

Introduction to LIMS for the Analytical Laboratory

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Today's modern laboratory is increasingly faced with pressures to perform more analyses while maintaining high data quality, with the same or fewer resources than a few years ago. Many laboratories are turning to automation. A significant tool to assist in managing laboratory operations is a computerized Laboratory Information Management System or LIMS. A LIMS solution should offer the laboratory the following benefits, sample login, chain of custody, tracking, data entry (both manual and via integration of analytical instrumentation), sample scheduling, QA/QC, chemical inventory, resource management and many of the other routine or mundane tasks that are well suited for computers to execute. The first step for any laboratory is to identify the key challenges that they are faced with and to establish a project plan with achievable milestones and objectives. In most cases laboratories will break the project into phases and attack the areas that will provide the greatest benefits. For example, one laboratory identified sample login and cost accounting as a bottleneck, so this area was closely examined and key areas for improvement were identified. The following actions were implemented; computerized Sample Tracking functionality was deployed with a bar-coded label printer, and scanners. The Sample Tracking included bar-coding samples and pre-login of samples that saved personnel time and avoided delays in obtaining the correct bottle labels and bottle types (as these were pre-printed and prepared in advance), and costs for each analyses were automatically assigned at login with automatic adjustments for rush samples. This allowed the management team to re-allocate resources and to gather real-time metrics on the laboratory login functionality and next other down-stream operations were analyzed and reviewed for opportunities for efficiency improvements. When a LIMS is deployed it is able to manage the overall laboratory operations from sample receipt, analyses, QA/QC, reporting, sample disposal to integration with enterprise applications facilitating data sharing across the organization.