

## SDMS

## (Sample Data Management System) A Solution for LIMS Implementation

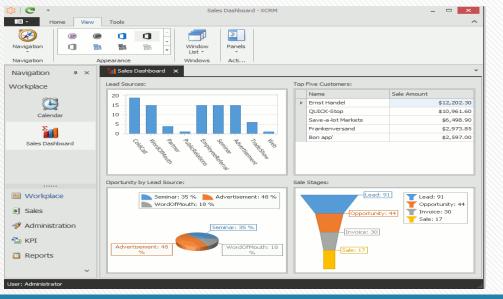


## About us

Headquarters: Houston, TX Employees: 40+ Funded: 2008 Products: BTLIMS, Inventory Management, LDM, SDMS







### Sample Data Management System (SDMS)

What is SDMS? What can SDMS do? What is it different versus LIMS?

We always face challenges during the LIMS implementations:

Customization, Customization, Customization...on:

Original sample analysis reports Original data entry templates

No end...

### Original Sample Analysis Reports and Data Entry Templates

The report and data entry layout design could be varied based on:

- Industries: Environmental, Industry, Food, Clinical, Microbiology, Asbestos...
- Elements: Water, Soil, Air, Gas, Media, Noise...
- Data Capture: Static Sampling; Dynamic Sampling (Frequency)
- Custom Preference: The templates that have been used for long time
- More...

Comparisons: The way regular LIMS handles vs the way clients prefer

### Normal LIMS\_ELN Data Entry: Ammonia

<b>Calibration Ru</b>												Calibration	) Chart		
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Calibration		mg/L	5.0	45.0	1.0	64	4.9	0.0105	1.0	1.0	100				_
Calibration	4   5.0	ma/L	25.0	25.0	5.0	2	3.6	0.7134	5.2	5.0	104 ~				~
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	Matrix				Weight(g)	1.00	-	-		0.				Qualifier	10/23
18101032.01	Matrix Liquid	10/23/2018 08:30	Qb18102311 Qb18102311	50	Weight(g)	1	112.6	-0.8013	0.2	0. 0.	1580	mg/L	0.1	Qualifier	10/23
18101032.01 18101037.02	Matrix Liquid Liquid	10/23/2018 08:30 10/23/2018 08:30	Qb18102311 Qb18102311	50 50	Weight(g)	1	112.6 120.3	-0.8013 -0.9324	0.2	0. 0. 0.	1580 1168	mg/L mg/L	0.1	Qualifier	10/23 10/23 10/23
<ul> <li>18101032.01</li> <li>18101037.02</li> <li>18101053.02</li> </ul>	Matrix Liquid Liquid Liquid	10/23/2018 08:30 10/23/2018 08:30 10/23/2018 08:30	Qb18102311 Qb18102311 Qb18102311	50 50 50 50	Weight(g)	1 1 1 1	112.6 120.3 126.0	-0.8013 -0.9324 -1.0294	0.2 0.1 BRL	0. 0. 0. 60	1580 1168 0935	mg/L mg/L mg/L	0.1 0.1 0.1	Qualifier	10/23 10/23 10/23 10/23
<ul> <li>18101032.01</li> <li>18101037.02</li> <li>18101053.02</li> <li>18101056.01</li> </ul>	Matrix Liquid Liquid Liquid Liquid	10/23/2018 08:30 10/23/2018 08:30 10/23/2018 08:30 10/23/2018 08:30	Qb18102311 Qb18102311 Qb18102311 Qb18102311 Qb18102311	50 50 50 50 5	Weight(g)	1 1 1 10	112.6 120.3 126.0 19.4	-0.8013 -0.9324 -1.0294 0.7849	0.2 0.1 BRL 60.9	0. 0. 0. 60	1580 1168 0935 .9360	mg/L mg/L mg/L mg/L	0.1 0.1 0.1 1	Qualifier	10/23 10/23 10/23 10/23 10/23
<ul> <li>18101032.01</li> <li>18101037.02</li> <li>18101053.02</li> <li>18101056.01</li> <li>18101088.01</li> </ul>	Matrix Liquid Liquid Liquid Liquid Liquid	10/23/2018 08:30 10/23/2018 08:30 10/23/2018 08:30 10/23/2018 08:30 10/23/2018 08:30	Qb18102311 Qb18102311 Qb18102311 Qb18102311 Qb18102311 Qb18102311 Qb18102311	50 50 50 5 5 50 50	Weight(g)	1 1 1 10 1	112.6 120.3 126.0 19.4 130.4	-0.8013 -0.9324 -1.0294 0.7849 -1.1043	0.2 0.1 BRL 60.9 BRL	0. 0. 0. 60 0.	1580 1168 0935 09360 0787	mg/L mg/L mg/L mg/L mg/L	0.1 0.1 0.1 1 0.1	Qualifier	10/23, 10/23, 10/23, 10/23, 10/23, 10/23, 10/23,
<ul> <li>18101032.01</li> <li>18101037.02</li> <li>18101053.02</li> <li>18101056.01</li> <li>18101088.01</li> <li>18101122.01</li> </ul>	Matrix Liquid Liquid Liquid Liquid Liquid Liquid	10/23/2018 08:30 10/23/2018 08:30 10/23/2018 08:30 10/23/2018 08:30 10/23/2018 08:30 10/23/2018 08:30	Qb18102311 Qb18102311 Qb18102311 Qb18102311 Qb18102311 Qb18102311 Qb18102311 Qb18102311	50 50 50 5 5 50 50 50 50	Weight(g)	1 1 1 10 1 1	112.6 120.3 126.0 19.4 130.4 128.2	-0.8013 -0.9324 -1.0294 0.7849 -1.1043 -1.0668	0.2 0.1 BRL 60.9 BRL BRL	0. 0. 60 0. 0. 0.	1580 1168 0935 09360 0787 0857	mg/L mg/L mg/L mg/L mg/L mg/L	0.1 0.1 0.1 1 0.1 0.1 0.1	Qualifier	10/23, 10/23, 10/23, 10/23, 10/23, 10/23, 10/23,
18101032.01           18101037.02           18101053.02           18101056.01           18101088.01           18101122.01           18101124.01	Matrix Liquid Liquid Liquid Liquid Liquid Liquid Liquid	10/23/20 18 08:30           10/23/20 18 08:30           10/23/20 18 08:30           10/23/20 18 08:30           10/23/20 18 08:30           10/23/20 18 08:30           10/23/20 18 08:30           10/23/20 18 08:30           10/23/20 18 08:30           10/23/20 18 08:30	Qb18102311 Qb18102311 Qb18102311 Qb18102311 Qb18102311 Qb18102311 Qb18102311 Qb18102311	50 50 50 5 5 5 50 50 50 50 50	Weight(g)	1 1 1 10 1 1 1 1	112.6 120.3 126.0 19.4 130.4 128.2 132.1	-0.8013 -0.9324 -1.0294 0.7849 -1.1043 -1.0668 -1.1332	0.2 0.1 BRL 60.9 BRL BRL BRL	0. 0. 0. 60 0. 0. 0. 39	1580 1168 0935 0.9360 0787 0857 0736	mg/L mg/L mg/L mg/L mg/L mg/L mg/L	0.1 0.1 0.1 1 0.1 0.1 0.1 0.1	Qualifier	Analys 10/23, 10/23, 10/23, 10/23, 10/23, 10/23, 10/23, 10/23, 10/23, 10/23, 10/23, 10/23, 10/23, 10/23, 10/23, 10/23, 10/23, 10/23, 10/23, 10/24, 10/24, 10/25,

### Normal LIMS\_ELN Data Entry: TSS

### File Edit

mple Run Log QCS	Sample Run Log										
SampleID	TrayID	InitialWt1(g)	InitialWt(g)	FinalWt1(g)	FinalWt(g)	WtDiff(g)	Appearence	VolumeUsed(ml)	Weight(g)	Results	NumericResults
18101275.01	39	1.39053	1.39053	1.39087	1.39087	0.00034	CLOUDY	100		3.4	3.4
18101276.01	40	1.39774	1.39774	1.40245	1.40245	0.00471	cloudy	100		47.1	47.1
18101307.01	41	1.40177	1.40177	1.40638	1.40638	0.00461	DIRTY	10		461.0	461
18101310.01	28	1.40149	1.40149	1.40154	1.40154	0.00005	CLEAR	250	2.	BRL	0.2
18101310.02	29	1.40010	1.40010	1.40040	1.40040	0.00030	CLEAR	250		1.2	1.2
18101310.03	30	1.39696	1.39696	1.39691	1.39691	-0.00005	CLEAR	250		BRL	-0.2
18101310.04	31	1.41160	1.41160	1.42050	1.42050	0.00890	CLEAR	250		35.6	35.6
18101347.01	33	1.41416	1.41416	1.41442	1.41442	0.00026	CLEAR	250		1.0	1.04

s	ample Run Log QCS	ample Run Log											
	RunType	SampleID	TrayID	InitialWt1(g)	InitialWt(g)	FinalWt1(g)	FinalWt(g)	WtDiff(g)	Appearence	VolumeUsed(ml)	Weight(g)	Results	Numeric
►	Method Blank		42	1.39587	1.39587	1.39586	1.39586	-0.00001		100		BRL	-0.1
	Dup	18101275.01	43	1.39221	1.39221	1.39260	1.39260	0.00039	CLOUDY	100		3.9	3.9
	LCS		44	1.39195	1.39195	1.43565	1.43565	0.04370		100		437.0	437

### Normal LIMS\_ELN Data Entry: Total Coliform

#### File Edit

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18	3101142	18101142.01	qb 18 10 19 24	10/18/2018 10:15	Raja	10/19/2018 10:15 - 10/19/2018 1	35	-	Absent	Absent			
18	3101151	18101151.01	qb18101924	10/18/2018 12:50	Raja	10/19/2018 12:50 - 10/19/2018 1	35	-	Absent	Absent			
18	3101164	18101164.01	qb18101924	10/18/2018 14:00	Raja	10/19/2018 14:00 - 10/19/2018 1	35	-	Absent	Absent			
18	3101164	18101164.02	qb18101924	10/18/2018 14:00	Raja	10/19/2018 14:00 - 10/19/2018 1	35	-	Absent	Absent			
18	3101165	18101165.01	qb18101924	10/18/2018 14:00	Raja	10/19/2018 14:00 - 10/19/2018 1	35	-	Absent	Absent			
18	8101165	18101165.02	qb18101924	10/18/2018 14:00	Raja	10/19/2018 14:00 - 10/19/2018 1	35	-	Absent	Absent			
18	3101184	18101184.03	qb18101924	10/18/2018 15:25	Raja	10/19/2018 15:25 - 10/19/2018 1	35	-	Absent	Absent			
18	3101186	18101186.01	qb18101924	10/18/2018 16:00	Raja	10/19/2018 16:00 - 10/19/2018 2	35	-	Absent	Absent			
18	3101186	18101186.02	qb18101924	10/18/2018 16:00	Raja	10/19/2018 16:00 - 10/19/2018 2	35	-	Present	Absent			
18	3101186	18101186.03	qb18101924	10/18/2018 16:00	Raja	10/19/2018 16:00 - 10/19/2018 2	35		Absent	Absent			
18	3101192	18101192.01	qb18101924	10/18/2018 16:00	Raja	10/19/2018 16:00 - 10/19/2018 2	35		Present	Absent			
18	3101192	18101192.02	qb18101924	10/18/2018 16:00	Raja	10/19/2018 16:00 - 10/19/2018 2	35	-	Absent	Absent			
18	3101193	18101193.01	qb18101924	10/18/2018 16:00	Raja	10/19/2018 16:00 - 10/19/2018 2	35	-	Absent	Absent			
18	3101193	18101193.02	qb18101924	10/18/2018 16:00	Raja	10/19/2018 16:00 - 10/19/2018 2	35	20	Absent	Absent			
18	3101203	18101203.01	qb18101924	10/18/2018 16:35	Raja	10/19/2018 16:35 - 10/19/2018 2	35	•	Absent	Absent			TX0150559
18	3101203	18101203.02	qb18101924	10/18/2018 16:35	Raja	10/19/2018 16:35 - 10/19/2018 2	35	-	Absent	Absent			TX0150559
18	3101203	18101203.03	qb18101924	10/18/2018 16:35	Raja	10/19/2018 16:35 - 10/19/2018 2	35	•	Absent	Absent			TX0150559
18	3101219	18101219.01	qb18101924	10/18/2018 17:45	Raja	10/19/2018 17:45 - 10/19/2018 2	35	-	Absent	Absent			

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Export Retrieve

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### Customer raw data entry template (Single analyte): COD

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### Customer raw data entry template (multiple analytes): Monitoring

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### Customer raw data entry template (complex): TH/Methane

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### The Solutions and Goals to be Achieved

### Be able to

- 1) design any custom raw data result entry templates
- 2) create multiple level calibration regression curve
- 3) manage single or multiple parameters (analytes)
- 4) set up formulas for calculations in any field
- 5) have data parsing functions to define fields and save to database
- 6) have functions to build simple parsers for instrument data imports
- 7) have functions to design and create complex custom raw data reports
- 8) have functions to set up run sequences with automatic QC batch creation
- 9) set up multi-level result approval process

### Solve the Problems with SDMS!

# Examples to demonstrate what we have achieved with our Sample Data Management System

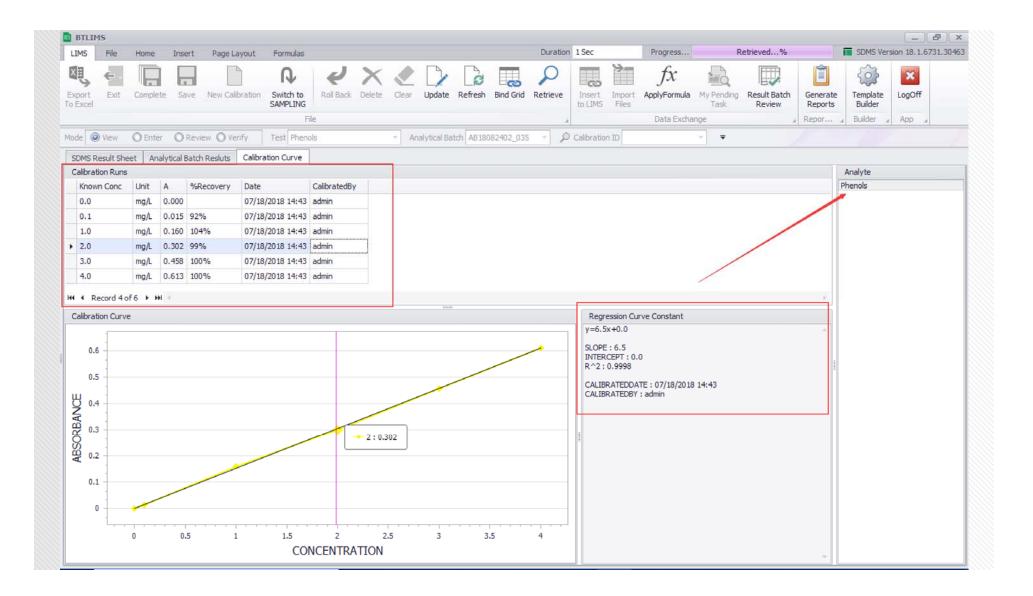
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			SAMPLE	181011010.02	1		10/11/2018	Parshall Flume	Jim Beam Brands (CL)	)
			Dup	181011010.02	1					
			50:50 Spike	181011010.02	1					
			SAMPLE	181012002.02	1		10/12/2018	Parshall Flume	Jim Beam Brands (CL)	
			SAMPLE	181012010.02	1		10/12/2018	Effluent - Monthly	Jim Beam Brands (FF)	)
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			SAMPLE SAMPLE SAMPLE SAMPLE CCV	181012010.02 181012012.02 181015001.02 CCV	1 1 1 1		10/12/2018 10/12/2018	Effluent - Monthly Effluent - Weekly - C	Jim Beam Brands (FF) Jim Beam Brands (FF)	)
			SAMPLE SAMPLE SAMPLE SAMPLE CCV	181012010.02 181012012.02 181015001.02 CCV	1 1 1 1		10/12/2018 10/12/2018	Effluent - Monthly Effluent - Weekly - C	Jim Beam Brands (FF) Jim Beam Brands (FF)	)
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	Method	EPA 4		Re	eagent ID	LT10		Analysi		8/24/18 8:45			
_	Instrument	Spec	20		MDL	0.	.1	Analyz	ed By	ksimpson			
	QCType	SampleID	Dilution	A	Response	Calculated ppm	Result	Spike Amt	TrueValue	OC Acceptance	%Recovery	%RPD	Rot Limit
	ICV		1	0.462	3.02	3.02	3.0	3.0		YES	100.6		0.1
-	CCV		1	0.450	2.94	2.94	2.9	3.0		YES	98.0		0.1
	Blank	-	1	0.000	-0.01	-0.01	<0.1	5.0		YES	20.0		0.1
1	SAMPLE	180810017.02	1	0.075	0.48	0.48	0.5			100	-		0.1
	SAMPLE	180802001.11	1	0.055	0.35	0.35	0.4						0.1
3	SAMPLE	180808035.05	1	0.062	0.40	0.40	0.4						0.1
1	SAMPLE	180809012.02	1	0.052	0.33	0.33	0.3			1). 1).		1	0.1
5	SAMPLE	180802001.05	1	0.044	0.28	0.28	0.3						0.1
5	Dup	180802001.05	1	0.047	0.30	0.30	0.3			YES		6.7	0.1
,	50:50 Spike	180802001.05	1	0.254	1.66	1.66	1.7	3.0	1.646	YES	100.7		0.1
3	CCV		1	0.454	2.97	2.97	3.0	3.0		YES	98.9		0.1
,	Blank		1	0.000	-0.01	-0.01	<0.1			YES			0.1
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SDMS	Result Sheet / Run Type	Analytical Bat QC Type	Sample ID	bration Cu Dilution	Reading	Response mg/L	Calculate mg/L	Result	Spike Amt	True Valu	e QC Accepta	nce %Recov	ery RPD	MDL	RptLimit	Status	Analyzed B	Analyzed D
	STANDARD	ICV	Sample 10	1	0.462	3.02	3.02	3.0	3.0	The value	YES	100.6	cry NPD	0.1	0.1	- VA -	ksimpson	08/24/2018
	STANDARD	CCV		1	0.450	2.94	2.94	2.9	3.0		YES	98.0		0.1	0.1		ksimpson	08/24/2018
	METHODBLANK	and the second second		1	0.000	-0.01	-0.01	<0.1	510		YES	5010		0.1	0.1	Call South a Start	ksimpson	08/24/2018
	SAMPLE	SAMPLE	180810017.02		0.075	0.48	0.48	0.5						0.1	0.1	The Party of the local	ksimpson	08/24/2018
	SAMPLE	SAMPLE	180802001.11		0.055	0.35	0.35	0.4						0.1	0.1		ksimpson	08/24/2018
	SAMPLE	SAMPLE	180808035.05		0.062	0.40	0.40	0.4						0.1	0.1		ksimpson	08/24/2018
	SAMPLE	SAMPLE	180809012.02		0.052	0.33	0.33	0.3						0.1	0.1		ksimpson	08/24/2018
	SAMPLE	SAMPLE	180802001.05	1	0.044	0.28	0.28	0.3						0.1	0.1	Exported	ksimpson	08/24/2018
	SPIKE	Dup	180802001.05	1	0.047	0.30	0.30	0.3			YES		6.7	0.1	0.1	Exported	ksimpson	08/24/2018
C	SPIKE	50:50 Spike	180802001.05	1	0.254	1.66	1.66	1.7	3.0	1.6	YES	100.7		0.1	0.1	Exported	ksimpson	08/24/2018
	STANDARD	CCV		1	0.454	2.97	2.97	3.0	3.0		YES	98.9		0.1	0.1	Exported	ksimpson	08/24/2018
	METHODBLANK	Blank		1	0.000	-0.01	-0.01	<0.1			YES			0.1	0.1	Exported	ksimpson	08/24/2018



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Ļ			总烃	/非甲烷。	总烃气相1	色谱法分	析原始证	录表				TP	H-GC			
2	项目编号	SHEDT190	02191009-	样品类别	有组织废气	测定项目	非甲烷总烃	方法依据	H	IJ 38-2017		Ge	nral	Info		
ſ	义器型号和编	1 气相色	·谱仪 (GC)	AI-018	检测器	FID	进样量	1mL	气化室	昷度 100	°C	In	strum	ent Co	onditi	ons
	柱温	80°C	检测器温度	200°C	空气流量	0.085Mpa	氢气流量	0.060Mp	a 检出	限 0.07m	g/m³					
Γ	(7. ·** + +	柱1(总烃柱)		玻璃微珠	未不锈钢填充柱	1m×3m		柱1	戰气流量	0.028	Мра					
	色谱柱	柱2(甲烷柱)	不	锈钢填充柱,	GDX-502 60	~80mesh,3×	3m	柱2	戰气流量	0.030	Мра					
F	标准物	质名称	净化空气	氮气中甲烷	氮气中甲烷	氮气中甲烷			QC				Ch	omico	ls use	4
	标气	批号		11			分析项目	结果(mg/n	n <sup>3</sup> 相对误	差空	É	是否合格	Che	emirca.	is use	a
	标气浓度	度(PPM)					甲烷		#DIV/	/0!		#DIV/0!				
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F			13547 13744	总烃	甲烷			非甲	烷总烃							
2	样品	编号	稀释倍数 DF	结果 (mg/m <sup>3</sup> )	结果 (mg/m <sup>3</sup> )	结果 (mg/m³)	标干排风量 (m <sup>3</sup> /h)	排放速率 (kg/h)	平均结 (mg/n		非放 相 (g/h) 9	目对偏差 %	标样浓度	加标量	回收率%	质据
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1	А	В	С	D	E	F	G	н	Г	J	Q	R	S	Т	
			总烃/	/非甲烷总	总烃气相1	色谱法分	析原始记	录表							
Γ	项目编号	SHEDT190	02191009-	样品类别	有组织废气	测定项目	非甲烷总烃	方法依据	HJ 3	8-2017	1				
ſ	义器型号和编	气相色	谱仪 (GC)	AI-018	检测器	FID	讲样量	1ml	气化室温度	₹ 100°C	1				
Γ	柱 温	80°C	检测器温度	200°C	空气流量	🖳 Report Slect	or	x	检出限	0.07mg/m <sup>3</sup>	Cross	to rou	oort o	t run	+ ;
Γ	4. ·***++	柱1(总烃柱)			不锈钢填充			<b>N</b>	流量	0.028Mpa	Crea	te rep	jort a	t run	ιı
1	色谱柱	柱2(甲烷柱)	不	锈钢填充柱,	GDX-502.64	report	•	Generate	流量	0.030Mpa	1				
Γ	标准物	质名称	净化空气	氮气中甲烷	氣气中甲烷		1		~	•	1				
Γ	标气	批号					分析项目	结果(mg/m <sup>i</sup>	相对误差	空白	是否合格	]			
Γ	标气浓度	€(PPM)	Sele	ect a re	port t	emplate	甲烷		#DIV/0!		#DIV/0!	]			
1	标准浓度(以C	ː)(mg/m³)					总烃		#DIV/0!		#DIV/0!	]			
Γ			稀释倍数	总烃	甲烷			非甲烷	总烃						
	样品	编号	作地和=1亩女X DF	结果 (mg/m³)	结果 (mg/m³)	结果 (mg/m³)	标干排风量 (m³/h)	排放速率 (kg/h)	平均结果 (mg/m <sup>3</sup> )	平均排放 速率(kg/h)	相对偏差 %	标样浓度	加标量	回收率%	质
F	C1903	001.01	1			#VALUE!	17675	#VALUE!	#VALUE!						
Ī	C1903	005.01	1			#VALUE!	8107	#VALUE!	#VALUE!	#VALUE!					
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		项目编	号	SHEIA	1900	7099016	样品类别	环境空气	测定项目	非甲烷总线	方法依据		4-2017	
		义器型号	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	气相	色谱	仪 (GC-FID)	AI-077	检测器	FID	进样量	1mL	气化室温度	100°C	
		柱沿		80°C		检测器温度	200°C	空气流量	0.085Mpa	氢气流量	0.060Mpa	检出限	0.07mg/m <sup>3</sup>	
		色谱	#	柱1(总烃				不锈钢填充柱				气流量	0.028Mpa	
				柱2(甲烷	(柱)		、锈钢填充柱,	1	L	m	柱2载		0.030Mpa	
		<u></u>	示律物质			净化空气	氮气中甲烷	氮气中甲烷	氮气中甲烷		Q			
			标气	CONTRACTOR INCOME.	l		L31304183	53101190	84909095	分析项目	结果(mg/m³)		空白	
				(PPM)		0	10	20	132	甲烷	10.9	2	0.00	
		标/笛农	度(UC	it)(mg/m	13)	0	5.36	10.7	70.7	总烃	11.0	3	0.00	
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		С	19071	36.49		1	0.60	0.49	0.11	1	1	0.16	20	
		C	19071	36.50		1	0.70	0.51	0.19	1	1	0.16	20	
		С	19071	36.51		1	0.66	0.52	0.14	1	1	0.16	20	
		C	19071	36.51		1	0.65	0.53	0.12	1	1	0.16	20	
			19071			1	0.65	0.42	0.22	1	1	0.16	20	
			19071			1	0.61	0.45	0.16	1	1	0.18	20	
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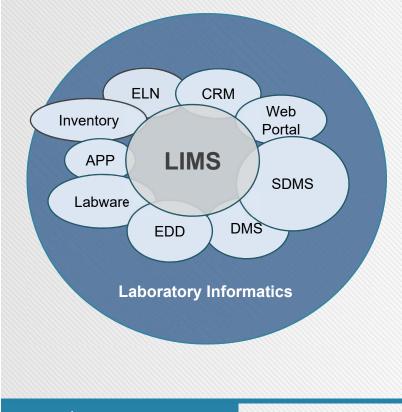
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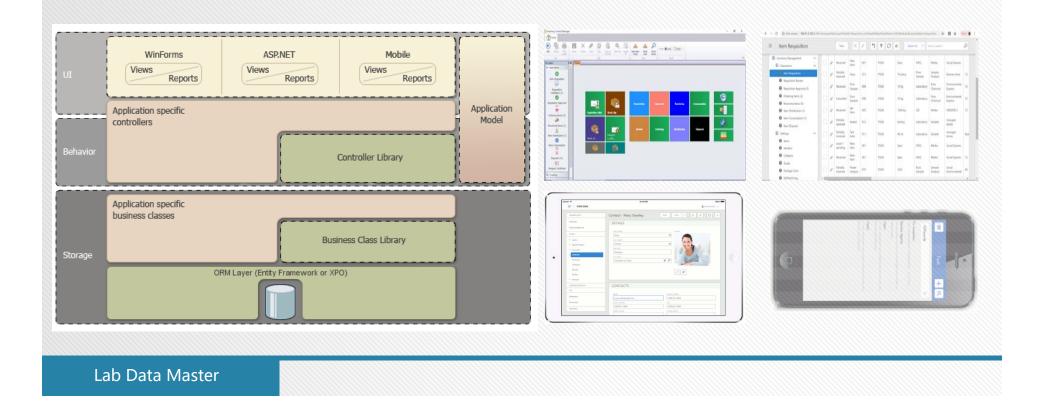
### **SDMS vs LIMS**



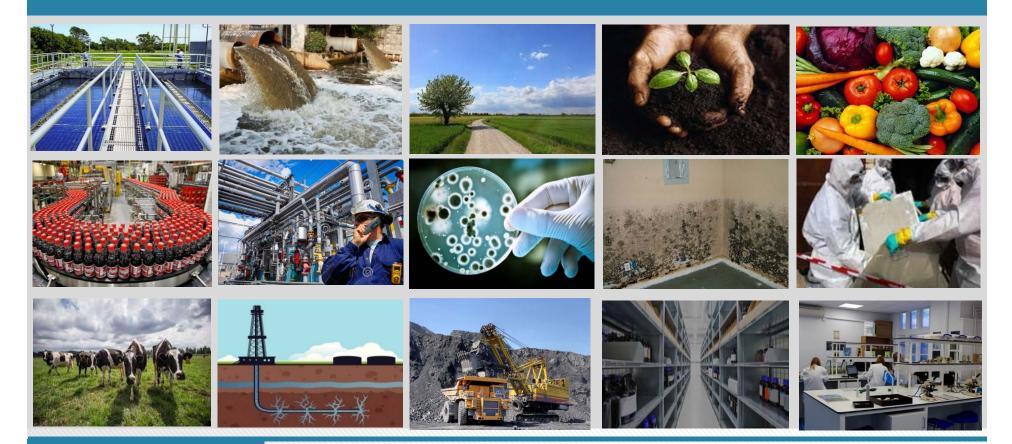
LIMS	SDMS
Covers entire workflow	A plug-in module; a tool
Industry dependent characteristics are obvious	A supplement to LIMS; Provides functionality that most LIMS do not have
Difficult to manage ongoing customization requests	Able to manage any customization on raw data result entry and report templates
Not easy to implement	Easily implemented

## **Product Architecture**

### Windows, Web, Mobile



## SDMS Technology for Every Lab



### Summary

- 1. A practical solution to LIMS implementation
- 2. No programming involved
- 3. Easy operation and popular
- 4. Wide adaptability and scope of application
- 5. Simple integration or stand-alone
- 6. Improved productivity and ROI

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# Thank you !

We will now be answering questions

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