

Pathways for Biological Reagent Quality and Workflow Tracking (CIMS)

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Abstract

Biological reagents are the single most important factor in the success of assays. Use of poor or unsuitable biological materials can lead to huge wastage of time and resources. CIMS is a novel system that provides an unique combination of active tracking in the laboratory and desktop analysis software. It provides laboratories with easy-to-use data portals for gathering cell quality data such as cell viability, cell density and passage number. It associates these reagent quality data with plates and tracks their progress around the lab. Once assay screening has been performed, the screening results for plates are merged with the reagent quality data. The CIMS viewer application can then be used to quickly and easily identify whether poor or unexpected screening results were caused by biological factors.

Built in 20 days

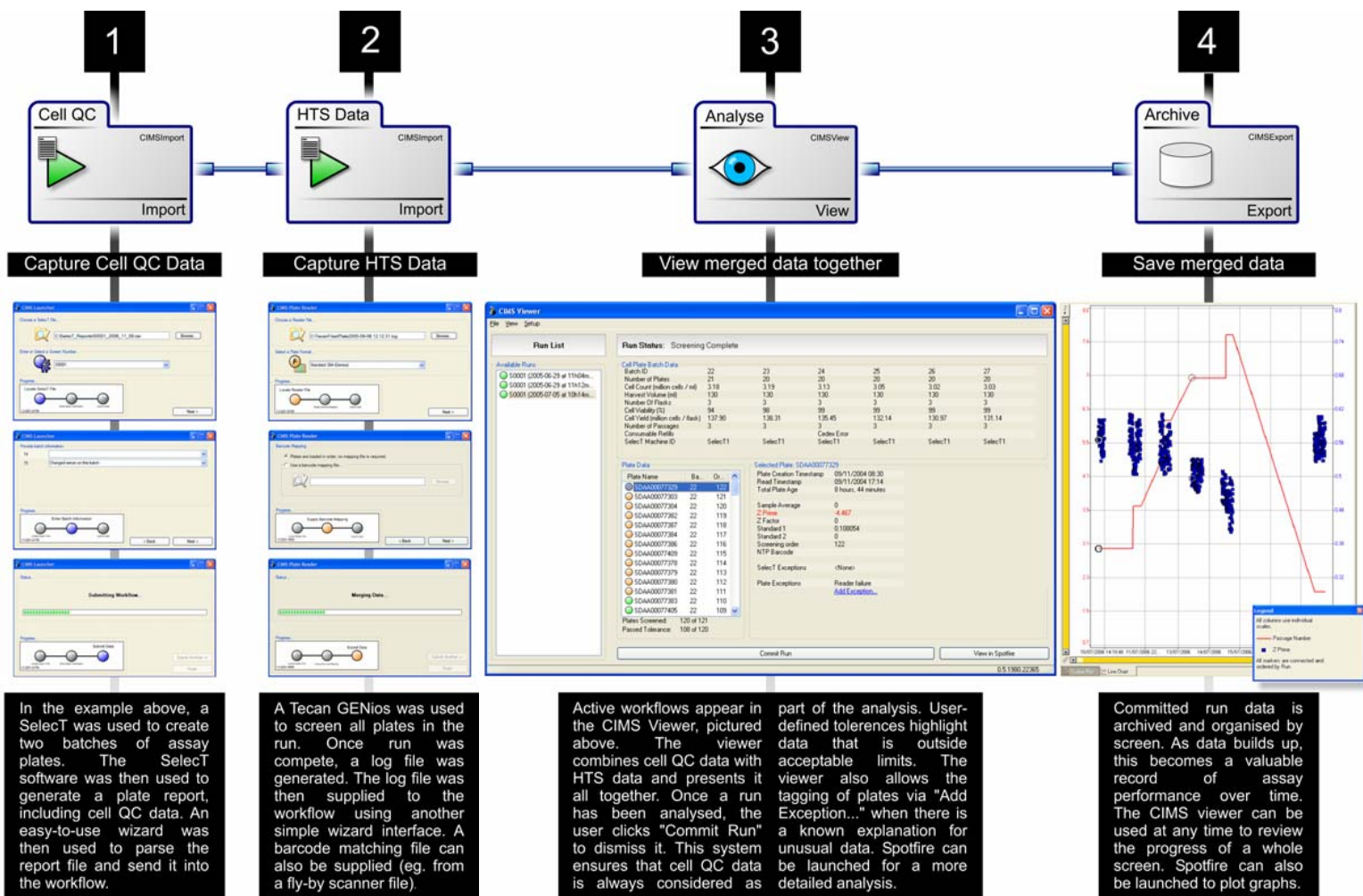
The CIMS solution was implemented in just 20 development days. This was achieved largely as a result of using the Pathways toolkit, which is a specially designed platform for building distributed laboratory workflow applications.

Service Oriented Architecture

The Pathways backbone provides a communication architecture which seamlessly distributes data between different parts of the application. The Pathways Software Development Kit (SDK) provides an intuitive method to access the distributed workflow data, without the need to resort to programming directly against web services.

A flexible solution

Originally built for a major pharmaceutical company, the CIMS solution can be configured to interface with different plate reader files and different cell QC instruments. Additional steps in the workflow, such as approval steps or multiple file outputs can also be added.



In the example above, a SelectT was used to create two batches of assay plates. The SelectT software was then used to generate a plate report, including cell QC data. An easy-to-use wizard was then used to parse the report file and send it into the workflow.

A Tecan GENios was used to screen all plates in the run. Once run was complete, a log file was generated. The log file was then supplied to the workflow using another simple wizard interface. A barcode matching file can also be supplied (eg. from a fly-by scanner file).

Active workflows appear in the CIMS Viewer, pictured above. The viewer combines cell QC data with HTS data and presents it all together. Once a run has been analysed, the user clicks "Commit Run" to dismiss it. This system ensures that cell QC data is always considered as

part of the analysis. User-defined tolerances highlight data that is outside acceptable limits. The viewer also allows the tagging of plates via "Add Exception..." when there is a known explanation for unusual data. Spotfire can be launched for a more detailed analysis.

Committed run data is archived and organised by screen. As data builds up, this becomes a valuable record of assay performance over time. The CIMS viewer can be used at any time to review the progress of a whole screen. Spotfire can also be launched to plot graphs.