Destination Paperless Lab

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Introduction

- Today's laboratory needs to be connected all along the information food chain – from external partners and contractors, to remotely collected samples, through analytical instrumentation right through to distributing data within the organization.

- This presentation will demonstrate, using laboratory informatics examples, how technology and connectivity has evolved to deliver a truly paperless laboratory environment, allowing users to gain maximum benefit from the information they process.

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Agenda

- **Why use paper?**
- **Why go paperless?**
- **Demo 1 – Starting Simple**
- **Technology & Architecture**
- **Demo 2 – Taking it to the next level**
- **Conclusions**
- **Questions**

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Why Use Paper?

Benefits of paper…

- Easy to use
- Require little/no user training
- Convenient
- Portable
- Supports multiple data types
- Scalable
- Persistent
- Legally defensible

Problems with paper…

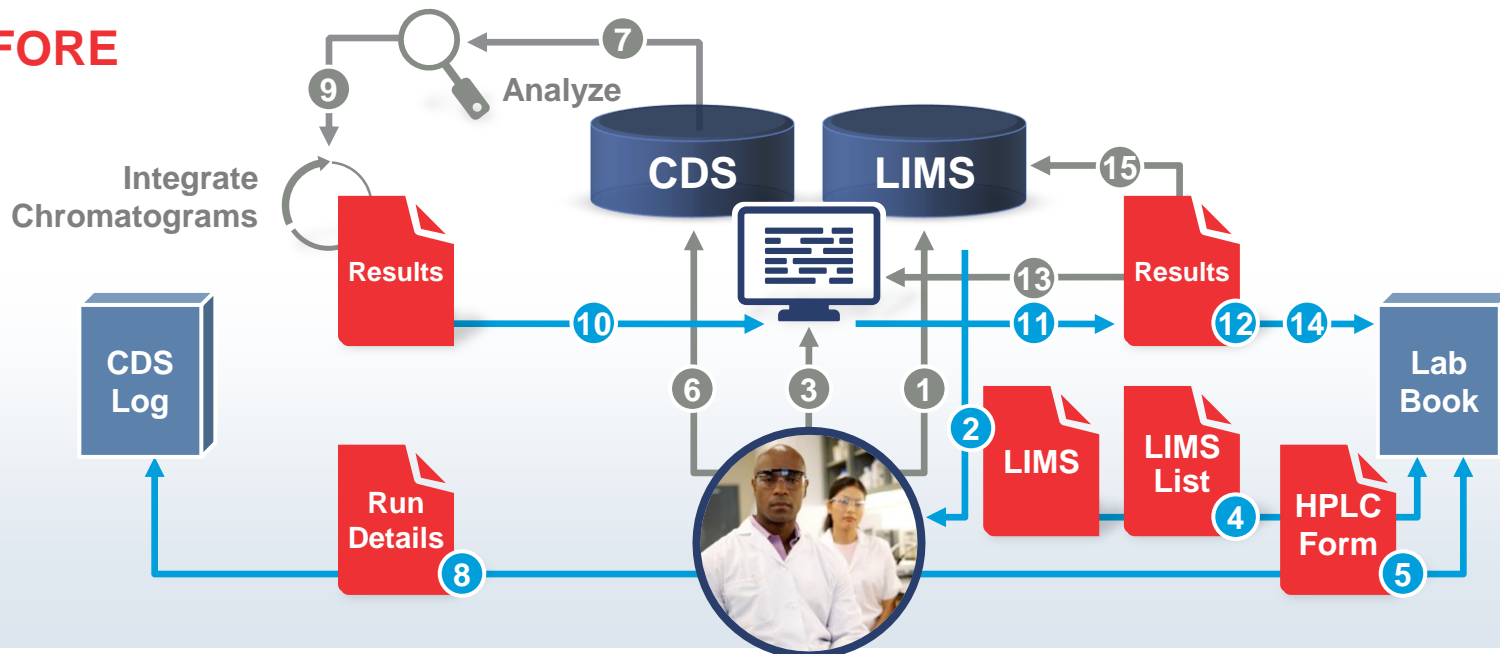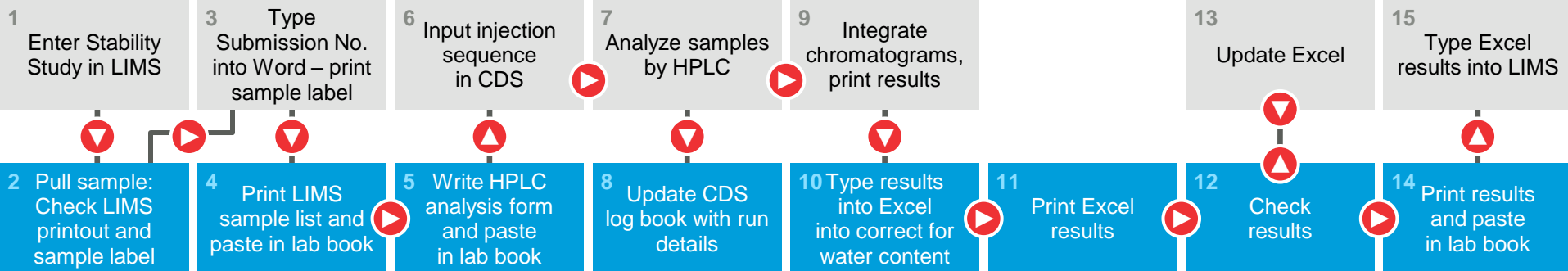| Security Risks	Expensive Maintenance	Not Searchable	Not Collaborative	Storage Issues

Why Go Paperless?

BEFORE

IT SYSTEM

1 Enter Stability Study in LIMS	**3** Type Submission No. into Word – print sample label	**6** Input injection sequence in CDS	**7** Analyze samples by HPLC	**9** Integrate chromatograms, print results		**13** Update Excel	**15** Type Excel results into LIMS
2 Pull sample: Check LIMS printout and sample label	**4** Print LIMS sample list and paste in lab book	**5** Write HPLC analysis form and paste in lab book	**8** Update CDS log book with run details	**10** Type results into Excel into correct for water content	**11** Print Excel results	**12** Check results	**14** Print results and paste in lab book

MANUAL PROCESSES

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Why Go Paperless?

AFTER

IT SYSTEM

| Enter Stability Study in LIMS | ▶ | Generate LIMS Sequence File and Download to CDS | ▶ | Analyze samples by HPLC | ▶ | Integrate chromatograms, print results | ▶ | Sign off results electronically | ▶ | Approve results by electronic signature | ▶ | Transfer Results to LIMS |

Pull sample: Print LIMS sample label
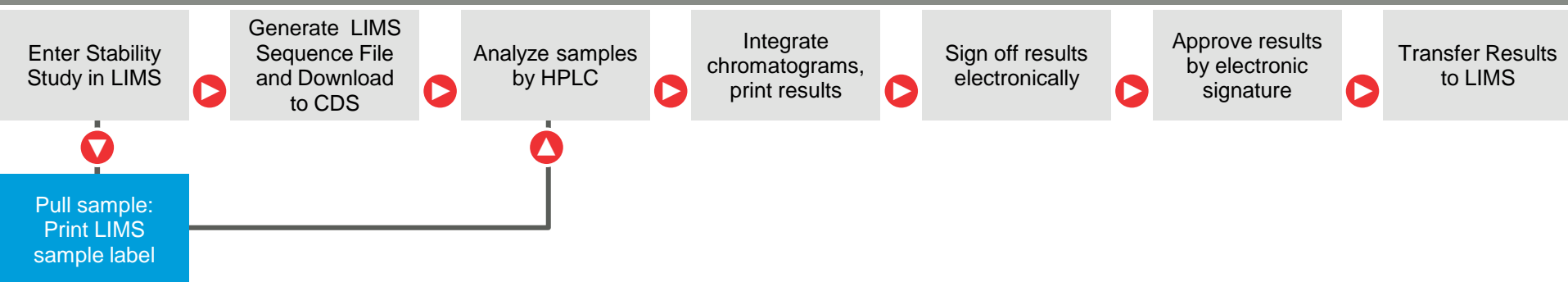
MANUAL PROCESSES

Delivering The Paperless Lab Environment
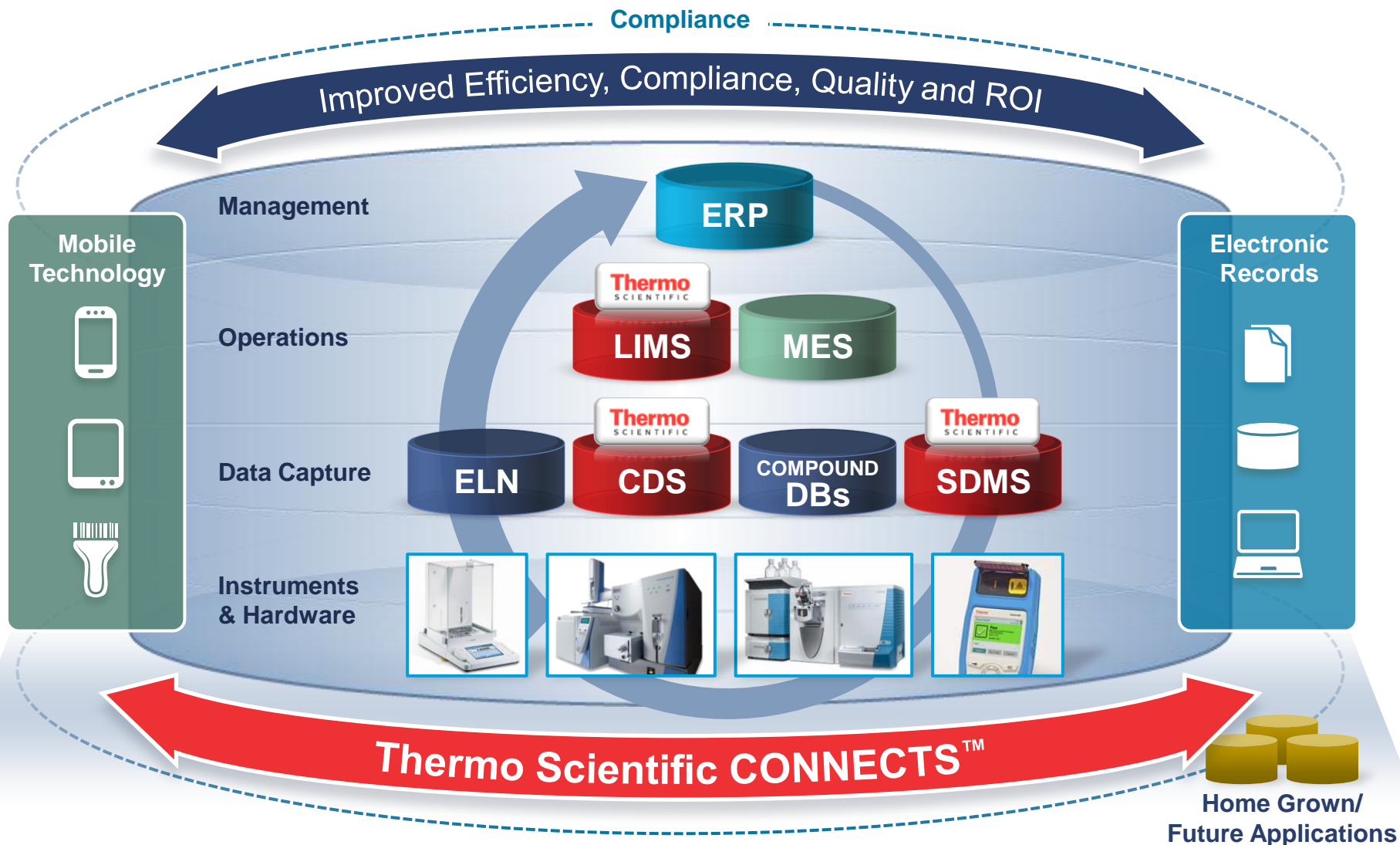
Evaluating Your Lab Operations

Dynamic on-demand, anywhere access to your information and knowledge — enabling faster, more informed decisions
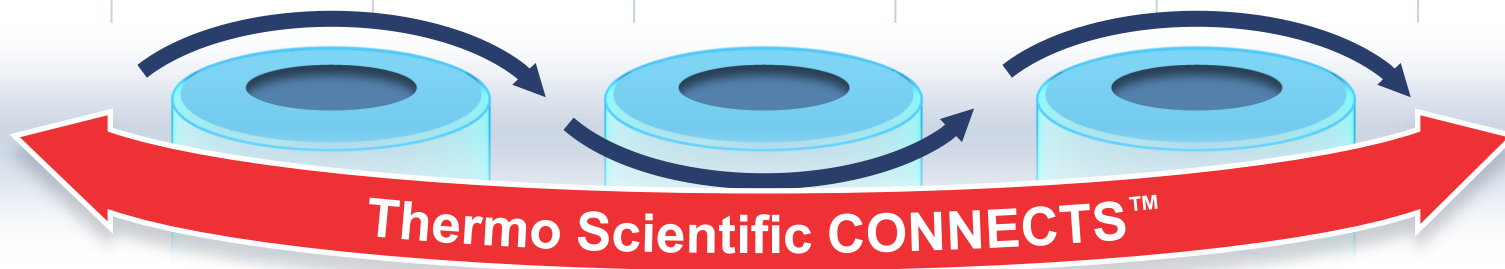

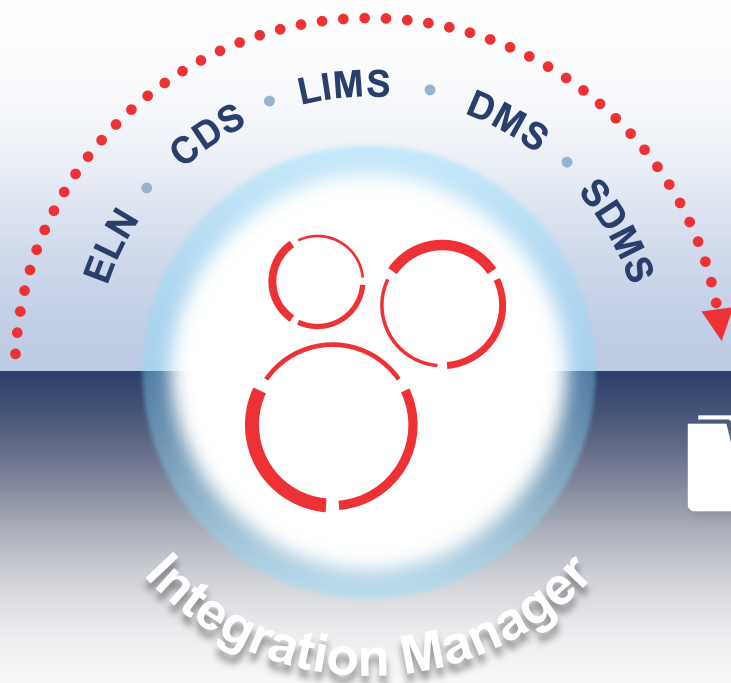| Sampling | Lab Testing | Inventory Management | Reagents | Supply and Procedure | Comparison & Reference Substance Qualification | Instrument Maintenance & Calibration |

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Connectivity and Automation

ELN · CDS · LIMS · DMS · SDMS

Integration Manager

Single connectivity platform
for all integration points in the process

SAP

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The 'Laboratory Interface'

- People are often used as the interface between systems and instruments

- Low tech solution

    - Also a low quality solution

- Human transcription has an error rate of 4σ or about 3-6 errors per 1000 transcriptions

- Under pressure (e.g. when mathematics is involved) that increases to 3 errors per 100 transcriptions

- New technology can change how we collect and connect data in the lab

Wouldn't it be nice if…?

- Samples are self identifying

- Data is passed to the instrument electronically

- Sequences, samples, controls all monitored

- Walk up instruments download data direct to your lab notebook

- *Sample vials are RFID or 2D barcode identified*

- *Wireless interface to instrument/data system*

- *Samples re-run, approved or rejected automatically*

- *Data transferred via Bluetooth to your 'notebook'*
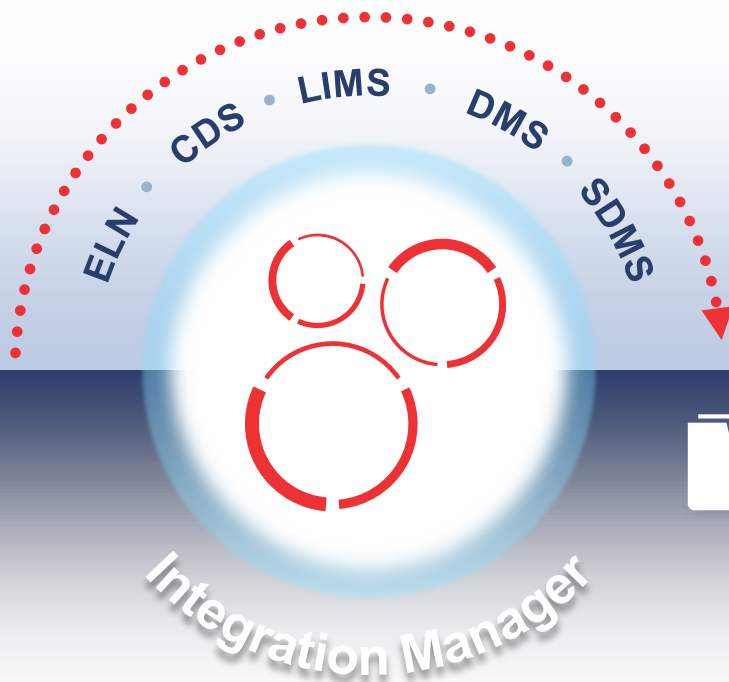
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Starting Simple – Demonstration 1

- Every lab has a balance

- Why interface something that simple?

- We can add control points and workflow to the process
  - Making your data collection secure, accurate and efficient

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CONNECT . AUTOMATE . VISUALIZE

Connectivity and Automation

ELN · CDS · LIMS · DMS · SDMS

Integration Manager

Single connectivity platform
for all integration points in the process

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Data Visualization

Real-time raw data access
anytime, anywhere

Only ThermoFisher

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Data Visualization - Concepts

Manual via PC
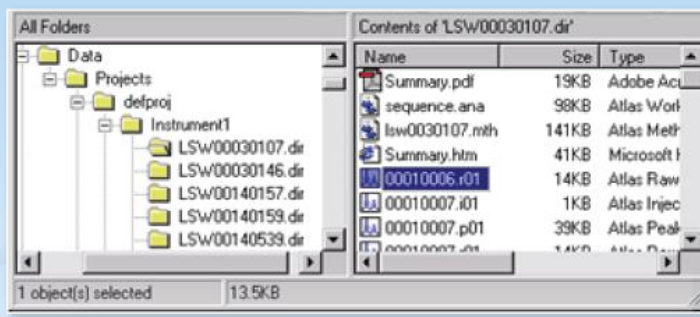
Automated using
Packaging Agents

Data Manager

File Converters

Original Data File(s)

Platform Neutral (xml) Files

Metadata + XML

Zip File

Zip File

Long term storage

Oracle
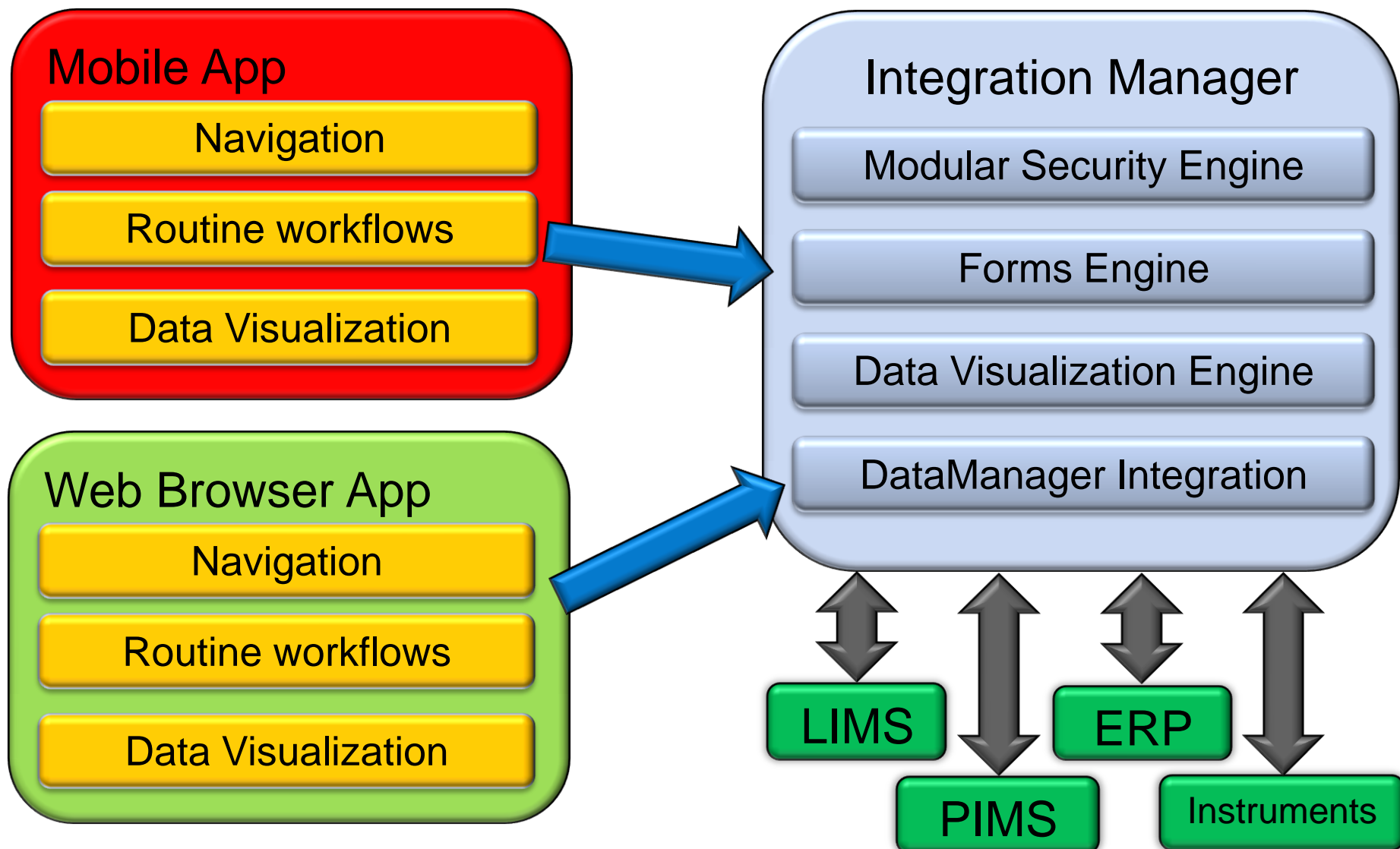Database

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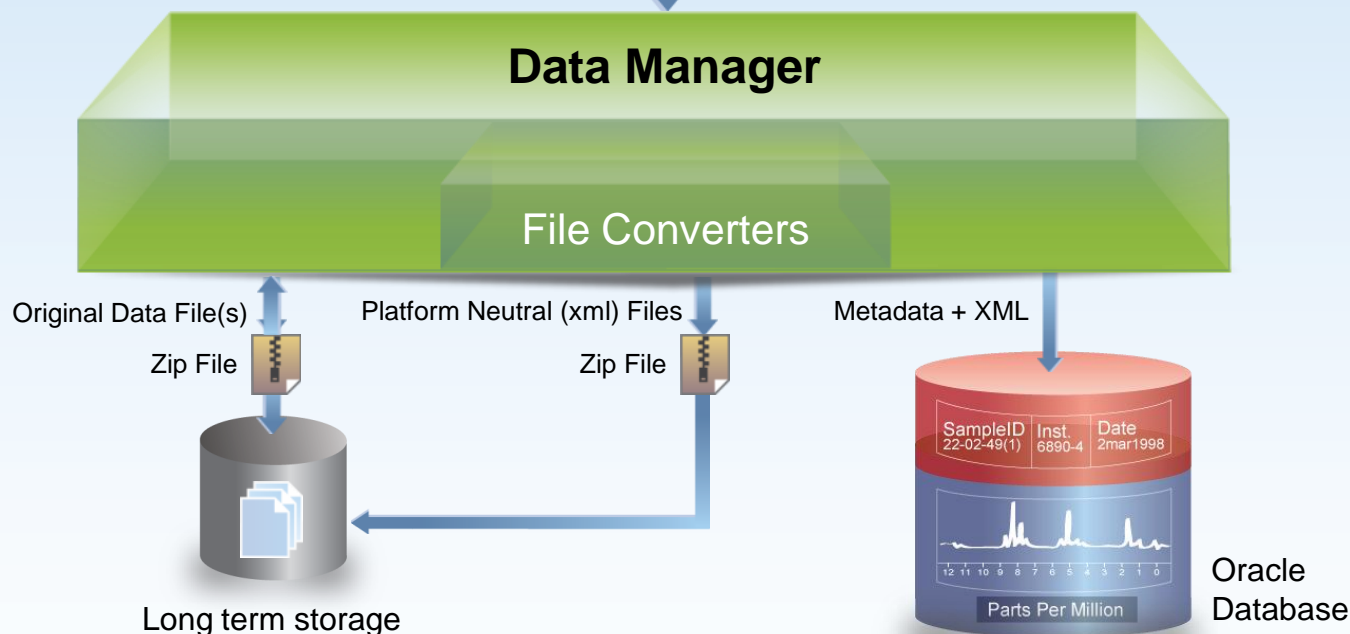
The Laboratory User Interface

- How will users carry out their work in the future?

- The advent of tablets and mobile computing has changed the way users think about software:

  - Ease of use – it should be obvious to a new user
  - Mobility – it shouldn't be fixed to a desk/bench
  - Automated – it should do things for me
  - Fit for purpose – it should fit in my environment

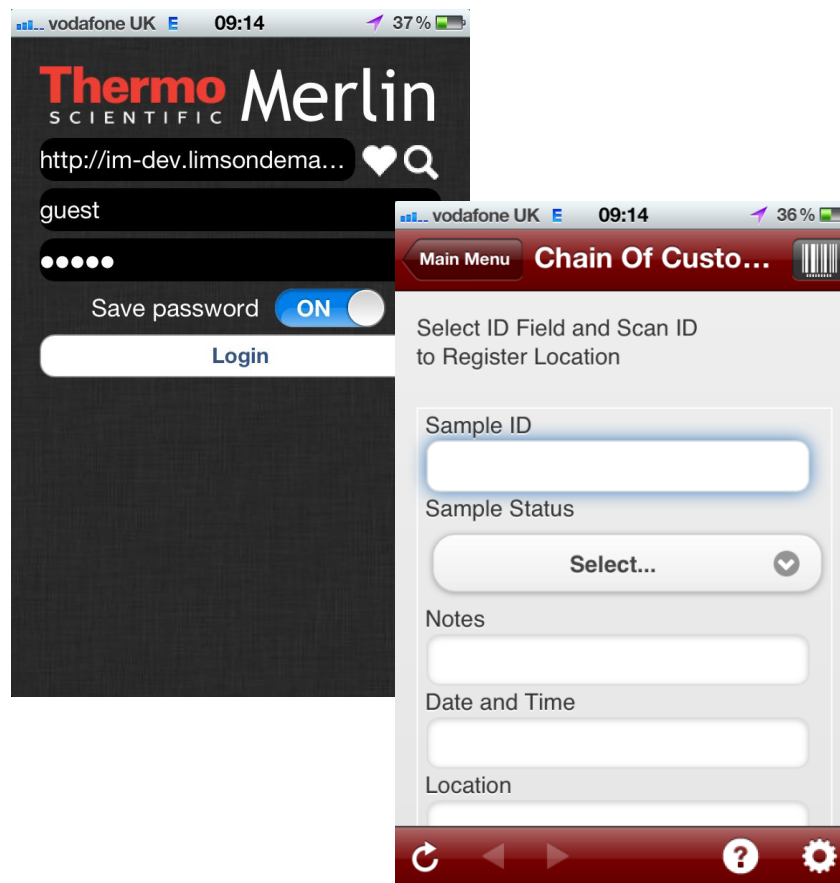*"Any sufficiently advanced technology is indistinguishable from magic"*

Arthur C Clarke

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Informatics Mobile Architecture

Mobile App
- Navigation
- Routine workflows
- Data Visualization

Web Browser App
- Navigation
- Routine workflows
- Data Visualization

Integration Manager
- Modular Security Engine
- Forms Engine
- Data Visualization Engine
- DataManager Integration

LIMS · ERP · PIMS · Instruments

Demonstration 2
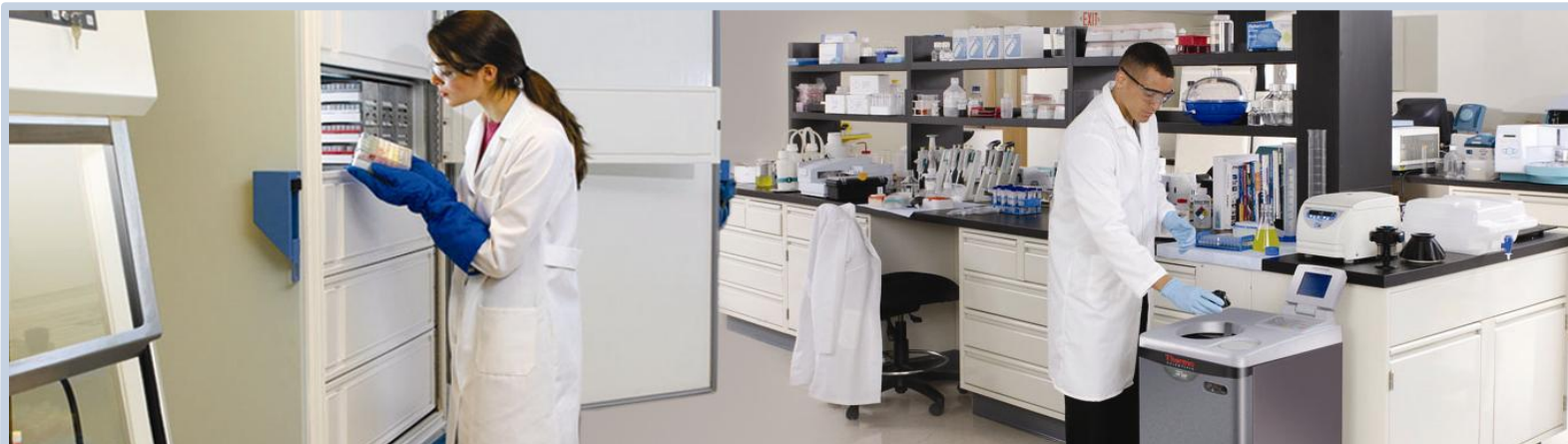
- Using Mobile Applications to collect laboratory data

Everything for the Laboratory…

…No Peers in the Industry

Ability to interact with your data	Support for any vendor	Breadth of Products	Depth of Experience	Unique Suite of Integration Tools

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Conclusions

Increase efficiency, compliance & quality

Save money

Integrate your data

Tools already exist
to deliver the Paperless lab

The Paperless Lab

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Questions?

Learn more at **www.thermoscientific.com/Informatics**

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