



# Integrating laboratory instruments to LIMS to drive compliance

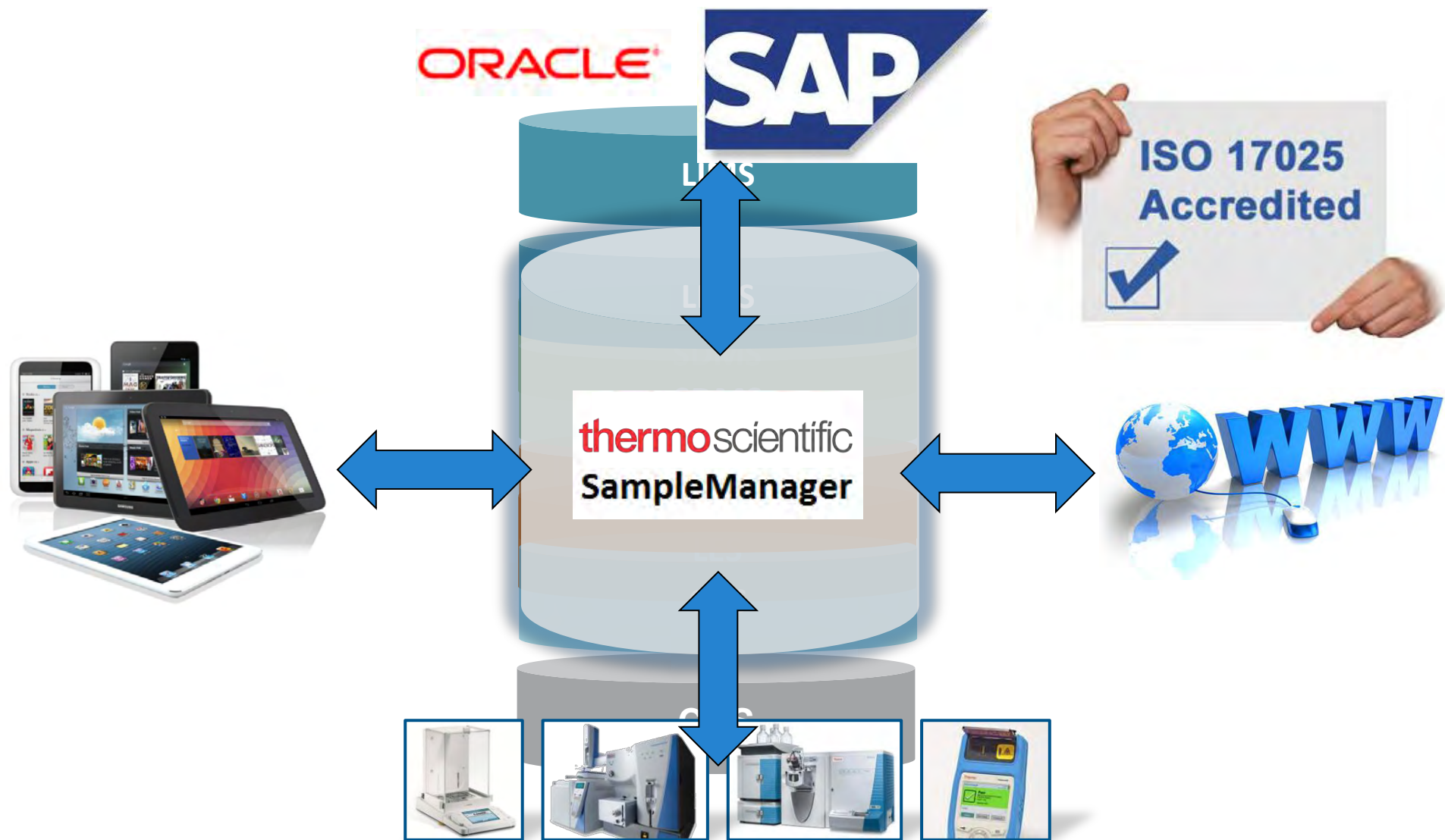
Steve Hunt, Middle East Account Manager

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# Integration, Integration, Integration

- We hear about integration all the time but what does it mean for your lab?
- How can integrating your instruments, equipment and systems bring costs down and help you achieve compliance?
- It's not just about connecting instruments

# Integrating Thermo Scientific™ SampleManager LIMS™



# Complete Laboratory Software Solution



**Increase efficiency,  
compliance & quality**

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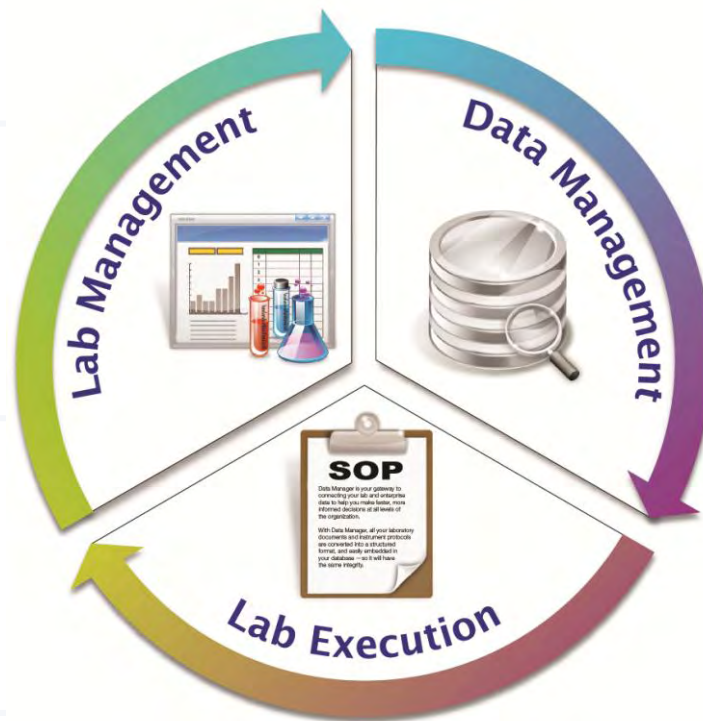
**Save money**

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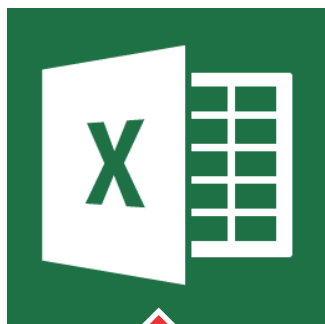
**Integrate your data**

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**All manual processes require extra checking & review**

**Excel™  
Spreadsheets**



**Manual Instrument  
Result Transcription**



**Paper Training  
Records**

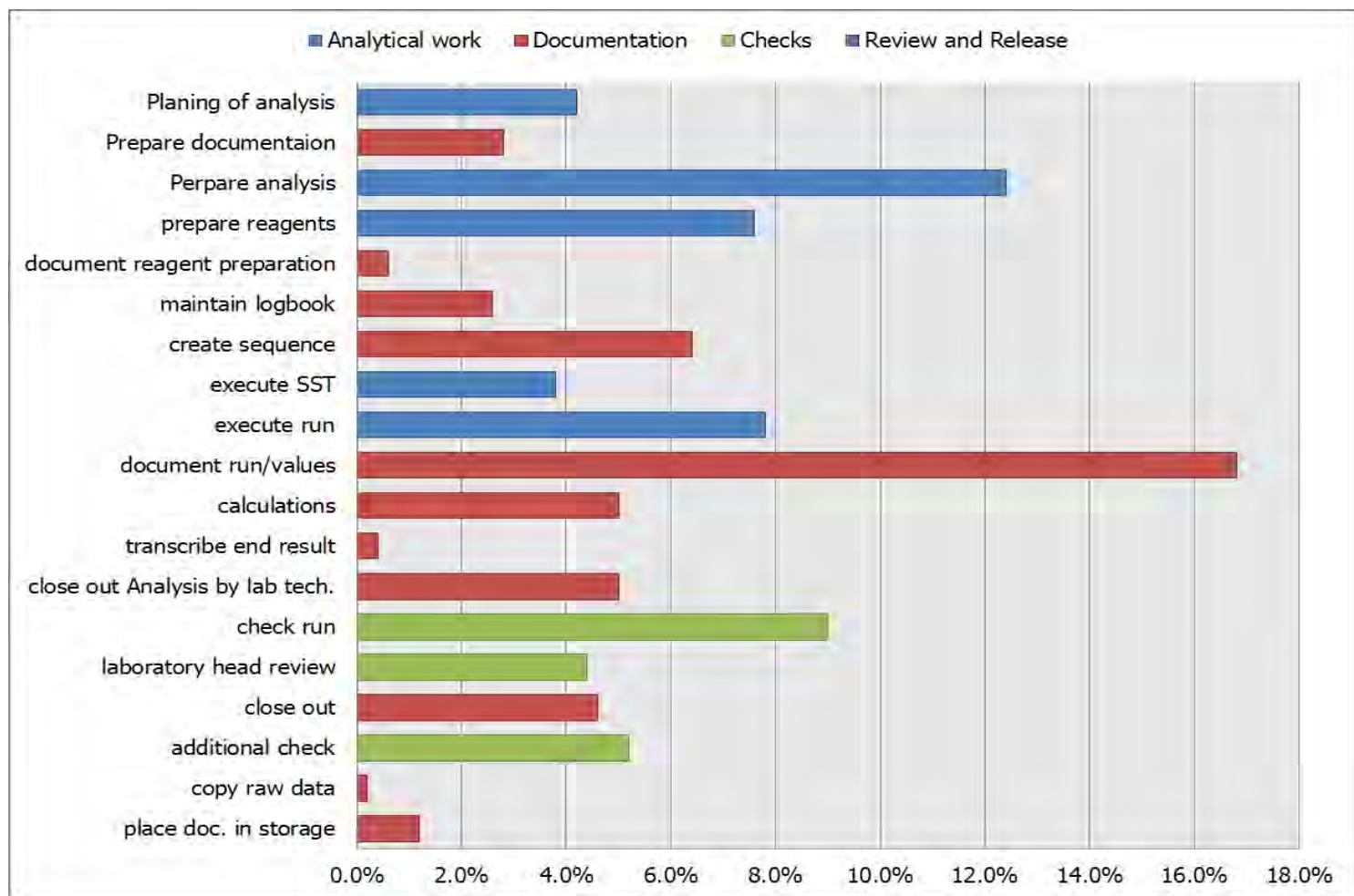


**Instrument Calibration &  
Service Logbooks**

**Paper Reports**

**Standards and  
Reagent Logbooks**

## As much as 40% of time is documentation to support compliance



## Fully integrated solution significantly reduces manual processes



Lab Execution

Instrument  
Calibration  
and  
Maintenance

Data  
Acquisition  
and  
Processing

Data  
Archiving

Stability  
Release

Product  
Specification

Batch Release





# How Thermo Fisher Scientific Automates Laboratory Processes

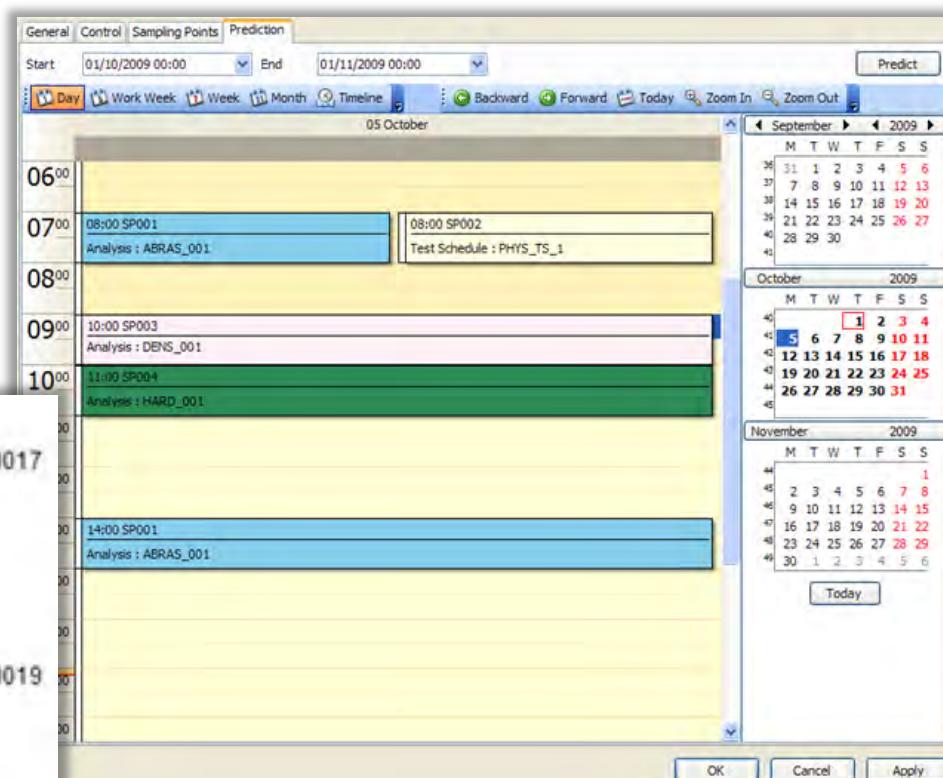
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**Dashboards provide a quick view of anything from stocks, to sample delivery, or trends at a particular location**



# Sample Receipt - Sample Tracking with Barcodes

One of the simplest ways to drive lab compliance



	16		17
SAMPLE NAME	SM-1-APR-2009-000016	SAMPLE NAME	SM-1-APR-2009-000017
SAMPLE POINT	500VGO	SAMPLE POINT	500VGO
SAMPLE TIME	01/04/2009. 15:56	SAMPLE TIME	01/04/2009. 15:56
CONTAINER	TANK21	CONTAINER	TANK21
HAZARD	BNTZ	HAZARD	BNTZ
	18		19
SAMPLE NAME	SM-1-APR-2009-000018	SAMPLE NAME	SM-1-APR-2009-000019
SAMPLE POINT	500VGO	SAMPLE POINT	500VGO
SAMPLE TIME	01/04/2009. 15:56	SAMPLE TIME	01/04/2009. 15:56
CONTAINER	TANK21	CONTAINER	TANK21
HAZARD	BNTZ	HAZARD	BNTZ
	20		21
SAMPLE NAME	SM-1-APR-2009-000020	SAMPLE NAME	SM-1-APR-2009-000021
SAMPLE POINT	500VGO	SAMPLE POINT	500VGO
SAMPLE TIME	01/04/2009. 15:56	SAMPLE TIME	01/04/2009. 15:56
CONTAINER	TANK21	CONTAINER	TANK21
HAZARD	BNTZ	HAZARD	BNTZ
	22		23
SAMPLE NAME	SM-1-APR-2009-000022	SAMPLE NAME	SM-1-APR-2009-000023
SAMPLE POINT	500VGO	SAMPLE POINT	500VGO

Easily design and print barcode labels, either on demand or on a schedule

## Mobile application enables productivity where it's needed

iPad 14:07 100%

**Thermo SCIENTIFIC** Welcome System Manager | Logout

Result Entry Save

SAMPLE ID	ANALYSIS	COMPONENT N...	TYPE	VALUE	UNITS	STATUS
5	A1/1	Comp Numeric1	N	12.9	g	Entered
5	A1/1	Matrix 1 Row(Ma...	N			Entered
5	A1/1	bool1	B	no		Modified
5	A1/1	char	C	K		Modified
5	A1/1	dt1	D	1 jan. 1970 01:00		Modified
5	A1/1	fie	F	Edit/View		Modified
5	A1/1	int	I	1 0:0:0		Modified
5	A1/1	n1	N	34		Modified
5						Modified

× The result value is not valid for this component



# Step by Step Method (SOP) Execution

Continue Laboratory Execution 'Weighing (045)'

Task Details

Name: Weighing (045)

Method: [weighing](#)

Assigned To: [System Manager](#)

Started: 06/06/2016 16:11

Progress

Step Name	Status
Balance	Completed
Weighed 5271	Completed
Weighed 5270	Completed
▶ Weigh Sample	In Progress

Weigh Sample

Scan a sample, then place it onto the balance.

Barcode scan

Parameters

Description	Value
Sample Identity	5269
▶ Balance Reading - Weight (mg)	200.96
Continue Scanning Samples?	<input checked="" type="checkbox"/>

Balance weight capture

Control progress through the SOP

Series of Sample

Read Stop Back Pause Continue

- Labs have lots of instruments
- Instruments produce a lot of results
  - 100 - 1000 a day?
- Manually writing results into the lab reporting system
  - A. Takes a lot of time
  - B. Has to be reviewed for errors
  - C. Is open to mistakes
- All this adds up to reduced efficiency

# The Solution

- Thermo Scientific™ SampleManager LIMS™
  - Bidirectional instrument integration
- Download
  - LIMS creates a sequence
    - Samples, QC's, blanks, washes etc
  - Sequence sent to the instrument
- Upload
  - When the instrument has done its analysis it exports a result file
  - Result file is mapped into LIMS against the correct samples

# Instrument Integration - Capture Results Directly

## Laboratory Information Management System (LIMS)



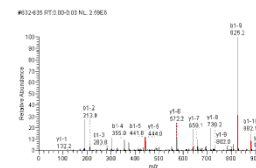
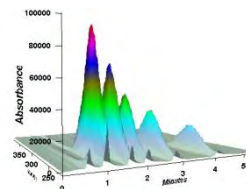
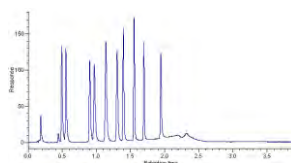
### Data Transformation Link

File/RS232

Chromatography Data System (CDS)

MSS

7.25



Balance

UV/FTIR

Gas  
Chromatograph

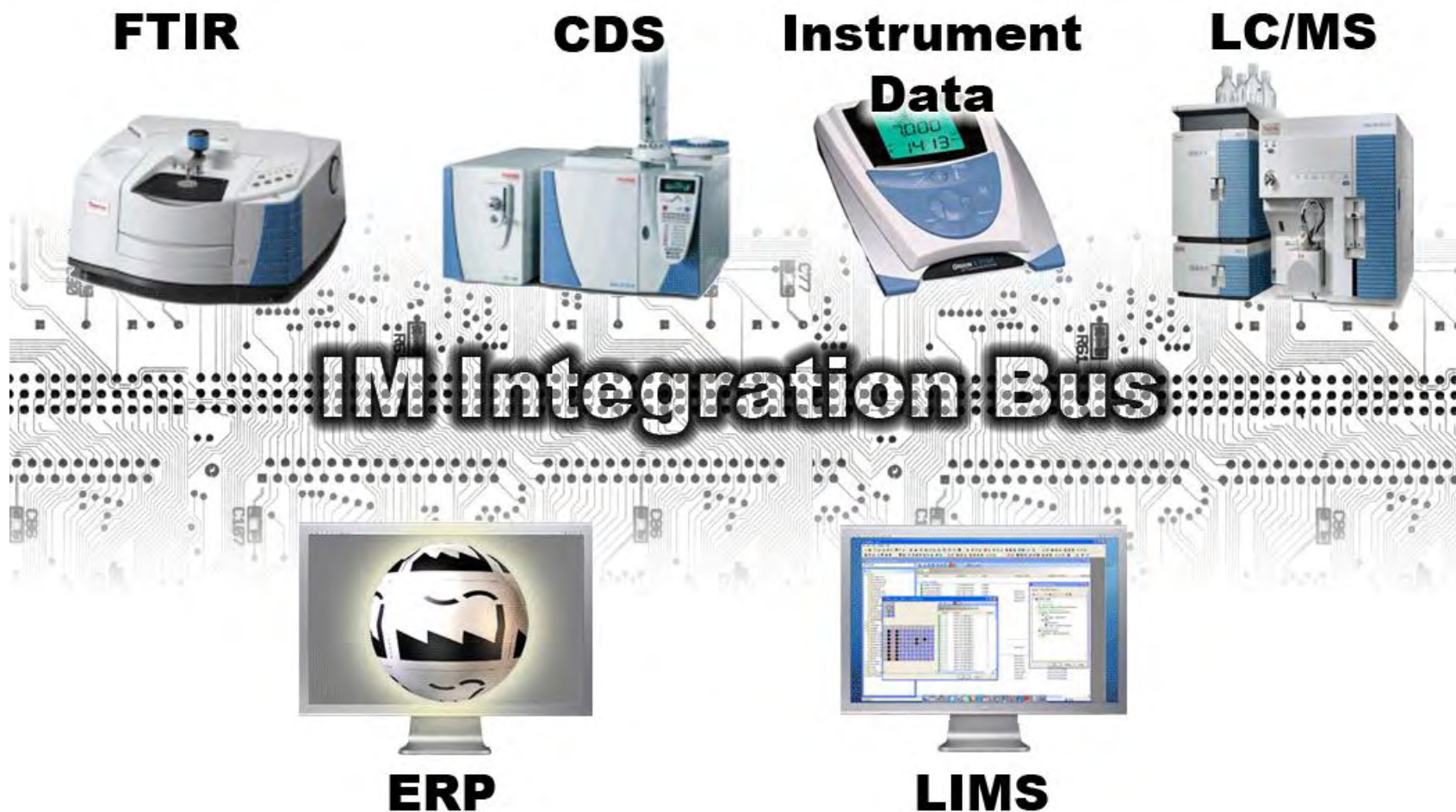
Liquid  
Chromatograph

Mass  
Spectrometry



**Integrate all instruments, not just those from Thermo Fisher**

# Integration Manager - 60% of all labs still don't do this



# Instrument Connectivity Return on Investment

- Automated data entry - no copying from paper
- Elimination of mistakes
- Streamlined review process
- Automatic notification



Time Saved Per Instrument

=



Saved Per year

# Result Review - Expedite the Review Process

- Automatic calculations using values collected
- Results automatically checked against stored specs in LIMS/SAP
- Results combined from all systems – CDS, SAP, etc. to provide holistic view
- Workflows can be used to map out decision processes
  - Automate decision making
  - Management by exception
  - Initiate actions based on results and outcomes
  - Alert team to non-compliance events
  - Drive automatic reporting



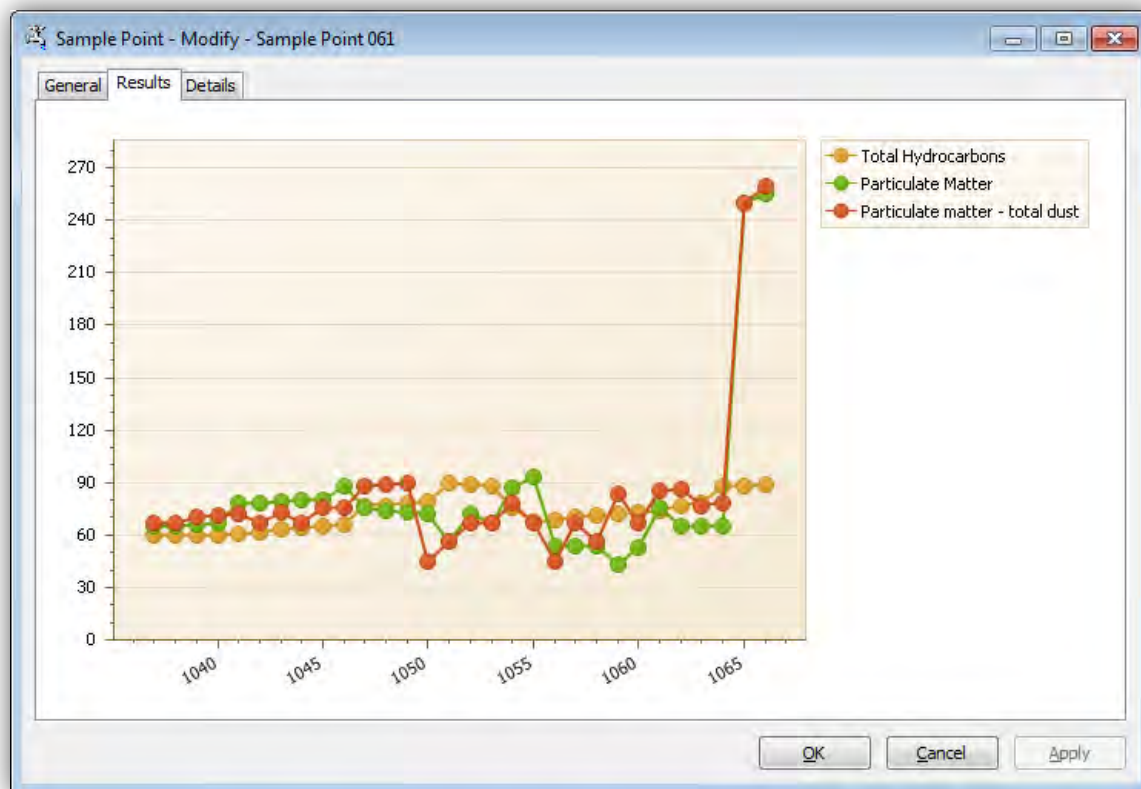
# Act on Results - Out of Specification Alerts

**Businesses request to  
rapidly:**

Send for re-test

Initiate corrective action

Produce and email reports



Dashboards can provide visual alerts to situations deviating from trend or failing specification.



What about all your scientific data?

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## The problem laboratories face across the globe



**Laboratories produce vast amounts of data from a number of different scientific instruments**

**MS, ICP, FTIR, UV, AA, LC, GC, SEM.....**

# Inability to retrieve instrument data files resulted in US FDA Warning Letters for several global pharma companies

How do avoid FDA warning letters by ensuring you can access the original raw data?

How do you collect all these different data types from each instrument efficiently?

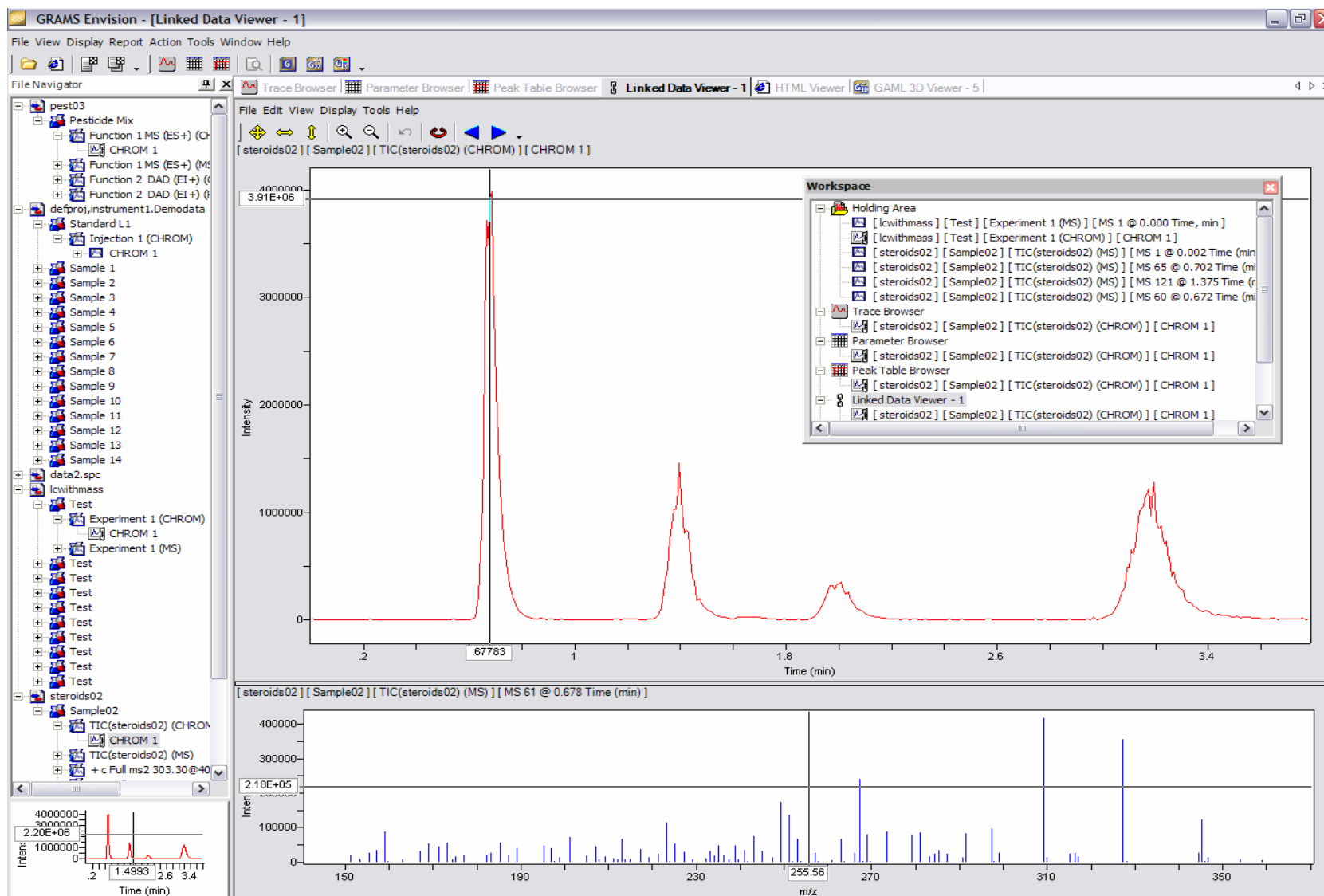
How do you centralise this data?

How do you share this data?

How do you search all this data?

How do you future proof this data?

# Data Management - View data from sample record



# Benefits of using an integrated laboratory

**Greatly improved compliance and productivity through massive reduction in paper and manual processes**

**Before Implementation**



**After Implementation**



Thank you!

