Transformation in the laboratory market drives systems innovation

With the pressure to deliver more test results at lower cost set to intensify, advanced information technology will enable laboratory professionals to be the drivers rather than the victims of change, as Martin Wilkinson explains.

The clinical laboratory market is in a period of rapid growth. Health expectations have risen globally in recent decades, with all member states of the World Health Organization committed to work toward the achievement of universal health coverage worldwide.

Pathology is involved in 70% of all diagnoses in the NHS. The global market for the clinical laboratory is expected to reach US$149 billion by 2020, if it follows the compound annual growth rate of 6.8% from 2014 to 2020 predicted in a new study by market analyst Grand View Research.

Driving this growth, along with the rise of universal healthcare, is an ageing population and the increased prevalence of chronic diseases such as obesity and diabetes. We are also seeing an upsurge in new testing methods, such as genetic testing and automated slide results scanning.

Key drivers transforming laboratories
Just as demand for laboratory services is rising, there is also pressure to meet this demand using fewer resources, to increase productivity while driving down costs.

Advances in automation, genomic testing and point-of-care testing (POCT) are all driving disruptive changes in the laboratory market. Other drivers include healthcare industry consolidation, with increased economies of scale expected to deliver more test results at lower cost. Information will drive the lifecycle of medical testing, as information technology (IT) systems capture information at each stage of the healthcare continuum.

‘Advances in automation, genomic testing and point-of-care testing are all driving disruptive changes in the laboratory market’

Today’s laboratory information management systems do not meet the requirements of this new environment. Instead, modern, agile information systems that enable the laboratory to capture, share, analyse and act upon vast amounts of detailed data will be required to run a smart business. This is necessitating a new breed of system, what InterSystems calls a ‘laboratory business management system (LBMS)’.

Transformation through information
Information is the core business for laboratories. It’s their primary output. Laboratory professionals will need a laboratory business management system an integrated health informatics platform to meet their new challenges.
A laboratory business management system will support connected care models that put patients at the centre of delivery, with support for a contiguous pathology patient record

Patient data will be stored in secure data repositories, accessible via a browser from any computing device. For laboratories within a hospital group, all patient data will be unified within a shared electronic patient record, and laboratory workflow will be fully integrated with the care process.

Laboratory business management systems will employ software architectures that enable them to be deployed as a unified platform accessible within a single laboratory, across multiple sites, or within a hospital or a group of hospitals. An LBMS will also interoperate with connected care systems and shared electronic health records throughout a region or country.

Extending laboratory information management capabilities across the healthcare enterprise will enable transformational change in clinical laboratories. For example, the ‘hub and spoke’ model being implemented in the UK following the Carter Report specifies that high-volume testing be done closer to patient locations, while specialised testing be done in high-volume testing laboratories. For example, the ‘hub and spoke’ model being implemented in the UK following the Carter Report specifies that high-volume testing be done closer to patient locations, while specialised testing be done in high-volume testing laboratories.

Laboratories to become a data-driven business

Using an LBMS, laboratories will be able to implement workflow protocols or standard operating procedures and cost every procedure. Clinical directors and business managers will run a fine-tuned, data-driven business, with LBMS giving them the visibility, control and accountability over business processes that are now seen in the best enterprise resource planning software.

Laboratory throughput and turnaround times will be monitored constantly. Software will pinpoint workflow bottlenecks without the need for custom analytics. Each laboratory or group will be able to configure relevant key performance indicators and/or service-level agreements easily and monitor them through dashboards and alerts.

Pathology is a traditionally unpredictable supply-and-demand service. When laboratory systems can capture and access relevant information along every step of the testing process, they will also deliver unprecedented ability to predict and manage variable workloads.

For example, at the same time a clinician completes a pathology test order, before the sample has even been taken from the patient, the data will feed into the LBMS, improving the predictability of workloads hours before they need to be resourced.

Faster results and second opinions

When you bring connectivity into the model, you don’t need to wait for the postman. Electronic transfer of results is not only faster, it’s also more secure. The progress of testing can be tracked from patient to laboratory to clinician. Reporting will be much faster, with results delivered instantly to care teams, with the single shared data repository automatically directing results to the patient record. Customers – clinicians, hospitals, family practitioners – will have instant access to results via their internet browsers, using the latest mobile devices, subject to appropriate security protocols.

The growth of digital pathology and telepathology will also allow digital samples to be transferred instantaneously for a second opinion. Use of an LBMS will support second opinions and referrals of digital pathology results rather than making physical transfers of specimens, thus reducing costs and the potential for error.

Putting patients at the centre of care

The LBMS will support connected care models that put patients at the centre of healthcare delivery, with support for a contiguous pathology patient record (PPR). This will be part of the electronic patient record (EPR) if the laboratory is part of a healthcare group, and integrated with regional or national shared electronic health records. The PPR would include all test data relevant to patients, even POCT results.

The LBMS will also support connected care functionality such as electronic gatekeeping. Clinical directors will be able to institute pre-approval processes for costly tests so they first satisfy funding rules, for example. At the same time, system workflows can ensure these orders are automatically submitted for approval to multiple connected parties and that they are instantly released when approved, speeding up the process and eliminating paperwork chasing within laboratories.

In conclusion, the fast-changing laboratory market is ripe for a new generation of information systems that meet the needs of a modern pathology environment. While the pressure to deliver more test results at lower cost will only intensify, advanced information technology will make laboratory professionals the drivers of change, rather than the victims of disruption.

‘Extending laboratory information management capabilities across the healthcare enterprise will enable transformational change in clinical laboratories’