



Purpose & Scope

The purpose of this document is to provide examples of reports using Microsoft Excel® with Instrument Manager™ and ODBC. It is not intended to be a highly technical document in scope, but rather a high level tutorial on how to extract information from Instrument Manager using Microsoft Excel. It is intended to be a living document and serve as a central repository for information regarding this topic

Intended Audience

The intended audience for this document is Data Innovations LLC direct customers and Data Innovations® business partners and their customers.

Definitions

- ODBC – Open Database Connectivity provides an industry standard method for two applications to share data. In this document, Microsoft Excel (one application) is querying and extracting data from Instrument Manager’s database (second application) for ad-hoc reports.

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Overview

The purpose of this document is to provide examples of reports using Microsoft Excel® with Instrument Manager and ODBC.

Report Application:

Information can be extracted from Instrument Manager with ODBC access using an ODBC-compliant application such as Microsoft Excel, Crystal Reports, Open Office, etc... The most common ODBC-compliant application in the laboratory is Microsoft Excel® and the reason for using it for our example reports. If you are using another application, this guide should provide guidance on how to develop similar reports in other applications.

Microsoft Excel® 2007 was used in the development of this guide. The same instructions can be used for Microsoft Excel 2003 user being cognizant of the differences in how Excel 2003 screen appear different than 2007.

How to Develop an Example Report:

To develop any of the example reports, follow these steps:

1. Review the *Before You Begin* section (page 2)
2. Perform the *Importing Data from Instrument Manager* instructions (page 3)
3. Perform the *Modifying the Data in Excel* instructions (page 6)
4. Perform one of the reports examples from the *Creating a Report* section

Before You Begin. . .

Before you begin using these instructions, you need to ensure:

- Your version of Instrument Manager is v8.08 to v8.14 and has the ODBC and Specimen Management software module licensed.
- Ensure “*Allow Extrinsic Functions in SQL Statements*” in the Instrument Manager database is enabled (See *Appendix A* on page 15 for Instrument Manager v8.08 – v8.14).
- The end-user system connecting to Instrument Manager has ODBC connectivity established as defined in ODBC User’s Guide for Instrument Manager.
- The end-user system has Microsoft® Excel 2003 or above. (These instructions were written using Microsoft Excel 2007).
- User should have at least a basic understanding of pivot tables / pivot charts in Excel.

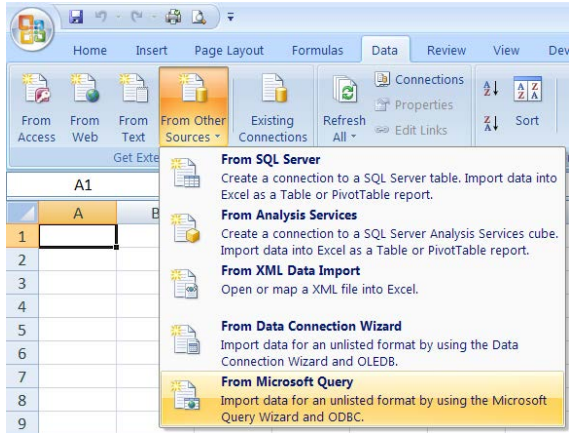
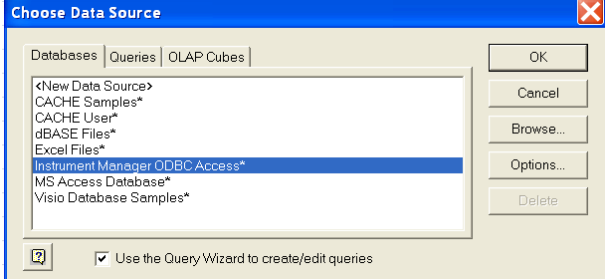
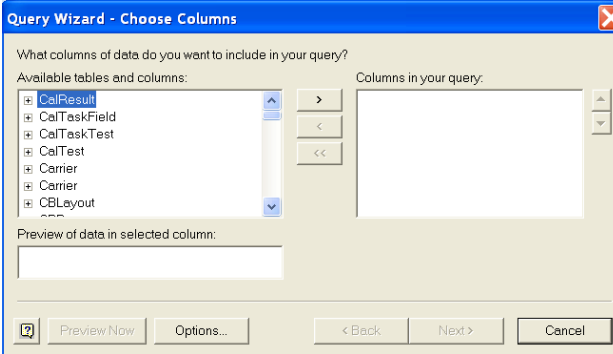
Consideration(s):

- The SQL statement in *Importing Data from Instrument Manager* section extracts information of all specimens in Instrument Manager. If your data retention is larger than 30 days or you have large daily specimen volumes, you should consider modifying the SQL query statement.



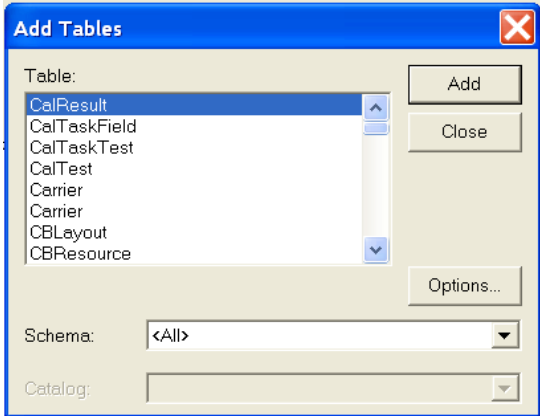
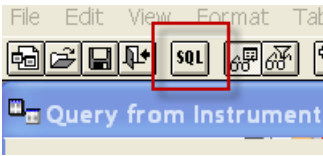
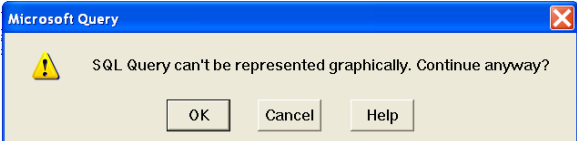
Importing Data from Instrument Manager

This process defines how to extract key data from Instrument Manager to develop reports.

Step	Action / Description	
1	With Excel open, select <i>From a Microsoft Query</i> from the <i>Data</i> → <i>Other Sources</i> menu.	
2	From the <i>Choose Data Source</i> window, select the Instrument Manager ODBC connection and select <i>OK</i> .	
3	<p>Select <i>Cancel</i> on the Query Wizard – Choose Columns window to close the wizard.</p> <p>Select Yes in the preceding confirmation dialog box (Do you want to continue editing this Query in Microsoft Query?)</p>	

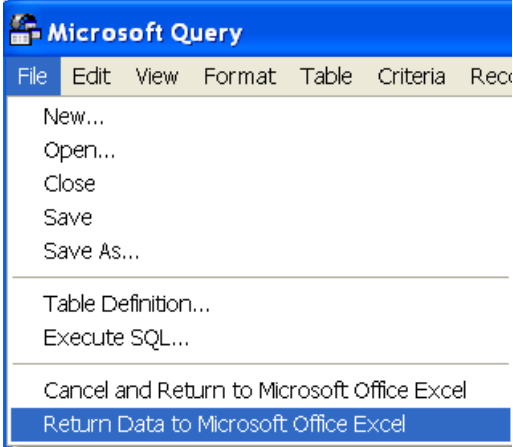
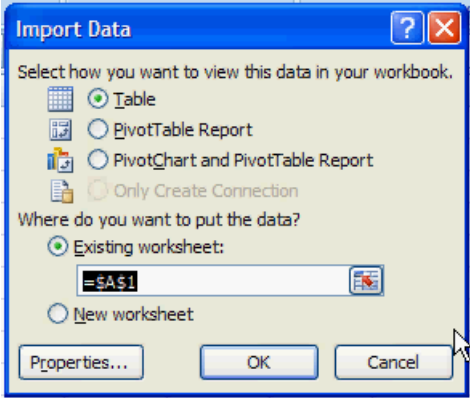


Importing Data from Instrument Manager - continued

Step	Action / Description	
4	Select <i>Close</i> on the <i>Add Tables</i> window.	
5	Select the <i>SQL</i> button on the tool bar in Microsoft Query to enter the SQL statement to import the data from Instrument Manager.	
6	Insert the following SQL statement into SQL statement window for the appropriate version of Instrument Manager. <u>Instrument Manager v8.08 – v8.14</u> <pre> SELECT sinfo.SID, pinfo.LocationWard, sinfo.Priority, sinfo.RequestedDateTmeTS, tinfo.TestCode, tinfo.TestResultsReviewedby, cast(\$\$timestamp^imconvert(status.DateTme) as TmeSTAMP) As ReleasedDateTmeTS FROM IM_SM.pinfo pinfo, IM_SM.sinfo sinfo, IM_SM.status status, IM_SM.tinfo tinfo WHERE sinfo.Patient = pinfo.Patient AND tinfo.Specimen = sinfo.Specimen AND tinfo.Patient = pinfo.Patient AND ((tinfo.TestStatus='Released') AND (status.Test=tinfo.Test) AND (status.Status='Released')) </pre>	
7	Select <i>OK</i> from the resulting confirmation window.	



Importing Data from Instrument Manager - continued

Step	Action / Description	
8	Import the data into Excel by selecting <i>File</i> → <i>Return Data to Microsoft Office Excel</i> from Microsoft Query window toolbar.	
9	Import Data dialog box will appear. Select <i>OK</i> from the dialog box to import the data into a table within Excel.	

Results: The imported data from Instrument Manager should appear in a worksheet within Excel.

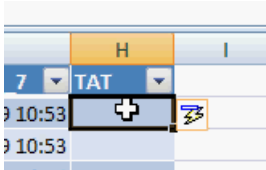
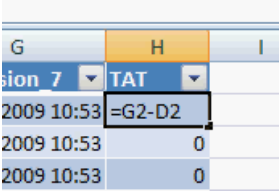
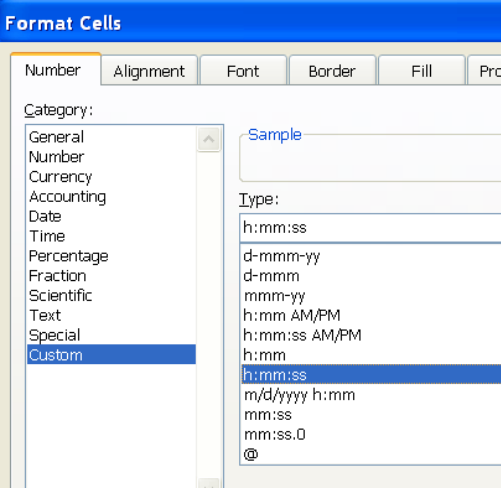
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	A	B	C	D	E	F	G	H
1	SID	LocationWard	Priority	RequestedDateTimeTS	TestCode	TestResultsReviewedby	Expression 7	
2	TC0007		R	11/20/2009 10:53	TEST2		11/20/2009 10:53	
3	TC0007		R	11/20/2009 10:53	H		11/20/2009 10:53	
4	TC0008		R	11/20/2009 10:53	TEST2		11/20/2009 10:53	
5	TC0008		R	11/20/2009 10:53	I		11/20/2009 10:53	
6	TC0009		R	11/20/2009 10:53	TEST2		11/20/2009 10:53	
7	TC0009		R	11/20/2009 10:53	L		11/20/2009 10:53	

Figure 1 - Example of Instrument Manager Extraction Data



Modifying the Data in Excel

This process defines how to modify and format the data after it is extracted from Instrument Manager in preparation for developing the report(s).

Step	Action / Description	
1	In cell <i>H1</i> , enter 'TAT' (without the quotes) for the label of this new column.	
2	In cell <i>H2</i> , enter the equation '=G2-D2' (without the quotes) to subtract the result time from the sample arrival time and then copy the formula for all the rows in the spreadsheet for column H.	
3	Copy and Select <i>Column H</i> and change the format of Column H to <i>h:mm:ss</i> by going to <i>Home</i> → <i>Format</i> → <i>Format Cells</i> → <i>Custom</i> and select <i>OK</i> .	



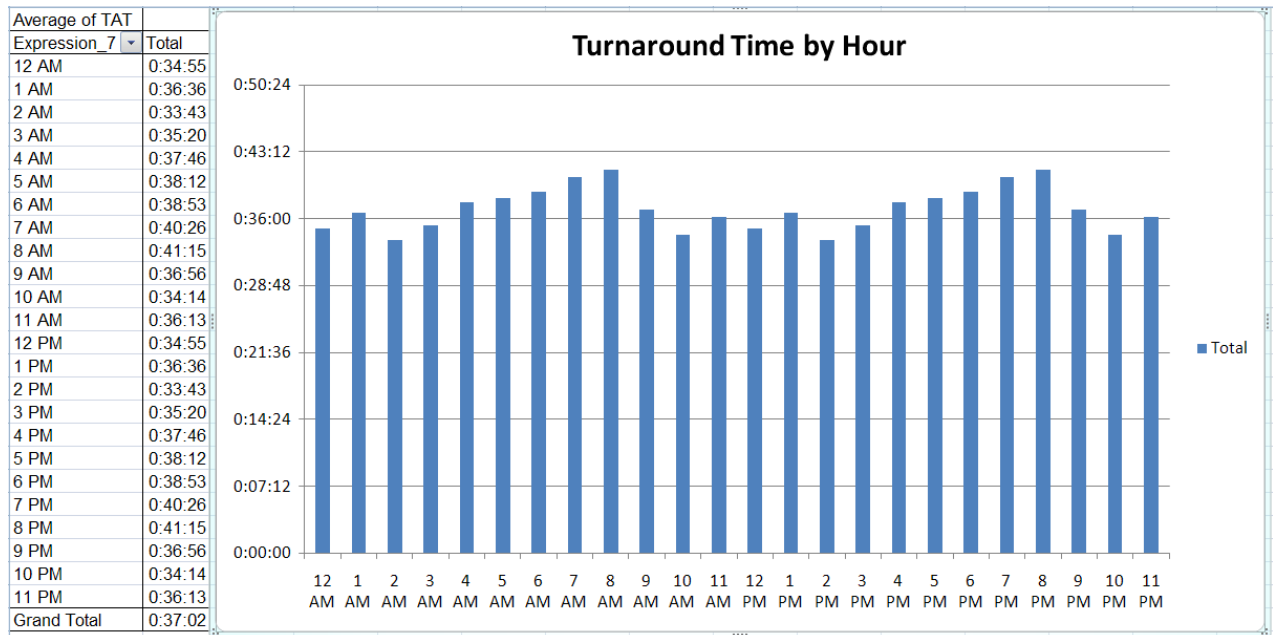
Report: Turnaround Time

Description of the Report:

This report provides the turnaround time by hour for all the test results in Instrument Manager. It is based on the assumption that the test arrival date/time is established when the order is downloaded from the LIS and the result completion date/time is based on the date/time of the result from the instrument.


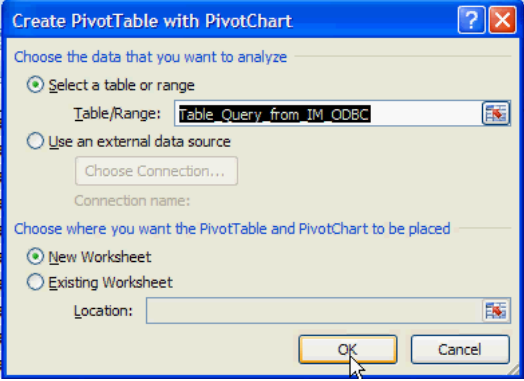
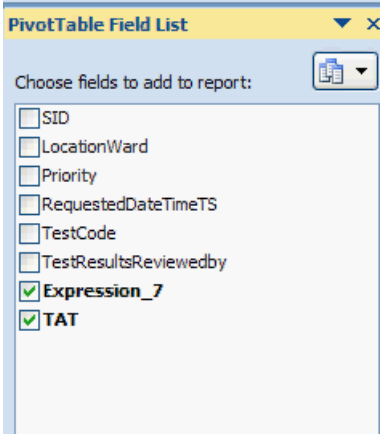
Example of the Report:

Below is an example of the report generated from Instrument Manager into Microsoft Excel.



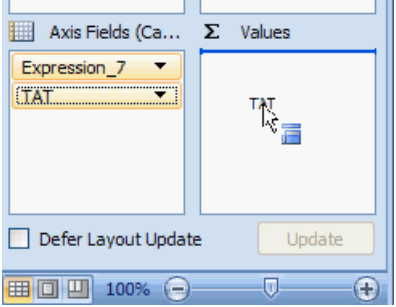
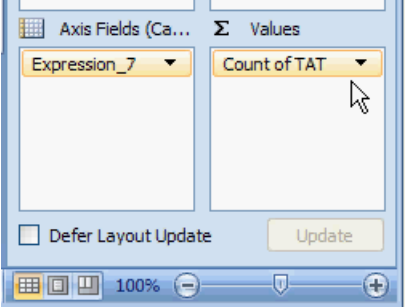
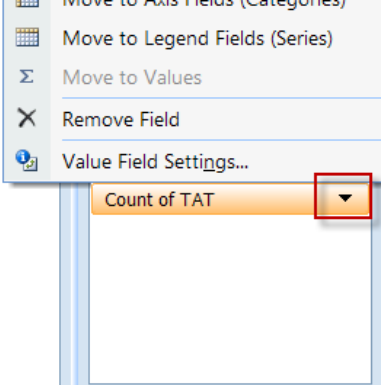
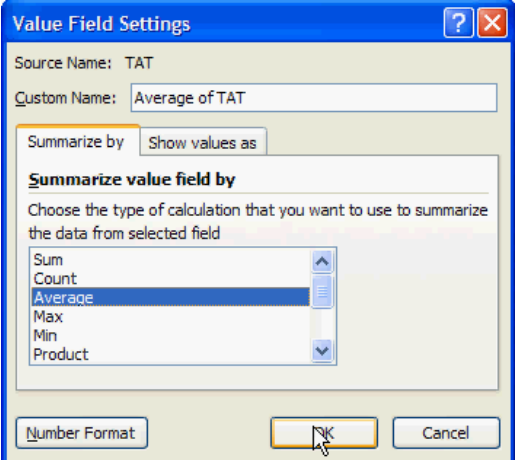


Report: Turnaround Time - continued

Step	Action / Description	
1	Select a cell within the new dataset and select <i>PivotChart</i> from the <i>Insert</i> → <i>PivotTable</i> menu.	
2	Select <i>OK</i> and using the default values from the <i>Create PivotTable with PivotChart</i> dialog box.	
3	Click the checkbox next to <i>Expression_7</i> and <i>TAT</i> in the <i>PivotTable Field List</i> box.	



Report: Turnaround Time - continued

Step	Action / Description	
4	Click and drag <i>TAT</i> from the <i>Axis Fields Categories</i> box to the <i>Values</i> box.	 
5	Click the down arrow on <i>Count of TAT</i> from the <i>Values</i> box and select <i>Value Fields Settings</i> option.	
6	Change the <i>Summarize value field by</i> from <i>Count</i> to <i>Average</i> and click <i>OK</i> .	



Report: Turnaround Time - continued

Step	Action / Description																														
7	<p>Select the Column B (all the values in the <i>Average TAT</i> column) and change the format to h:mm:ss by going to <i>Home</i> → <i>Format</i> → <i>Format Cells</i> → <i>Custom</i> and select <i>OK</i>.</p> <div style="display: flex; justify-content: space-around;"> <div data-bbox="980 268 1308 569"> <table border="1"> <thead> <tr> <th></th> <th>A</th> <th>B</th> </tr> </thead> <tbody> <tr><td>1</td><td>Average of TAT</td><td></td></tr> <tr><td>2</td><td>Expression_7</td><td>Total</td></tr> <tr><td>3</td><td>12 AM</td><td>0.024247685</td></tr> <tr><td>4</td><td>1 AM</td><td>0.025416667</td></tr> <tr><td>5</td><td>2 AM</td><td>0.023414352</td></tr> <tr><td>6</td><td>3 AM</td><td>0.02453125</td></tr> <tr><td>7</td><td>4 AM</td><td>0.026232639</td></tr> <tr><td>8</td><td>5 AM</td><td>0.026527778</td></tr> <tr><td>9</td><td>6 AM</td><td>0.027008102</td></tr> </tbody> </table> </div> <div data-bbox="948 600 1349 989"> </div> </div>		A	B	1	Average of TAT		2	Expression_7	Total	3	12 AM	0.024247685	4	1 AM	0.025416667	5	2 AM	0.023414352	6	3 AM	0.02453125	7	4 AM	0.026232639	8	5 AM	0.026527778	9	6 AM	0.027008102
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8	<p>Select any cell in <i>Column A</i> (e.g. A3) that is not a label and right-click and select '<i>Group</i>' from the menu.</p> <div data-bbox="867 1016 1425 1360"> </div>																														
9	<p>Select <i>Hours</i> from the <i>Grouping</i> dialog box and deselect <i>Months</i> and click <i>OK</i>.</p> <div data-bbox="980 1394 1312 1814"> </div>																														



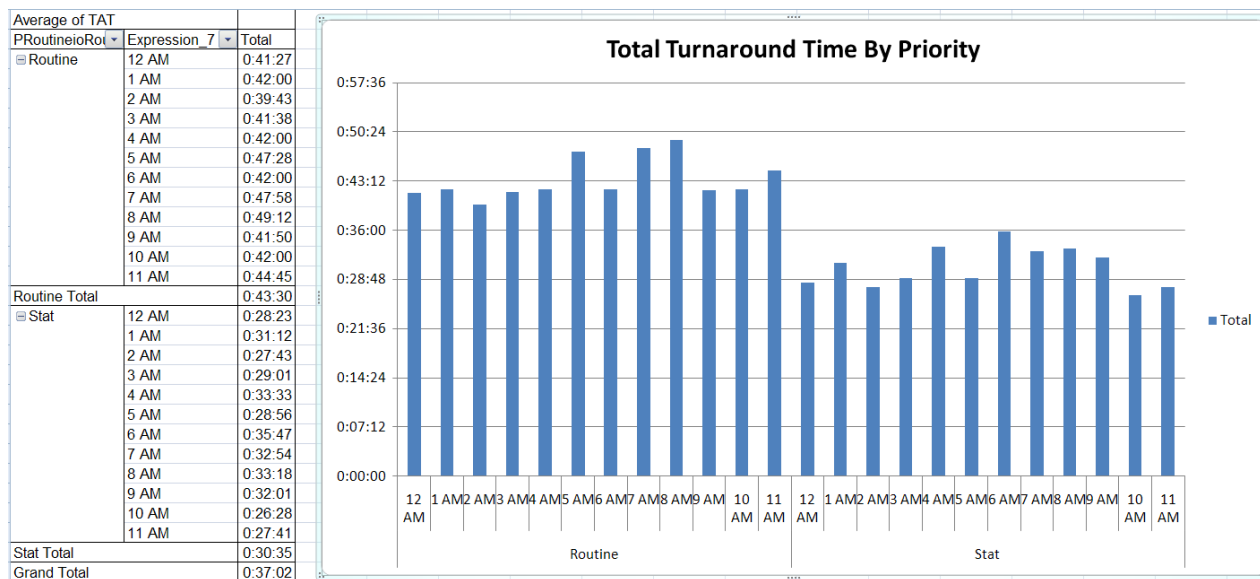
Report: Turnaround Time by Priority

Description of the Report:

This report provides the turnaround time by hour and by specimen priority for all the tests in Instrument Manager. It is based on the assumption that the specimen arrival date/time is established when the order is downloaded from the LIS and the result completion date/time is based on the date/time of the result from the instrument.


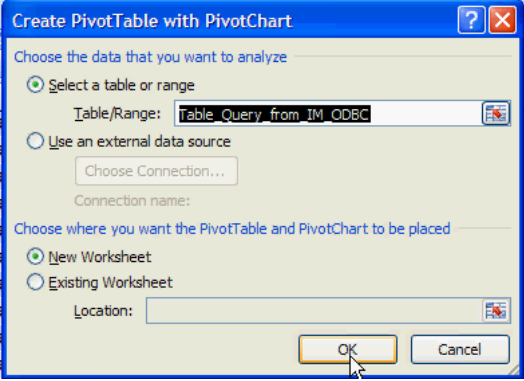
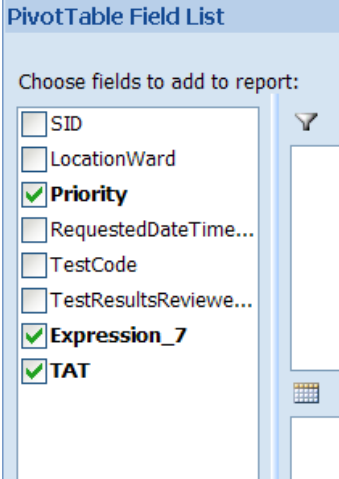
Example of the Report:

Below is an example of the report generated from Instrument Manager into Microsoft Excel.



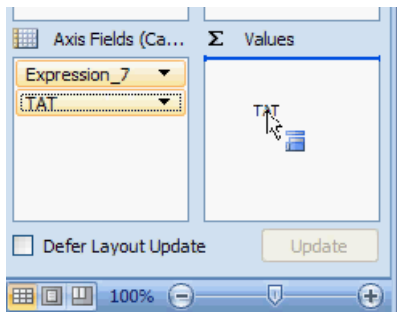
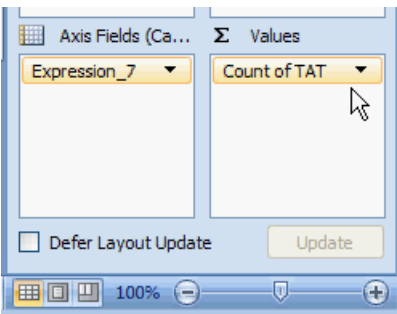
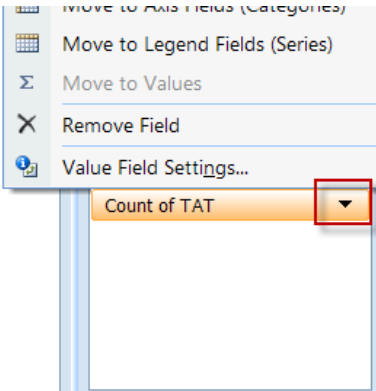
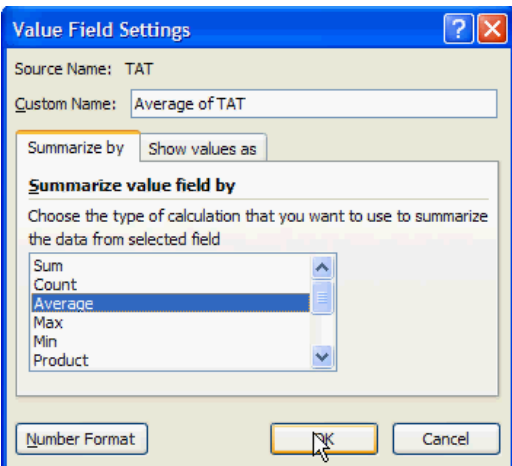


Report: Turnaround Time by Priority - continued

Step	Action / Description	
1	Select a cell within the new dataset and select <i>PivotChart</i> from the <i>Insert</i> → <i>PivotTable</i> menu.	
2	Select <i>OK</i> and using the default values from the <i>Create PivotTable with PivotChart</i> dialog box.	
3	Click the checkbox next to <i>Priority</i> , <i>Expression_7</i> and <i>TAT</i> in the <i>PivotTable Field List</i> box.	



Report: Turnaround Time by Priority - continued

Step	Action / Description	
4	Click and drag <i>TAT</i> from the <i>Axis Fields Categories</i> box to the <i>Values</i> box.	 
5	Click the down arrow on <i>Count of TAT</i> from the <i>Values</i> box and select <i>Value Fields Settings</i> option.	
6	Change the <i>Summarize value field by</i> from <i>Count</i> to <i>Average</i> and click <i>OK</i> .	




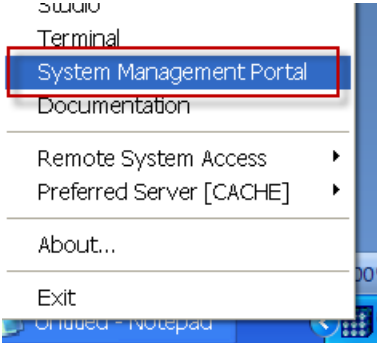


Report: Turnaround Time by Priority - continued

Step	Action / Description																																	
7	<p>Select the Column C (all the values in the <i>Total</i> column) and change the format to h:mm:ss by going to <i>Home</i> → <i>Format</i> → <i>Format Cells</i> → <i>Custom</i> and select <i>OK</i>.</p> <div style="display: flex; justify-content: space-around;"> <table border="1" data-bbox="927 275 1370 575"> <thead> <tr> <th>A</th> <th>B</th> <th>C</th> </tr> </thead> <tbody> <tr><td>Average of 1</td><td></td><td></td></tr> <tr><td>Priority</td><td>Expression_7</td><td>Total</td></tr> <tr><td>Routine</td><td>7/14/2009 0:41</td><td>0.028784722</td></tr> <tr><td></td><td>7/14/2009 1:42</td><td>0.029166667</td></tr> <tr><td></td><td>7/14/2009 2:39</td><td>0.027581019</td></tr> <tr><td></td><td>7/14/2009 3:41</td><td>0.028912037</td></tr> <tr><td></td><td>7/14/2009 4:42</td><td>0.029166667</td></tr> <tr><td></td><td>7/14/2009 5:47</td><td>0.032962963</td></tr> <tr><td></td><td>7/14/2009 6:42</td><td>0.029166667</td></tr> <tr><td></td><td>7/14/2009 7:47</td><td>0.033310185</td></tr> </tbody> </table> <div data-bbox="948 604 1349 989"> </div> </div>	A	B	C	Average of 1			Priority	Expression_7	Total	Routine	7/14/2009 0:41	0.028784722		7/14/2009 1:42	0.029166667		7/14/2009 2:39	0.027581019		7/14/2009 3:41	0.028912037		7/14/2009 4:42	0.029166667		7/14/2009 5:47	0.032962963		7/14/2009 6:42	0.029166667		7/14/2009 7:47	0.033310185
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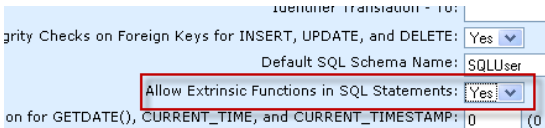
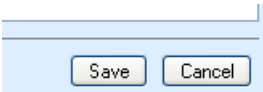

Appendix A: Database Configuration for Instrument Manager v8.08 - v8.14

This process defines how to ensure a key database configuration option is enabled to allow advanced SQL statements Instrument Manager system using ODBC for Instrument Manager.

Step	Action / Description	
1	On the Instrument Manager system, click on the Cache (blue cube) icon in the lower right corner of your desktop.	
2	Select <i>System Management Portal</i> from the Cache menu that appears.	
3	<p><u>For v8.08 and v8.09</u></p> <p>Enter "Admin" as the <i>User Name</i> without the quotes and "SYS" as the <i>Password</i> and click on the <i>Login</i> button.</p> <p><u>For v8.11 and above:</u></p> <p>The login / password is based on the user login and password and their security rights in Instrument Manager.</p>	
4	Select <i>Configuration</i> from the <i>InterSystem's System Administration</i> page.	



Appendix A: Database Configuration for Instrument Manager v8.08 - 8.14- continued

Step	Action / Description	
5	Select <i>SQL Settings</i> from the <i>InterSystem's System Configuration</i> page.	 <p>The screenshot shows a 'SYSTEM CONFIGURATION' window with a list of settings. 'SQL Settings' is highlighted in red.</p>
6	Ensure <i>Allow Extrinsic Functions in SQL Statements</i> option is set to <i>Yes</i> .	 <p>The screenshot shows configuration options for 'Allow Extrinsic Functions in SQL Statements' set to 'Yes'.</p>
7	Click the <i>Save</i> button in the lower-right of the window to the configuration options.	 <p>The screenshot shows 'Save' and 'Cancel' buttons.</p>
8	Close the browser window for the <i>InterSystems System Management Portal</i> by clicking the red-X (close button) in the upper-right corner of the browser window.	 <p>The screenshot shows the close button (red X) in the browser window's title bar.</p>