Laboratory Information Management System (LIMS) Replacement

1. Introduction

The Health Board is to transition from its current LIMS to the new national LIMS in late March 2014. This is a significant change that needs to be managed to mitigate the risk of partial or full loss of a service to a key clinical decision support tool for the Health Board.

This paper discusses the background to this change, the purpose of LIMS, the complexity of this programme of work and the issues and challenges it presents along with the potential benefits that will accrue.

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2. Background

National Pathology Modernisation plans in Wales were first announced in 2005 with informatics noted as a key enabler:

‘The need to modernise and maximise the potential of informatics has been a major recurring theme and is at the heart of modern pathology service provision. A fully integrated informatics system is essential for the effective and efficient management of services and is needed for both clinical service delivery and laboratory management’.
Plans emerged for a new national Laboratory Information Management System (LIMS) as the systems used across Wales are based on old technology, different systems, limited connectivity between systems and cannot be used to underpin a consolidation of Pathology Services across NHS Wales to effect national service improvement and achieve best value for money.

The LIMS project run by NHS Wales Informatics Service (NWIS) is working to provide a common, modern, flexible and integrated solution across NHS Wales.

After a national procurement cycle a contract was signed with InterSystems Corporation (ISC) for their TrakCare LIMS. A project approach was established to plan readiness for implementation with Betsi Cadwaladr University Health Board (BCUHB) to be followed by Hywel Dda Health Board (HDHB) and ABMUHB.

Significant delays to the project resulted in BCUHB and ABMUHB deciding to delay local implementation. The initial HDHB implementation experienced significant issues and caused a suspension of the implementation programme to allow for key issues to be resolved.

A Wales Government Gateway Review undertaken in early 2013 noted the number of delays and issues and recommended, amongst other things:

- the appointment of high level Senior Responsible Officer (SRO) and Project Director with experience of successful implementation
- the appointment of a clinical leader/leads for the various pathology disciplines

Implementation in Hywel Dda took place successfully during late summer and early Autumn 2013 resulting in discussions taking place regarding implementation within this Health Board. Implementation in Cwm Taf Health Board followed in November 2013 and this now allows this Health Board’s implementation to be progressed.

In October 2013, key representatives from ABUHB and NWIS met the new SRO and National Project Director where it was impressed upon all that there was to be an ‘immoveable’ revised date for ABUHB ‘go live’ of late March 2014 and that everything possible must be done to achieve this.

3. Current National Programme Position

Hywel Dda Health Board is now fully live on LIMS using Myrddin PAS to report results. Cwm Taf Health Board is live on LIMS using Welsh Clinical Portal (WCP) to report results. Both Health Boards have started to use the electronic test requesting facility within WCP. The method for displaying results and test requesting are key features in clinical user acceptability.
4. What is LIMS?

LIMS is a computerised information system into which laboratory staff key in requests from wards, theatres, A&E and clinics for pathology tests to be undertaken. Samples are fed through pathology analysers which are connected to the LIMS and which pass the measurements and the results data to LIMS via dedicated interfaces. Test results are then aligned to the patients’ identity by LIMS ready for use by the clinicians and their team.

Currently with ABUHB, the requester will logon to Clinical Work Station (CWS), find their patient and CWS will get the results direct from the existing LIMS as soon as the requester clicks on “show test results”. This functionality has been available locally for many years and is valued by clinicians.

LIMS is one of the most important clinical information systems with the delivery of electronic results being a feature that has existed in this Health Board since 1996. The result is that our core clinical processes are entirely reliant on LIMS being reliable and delivering timely and accurate results to our staff at all times.

5. Benefits and Business Case

The benefits of the national LIMS were initially derived at a National level and included the following components:

**Electronic Results reporting** – to remove the delay between manual and electronic delivery. Other Health Boards have not had this facility but this benefit is already available in ABUHB.

**Test requesting** – as clinicians requested tests electronically, the system would check a number of standards (including duplicate requests) and warn the clinician if the test was not appropriate etc. There is a perception this would reduce demand on the service and protect the patient from unnecessary testing. There should be a significant reduction in pathology administration of booking the request into the system as per current process resulting in financial savings. This particular ‘benefit’ is seen by many clinicians as passing the administrative task to them and the Health Board must ensure the system design supports full adoption of this process by making it as quick as the current manual method of requesting. Electronic identification of the requester would also support the delivery of personal Alerts and Notifications.

**Alerts and Notifications** – whereby the consultant and their team would be electronically notified that a result was now available (which would remove the need for the paper report alert), and they would have the facility to sign off and record any actions providing a robust audit trail and enabling the discontinuation of paper reporting. This has the support of
many clinicians in ABUHB and is expected to deliver major patient safety improvements.

The Health Board currently has two Blood Transfusion systems which constitutes a risk with the possibility of split transfusion records across the Health Board (especially if patient flow change). There is one system (Masterlab) for North Gwent and one for South Gwent (Telepath). Data will be taken on from both systems in to the new LIMS thus creating a single record for each patient. However, this development is planned to take place in 2015.

The cost of the new LIMS will be £266k pa and the Health Board currently pays £110k pa for Telepath and Masterlab combined. There is also an increased printing cost estimated at £14k pa.

NWIS will bear the cost of the legacy systems leaving the Health Board with an additional cost of £170k pa requirement.

The wider South Wales strategy expects commonality and standardisation to exist in laboratory services such that this can be utilised for rationalisation and modernisation of these services.

6. **Category A, B and C Requirements**

The Health Board, as part of its preparation for the LIMS implementation, undertook work to identify the key dependencies to reduce risk with the implementation and operation of this major clinical system. When ABUHB met the SRO in October 2013 regarding the agreement for a go-live date of late March 2014, the Health Board stipulated the delivery of a list of products, services or functions either pre, post, or beyond the go-live date to support implementation and reducing service and financial benefits.

This was also important in ensuring clinician acceptance because some of the system functionality was already available locally through CWS. Sustaining performance levels for display of test results is an absolute imperative.

These are classified as Category A, B and C dependencies and progress against these are outlined in Table 1.
Table 1

<table>
<thead>
<tr>
<th>Category A</th>
<th>Cat A Status</th>
<th>Category B</th>
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<tbody>
<tr>
<td>Must be in place for Go Live</td>
<td></td>
<td>Post Go Live delivery roadmap required. Schedule to be immediately post Go-Live</td>
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<tr>
<td>eMPI</td>
<td>←→</td>
<td>Electronic Requesting Secondary Care</td>
</tr>
<tr>
<td>WCCG (Enabler for GPTR)</td>
<td>←→</td>
<td>Alerts &amp; Notifications</td>
</tr>
<tr>
<td>NADEX CWS User Credentials</td>
<td>↑</td>
<td>CANISC / CHIRP Interfaces</td>
</tr>
<tr>
<td>Results Reporting Secondary Care</td>
<td>↑</td>
<td>Electronic Requesting Primary Care</td>
</tr>
<tr>
<td>Results Reporting Primary Care (CWS &amp; GPTR)</td>
<td>↑</td>
<td>Full Historical Results Backload</td>
</tr>
<tr>
<td>Welsh Pathology Handbook (TRAK v2)</td>
<td>↑</td>
<td></td>
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<tr>
<td>&quot;4 Years&quot; of historical results Backloaded</td>
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<td></td>
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<tr>
<td>Point of Care Results</td>
<td>↑</td>
<td></td>
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<tr>
<td>Email Notifications</td>
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<tr>
<td>Linked go live schedule with C&amp;V (Virology)</td>
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7. Progress with LIMS Implementation

The preparation for a transition from Telepath to TrakCare is currently on plan and the following key project deliverables are progressing well:

- Interfaces
- Training for staff
- Cut-over planning
- Local Configuration
- Local Verification
- Go-Live preparation

Progress against the Category A requirements in Table 1 are now green or amber-improving, with the only exception being the email notifications. This latter requirement provides a service that gives information to non-requesting individuals or groups in respect of certain types of test results or outcomes. E.g. the calibration team receive a report of out-of-normal-range results to ensure that analyser calibrations remains valid; the hospital Cross Infection Team receive notifications when a positive C-Diff or MRSA result has been returned, etc. Discussions with NWIS to seek a resolution are continuing.

The bulk of the programme risks are now associated with Category B items, where further progress is required.

The Health Board has been reviewing the implementation in Cwm Taf and Hywel Dda Health Boards to inform local progress. A key issue is to ensure local clinicians can access results in speedy, accurate and usable way. This requires results reporting functionality which at least maintains current standards. It was agreed to use CWS to show results from LIMS.
whilst still using the national services in the background. This method being preferred to showing results in a WCP window within CWS known as ‘reverse stapling’.

Discussions are still being held with NWIS over the means of delivering electronic requesting and alerts/notifications (Category B) where the HB has a preference to do this within CWS, utilising the national pathology messaging service rather than feeding WCP into a window within CWS, the latter method currently giving poor performance and usability on all testing to date.

Similar concerns exist around the delivery of a quality electronic requesting service to our 89 Gwent GP practices, with the likelihood being that the implementation will be protracted and will extend into 2015 in line with the National GP Clinical Information System rollout.

This remains the major risk to a successful implementation and discussions are proceeding with NWIS to ensure satisfactory arrangements are in place to deliver results to meet clinician requirements. The implementation may need to be delayed in the event of satisfactory arrangements not being in place.

8. Key Issues

The Health Board have identified the key issues needing further specific attention to deliver the LIMS implementation by late March 14 (Category A issues) and for the subsequent delivery of the service and financial benefits (Category B). These include:

- **Category A**
  - Implementation of new results reporting approach in sufficient time for bedding in and performance monitoring prior to go live.
  - Ensure sufficient time for full end to end testing prior to go live for all Category A dependencies.
  - Successful completion of all laboratory testing including complex workflows, regression checks and Dry Runs.

- **Category B**
  - Electronic Test Requesting for secondary care requires clarity on the level of integration acceptable to both NWIS and ABHB, which delivers ABHB clinical acceptance and meets national agreed patient safety standards.
  - Further discussions with Primary Care regarding current available national test requesting application and integration efficacy with their primary care systems. Further engagement is planned with Primary care to scope requirements and map to national development plan for delivery and/or other mitigation.
  - Historical results backlog for Masterlab data remains a challenge at summary and detail level and resources are now committed to
technically scope extraction and import possibilities in addition to discussions with the supplier.

- Delivery of GP Test Requesting (GPTR) for 89 GP’s to view all results for their patients (Cat A) and request tests (Cat B) is challenging due to the current status of the GP systems and GPTR.

9. **Key Risks**

The major risk at the present time is the poor response time and clinical functionality of test reporting. The WCP ‘reverse stapling’ and results reporting approach agreed with NWIS in 2012 to comply with national ICT architecture is unlikely to provide the necessary performance to allow implementation to proceed.

Performance and usability in delivering test results reporting through the National Application (WCP) failed user acceptance and the Health Board has commenced development of an alternative approach utilising CWS which is planned for go live late February 2014 which only allows 4 weeks testing prior to implementation.

The Category B dependences for Test requesting and Alerts and Notifications have not been delivered to a satisfactory level of performance. The Health Board are discussing the technical solutions to these issues with NWIS, with the preferred option again using CWS as the best approach to deliver a service to meet clinical and performance parameters. This approach will be confirmed by Mid January 2014 and will need to be supportive of National design principles whilst offering a level of assurance that ABHB clinicians will utilise the functionality and so enable the realisation of the service and financial benefit needed to cover the additional revenue cost of Trakcare. The other risks currently being managed include:

- Resource impact on all staff for training requirement
- Financial penalties in the event of timetable delays
- Risk of failure to deliver Category B (post go live) items and a consequent risk of failure to achieve affordability and service improvement
- The continued national slippage of Histopathology and Cytology implementation and the local implementation

10. **Conclusion**

There remains a general agreement that transitioning to the new national TrakCare LIMS service is beneficial to healthcare delivery in Gwent and Wales, supporting local and regional modernisation and rationalisation.

Specifically, the laboratory services transition phase of this project is progressing well, as are the Category A (pre go-live) user requirements, although the software development is running late giving a shortened
time for acceptance testing and the email notification function still requires reaching.

The go-live date of late March has been impacted by a number of minor issues since October 2013 and work is still being undertaken to recover the impact and allow implementation to proceed.

Category B requirements are the most significant risk to the programme at present, particularly to ensure both primary and secondary clinical requirements are met. These requirements are key to ensure that service and financial benefits can be delivered.

The Health Board implementation needs to continue with the retention of a strong focus for resolving and mitigating current risks. The implementation date for LIMS for late March 2014 can still be delivered. This must be associated with delivery of the Category B dependencies by summer 2014 as these provide the opportunity to deliver further quality improvements and the financial savings.

11. Recommendation

The Health Board is asked to note:

- note the progress in implementing the LIMS national programme within the Health Board
- note the current risks and actions being taken to resolve issues to enable a successful implementation
- support the focus on delivery of both the LIMS implementation and the delivery of Category B dependencies to realise the service and financial benefits

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