

CASE STUDY 5

SECTOR: NHS

DELIVERABLE: **1) NEW AUTOMATED BLOOD SCIENCES LABORATORY TRACK VIA AN
OUTSOURCED MANAGED SERVICES CONTRACT
2) REFURBISHED PATHOLOGY LABORATORY**

THE CLIENT:



The Queen Elizabeth Hospital King's Lynn NHS Foundation Trust (QEH) is a 514 bed general hospital providing services to approximately 220,000 people in West Norfolk, North East Cambridgeshire and South Lincolnshire. It is also the largest regional employer employing approximately 2400 staff.

The QEH Pathology department, located over two floors on its own wing off the main hospital building, provides a full set of pathology services (i.e. Blood Sciences, Microbiology, Immunology, Histopathology and Blood Transfusion) to both the hospital and all the GP practices that fall within its catchment area. For a couple of years the pathology department had been engaged in a programme to implement 'Lean' (at its core 'Lean' aims to reconfigure its end to end (non silo) processes to deliver more value for the end customer using fewer resources with the pinnacle being maximum customer value with zero waste). The next major 'Lean' improvement for the department was to replace all the current end of life, standalone and labour intensive Blood Sciences analysers with a fully automated robotic analyser track. A recent evaluation of the QEH Pathology Unit by Clinical Pathology Accreditation (CPA sets and monitors pathology standards of practice for the UK) had raised concerns about the high temperature in the unit as well as to the unit's access security. The CPA had indicated that if these issues were not addressed by their next visit QEH would fail its next accreditation review and would no longer be an accredited laboratory.

QEH therefore made the decision that it needed to undertake an urgent programme of change to a) refurbish the pathology unit, which would include an upgrade to the department's environmental cooling and security systems and b) automate its Blood Sciences service.

Zebrazoo Consulting was brought on board to project manage the refurbishment of the unit. An internal member of staff had been appointed to project manage the automation

of Blood Sciences but shortly after starting the project he decided to leave the Trust. As the two Pathology projects had a number of key interdependencies QEH decided that it made more sense for the two projects to be managed by Zebrazoo Consulting.

QEH's key business objectives for implementing this change programme were:

- to safeguard the hospital's wider services by future proofing its accredited

pathology service on which these wider services were dependent

- the necessary replacement of analysers that were at the end of their life
- to improve efficiency and productivity (and hence generate savings) through automation
- to improve the overall pathology customer service provided to internal and external customers
- to create revenue generating opportunities for the Trust by installing a Blood Sciences solution that had capacity to insource additional work.

Key Areas of Change:

- Capital refurbishment
- Outsourcing
- Business Process Re-engineering
- Culture change

Zebrazoo Consulting's Impact – Pathology Refurbishment Project:

Zebrazoo Consulting prepared an outline business case (OBC) for refurbishing the Pathology Unit. The business case was premised on:

- Failure to invest in a refurbishment programme to address the issues identified by the CPA would lead to the Trust losing accreditation for its pathology service. This would lead to other Trust services having to be withdrawn with an associated loss of income to QEH,
- A new automated Blood Sciences track could not be installed in the existing configuration of the Blood Sciences laboratory.

The OBC took into account the following key requirements:

- It would not be possible to decant the unit and hence refurbishment would need to

be undertaken in a live environment over 6 key phases

- General refurbishment would include: installing a new environmental cooling system, new secure and appropriately glazed windows, new flooring, new lighting, new ceilings and new doors with swipe control access
- Phase 1 would require a large central store room to be converted into temporary laboratory space to facilitate the existing Blood Sciences laboratory being emptied, gutted, extended to take in an existing office and then fully refurbished to accommodate a new automated track. This phase would also require a very large mothballed chiller plant to be recommissioned to provide environmental cooling capacity for the pathology unit. The start of the installation phase of the automation project would be dependent on completion of this phase of the refurbishment project
- Phases 2 through 5 would require the areas for Microbiology, Histopathology, Immunology and Blood Transfusion refurbished sequentially while daily services were maintained
- Phase 6 would require the temporary laboratory space created in Phase 1 emptied and converted into a sample preparation room for the adjacent automated Blood Sciences laboratory.

The OBC was submitted to the Trust's Finance & Investment Committee for approval to proceed to tender and full business case (FBC). Approval was received.

Working closely with QEH's Estates Department team an invitation to tender for the package of refurbishment work was compiled and issued. After completing a review of the tenders received a FBC was

completed with updated financial schedules, project timescales and the relevant investment appraisal. The FBC was submitted to the Trust Executive Board for approval.

Approval for the £1m project was received and from the companies that tendered Pentaco was appointed.

Over the course of 7 months Zebrazoo Consulting coordinated the project to ensure that:

- The large mothballed chiller unit was recommissioned and connected in parallel with another unit in situ to provide chiller capacity for Pathology (as well as for Theatres and Radiology)
- A new electric panel was installed to accommodate an emergency generator switchover facility for the Pathology Unit in case QEH experienced a power outage. Pathology was previously not connected to the emergency backup generator
- The old storage room was refurbished to accommodate Blood Sciences while Phase 1 refurbishment was being undertaken
- Phase 1 refurbishment of the new area to accommodate the automated Blood Sciences track was completed 2 weeks ahead of schedule. This included refurbishing and environmentally cooling the adjacent IT Comms Room that housed a number of servers and switches
- Phases 2 through 5 were undertaken as live environment refurbishments and were completed on time and with limited disruption to services
- By the time Phase 5 had been completed the new automated Blood Sciences track had been installed and was operational. This allowed the temporary Blood Sciences lab to be converted into a sample preparation area and thereby conclude Phase 6

- The project was completed on time and under budget. With the project budget having been underspent the QEH Trust Executive Board opted to use the savings to undertake a limited refurbishment of the Phlebotomy patients waiting area.

The success of the project was based around a well executed communication plan and good coordination between the QEH project team, the appointed contractor and the pathology unit staff.

Zebrazoo Consulting's Impact – Pathology Automation Project:

The equipment in the existing pathology Blood Sciences unit comprised a number of standalone analysers, most of which were at the end of their life and needed to be replaced. All these analysers had to be manually loaded and unloaded as blood samples were progressed through the requested set of tests. This was totally inefficient and QEH therefore wanted to make use of the technology advances in automation. QEH was however unsure which model to adopt in relation to procuring this automated solution, i.e. should it:

- buy and operate the automated track, depreciating it over time?
- lease and operate the automated track?
- outsource by entering into a managed services contract with an appropriate supplier?

Working closely with a specialist financial analysis consultant a business case was submitted to the Trust Executive Board that a) outlined the need for the investment and b) requested a decision on the buy / lease / outsource options presented.

Taking the following key factors into consideration:

- the cost and cash flow impact of purchasing an automated track solution;
- the speed at which technology is advancing and hence the likely desire to refresh the equipment at a date sooner than its normal end of life replacement;
- the accounting treatment of financial leases and its impact on the balance sheet;
- the inability of an NHS organisation to claim VAT back on the purchase price of assets; and
- the likelihood of an NHS organisation being able to claim the VAT back on a managed services contract

QEH made the decision to invest in a managed services contract solution.

On the back of the responses received to an invitation to tender and further due diligence, a full business case was submitted to Trust Executive Board for approval. The business case was approved and following lengthy contract negotiations a managed services contract (MSC) was awarded to pathology automation specialists Siemens.

The high level terms of the MSC were:

- a ten year contract with break/extension clauses
- Siemens would supply a fully automated track with capacity to process double the Trust's current Blood Sciences test volumes
- Siemens would undertake periodic refreshes of the equipment
- Siemens would supply all consumables e.g. reagents
- QEH would supply all staff and operate the track
- Siemens would be responsible for the installation and would then monitor and maintain the track.

After the Pathology Refurbishment Project had delivered the temporary Blood Sciences laboratory space, Siemens installed and calibrated their new analysers in standalone mode (i.e. not connected to a track). QEH staff were trained on how to use the analysers to perform their existing repertoire of tests. Once calibration of the analysers had been completed and the staff had been trained on using the equipment and interpreting the results the old Blood Sciences laboratory was decommissioned and old analysers scrapped or returned to the original manufacturer.

While normal service was being maintained new barcodes were designed and a new process implemented that would ensure that these barcodes would be fixed to each sample submitted from within the Trust and by GPs. After preparing the samples in the sample preparation room the barcodes would allow the scanners on the automated track to determine which tests needed to be performed and hence to which analyser it needed to deliver the sample for processing.

On completion of Phase 1 of the Pathology Refurbishment Project the newly refurbished Blood Sciences laboratory was handed over to Siemens to install the new automated track. The QEH project team ensured that utility services were commissioned when required and a second set of analysers (to the ones that were being used in standalone mode) were connected to the track, commissioned, calibrated and tested. QEH staff were then trained on how to use and interact with the automated track and robotic analysers.

As these set of analysers were capable of managing the full volume of current activity on their own, work was migrated across in tranches from the standalone environment to the new automated track. Once the track was processing all the samples the analysers that

had been used in standalone mode were moved into the new automated laboratory and connected to the track.

At this point the temporary laboratory area started to be used to prepare samples for processing on the track. At a later date which coincided with Phase 6 of the Pathology Refurbishment Project the room was further optimised for sample preparation.

The analysers had arrived on site during October and were being used in standalone mode by November. The refurbished laboratory was handed over to Siemens in the second week of January for track and analyser installation. By the end of February QEH was delivering a fully automated Blood Sciences service from the newly refurbished laboratory.

Working closely with Siemens, Zebrazoo Consulting and the rest of the QEH project ensured that the Pathology Automation project was delivered on time.

Careful programme planning ensured that all interdependencies between the Pathology Refurbishment Project and the Pathology Automation Project were clearly understood by all members of the two project teams. Careful coordination ensured that the key dates were met with neither project being delayed by the other.

On Monday 21 March 2011 the new automated Blood Sciences laboratory was formally opened by Sir Keith Pearson JP, Chair of The NHS Confederation. [\[Link To Press Releases?\]](#)

To see a short video of the new Blood Sciences laboratory, automated track and processes in operation please click on this link: [\[insert link\]](#)