland, Rebecca (Health)

From: Evans, John (Health)
Sent: Thursday, 25 May 2017 9:42 AM
To: [REDACTED] (Health) [REDACTED]
Subject: Data Migration document [SEC=UNCLASSIFIED]
Attachments: Data Migration.docx

Hi [REDACTED]

I have written a Data Migration document which I believe provides the information you requested during our discussion yesterday. Please advise if I have missed anything.

The document is stored at Q:\COMMON\Projects\IM&IT\UCPH Digital Solutions Program\Integrated Diagnostic Imaging Solution\Data Migration\Data Issues (copy attached).

Regards

{ John

John Evans | Data Analyst - UCPH Digital Solutions Program

Phone: 02 6205 4354 | Email: John.Evans@act.gov.au | [REDACTED]

Future Capability & Governance | Digital Solutions Division | Health Directorate | ACT Government
Level 2, 2-6 Bowes St Woden ACT | PO Box 11, Woden ACT 2606 | act.gov.au

Data Integrity Methods

Relational databases are, as the name suggests, built on a set of tables between which exist relationships (e.g. parent/child). The relationships are usually incorporated into the data schema embedded in the server to enforce rudimentary data integrity. From the (admittedly limited due to the lack of access under SQL) analysis of RIS there appears to be no such information embedded in the server and so it must be assumed that all data integrity is enforced solely in the application code/processes. Whilst embedding a significant part of the data integrity in the data schema in the server is not mandatory (some data integrity rules simply cannot be embedded in the data schema and so must be done in code/processes) for modern databases it is the norm. Failure to adhere to such norms facilitates errors from both failures in code/processes and human error on the part of those with the authority to write directly to the tables.

Inspection of the data to-date (currently focussed on the “patient” part of the application) indicates significant failures in data integrity.

Entity Relationship Diagrams (ERD)

Most database applications are focussed on one purpose. In the case of RIS the focus is on the managing of imaging. Tables related to patients, procedures, locations, staff, equipment, and images/reports are all logically linked under some form of relationship and there is not normally any tables that are not linked to all of the others via some path or other.

Given the apparent lack of information about data relationships embedded in the server, the only ERD information apparently available is that in Siemens document “swf_VB20A_Entity_Relationship_Diagrams.pdf”. Initial analysis of parts 3 and 4 of this document (the ERDs) reveal:

- A large number of tables/views that appear to be unconnected to others. Logical analysis reveals that there should be relationships and that the ERDs don’t show said relationships demonstrates that the ERDs are deficient;
- Inspection of a limited number of apparently unrelated tables reveals instances such as `dbo_visit_doctor` (appears only in table 3.1) that should logically be related to a visit by a patient is not linked to anything.

Other issues include that:

- Some relationships depicted in the ERDs are inconsistent with the norms of normalisation.

Data Dictionary

The data dictionary at document “swf_VB20A_Data_Dictionary.xls” provides useful information about a number of aspects of the database including:

- Textual descriptions of the purpose of tables; and

- Data structures and facilitates locating matching field names for identifying potential relationships.

Summary of existing documentation

Whilst the available documentation is significantly better than none, it does not provide nearly sufficient content or detail to be considered to be acceptable.

Data Integrity issues

Taking a rudimentary instance `dbo_pat_name` and `dbo_patient` (under query "patient and pat_name") reveals 134 records in `dbo_patient` for which there is no parent record in `dbo_pat_name` (115 unique patients).

Other instances exist in the limited number of relationships checked to-date. From this it appears that the data-integrity of RIS is quite poor.

Data Cleansing

Intent

Faulty data can be the cause of failures of applications; consequently resolution of that faulty data is necessary when migrating data to a new environment. Cleansing faulty data is the process of either excluding or correcting data. Where correction is not possible/plausible then exclusion is frequently the only viable option. Within the ACT Health environment, it may be that there are a number of administrative systems that operate in parallel (on different aspects of the patient experience) from which correct data might be copied where the data provides a similar function (e.g. patient identification and/or demographic data). Where neither correction nor exclusion are options then retention of flawed data is unavoidable and suitable management processes must be implemented.

Business can also use migration as an opportunity to exclude data that no longer provides value (e.g. due to ageing, changing needs, etc.). This removal of data can be included in the cleansing process. Having said that, any removal of data can exacerbate data-integrity issues therefore it must be done with due care so as to avoid introducing additional data-integrity issues.

Decision process

All decisions related to the exclusion of data are business decisions; however the decisions are frequently based on the analysis of that data. That analysis might include:

- Summarising relevant data to determine the range of the data (e.g. date range, geographic range, etc.);
- Verifying data relationships such as parent/child to identify orphan records;
- Verifying data plausibility against expected norms (e.g. age of people).

Decisions rules regarding data retention and/or correction will be documented by the decision-makers. Those rules might be a simple exclusion of all records where a particular field falls outside of

a specified range or they might apply to individual records. Regardless of the rule it must explicitly identify relevant records and explicitly state the course of action.

Where records are to be excluded from the data set to be migrated to the new application but retained in some other form then the decision process must specify that retention process. Alternative environments will require sufficient documentation to facilitate subsequent retrieval and understanding. De-normalisation of the data might be justified to simplify the storage and documentation of this data.

Where records are to be excluded from the data set and not retained it might still be necessary to document the decision and possibly some record-counts or other metadata for retention.

Methodology

Given the lack of enforcement of data-integrity issues in the server schema the data must be thoroughly tested for integrity. Given the lack of reliable entity information in RIS some reverse-engineering will be necessary to identify the data relationships that will be enforced.

Having determined which data is to be corrected/excluded the process must be documented. This is best accomplished by managing the correction/exclusion in the migration process. This is done by embedding said correction/exclusion in reference tables or SQL programs that are applied to the source data when generating the migration data. The reference tables can include statements related to the reason for the decision as well as before/after values. The process can also generate log files for audit as well as tables of excluded data for archiving.

Reference tables for actions on specific records can be developed externally to the migration process (e.g. MS Excel, MS Access, etc.) and imported to the migration process. These records can include comment fields for appending to the details recorded in the log explaining the action.

Rules pertaining to value ranges can be embedded in SQL programs and can incorporate comment fields for appending to the details recorded in the log explaining the action.

The migration process will generate tables in the form specified by the vendor of the new application. The complexity of the process will be better understood when the specifications are provided.

Data Migration

Initial set-up

Once the specifications regarding data cleansing have been finalised then the data-cleansing part of the migration can be implemented.

Once the data format requirements of the new vendor have been understood then the transformation process can be implemented.

Populating the reference tables can continue to occur (including on external environments for subsequent uploading) and range-based exclusions can be adjusted. The time-consuming aspect of

migration is the preparation of the migration and the external retention environments and associated documentation.

Evolution of the data migration

The migration process in general will be quite rigid; however the need for some flexibility is unavoidable. The need for flexibility might include:

- That the current application will continue to accept data with the possibility that the reference tables will require late-stage adjustment;
- That the interconnections within the data can have implications beyond the immediate data, and therefore excluding/changing some data might impact data integrity related to other tables triggering downstream changes;

From this the migration process must allow for multiple iterations, and verifying data integrity of the final tables will be necessary. The iterations will mostly occur long before migration to production, however given the current application is continuing to accept data then some last-minute adjustments might be necessary.