CASE STUDY:

LIMS • Spotfire Integration

Overview:

A major research-based biopharmaceutical company was moving towards a data lake model in their clinical research programs with multiple clinical research organizations they work with and wanted to perform data visualizations and analytics from the clinical and research LIMS data. To review assay results and check assay quality, the Biomarker research department wanted to setup standard visualizations for clinical research results covering biomarkers across different studies (e.g., Analyte Data, Assay Control and Standard Curve Data, Sample ID, Site Info, Visits, Timepoints, etc.). Additionally, scientists within the company had the need to gather and share Immunoassay, Gene Expression, Genomic Extraction, and Sequencing data. Finally, the scientists needed the flexibility to build their own visualizations in a way that did not require any programming knowledge.

Business Challenge:

The LIMS system the company was using had a fairly rudimentary out-of-the-box (OOB) visualization functionality that did not meet their visualization requirements. As a result, the company was using JMP and SAS to provide for data visualization and analytics needs. Unfortunately, JMP was difficult for end users to navigate, and SAS required programming knowledge.

Since the company was involved in clinical research, there was the distinct possibility the data visualization/analytics platform chosen would need to be qualified and even validated to meet regulatory requirements. The company decided to partner with Astrix for assistance in selecting and developing a solution that could fulfill their data visualization/analytics requirements.

The Astrix Team helped the client discover an effective data visualization/analytics solution which ended up saving the company nearly $600,000 on licensing, validation, infrastructure and development costs.

Service Provided:

Astrix was heavily involved in both the technology selection process and the development of the visualization/analytics solution.

The client's LIMS vendor had a partnership with a third-party data visualization/analytics company, and this was initially considered a strong solution possibility, but the client still wanted to go through a formal technology selection process to ensure the best data visualization/analytics tool was chosen.

After several meetings with the client's end users and IT department, the Astrix Team determined the client was already utilizing a qualified third-party data visualization/analytics application (Spotfire) in other areas within the company that could be integrated with the LIMS. Given that Spotfire could satisfy all the client's functional requirements, and the client already had both a site enterprise license for Spotfire and onsite expertise, the client chose the Spotfire integration with the LIMS as the best solution.

The services that Astrix provided for the technology selection process were:

- **Conducted a series of meetings with the client's Biomarker research department to gather requirements for the standard visualizations. These requirements included the data visualization formats allowing researchers to review assay results and check assay quality.**

    Key requirement: Ability to highlight datapoints in the visualization and return records of interest selected by the reviewing scientist.

- **Established a wireframe of the data visualization review process within the LIMS user interface.**

- **Performed a risk assessment that included a performance and integration evaluation comparing the LIMS vendor visualization capabilities and Spotfire to aid the decision making process.**

- **Performed analysis evaluation on LIMS vendor vs Spotfire on the following: Analytics Capabilities, Data Visualization capabilities, Resourcing Logistics, On-Prem vs Cloud, Single Sign On (SSO) & LDAP Support, OOB functionality, Data Security, Performance, Setup/Install, Upgrade paths, User Interface, Architecture, etc.**

- **Conducted a proof of concept to confirm the research LIMS database could be accessed by Spotfire and the LIMS user interface could launch the Spotfire application.**

Astrix also worked with the Spotfire vendor (Perkin Elmer) to implement the Spotfire/LIMS integration. Some of the many services Astrix provided in this collaborative implementation included:

- **Analyzed each one of the visualization requirements and classified which were LIMS-only vs Spotfire-only vs joint LIMS/Spotfire efforts and defined the scope of each.**

- **Established appropriate user level licensing of the SpotFire product for the scientists.**

- **Established scope-of-work (SOW) with the Spotfire project engineer on: Project Phases, number of days for visualization development and Additional Information links, Project Manager efforts, Design, and Parameterize URLs.**

- **Established cross study and cross object (Biomarker, Sample ID, Site, etc.) query requirements**

- **Updated the User Requirements Specifications, Functional Requirements Specifications, and Design Specifications of the research LIMS with respect to the data visualization.**

- **Added a module to the LIMS user interface that allowed the user to launch Spotfire from a LIMS report screen. The visualized data from the LIMS would be viewed within Spotfire. This established Spotfire as a standalone application that could be utlized offline, while providing flexibility and integrated functionality to the LIMS.**

- **Established and accommodated additional ad-hoc visualizations and allow the scientists to share information and comments on the visualizations.**

- **Designed functionality that allows scientists to drilldown and export records of interest from the Spotfire visualizations.**

- **Designed web based functionality into the system, such as bookmarking the data visualizations of a study directly without having to go through LIMS.**

- **Designed different types of visualizations that included Dot Plots, Data Curves, Box Plots, Control Trends, Calibration Curves.**

- **And much more....**

Results Delivered:

The discovery by Astrix Business Analysts that the client already had a data visualization and analytics tool that could effectively integrate with their LIMS to satisfy requirements allowed the client to save nearly $600,000 on licensing, validation, infrastructure and development costs. Significant time and money were also saved with the dramatically reduced end user training required for the Spotfire/LIMS integration solution, due to the end users already being familiar with the systems involved.

In the end, the client was very happy with the integration of Spotfire with their LIMS as a data visualization/analytics solution. This integration allowed for significant improvements for the client in both the efficiency of clinical activities and the archival of knowledge to facilitate the development of innovative medicines.

ABOUT US:

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astrix
TECHNOLOGY GROUP

CORPORATE HEADQUARTERS
125 Half Mile Rd, Suite 200
Red Bank, NJ 0770
732-661-0400