SDMS and LIMS Integration

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Quality Lab Workflow

Sampling → Analytical Data Generation → Evaluation → Report Creation → Review & Sign Off → Certificate of Analysis

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The Integration Challenge

Data Sources

Data Consumers

LIMS  ERP  ELN  Discovery Database
Data Export/Re-use

Data Sources

Waters NuGenesis SDMS

Data Consumers

LIMS  ERP  ELN  Discovery Database
How to Create CoAs?

Waters NuGenesis SDMS

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Data Transfer LIMS

- Batch ID
- Sample ID
- Worklist
- Results

Extraction
Template

Waters NuGenesis SDMS

Print Data

Raw Data

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SDMS2LIMS
Why Connecting Instruments to LIMS

- Save time
- Avoid errors
- Increase compliance
- Concentrate on exceptions
- Simplify documentation

=> Control the process
Which Instruments Should be Connected?

- All instruments?
- All instruments the LIMS knows?
- Chromatographic instruments? (80% of the data)
- Balances? (weights for chromatography)
- Non chromatographic instruments?

=> Evaluation of effort and benefit
How Shall Instruments be Linked?

- Each one individually (spaghetti connection)
- To a central point and then to LIMS (platform)

- Flexibility
- Implementation costs
- License costs
- Expertise
- Tracability

=> What can the Waters solution do?
Phase 1: LIMS to Instrument
Non-CDS Instruments Solution

LIMS

Printed work list for manual entry

Non-CDS Instrument
Phase 2:
Instrument to SDMS
Complex Instruments Solution

LIMS

Web Service Interface

Non-CDS Instrument

Print Report

.NET Interface

SDMS System
Phase 3: SDMS to LIMS
All Instrument Results

LIMS

COM Interface

Web Service Interface

Return Data/Result

.NET Interface

SDMS System

Empower

Non-CDS Instrument
What Format is Needed

[Image of a software interface showing options for file paths, temporary folders, trigger configuration file, deletion configuration file, error file, database driver type, data source alias, username, password, test connection, annotation attached, generate SDMS data table, mode options, and last configuration save options.]
Please select:
- a SDMS project: ERE_Test
- an Extraction Template: Ext_Temp_Coding_Examples_Split
- a SDMS view: Complex View
- a LIMS Environment: Development2-Sapphire

**Preview of Formatted Data**

**TableName: metadata**

<table>
<thead>
<tr>
<th>MODUL</th>
<th>u_analysisdate</th>
<th>s_instrumentid</th>
<th>QC_Batch_ID</th>
<th>LIFT_Param_List_ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>mx58883</td>
<td>6/14/2009</td>
<td>ExcelTests</td>
<td>ExtCode-Split</td>
<td>PLT000123</td>
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</tbody>
</table>

**TableName: samplesetdata**

<table>
<thead>
<tr>
<th>LIFT_Sample_ID</th>
<th>conc Result</th>
<th>LIFT_Result_ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-0906-00001</td>
<td>2.12</td>
<td>1</td>
</tr>
<tr>
<td>S-0906-00002</td>
<td>2.20</td>
<td>2</td>
</tr>
<tr>
<td>S-0906-00003</td>
<td>2.15</td>
<td>3</td>
</tr>
<tr>
<td>S-0906-00004</td>
<td>2.13</td>
<td>4</td>
</tr>
</tbody>
</table>

**TableName: sdmsdata**

<table>
<thead>
<tr>
<th>LIFT_Report_ID</th>
<th>ExtCode-Split</th>
</tr>
</thead>
</table>
Within Seconds
All Instrument Results

LIMS

Web Service Interface

Easy

COM Interface

Empower

Flexible

Non-CDS Instrument

Robust

.NET Interface

SDMS System
LIMS2VP + VP2LIMS
Two Major Types of Laboratory

- Discovery, R&D
  - Free-flow
  - Geared towards new scientific discoveries
  - Seeks to protect intellectual property rights

- Process, QC
  - Follows standard protocols
  - Geared towards routine testing
  - Often follows GxP such as EPA regulations

Maze obtained from pbs.org