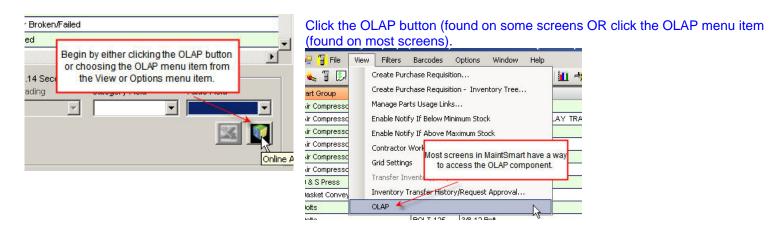
## MaintSmart 4.1 OLAP (Online Analytical Processing) Component

OLAP is a tremendously powerful component that provides analytical processing features similar to those found in Microsoft Excel Pivot Tables and Pivot Charts. Drag-and-drop views give you real-time information, insights, and results in seconds. Drag up to five column fields, five row fields and five value fields to generate a user-defined two or three dimensional data set of virtually any data in the MaintSmart database.

MaintSmart leverage the data queries you create in the MaintSmart Analysis screens by linking to these user defined data sets with the OLAP component. Additionally OLAP is available on most other screens including work order, down time, purchasing, inventory and preventive maintenance screens. Data from any of these screens may be arranged as needed by drag and drop in the OLAP screen. This data may then be totaled by row and column using one of several statistical functions. This data set is then charted automatically.

Clicking on a grid cell in the OLAP data grid causes the underlying data for that cell to be displayed in a separate grid. The OLAP data grid may be exported directly to Excel (just like all grids in MaintSmart) for further analysis.



oose fields to add to table:	Olap Grid Olap Chart Raw Data				
Impact 🔺	Cause	1	2	3	Total
Equipment Code	Ac/dc Drive Fail/malfunction	48	0	0	48
How Many Technician	Actuator Failed/Broken	78	36	2	116
Operator Shift	Adjust Timing	Data is arranged			8
Plant ID	Adjustment Screw Stripped/Broken	Technician Shift. totaled using or			4
TimeDown	Air Compressor Failure	functions (Sum, A	verage, Count,	Variance,	2
Repair Time User ID	Air Cylinder Failed	Standard Deviation, etc.)			12
User ib	Bad Circuit Board	0	3	0	3
g fields between areas b <mark>e</mark> low:	Bad Terminal/Connection	60	0	0	60
filter 🛛 🛄 C <mark>o</mark> lumn Fields	Blade(a) Broken		23	5	37
Technician Shift	Blader Drag and drop fields from the		5	0	5
	Blowr box into the four list boxes. Yo		6	0	6
	Brack Column or Row field to get a data set.		0	11	11
	Broken/Damaged Photo Eye Reflector	3	0	0	3
Row Fields 🔨 Values 🖌	Broken/Damaged Wire	30	30	0	60
ise Time Down (Sum)	Burned/Damaged Coil	26	0	35	61
~	Burned/Damaged Motor Winding	50	0	46	96
	Carrier Chain Off Track/Sprocket	0	50	0	50
Defer Updates	Circuit Breaker Tripped	10	3	3	16

When OLAP screen appears drag and drop fields from the uppermost filed box to the lower list boxes. You may drag up to five fields into each box, however the data grid and chart may become cluttered with this much data. There are several options available by right-clicking on the selected field(s) and choosing from the resulting dialog screen. These include filtering, formatting and formatting based upon the value.

🚽 🛃 🔣 🗐 🥙 🕅 Grid 🗸	🖉 Chart 🕶 🗔 Report 🔹	🍃 🛃 🔣   🍠 🍽   🎹 Grid 🗸 🚧	:hart 🔹 🗍 Report 🔹		
	Field Settings: TimeDown	Choose fields to add to table:	Olap Grid Olap Chart Raw Data		
Choose fields to add to table:	-	Impact 🔺	Cause	1	2
Impact	Filter Subtotals Format Display High Values Low Values	Equipment Code	Ac/dc Drive Fail/malfunction	48	0
Equipment Code	Sum	How Many Technician	Actuator Failed/Broken	78	36
How Many Technician	Count	Operator Shift	Adjust Timing	6	2
Operator Shift	Average Maximum	Field Settings: TimeDown			0
Plant ID	Minimum		THE REPORT		0
🗹 Time Down	First Last	Filter Subtotals Format Displa	ay High Values Low Values		2
Repair Time	Variance	Apply to values Above			3
User ID	<ul> <li>Standard Dev Right mouse-clicking the values in the Column, Variance Popt Row or Value Fields lists provides additional</li> </ul>	)ra 20	Absolute		0
)rag fields between areas below:	Variance Pop Standard Dev filtering, formating and other capability that may	7	Not Set		23
	he applied to the data set. In this case the	Style	Absolute		5
🖌 Filter 🔤 🛄 Column Fields	Subtotals tab is selected. This provides a way to	Background: Red	Percentage		-
Technician Shift		Foreground:	•		0
	"sum".	Bold:			0
	Weigh by: (None) -		Using the "High Values" option you may		0
			highlight values beyond a certain level. "Low		30
Bow Fields Σ Values	OK	V	alues" works similarly for below range values. Colors are completely user defined.		0
Cause Time Down (Sur	<b>n</b>		Colors are completely user defined.		0
	Burned/Damaged Coil 26				50
	Burned/Damaged Motor Winding 50		OK Cancel		3
	Carrier Chain Off Track/Sprocket 0		OK Cancel		

Below shows how multiple fields are displayed. In this example there are two column fields and two value fields. The value fields are summed in this case in separate columns, grouping by Operator and Technician Shift. Rows are also summed.

🔄 Down Time Type 📃		1		3		Total	Total	
🖌 Technician Shift		/	2 📕		3	TUCAL	Tutai	
Impact	Cause	nwo	Repair Time	Time Down	Repair Time	Time Down	Repair Time	
Equipment Code	Roller Broken/Failed	0	0	0	0	15	15	
How Many Technician   Operator Shift	Roller(s) Bad	0	0	0	0	5	5	
Plant ID	Safety Interlock Open	0	0	0	0	59	59	
✓ Time Down	Scaper Damaged or Fell Out	0	0	0	0	60	60	
✔ Repair Time	Shaft Bearing Failed	0	0	0	Ő	38	25	
User ID 🗸	Sprocket Slipped	0	0	0	0	95	95	
 Drag fields between areas below:	Sprocket Worn	15	12	0	0	15	12	
- ✓ Filter Column Fields	Stop Plate Failed	0	0	0	0	7	7	
Technician Shift	Structural Failure	0	0	0	0	2	2	
Operator Shift	Switch (Other) Failed	0	0	0	0	33	24	
	Switch Sticking Switch StickingSwitch Stickir	0	0	0	0	2	2	
Multiple fields may be used for each column, row and/or value.	Table Top Chain Broken	6	6	0	0	47	45	
	Table Top Chain Off	0	0	0	0	5	5	
Row Fields Σ Values	Temp. Controller Malfunction	45	2	0	0	45	2	
Cause Time Down (Sum)	Temperature Sensor Loose or Fail	0	0	0	0	2	2	
🌂 Repair Time (Sum	Track Bett	0	0	0	0	3	3	
	Variable Pulley Failed	0	0	0	0	14	14	
	Water in Machine or Electrical	0	0	0	0	325	325	
	Total	349	289	2	2	2,931	2,747	

## Easily export the resulting data from grid to Excel.

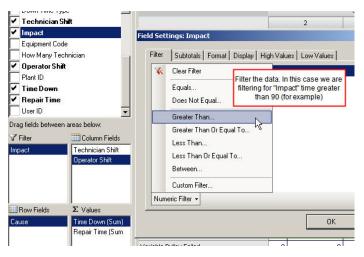
Right-click outside of grid area to export to Excel	Export OLAP Grid	
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🗂 Eile Edit View Insert Format Tools [	<u>)</u> ata <u>W</u> indow <u>H</u> e	elp Acro <u>b</u> at			
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B4 🗾 = 41					
A	B	C	D	E	F
1	1	1	1	1	1
2	1	1	2	2	3
3 Cause	Time Down	Repair Time	Time Down	Repair Time	Time Down Re
Ac/dc Drive Fail/malfunction     Actuator Failed/Broken	41	57	7	6	0
	<u>34</u> 6	29	44 0	44	0
6 Adjust Timing 7 Adjustment Screw Stripped/Broken	2	6	0	0	0
Adjustment Screw Stripped/Broken     Air Compressor Failure	2	2	0	0	0
9 Air Cylinder Failed	2	2	10	10	0
0 Bad Circuit Board	0	0	0	0	0
1 Bad Terminal/Connection	0	0	60	60	0
2 Blade(s) Broken	0	0	0	0	9
3 Blade(s) Duli	0	0	0	0	0
4 Blown Fuse	0	Ő	0	0	Ő
5 Bracket Failed	0	0	0	0	Ō
6 Broken/Damaged Photo Eye Reflector	0	0	3	3	0
7 Broken/Damaged Wire	0	0	30	30	0
8 Burned/Damaged Coil	0	0	26	26	0
9 Burned/Damaged Motor Winding	0	0	50	50	0
20 Carrier Chain Off Track/Sprocket	0	0	0	0	0
21 Circuit Breaker Tripped	0	0	0	0	10
22 Clutch/Brake Worn/Fail	0	0	5	5	0
23 Contacts Burned/Damaged	0	0	0	0	30
24 Conveyor Belt Torn/Damaged	0	0	5	5	50
25 Conveyor Broken/Failed	0	0	8	8	55

his is the resulting Excel spreadsheet. You may also lick the Excel icon at top of screen however this option imply saves the data as Excel but doesn't automatically pen the spreadsheet after saving.

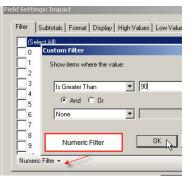
	Cause		own	Repair Time	Time Down	Repair Time	Time I	Down
nt Code ny Technician 🛛 🚺	🚽 Detail View: 8 rec	ords			1		×L	15
or Shift	AreaDescription	Cause		Comments	Common			5
	Bun Wrapping	Safety Interlock Open			Bagger #	3 3/30/199	97 🗖	59
wn	No Area Assignmer	Safety Interlock Open			Proof Box	#1 4/6/1997		60
ime	Bread Slicers	Safety Interlock Open			Slicer #2	4/17/199	97	38
	No Area Assignmer	Safety Interlock Open			Proof Box	#1 6/15/199	97	95
ween areas below:	Bread Baggers/Wr	Safety Interlock Open			Wrapping	Machine 6/20/199	97	15
	No Area Assignmer	Safety Interlock Open			Proof Box	#1 7/3/1997		7
Column	No Area Assignmer	Safety Interlock Open	Distant all als		Benef Box	#1 7/4/1997	7 –	2
Techniciar	Bun Cooler	Safety Interlock Open	Right-click on a grid cell to see a grid of the underlying data that generated et Conveyor # 7/23/1997				97 -	33
Operator S				for that grid cel				33
			actual field	d names are dis	splayed in			2
				this case)				47
								5
s Σ Values								45

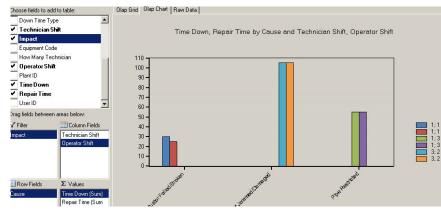
Right clicking in the grid area on a particular cell causes the underlying data that generated the value in that cell to be displayed in a separate grid.



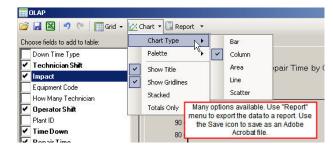
Right-click a Value field and you will have the opportunity to format, filter or change the subtotal setting for that value. Subtotal settings include: Sum, Average, Max, Min, Variance, Standard Deviation and more.

Format colors based upon high or low value constraints as shown below:





## MaintSmart will also create a corresponding chart for the data.



Olap Grid Olap Chart Raw Data 3 1 Filtered data set Total Total 3 2 e Down Repair Time Time Down Repair Time Time Down **Repair Time** Cause 25 Actuator Failed/Broken 0 0 30 0 0 105 105 Oven Shelf Jammed/Damaged 0 0 105 55 55 Pipe Restricted 55 0 0 Total 55 55 105 105 190 185

This is an example of a filtered data set. In many cases you'll want to filter the data especially if you want a legible uncluttered chart.

As you can see this is a tremendously powerful and useful tool. The OLAP component is very flexible and available on all screens where appropriate.