

PSCL



Work smarter.

CEMENT QUALITY



CEMENT
QUALITY

LDMS

Laboratory
Data
Management
System



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Work smarter:

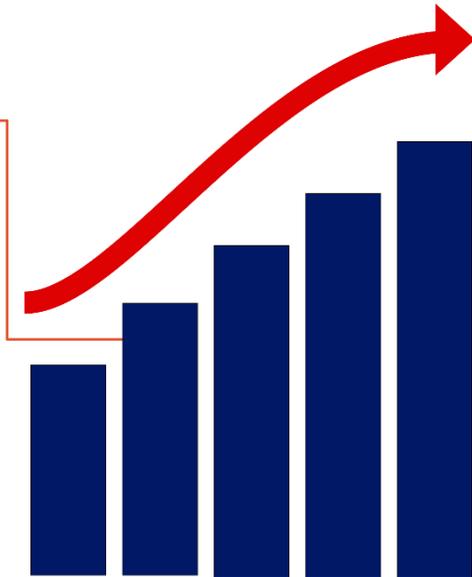
With over 60 installations LDMS is a world leader in laboratory information systems for the cement & bulk construction materials industries.



What does LDMS bring to your operation?

Continuous Quality Improvement

Through enhanced testing and a direct link to process control the quality of your output is assured.



Insurance

Certificates produced by LDMS can be instantly audited to verify:

- Testing Procedures,
- Instrument Calibration
- Personnel Qualifications

Helps with Sarbanes-Oxley compliance.

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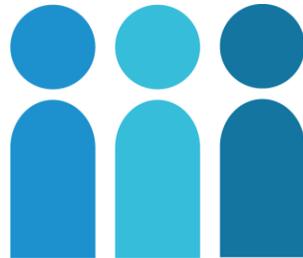
LDMS delivers on your journey towards Industry 4.0 and digitalization



LDMS becomes the Hub of your Lab

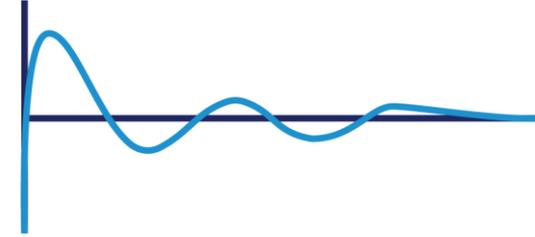


LAB



PEOPLE

The logo for LDMS (Laboratory Data Management System) is a blue rectangular box. At the top left is a white icon of a laboratory flask with two small circles inside. To its right, the words "CEMENT QUALITY" are written in white, stacked vertically. Below this, the word "LDMS" is written in large, bold, white letters. Underneath "LDMS", the words "Laboratory Data Management System" are written in smaller white text, stacked vertically.



PROCESS



ACCREDITATION

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How does LDMS bring value to your operation?

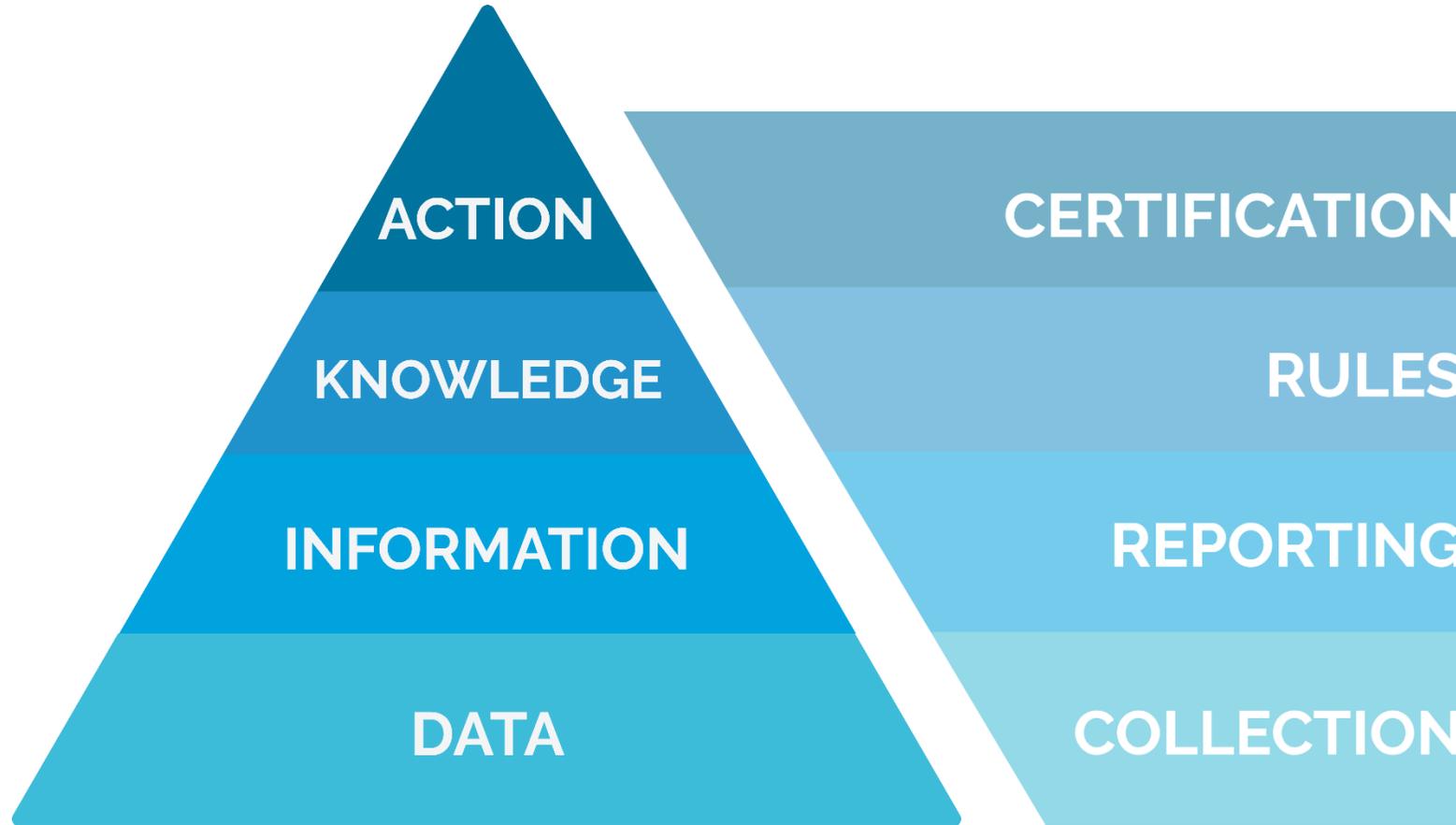
LDMS maximizes your lab's value by turning raw data into actionable knowledge.





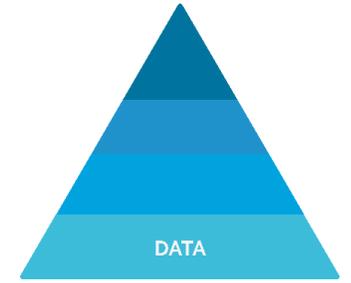
LDMS Data Management

LDMS turns raw data into actionable knowledge





The LDMS difference starts with getting data into the system



Manual Input

1

Range Checking

Reduce manual entry errors with range checking

2

Real Time Results

Calculations are updated in real time upon user entry

3

User Certifications

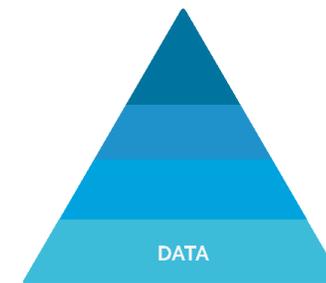
Only qualified staff can enter data

4

Instrument Calibration

Only properly calibrated instruments can be used

The LDMS difference starts with getting data into the system



Automated Input

1

Multi-Value Instruments

XRF, XRD, PSD use multi-value analysis that's attached automatically to the sample

2

Single Value Instruments

Calculations are updated in real time upon user entry

3

Process Data

Only qualified staff can enter data

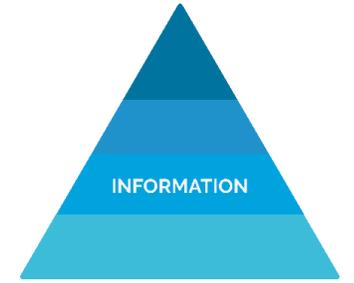
4

Microscopy Image Analysis

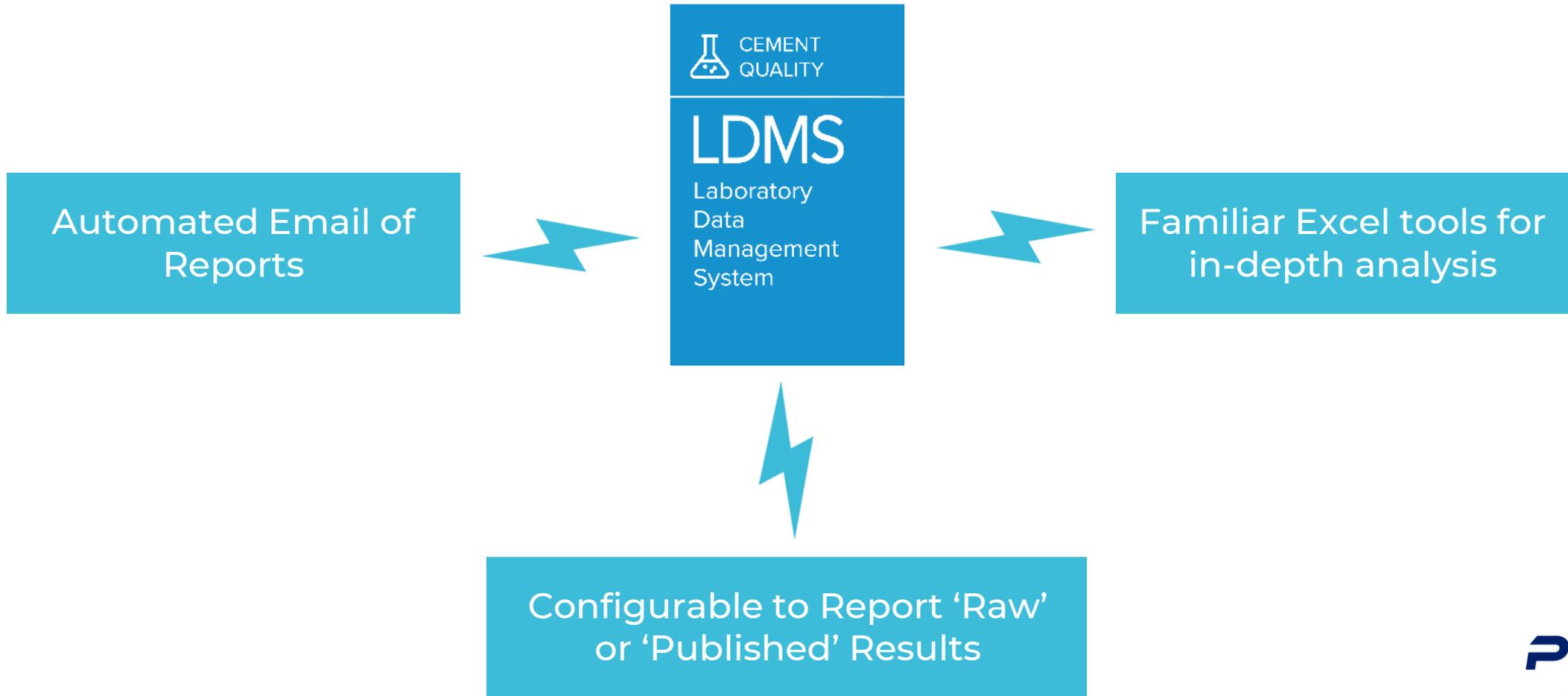
Helps turn you chemists knowledge into repeatable results.



LDMS lets you see your data where and when you need it



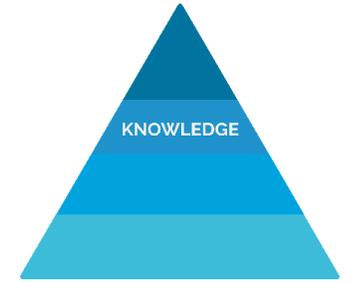
Reporting





LDMS helps you understand your data

Calculations



1

Calculations are part of Configuration

Assurance that results
are achieved the same
way every time

2

Real Time Calculations

You can see your result
immediately and will
know if there are any
range violations
immediately

3

Auditing

Know how you
obtained every result

4

Modular Calculation Capability

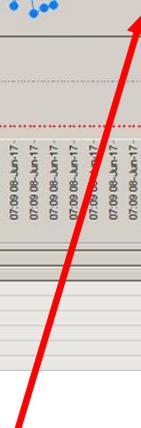
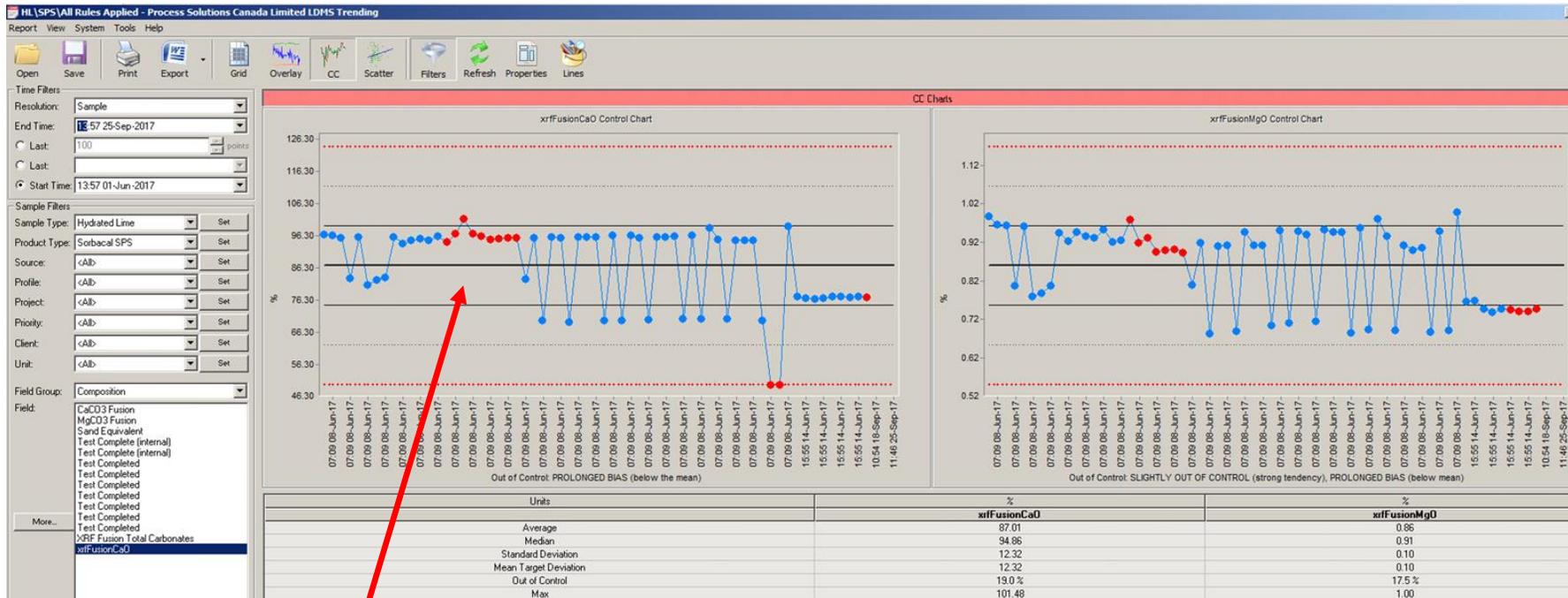
LDMS is always
building for the future

Data Management

LDMS helps you understand your data

KNOWLEDGE

Control Chart (SQC/SPC)



Control Charts can show clearly when the process is out of control and when action needs to be taken

The CC (Control Chart) Monitor program runs in the background. It continuously checks for rule violations. Once these violations are detected the end users are alerted to this event.



LDMS

Laboratory Data Management System

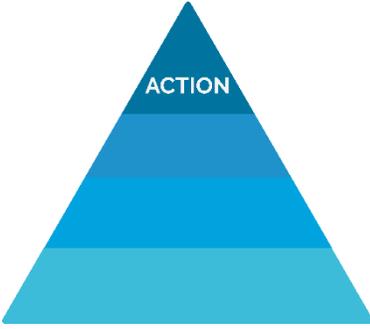


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Data Management

LDMS Data Management - Action



ACTION

PROCESS

Results are written directly and without delay to the control system historian or PLC allowing for control algorithm integration for **immediate quality improvement**

CERTIFICATES

Certificates produced by LDMS can be instantly audited to verify:

- Testing Procedures,
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- Personnel Qualifications



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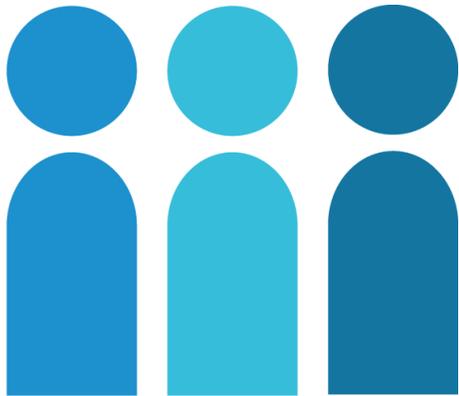
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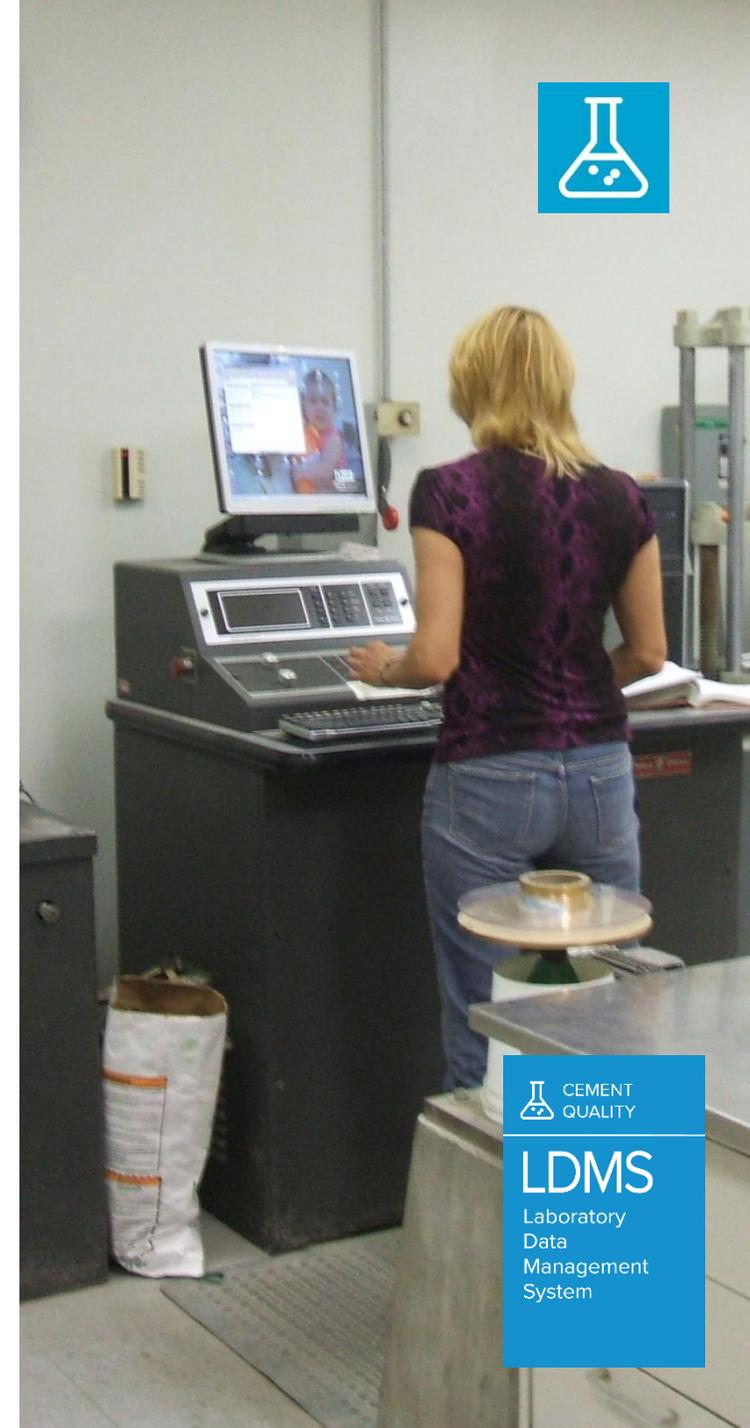
Laboratory
Data
Management
System



LDMS allows you to manage the different roles and responsibilities within your lab

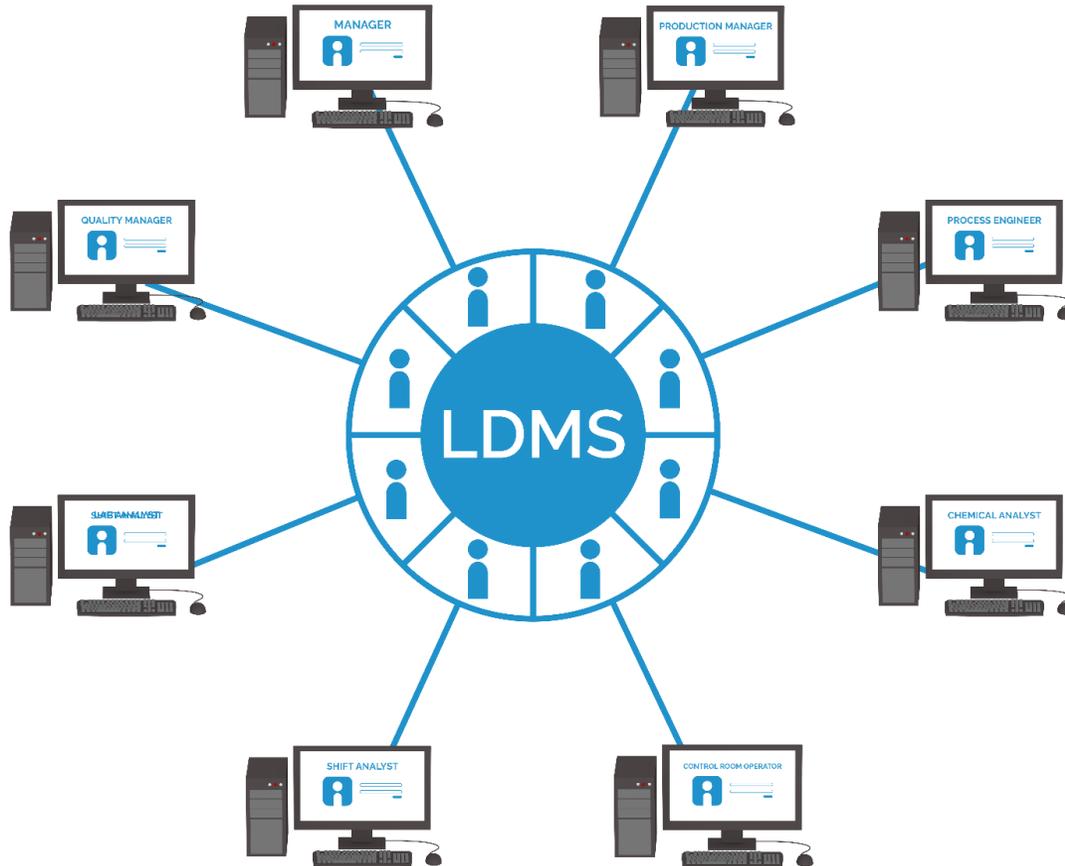


- Shift Analyst
- Control Room Operator
- Physical Lab Analyst
- Central / Chemical analyst
- Lab / Quality Manager
- Process Engineer
- Quality / Production Manager
- Corporate User / Manager





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LDMS allows you to manage the different roles and responsibilities within your lab

LDMS puts the right tools in front of users based on their role in your organization



When they log in, users will see a unique interface based on what is required to do their job.



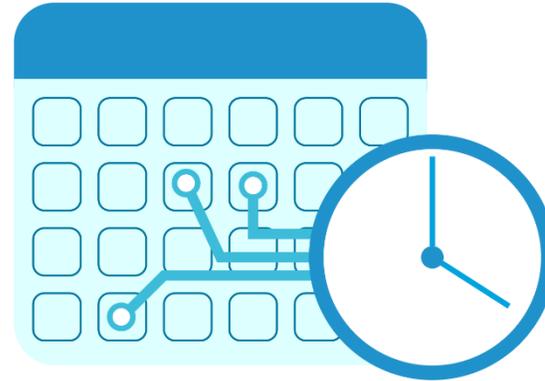
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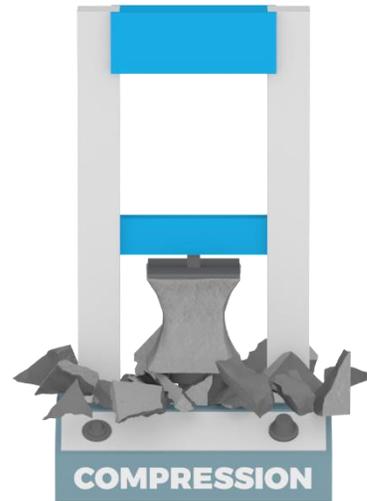
People Management

LDMS scheduling endures that your staff know what tests to do and when

- Prevent missed tests.
- Enjoy the ease of multi-task management



Sample Schedules Based on Shift



Break Schedules

| Test Report | | | | | |
|------------------|------------------|---------|----------|----------|--------|
| Start Time | End Time | SiO2(%) | Al2O3(%) | FeeO3(%) | CaO(%) |
| 2020-04-07 09:00 | 2020-04-07 09:01 | 3.12 | 0.62 | 0.55 | 51.66 |
| 2020-04-07 09:01 | 2020-04-07 09:02 | 2.80 | 0.64 | 0.52 | 51.79 |
| 2020-04-07 09:02 | 2020-04-07 09:03 | 2.37 | 0.85 | 0.28 | 52.80 |
| 2020-04-07 09:03 | 2020-04-07 09:04 | 7.74 | 0.50 | 0.40 | 61.94 |
| 2020-04-07 09:04 | 2020-04-07 09:05 | 4.30 | 0.76 | 0.51 | 49.41 |
| 2020-04-07 09:05 | 2020-04-07 09:06 | 3.47 | 0.78 | 0.71 | 61.01 |
| 2020-04-07 09:06 | 2020-04-07 09:07 | 7.75 | 0.64 | 0.39 | 51.97 |
| 2020-04-07 09:07 | 2020-04-07 09:08 | 2.61 | 0.59 | 0.56 | 50.91 |
| 2020-04-07 09:08 | 2020-04-07 09:09 | 3.40 | 0.70 | 0.54 | 50.92 |
| 2020-04-07 09:09 | 2020-04-07 09:10 | 2.93 | 0.80 | 0.31 | 51.76 |
| 2020-04-07 09:10 | 2020-04-07 09:11 | 3.74 | 0.75 | 0.34 | 61.07 |
| 2020-04-07 09:11 | 2020-04-07 09:12 | 4.63 | 0.87 | 0.37 | 50.97 |
| 2020-04-07 09:12 | 2020-04-07 09:13 | 4.27 | 0.88 | 0.67 | 49.16 |
| 2020-04-07 09:13 | 2020-04-07 09:14 | 2.75 | 0.60 | 0.70 | 49.80 |
| 2020-04-07 09:14 | 2020-04-07 09:15 | 1.99 | 0.97 | 0.26 | 50.91 |
| 2020-04-07 09:15 | 2020-04-07 09:16 | 2.09 | 0.69 | 0.67 | 61.11 |
| 2020-04-07 09:16 | 2020-04-07 09:17 | 1.93 | 0.49 | 0.53 | 54.57 |
| 2020-04-07 09:17 | 2020-04-07 09:18 | 2.15 | 0.69 | 0.41 | 61.68 |
| 2020-04-07 09:18 | 2020-04-07 09:19 | 3.02 | 0.58 | 0.49 | 50.71 |

Report Schedules

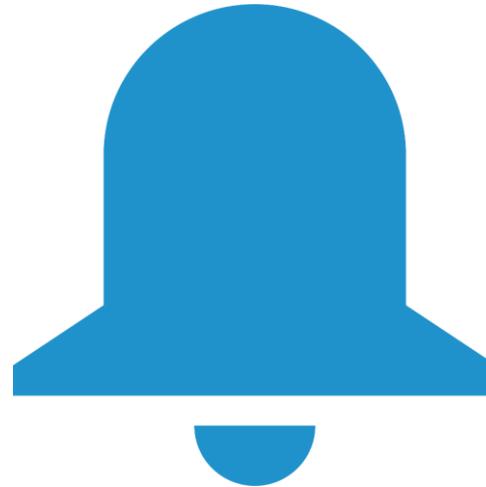


LDMS helps your people reduce errors

Range Violations and Alarms

User is immediately notified of range violations

Helps your people reduce errors.



Ranges can be configured to require confirmation from supervisors

Problems are immediately escalated to a level where they can be dealt with.





LDMS provides field proven Data Integrity
...because you never need it until you need it



DATA AUDIT

- ✓ Every entry is has an audit trail
- ✓ Out-of-range or re-test can require user comment
- ✓ Complete sample tracking history

DATA SECURITY

- ✓ Data entry controlled by authorisation and user capability
- ✓ Out-of-range entries requiring supervisor or second-user verification
- ✓ Physical key login allows multi-station use.
- ✓ Published results are locked from overwrite

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CEMENT QUALITY

LDMS brings value to your operation with its unique blend of **Data Management, People Management & Security**



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LDMS Enterprise Functionality

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Laboratory Data Management System

Single System (Central) or Multiple configuration with central CQDB Rollup:

LDMS accommodates diverse central analysis philosophies.

No need to force major changes of existing systems

LIML – defines a standard for system interchange



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