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Laboratory Information Systems
Opportunities in APAC

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Laboratory Information Systems (LIS) is a suite of software applications that helps manages daily operations of a laboratory, ensuring better control and management of resources. This article looks at the LIS market in Asia Pacific as well as the factors of successful LIS implementations.

Laboratory Information System

Laboratory Information System or LIS is a suite of software applications that helps to manage the daily operations / workflow of a laboratory. Accounted for as one of the largest capital expenditure in any diagnostic laboratory, a successful LIS implementation not only ensures effective control and management of resources but also offers the following benefits:

- Increase in productivity
  o Faster turnaround time for results
  o Processes large quantities of specimens safely and efficiently
- Greater data accuracy
  o Faster data validation
  o Reduces instances of lost or misplaced specimens
- Reporting and Statistics
  o Ensures billing accuracy
  o Ability to track and audit data on any course of events
  o Provides workload and statistical reports

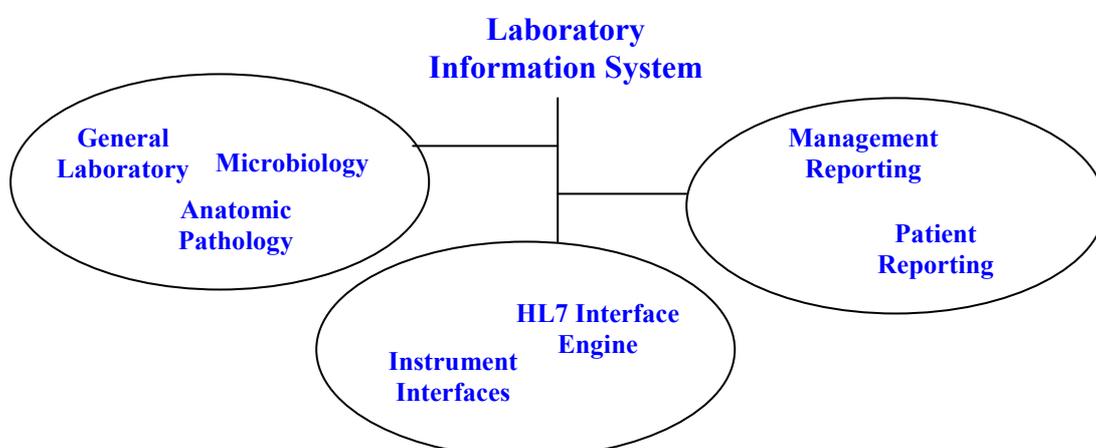The typical components of a LIS may be depicted as below

Figure 1 – Typical components of a LIS

Connection to the HIS and EMR

While the LIS plays an important role in ensuring accurate laboratory results, it does not work alone; patients' test results / reports are usually interfaced to the Electronic Medical Records (EMR) to ensure that clinicians can access to updated / complete test results.

Together with patients' results gathered from other departments (eg. Radiology), the EMR enables the clinician to obtain a comprehensive overview of patients' medical history. This greatly enhances the clinical decision-making process and ultimately helps to deliver better patient care.
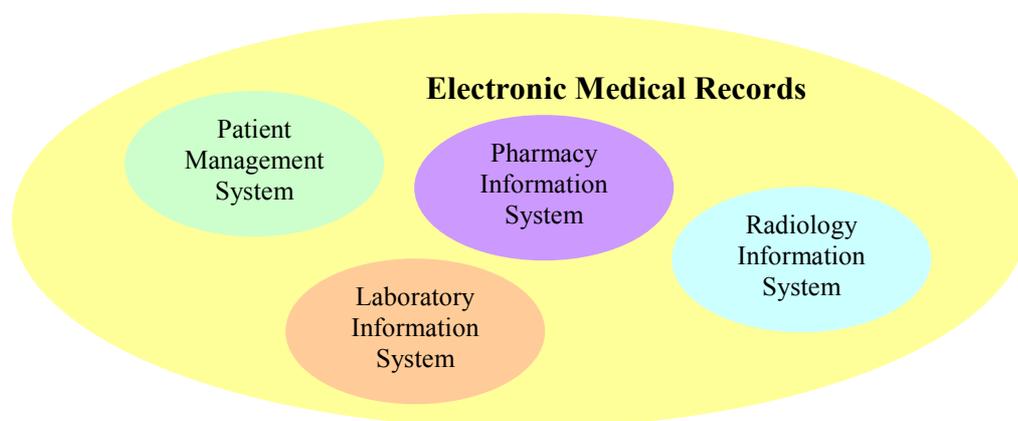

Figure 2 – Examples of ancillary systems interfaced to the EMR

In addition to vendors that specialize only in LIS solutions, there is also rising competition in the market from;

Total Hospital Information System (THIS) vendors
Touted as a 'one-stop service provider', THIS is a convenient solution for full hospital re-haul. However, LIS modules from such total solutions sometimes lack in features and flexibility.
In Vitro Diagnostics (IVD) vendors
Some IVD vendors offer their own LIS solutions which are bundled with their instruments. Although limited in features, such LIS can be economically attractive at the onset (IVD vendors offer price advantage through re-agent bundling.)

The Secret to Success – The Implementation Process

While most solution providers have kept pace with technology (Like offering Web-based platforms) the core functionality required by diagnostics laboratories have remained much the same over time.

"80% of the functions found in commercial LIS are similar, the key differences lies on how it is implemented."

Mr Lee Kok Keong
Founder, BioInfoComm (Singapore)

This has resulted in most commercial LIS providing solutions with very similar functionalities. Facing intense competition, LIS vendors have realized that the only way to stand out from the crowd is to be focused in the implementation phase of a LIS and ensure that their customers reap the maximum financial and clinical benefits while enjoying a high level of end-user satisfaction

Enter the LIS Administrator

The LIS Administrator is often a laboratory technician who plays the role of the "implementation lead" or commonly known as the "process champion". This is an important role in the rollout of a LIS implementation as the LIS Administrator has to ensure that process flow (workflow) of the laboratory is mapped correctly.

No two laboratories share the exact same workflow; while similarities may exist, each laboratory has its unique requirements and its way of doing things which are influenced by work culture and management style. Hence the LIS administrator plays an important role in ensuring that the vendor has implemented the correct business logic / workflow that for the facility.

The LIS administrator also plays the role of an educator, creating awareness amongst the end-users about the benefits of the LIS as part of the change management process.

Define Needs → Workflow Analysis → Operational Assessment → Utilization Review → Cost Benefits Analysis

Figure 3 – Steps towards a LIS implementation

The Implementation Journey - Pitfalls to Avoid
Depending on the scope of the project, implementation can take anywhere from a month to a few years; therefore it is vital that the vendor is chosen correctly as the choice of partnership can make or break the success of the LIS implementation.

One of the most important factors includes having the LIS vendor understand the local culture and work processes. Having said that, while a strong network of local support is important, some facilities fall into a situation where they engage small local startup (consisting perhaps of 1-2 developers) to develop a customized LIS. While the final solution might fit like a glove, it may not be the right 'way' to do things as the developer might not know the compliance regulations or international standards required. A nastier scenario that frequently occurs is when the local startup /vendor folds up after a few years, leaving the hospital with a non-supported / non-evolving LIS.

In addition to having good local support and infrastructure, it is also important for bigger or international LIS vendors to have a R&D arm that constantly ensures that their solutions consistently evolve to follow the need / growth of the medical facility even after implementation. This is particularly important in ensuring that the investment in their LIS is maximized.

While there is no magical formula to ensure that the potential vendor has the capability to fulfill all of the above, it may be wise to ask for reference sites and speak with existing users to share their experiences.

- Does the potential LIS vendor 'listen' to their customers and anticipate to changes?
- Has the implemented LIS met the needs of the facility?
- Has the potential vendor proven their after sales support capabilities?

Adoption in Asia Pacific
While demand for LIS is relatively low in countries which are advanced adopters of healthcare IT (e.g. South Korea, Japan and Singapore) the potential is huge in the large and upper medium hospitals in Malaysia, Indonesia, Vietnam, Thailand, Philippines, India and China.

Although deemed as a relatively mature market, the LIS market is still viable due to

- An increasing need for new LIS implementation as more facilities seek to cut down on test result reporting errors, increase profitability, improving patient care, and minimizing risk

- Replacement of outdated LIS since the maintenance costs of continuing outdated systems can be high, and many legacy LIS systems will not support the needs of modern laboratories.

- Ageing population in Asia coupled with the lack of qualified technicians has pushed governments to establish Total Laboratory Automation systems to perform laboratory testing in a timely and cost-effective manner; the results are not only increased productivity, accuracy and patient safety but also the need to manage information effectively.

Another booster for the adoption of LIS is the blooming medical tourism industry in the region. The quest for foreign patients is fueling the need among medical institutes to establish standards, comply with international regulations and invest in both medical technology and Clinical Information Systems such as LIS to raise the quality of patient care.

With such strong growth factors, the LIS solution looks to be in continued demand in Asia Pacific.

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