

# Queen Elizabeth Hospital

A Review of ORIOLE:

**Current Capabilities** 



**Redwing Business Intelligence Ltd** 

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# **Queen Elizabeth Hospital:** Review of ORIOLE: current capabilities

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# **Review of Oriole: current capabilities**

### **Summary**

A question was raised regarding system capabilities. The areas of interest were Session Closures and Theatre Case Cancellations. The next section of this document describes and shows samples of the existing quarterly activity reporting, that was produced by dint of much manual effort.

This issue is this: does Oriole have the capabilities within it today to generate the required analytics?

It's clear from the results described below, that the ORIOLE system for Operating Theatres Intelligence **does** indeed have the current capability to produce the required information.

# Methodology

- First, for each of Theatre Cases and for Session Closures, an analysis was done of whether the basic information was actually present in the data warehouse (the cube). All required information was indeed present within the data warehouse, and very easily accessible using point, click, drag-and-drop of the appropriate selections in the Cube Browser. Please note that the Cube Browser is in SQL Server Management Studio, which is an Informatics tool.
- Second, existing canned reporting was looked at to see if it would produce the information required. It was determined that it would *not* produce the specific analytics required.
- This lack of canned reporting capability was considered quite acceptable. The canned reporting was only ever intended to cover 80% of known initial requirements. Ad-hoc and new reporting had always been intended to be produced in the first instance using Excel, as is demonstrated in this document. Excel is the way to cater for the unanticipated 20%.
  - Should the new report be a one-off, then it would be produced in Excel (with or without the use of PowerPivot as appropriate).
  - Should the new report be a regular requirement, then it would be produced in Excel (with or without the use of PowerPivot as appropriate). Afterwards, it would be added to Excel Services or the PowerPivot Gallery as appropriate, so that anyone may run the new report on-demand.
  - Should monitoring of the new Excel report indicate that it was being run very frequently, and consuming a lot of resources, then it should be re-written as a canned report and added to the standard report library.
- Finally, Excel was used as a simple reporting tool, again using point, click, drag-and-drop of the appropriate selections. This method required nothing more specialised than Excel on the desktop, which is indeed an end-user tool, and which was intended to be available to everyone. The later sections of this document give very detailed step-by-step instructions.
- It is important to have the right desktop tool, which is the current version of Excel (i.e. Excel 2010). Once you have that, the entire data warehouse is open to you.
   It's also necessary to have a reasonably up-to-date version of Internet Explorer to be able to use the canned reporting properly (i.e. at least IE8).

# **Quarterly Activity Reporting Requirement**

#### Theatre Case Cancellation



The requirement is to be able to count Theatre Case Calculations by reason for cancellation, and to drill into the underlying data to find the specific reasons for cancellation.

The need at this time is to demonstrate that this can be done using the common or garden desktop analytics tool, Excel.

Note that canned reports can be exported in Microsoft Word format, or simply pushed directly to Subscribers on a periodic basis,

Given this requirement is quarterly, Redwing recommends a canned report..

#### **Session Closure Requirement**





In October 3 sessions were cancelled due to bed shortages with two others cancelled as patient was unfit. Both these were major cases which is why the whole session was lost.

The requirement is to be able to count Session Closures by reason for closure, and to drill into the underlying data to find the specific reasons for closures.

The need at this time is to demonstrate that this can be done using the common or garden desktop analytics tool, Excel.

Note that canned reports can be exported in Microsoft Word format, or simply pushed directly to Subscribers on a periodic basis,

Given this requirement is quarterly, Redwing recommends a canned report.

# **Analysis of Theatre Cases**

Measures (the things we can add up) that are available for analysis of Theatre Cases.

The ones circled in red are the ones of interest. Cancelled Within A Day is the Case Count for Theatre Cases where the time of cancellation is with 24 hours of the projected operation date and time.

The dimension attributes in green are also of interest.



This is how Cancellation information looks in the data warehouse (cube) browser. Note that one cell has been picked. It is highlighted. When the right mouse button is clicked, the pop-up contextual menu appears. The choice being made in this example is to list the underlying data.

Dimension		H	lierard	hy	Operator							
Cancellation Type					ion Groups					Not Equal		
Calact dimension >												
<select dimension=""></select>												
Neo Eilter Eielde Here												
rop Filter Fields Here	Month	th 🔻 Date										
⊒ July 2011						Augus	t 2011		Geptembe	er 2011	Grand Total	
Cancellation Crown Docs	Cancellation Deco	Case Cou	int Car	scelled	Within A Day	Case Cou	nt Cancelled	Within A Day	Case Count	Cancelled Within A Day	Cace Count	Cancelled Within A Day
ancellation Group Desc v	Calicellation Desc •	Case Cou		icelieu	WIGHT A Day	o	o o	WIGHT A Day	case count	concelled within A Day	to to the total to	10
j beu snortage	Ward Bad Chastrage	5	3			0	ð or		5	5	10	10
	Total	2	5			00	00		72	72	175	175
Clinian	Total	8	8			94	94		73	/3	1/5	1/5
j Cinicai	Operation not Required	85	52			28	20		/5	3/	188	109
	Patient Unfit	30	2/			25	19		30	26	85	72
	Iotal	115	79			53	39		105	63	2/3	181
D.N.A.	Did Not Arrive	6	6			6	6		8	8	20	20
	lotal	6	6			6	6		8	8	20	20
Equipment	Failure/Unavailable	1	1								1	1
	lotal	1	1			-	-		-	-	1	1
Non-Clinical	List Overrun	8	8			3	3	1	6	6	1/	1/
	No Surgeon/Anaesthetist	4	4	-	Copy	Сору		6	3	39	28	
	No Theatre Staff	5	5	-	Auto Eilter		-	-	8	8		
	Other	19	14	-	Auto Filter	to Filter			8	5	35	26
	Patient Cancelled/Refused Operation	85	32	-	Remove Total			39	13	186	69	
1.2.1	Total	121	63						59	27	285	148
rand Total		251	157	~	Show Emp	oty Cells			245	171	754	525
					Clear Peru	lte						
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				Ž 🗸	Sort Ascer	nding						
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					Show Only	the Bott	om 🕨					
					Show As		•	1				
					Command	is and Op	tions					
					commanus and options							

When *List Cancellation text* is picked, this *drillthrough* pop-up appears, showing the detail supporting the number 8 in the cross-tab table in the browser:

\$Theatre C	[\$Theatre Case].[	[\$Theatre Case	[\$Theatre Case].[Case Cancellation Text]	[\$Cancellatio	[\$Cancellatio
1515567	No Operation	20110731	Insufficient time	List Overrun	Non-Clinical
712314	No Operation	20110715	Lack of time	List Overrun	Non-Clinical
1511789	No Operation	20110726	Lack of time	List Overrun	Non-Clinical
241373	No Operation	20110717	Insufficient time in session	List Overrun	Non-Clinical
211298	No Operation	20110712	Out of time for session	List Overrun	Non-Clinical
243273	No Operation	20110711	Out of time	List Overrun	Non-Clinical
767100	No Operation	20110716	Cancelled and Pt not brought to theatre as previous Pt had complications	List Overrun	Non-Clinical
98381	No Operation	20110716	No time left in session - previous patient overran with problems	List Overrun	Non-Clinical
					Class

Both the numbers and the underlying data are available for reporting. Of course, the text must be entered into ORMIS in the first place. It will not be available for any reporting otherwise.

The conclusion from all this is that the ORIOLE data warehouse **does** indeed contain all the information on Theatre Case Cancellations that could be required for any analysis, assuming it had been entered in the first place. Of course, if not, then not even going back to ORMIS will help.

# **Analysis of Sessions**

Measures (the things we can add up) that are available for analysis of sessions.

The ones circled in red are the ones of interest.

🮯 Oriole	
E Measures	
🕀 🚞 Cases	
🕀 🚞 Delays	
🕀 🚞 Procedures	
🖃 🦢 Sessions	
Early Finish Count	
📲 Early Finish Mins	
🖷 Early Finish Percentage	
Early Start Count	
Early Start Mins	
Early Start Percentage	
🖷 Funded Sessions	
Funded Sessions Planned	
📲 Late Finish Count	
📲 Late Finish Mins	
🖷 Late Finish Percentage	
📲 Late Start Count	
📲 Late Start Mins	
Late Start Percentage	
🖷 Open Session Length	
Open Session Length over Planned Session Length	
In the second se	
Den Sessions	
Operating Rate	
Overall Closure Rate	
Planned Closure Rate	
Planned Closures	
Planned Session Length	
Planned Sessions	
Bun Time	
🔐 Run Time over Open Session Length	
Run Time over Open Session Length	
Dun Time over Session Length	
Session Elective Trauma Count	
Session First Delay Minutes	
Session Length	
Session Total Actual	
Session Total Available	
Session Treatment Duration	
III Single Double	
Treatment Time over Run Time	
Turnaround Time	
Infunded Sessions	
Inplanned Closure Rate	
Implanned Closures	
🖷 Usage Rate	
🖷 Utilisation Rate	
I I Admission Type	

#### **Measures of interest**

Session Count	Raw count of sessions
Single Double	Count of sessions where half day sessions count as 1, an all-day session counts as 2. Single Double is always bigger than Session Count.
Unfunded Sessions	'Single Double' where there is <i>no</i> funding
Funded Sessions	'Single Double' where there is funding
Planned Closures	The amount by which Funded Sessions is to be reduced for reasons such as Audit or Consultant Surgeon Annual Leave
Planned Sessions	Funded Sessions minus Planned Closures
Unplanned Closures	The amount by which Planned Sessions is to be reduced for reasons such as No Beds Available or Equipment Failure
Open Sessions	Planned Sessions minus Unplanned Closures

Here's a diagram showing an example of these calculations:





#### List of all possible Session Closure and Reinstatement Codes that could be used



#### Browsing the Data Warehouse (Cube)

Using a test database of realistic but not real data, the following results were obtained with the Cube Browser. This is for a single month, but could be any time period desired.:

#### Result 1. The measures alone.

Dro	p Filter Fields H	lere										
	Month 🔻 🛛 Da	te										
	g July 2011											
ere	Session Count	Single Double	Unfunded Sessions	Funded Sessions	Planned Closures	Planned Sessions	Unplanned Closures	Open Sessions				
Ť	456	515	6	509	13	496	29	467				
eld												
Ē												
Rov												
d												
à												

This makes perfect sense. Everything is in order:

Session Count	456				
Single Double	515				
Unfunded Sessions	6				
Funded Sessions	509 ( = 515 – 6 )				
Planned Closures	13				
Planned Sessions	496 ( = 509 – 13 )				
Unplanned Closures	29				
Open Sessions	467 ( = 496 – 29)				

#### Result 2. Broken down by reinstatements.

Drop Filter Fields Here												
	Month 🔻 🛛 Da	nth 🔻  Date										
	July 2011	uly 2011										
Reinstatement Desc 🛛 🔻	Session Count	Single Double	Unfunded Sessions	Funded Sessions	Planned Closures	Planned Sessions	Unplanned Closures	Open Sessions				
(Blank)	440	499	6	493	13	480	29	451				
Cancelled in Error	2	2		2		2		2				
Covered by Other Consultant	4	4		4		4		4				
Covered by Other Staff	10	10		10		10		10				
Grand Total	456	515	6	509	13	496	29	467				

Reinstatement statistics are useful to know, but the salient point here is that Reinstated Sessions fall into the Open Sessions category.

#### Result 3. Broken down by Closure Group and specific Closure Type.

Drop Filter Fields He	re											
		Month V Date E July 2011										
Closure Group 🔻	Closure Desc 🔹	Session Count	Single Double	Unfunded Sessions	Funded Sessions	Planned Closures	Planned Sessions	Unplanned Closures	Open Sessions			
Open	Open / Not Closed	426	483	6	477		477	10	467			
	Total	426	483	6	477		477	10	467			
Planned	Audit	5	5		5	5	0					
	Consultant Surgeon annual leave	7	7		7	7	0					
	Routine Maintenance	1	1		1	1	0					
	Total	13	13		13	13	0					
🖃 Unplanned	Anaesthetist unavailable	1	1		1		1	1				
	ITU/HDU beds unavailable	1	1		1		1	1				
	No Beds Available	1	1		1		1	1				
	Other	3	3		3		3	3				
	Session transferred to other theatre	4	4		4		4	4				
	Surgeon Unavailable	3	3		3		3	3				
	Theatre Staff Shortage	2	3		3		3	3				
	Theatre staff unavailable	2	3		3		3	3				
	Total	17	19		19		19	19				
Grand Total		456	515	6	509	13	496	29	467			

Note that empty rows are not shown, so this month, the test data did not have any Theatre Washdowns, for example. Open sessions are included, and show up in the Grand Totals.

The next image shows Open sessions filtered out *and* with empty rows present.

Here's what it looks like. Note that the numbers and totals remain the same:

Dimension		Hierarchy		Operator		Filter Exp	pression			
Closure Type		Closure Group		Not Equal		{ Open ]	}			
<select dimension<="" td=""><td>&gt;</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></select>	>									
Drop Filter Fields He	re									
			Month		August 2011		September 20	11	Grand Total	
Closure Group 🔻	Closure Desc	•	Session Count	Single Double						
Planned	Audit		5	5	5	5			10	10
	Bank Holiday				48	56			48	56
	Consultant Anaest	thetist Annual Leave					2	2	2	2
	Consultant Surgeo	n annual leave	7	7	5	5	5	5	17	17
	Consultant Surgeo	n on professional leave					2	2	2	2
	Planned closure				3	3			3	3
	Routine Maintenan	nce	1	1					1	1
	Total		13	13	61	69	9	9	83	91
🖃 Unplanned	Anaesthetic Staff	shortage			1	1			1	1
	Anaesthetist unav	ailable	1	1	1	1			2	2
	Consultant Surgeo	n Sick Leave			4	4			4	4
	ITU/HDU beds una	ivailable	1	1	1	1	2	3	4	5
	No Beds Available		1	1	20	23	9	9	30	33
	Other		3	3	18	19	9	11	30	33
	Session transferre	d to other theatre	4	4	2	2	1	1	7	7
	Surgeon Unavailab	le	3	3	6	6	3	3	12	12
	Theatre Staff Shor	rtage	2	3	1	1			3	4
	Theatre staff unav	/ailable	2	3	2	3	1	1	5	7
	Ward beds unavail	lable			7	8	2	2	9	10
	Total		17	19	63	69	27	30	107	118
Grand Total			30	32	124	138	36	39	190	209

In July, we had a raw count of **30 sessions closed**.

#### Result 4. Theatre Closure KPIs.

We can, of course, generate all possible KPIs around closures.

_			
Dr	op Filter Fields Here		
	Month 🔻 Date		
	⊕ July 2011		
ere e	Overall Closure Rate	Unplanned Closure Rate	Planned Closure Rate
Ľ	8.25%	5.85%	2.55%
1 Sp			

#### Getting the most detailed level of data (the atomic transactions)

As before, we could right-click and get a popup.

If we did that, here's the data view (split over two lines):

Q	🕻 Data Sample Viewer (firs	t 1000 record	ls)					
ſ	[\$Section] [D ACTION]	[Continue]	21 Innina 291	[\$Serrion] [Serrion   Itilization Category	1 [¢Sercion] [Sec	rion Typel	(Serrion) [Serrion Funding]	
	(null)	20110702	1012	Funded - Closed - Unplanned	Elective	sion type]	Funded	
			- 12	- fam				
1	Session].[Session Period]	[\$Closure Ty	rpe].[Closure De	esc] [\$Closure Type].[Closure Group]	[\$Reinstateme 2	[\$Theatre].[T	[\$Session Consultant].[Staff Sur	rname]
Ν	lorning	ITU/HDU bea	ds unavailable	Unplanned	(null)	RT2	MCMAHON	

However, we can also list the raw data directly (all lowest-level data is in the cube). This is for July:

	Session Date	Planned Session Start	Planned Session Finish			Date Closed	Session Type
1	20110726	2011-07-26 13:30:00.000	2011-07-26 17:00:00.000		Audit	2011-07-18 00:00:00.000	Unknown
2	20110708	2011-07-08 09:00:00.000	2011-07-08 12:30:00.000		Consultant Surgeon annual leave	2011-05-23 00:00:00.000	Unknown
3	20110724	2011-07-24 14:00:00.000	2011-07-24 17:30:00.000		Consultant Surgeon annual leave	2011-05-23 00:00:00.000	Unknown
4	20110729	2011-07-29 09:00:00.000	2011-07-29 12:30:00.000		Consultant Surgeon annual leave	2011-05-23 00:00:00.000	Unknown
5	20110704	2011-07-04 14:00:00.000	2011-07-04 17:30:00.000	Doing a general list at Eccleston	Session transferred to other theatre	2011-06-14 00:00:00.000	Unknown
6	20110710	2011-07-10 09:00:00.000	2011-07-10 12:30:00.000		Session transferred to other theatre	2011-05-22 00:00:00.000	Unknown
7	20110724	2011-07-24 09:00:00.000	2011-07-24 12:30:00.000		Session transferred to other theatre	2011-07-05 00:00:00.000	Unknown
8	20110730	2011-07-30 09:00:00.000	2011-07-30 12:30:00.000		Consultant Surgeon annual leave	2011-05-23 00:00:00.000	Unknown
9	20110730	2011-07-30 14:00:00.000	2011-07-30 17:30:00.000		Consultant Surgeon annual leave	2011-04-26 00:00:00.000	Unknown
10	20110702	2011-07-02 08:30:00.000	2011-07-02 12:30:00.000	No ICU bed available	ITU/HDU beds unavailable	2011-07-02 00:00:00.000	Elective
11	20110725	2011-07-25 09:00:00.000	2011-07-25 17:30:00.000	All day session closed bacause of staff illness	Theatre Staff Shortage	2011-07-25 00:00:00.000	Elective
12	20110726	2011-07-26 13:30:00.000	2011-07-26 18:00:00.000	Audit	Audit	2011-05-30 00:00:00.000	Elective
13	20110718	2011-07-18 08:30:00.000	2011-07-18 13:30:00.000	No surgical beds available	No Beds Available	2011-07-17 00:00:00.000	Elective
14	20110719	2011-07-19 08:30:00.000	2011-07-19 13:30:00.000	Critical theatre staff sick	Theatre Staff Shortage	2011-07-18 00:00:00.000	Elective
15	20110726	2011-07-26 09:00:00.000	2011-07-26 12:30:00.000	No Surgeon	Anaesthetist unavailable	2011-07-18 00:00:00.000	Elective
16	20110726	2011-07-26 14:00:00.000	2011-07-26 17:30:00.000	Audit	Audit	2011-05-30 00:00:00.000	Elective
17	20110704	2011-07-04 14:00:00.000	2011-07-04 17:30:00.000	Session transferred to Day	Session transferred to other theatre	2011-07-03 00:00:00.000	Elective
18	20110729	2011-07-29 09:00:00.000	2011-07-29 12:30:00.000		Consultant Surgeon annual leave	2011-05-23 00:00:00.000	Unknown
19	20110729	2011-07-29 13:00:00.000	2011-07-29 16:30:00.000		Consultant Surgeon annual leave	2011-05-23 00:00:00.000	Unknown
20	20110726	2011-07-26 14:00:00.000	2011-07-26 17:30:00.000	Audit	Audit	2011-05-30 00:00:00.000	Elective
21	20110724	2011-07-24 09:00:00.000	2011-07-24 12:30:00.000	There are no staff or patients availabe	Theatre staff unavailable	2011-07-24 00:00:00.000	Elective
22	20110708	2011-07-08 14:00:00.000	2011-07-08 17:30:00.000	No patients	Other	2011-07-10 00:00:00.000	Elective
23	20110710	2011-07-10 14:00:00.000	2011-07-10 17:30:00.000	All the patients on the list were done in the momi	Other	2011-07-11 00:00:00.000	Elective
24	20110712	2011-07-12 14:00:00.000	2011-07-12 17:30:00.000	Only one patient - unfit so session closed	Other	2011-07-12 00:00:00.000	Elective
25	20110726	2011-07-26 14:00:00.000	2011-07-26 17:30:00.000	Air con maint	Routine Maintenance	2011-07-18 00:00:00.000	Elective
26	20110723	2011-07-23 14:00:00.000	2011-07-23 17:30:00.000	No surgeon - in Day	Surgeon Unavailable	2011-07-22 00:00:00.000	Elective
27	20110727	2011-07-27 09:00:00.000	2011-07-27 18:00:00.000	Session close - staff sickness	Theatre staff unavailable	2011-07-31 00:00:00.000	Urgent/Trauma
28	20110712	2011-07-12 09:00:00.000	2011-07-12 12:30:00.000	No general surgeon and not enough staff to offe	Surgeon Unavailable	2011-07-04 00:00:00.000	Unknown
29	20110715	2011-07-15 13:30:00.000	2011-07-15 17:00:00.000		Surgeon Unavailable	2011-07-10 00:00:00.000	Unknown
30	20110726	2011-07-26 13:30:00.000	2011-07-26 17:00:00.000		Audit	2011-07-18 00:00:00.000	Unknown

Note 30 rows; this is consistent with the totals shown in the cube browser

Note *Session Type*. Some sessions are identified as Unknown. This is how the data was originally entered into ORMIS.

Note also the comment column in the middle. There is a place for text to be entered describing the reason for Session Closure. If it is not entered into ORMIS, it is not available for analysis.

The conclusion from all this is that the ORIOLE data warehouse **does** indeed contain all the information on Session Closures that could be required for any analysis, assuming it had been entered in the first place. Of course, if not, then not even going back to ORMIS will help.

# **Reporting: connecting to the data warehouse**

Starting with a blank Excel 2010 worksheet

XII		-	-	The same of the sa	-	B	-		-			Bool	d - Microsoft	t Excel					
Fil	e Hoi	me Inse	rt Pag	e Layout	Formulas	Data P	Review	View	PowerPivot	Team									
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Select the Data tab and highlight 'From Analysis Services' from the 'Get External Data' section

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		Get Ex	图	From SQL	Server	on to a SC	1 Server table. Im	nort data	Sort & Fi	lter			Data Too
	A1			into Excel	as a Tab	le or Pivo	Table report.	portiona	-				
	А	В	3	From Ana	alysis Ser	vices			н	1	J	K	L
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2			SEA.	From XM	L Data In	nport							
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4			TEN	From Dat	a Conne	ction Wiz	ard		_				
5			The	Import da	ita for an	unlisted	format by using t	he Data					
6				Connectio	on Wizar	d and OL	EDB.		-				
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A dialog box appears. Complete the server name, allow the default 'Use Windows Authentication' and click 'next'

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		Data	Connection W	/izard					2	×		
		Cor Er	ter the information	tabase S	Gerver and to connect	to the databa	ise server.		No.			
		1	. Server name:	Grace								
		2	Log on creder     O Use <u>Wind</u>	ntials lows Auther	ntication	Descoured						
			User Nar Passwo	ne:	er manne annu r	-doowld U						
					6	ancel	< <u>B</u> ack	Next >	Finish			
		-	_	_	_		_			-		

#### And another dialog box appears

es *	Existing Connections	Refresh All - Geo Edit L	inks XI S	Sort Filter	Advanced	Text to Remo Columns Duplic	we Data ates Validation Data Tor	Consolida	te What-If Analysis *	Group U	Outline	otal
	f <sub>x</sub>											-
С	D	E	F G	Н	1	J K	L	М	N	0	Р	(
		Data Conne	ction Wizard				8	×				
		Select D Select th	atabase and e Database and T	Table able/Cube which	contains the dat	a you want.	X					
		Select the d	latabase that cont	tains the data yo	want:							
		Connect	to a specific cube	or table:								
		Name	Description	Modified	Creat	ed Type						
		Cases Delays Oriole Proced	ures ns	2/14/2012 9:3 2/14/2012 9:3 2/14/2012 9:3 2/14/2012 9:3 2/14/2012 9:3	17:56 AM 17:56 AM 17:56 AM 17:56 AM 17:56 AM	PERSPECTIVE PERSPECTIVE CUBE PERSPECTIVE PERSPECTIVE						
			_	Ca	ncel <	jack Next >	Enis					

This is interesting. The last column says Type, and under it, is PERSPECTIVE and CUBE.

CUBE is the entire data warehouse. Don't use that one, it is too complex, and we want separate reporting for Sessions and Theatre Cases. Each PERSPECTIVE is a subset of the warehouse, showing just the relevant parts.

At this time, make sure that Oriole appears in the drop-down list box labelled 'Select the database that contains the data you want', highlight Sessions, tick the check box labelled 'Connect to a specific cube or table' and then click Next. (Note that the Oriole database contains the CUBE and the PERSPECTIVEs.)

This should bring up the Data Connection Wizard.

fx	Connections Soft of Filter Data Tools	
D	я в а н и и н м	11.3
	Data Connection Wizard	
	Save Data Connection File and Finish Enter a name and description for your new Data Connection file, and press Finish to save.	
	File Name:	
	Oriole Sessions.odc Browse	
	Save password in file     Qescription:	
	Connect to Oriole	
	Frjendly Name:	
	Oriole Sessions	
	Search Keywords:	-
	Always attempt to use this file to refresh data Excel Services: Authentication Settings	
	Cancel < Back Next > Enish	

As you can see, we've labelled it 'Oriole Sessions' and this is the last step in connecting to the data warehouse.

Click 'Finish.

Later, you can repeat these steps, but choose the Cases perspective, to create a data connection to the Theatre Cases perspective in the cube.

With the Data connection established, we're now going to Import Data.

After the finish button was clicked, you will get a dialog box like this:

Import Data		9	23
Select how you w Table Table Pivo Conly Where do you wa Existing w	ant to view this da Table Report Chart and PivotTa Create Connection ant to put the data orksheet:	ata in your work ble Report n !?	book.
=\$A\$1	sheet		

The default is good here. Click OK to create a PivotTable report. We're not going to create any charts, or do more fancy stuff with PowerPivot and the DAX Data Expressions language. This is going to be quite basic. Bells and whistles can be added later.

This is a basic Excel spreadsheet. It is connected directly to the Sessions Perspective of the data warehouse, and has access to all of the data we looked at in *Analysis of Sessions*.

🔀   🛃 🧐 ▾ (∾ ▾   ╤	Book1 - Microsoft E	cel	PivotTable Tools	100	
File Home Insert Page L	ayout Formulas Data Review	View Developer Power	rPivot Options Design		x 🖷 🗆 🕥 a
PivotTable Name:     Active Field:       PivotTable1     Image: Construction of the second s	⇒ Group Selection     ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	t Refresh Change Data Data	Select Move PrivotTable Actions Calculation	Ilues By ~ As ~ & Sets ~ PivotChart OLAP What Tools ~ Analys Tools	Hield Huttons Headers Show
A1 • 🤄	$f_{x}$				~
Prottable         Active Field           A         B         C           1         -         -           2         PivotTable1         -           3         PivotTable1         -           4         To build a report, choose fields from the PivotTable         -           6         Field List         -           7         8         -           9         -         -           11         -         -           12         -         -           13         -         -           14         -         -         -           15         -         -         -           16         -         -         -           17         -         -         -           18         -         -         -           19         -         -         -           20         -         -         -           21         -         -         -           22         -         -         -           23         -         -         -           24         -         -         -	Group         Sort & Filter           F         G           D         E         F         G           Image: Sort & Filter         Image: Sort & Filter         Image: Sort & Filter         Image: Sort & Filter           Image: Sort & Filter         Image: Sort & Filter         Image: Sort & Filter         Image: Sort & Filter         Image: Sort & Filter           Image: Sort & Filter         Image: Sort & Filter         Image: Sort & Filter         Image: Sort & Filter           Image: Sort & Filter         Image: Sort & Filter         Image: Sort & Filter         Image: Sort & Filter           Image: Sort & Filter         Image: Sort & Filter         Image: Sort & Filter         Image: Sort & Filter           Image: Sort & Filter         Image: Sort & Filter         Image: Sort & Filter         Image: Sort & Filter           Image: Sort & Filter         Image: Sort & Filter         Image: Sort & Filter         Image: Sort & Filter           Image: Sort & Filter         Image: Sort & Filter         Image: Sort & Filter         Image: Sort & Filter           Image: Sort & Filter         Image: Sort & Filter         Image: Sort & Filter         Image: Sort & Filter           Image: Sort & Filter         Image: Sort & Filter         Image: Sort & Filter         Image: Sort & Filter           Image: Sort & Filer         Image: Sort &	Data           H         I         I           I	Actions         Calculation           J         K         L         M           I         I         I         I           I         I         I         I           I         I         I         I           I         I         I         I           I         I         I         I           I         I         I         I           I         I         I         I           I         I         I         I           I         I         I         I           I         I         I         I           I         I         I         I           I         I         I         I           I         I         I         I           I         I         I         I           I         I         I         I           I         I         I         I           I         I         I         I           I         I         I         I           I         I         I         I           I         I         I		Show VotTable Field List VotTable Field VotTable VotTa
40 41 42 43 Ready Sheet1 Sheet2 Shee Ready □	t3 /9 /	] 4 [	10		Defer Layout Update Update

There are three things to note here:

- The PivotTable File List pane on the right of the main window;
- The three highlighted buttons for controlling what you see and what you don't; and
- The PivotTable tools tab at the top of the Ribbon. In the image above, the Options tab is selected. The image below show the Design tab.

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File	Home I	isert Pa	ige Layout	Formulas	Data	Review	View	Developer	PowerPivo	t Option	s Design		
Subtotals	Grand Rep Totals * Layo	ort Blank	🗹 Row H	eaders 📄	] Banded R ] Banded C	lows Columns							4 4
	Layout		F	vivotTable Styl	e Options					PivotTable Sty	les		

# **Reporting: develop a spreadsheet.**

If you have never worked with PivotTables before, then <u>here</u>'s a good general guide.

<u>Here</u> is a useful webcast (SQL Server 2008 R2 Analysis Services: Creating Excel 2010 PivotTable and Developing Report with Analysis Services Cube.

Please note that clicking a cell outside the chart or table area removes the field list from view.

The first step is to pick the fields to add to the report in the PivotTable Field List.

Pick Session Count, and the spreadsheet will change to this:

	•   <del>↓</del>	Page Laver	rt Formula	Book1	- Microsoft	Excel	Davalanar	Bourari	Divot	PivotTab	ole Tools						
PivotTable Name: PivotTable1 PivotTable1 PivotTable	Active Field: Session Count	ngs =∃ €	Group Select Ungroup Group Field Group	ion ⊉↓ ∡↓	AZA Sort In Sort & Filter	sert cer •	h Change Data Source *	Clear	Select Actions	Move ivotTable	Show Valu Fields, Item Calculat	Values By ~ es As ~ s, & Sets ~ ions	PivotChart	OLAP Tools * A Tools	Whanaly	At-If Field +/- Field List Buttons Headers Show	
A2	<u>→ (°</u>	f <sub>x</sub>	18739												_		~
A	В	С	D	E	F	G	H	1.1	J	K	L	М	Ν	0		PivotTable Field List	<b>▼</b> X
1 Session Cou	unt															Change fields to add to conarts	
2 18 3 4 5	739															Usage Rate	
6																🗄 🚪 KPIs	
7 8 9 10 11 12																Galendar Galendar Galendar Galendar Y+4-Q-D Galendar Y+4-Q Year Month Date	
13																	
14																H Core fields	
16 17																Closure Type	E
18																Closure Complete	
19																Closure Desc	
20															_		- 11
22																Consultant     Consultant	-
23																	
24																Drag fields between areas below:	Labels
25																	
27																	
28																	
29																	
30																	
31																	
33																	
34																Row Labels <b>Σ</b> Values	
35																Session Co	unt 🔻
36																	
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39																	
40																	
41																	
42															-	Defect avaut Lindate	Indata
H A D H Shee	et1 Sheet2	Sheet3	2					[ ◀						► I		Defer Layout opdate	puate
Ready 🔠		_														100%	- + ":

Note that the Session Count is checked, and it appears in the Values section at the lower right.

Time to add a date filter.

- 1. Scroll down the Field List until you get to Calendar.
- 2. Drag Y-M-D to Report Filter. You will note a check mark appear, and there will be a Y-M-D in cell A1. It will say All in B1, and there will be a down arrow.
- 3. Click on the down arrow. You will get a selection pop-up.
- 4. Put a tick in the 'Select multiple items box', then click on the + sign next to the word All.
- 5. The years will appear. Remove the tick from the box next to All.
- 6. Click the + next to Calendar 2011.n The months of 2011 should appear. Put ticks next to July, August, and September.

The screen should look like this:



You've just done a Report Filter multi-select, picking out the three months.

Of course, you don't have to pick the *same* three months. It depends on what you are interested in.

Don't forget to click OK at the end! The screen should now look something like the image below. Note the filter icons in the PivotTable Field List.

	Α	В	С	D	E	F	G	н	1	J	К	L	M	N	PivotTable Field List	<b>▼</b> X
1	Y-M-D	(Multiple Items) 耳												[		
2															Choose fields to add to report:	- 12
3	Session Count														🗉 📑 Calendar	•
4	1325														□ □Y-H-Q-D	
5															Year	
6															Half Year	
7															Quarter	
8															Date	
9															🖃 🗸 Х-М-D	7
10															Year	Y
11															Month	Y
12															Date	7
13															TY-W-D	
																_

#### Now, drag Y-M-D into the Column Labels section.

	А	В	С	D	E	F	G	Н	1	J	K	L	M	N	PivotTable Field List	×
1																
2															Choose fields to add to report:	- <u>-</u>
3		Column Labels 🖵													□ □ Y-H-Q-D	^
4		Ealendar 2011	Grand Total												Year	
5	Session Count	1325	1325												Half Year	
6															Quarter	
7															Date	
8															🖃 👿 Y-M-D	Y
9															Year	Y
10															Month	Y
11															Date	Y
12														_	⊕ T-W-D	
13															🖃 院 More fields	
14															Day Of Month	
15														_	Day Of Week	=
17															Month	
18															🖃 🗐 Closure Type	
19															Closure Code	
20															Closure Complete	
21														=	Closure Desc	
22															Closure Group	-
23																
24															Drag fields between areas below:	
25															Report Filter Colum	1 Labels
26															Y-M-D	-
27																

It has disappeared from A1 and B1, and re-appeared as a *filtered* (note the icon in B3) set of column labels. Open up the labels by pressing the + in B4.

	А	В	С	D	E	F	
1							
2							
3		Column Labels 耳					
4		Calendar 2011	_		Calendar 2011 Total	Grand Total	
4		■ Calendar 2011 Uly 2011	⊕ August 2011		Calendar 2011 Total	Grand Total	
4 5 6	Session Count	□ Calendar 2011	⊞ August 2011 451	⊞ September 2011 418	Calendar 2011 Total 1325	Grand Total 1325	

If you look on page 7 under *Browsing the Data Warehouse*, you will see a value of 456 for July's Session Count. It's the same 456 as in B6. That's because it is the same data. **Not** a copy of that data. This is reading the data warehouse directly, just like the Cube Browser.

It's the real thing.

Now, drag Closure Group and then Closure Desc from under Closure Type to Row Labels. Your screen should look like this:

🗶   🛃 🍯 🕶 🖓 👻   📼	Book1 - Microsoft I	Excel		PivotTable	Tools	
File Home Insert Page Layout Formula	s Data Review	View De	eveloper PowerPin	vot Options	Design	a 😮 🗖 🗸
PivotTable Name: Active Field: 👦 🌳 Group Selecti	on ALAZ	<b>a</b>			🗊 Summarize Values By 🔻	🔒 🔜 👘 Field List
PivotTable1 Month 4 Ungroup	Ž 🕴 🚊 👗	31		neti neti	Show Values As -	Liff Strate Life Hand
Pield Settings	Z Sort Ins	ert Refresh Cha	ange Data Clear	Select Move	🔀 Fields, Items, & Sets 🛪	PivotChart OLAP What-If
PivotTable Active Field Group	Sort & Filter	Dat	ta	Actions	Calculations	Tools Show
B5 x 1uly 2011						~
	D	C	D	E	E	DiscaTable Field Link
1	5	C	b	-		
2						Choose fields to add to report:
3 Session Count	Column Labels 🖵					Date
4	□ Calendar 2011			Calendar 2011 To	otal Grand Total	∃ 🛛 Y-M-D 🌱
5 Row Labels	∃ July 2011	• August 2011	September 2011			Year 🍸
6 = Open	426	327	382	2 1	1135 1135	Month Y
7 Open / Not Closed	426	327	382	2 1	1135 1135	Date 🛛 🍸
8 BPlanned	13	61	9	)	83 83	
9 Audit	5	5			10 10	🖃 🖳 More fields
10 Bank Holiday		48			48 48	Day Of Month
11 Consultant Anaesthetist Annual Leave			2	2	2 2	Day Of Week
12 Consultant Surgeon annual leave	7	5	5	5	17 17	Month
13 Consultant Surgeon on professional leave			2	2	2 2	E Closure Type
14 Planned closure		3			3 3	Closure Code
15 Routine Maintenance	1				1 1	Closure Complete
16 BUnplanned	17	63	27	7	107 107	Closure Desc
17 Anaesthetic Staff shortage		1			1 1	Closure Group
18 Anaesthetist unavailable	1	1			2 2	
19 Consultant Surgeon Sick Leave		4			4 4	Drag fields between areas below:
20 ITU/HDU beds unavailable	1	1		2	4 4	Y Report Filter Column Labels
21 No Beds Available	1	20	<u>,</u>	,	30 30	Y-M-D ¥
22 Other	3	18	-		30 30	
23 Session transferred to other theatre	4	2	1		12 12	- 1
24 Surgeon Unavariable	3	0			2 2	
25 Theatre staff unavailable	2	1			5 5	Row Labels Σ. Values
27 Ward beds unavailable	2	2 7	-		9 9	
28 Grand Total	456	451	415	2	1325 1325	Closure Desc
29	450	-51	410		1010	
30						
31						
32						Defer Layout Update     Update
H + H Sheet1 Sheet2 Sheet3						
Ready 🛅						

#### Almost there.

We are now going to change the Row Labels to add a multi-select filter. We're going to lose the Open Sessions.

Note that B3 has a down a down arrow plus a filter icon.

Note that A5 has just a down arrow.

Click on the down arrow in A5, where it says Row Labels. You get a selection pop-up and the first thing It says is Select Field. Click on it, and you will see that it offers the options of with Closure Group or Closure Desc. Leave it at Closure Group.

In the lower section, remove the tick from the box next to Open..

Click OK, and you screen should look like this:

	Book1 - Microsoft	Excel		PivotTable Too	ols	
File Home Insert Page Jayout Formul	as Data Pevier	v View Di	aveloner PowerDiv	ot Options De	sign	
Direct Table Name: Active Field:					sign	
Privotrable Name: Active Field:					ummarize values by	
Pivotiable1 Month + Orgroup	Z↓ Sort In	sert Refresh Cha	ange Data Clear S	elect Move	now values as -	PivotChart OLAP What-If
PiertTabla Active Field	Sort & Filter	cer • • S	Source *	PivotTable	felds, items, & Sets	Tools * Analysis *
Pivotiable Active rieu Group	Suit of Filter	Ddi	ta ,	Actions	Calculations	10015 5110W
B5 • Jar July 2011	_	-		_		
A	В	С	D	E	F	PivotTable Field List 🔹 🗙
1						Choose fields to add to report:
2 Socian Count						Date
	Colendar 2011			Calendar 2011 Total	Grand Total	
5 Row Labels	∃ luly 2011	∃ August 2011	september 2011	Calendar 2011 (Otal	Grand Fotor	Year Y
6 = Planned	13	61	9	83	3 83	Month Y
7 Audit	5	5		10	0 10	Date T
8 Bank Holiday		48		48	3 48	
9 Consultant Anaesthetist Annual Leave			2	2	2 2	🖃 🖳 More fields
10 Consultant Surgeon annual leave	7	5	5	17	7 17	Day Of Month
11 Consultant Surgeon on professional leave			2	2	2 2	Day Of Week
12 Planned closure		3		а	3 3	Month
13 Routine Maintenance	1			1	1 1	Closure Type
14  Unplanned	17	63	27	107	7 107	Closure Code
15 Anaesthetic Staff shortage		1		1	1 1	Closure Complete
16 Anaesthetist unavailable	1	1		2	2 2	Closure Desc
17 Consultant Surgeon Sick Leave		4	2	4	4	Closure Group 🖓 🔻
18 IIU/HDU beds unavailable	1	1	4	4	4 4	Data falla babara anara babara
19 No Beds Available	1	20	2	30	J 30	Drag fields between areas below:
20 Other 21 Session transferred to other theatre	4	2	1		7 7	Y-M-D
22 Surgeon Unavailable		- 6	- 3	12	, .	
23 Theatre Staff Shortage	2	1	-	3	3 3	
24 Theatre staff unavailable	2	2	1	5	5 5	
25 Ward beds unavailable		7	2	9	9 9	
26 Grand Total	30	124	36	190	0 190	Row Labels <b>Σ</b> Values
27						Closure Group   Session Count
28						Closure Desc 🔻

#### And there it is.

A few cosmetic changes and it's just like it appeared in the Cube Browser that's built into SQL Server.

 						_
1	A	В	С	D	E	
1						
2						
3	Session Count					
4					Quarter Total	
5		July 2011	August 2011	September 2011		
6	Planned	13	61	9	83	
7	Audit	5	5		10	
8	Bank Holiday		48		48	
9	Consultant Anaesthetist Annual Leave			2	2	
10	Consultant Surgeon annual leave	7	5	5	17	
11	Consultant Surgeon on professional leave			2	2	
12	Planned closure		3		3	
13	Routine Maintenance	1			1	
14	Unplanned	17	63	27	107	
15	Anaesthetic Staff shortage		1		1	
16	Anaesthetist unavailable	1	. 1		2	
17	Consultant Surgeon Sick Leave		4		4	
18	ITU/HDU beds unavailable	1	. 1	2	4	
19	No Beds Available	1	20	9	30	
20	Other	3	18	9	30	
21	Session transferred to other theatre	4	2	1	7	
22	Surgeon Unavailable	3	6	3	12	
23	Theatre Staff Shortage	2	1		3	
24	Theatre staff unavailable	2	2	1	5	
25	Ward beds unavailable		7	2	9	
26	Grand Total	30	124	36	190	
27						

#### Here is Theatre Case Cancellations:

	Column Lat 🖵							
	⊟ Calendar 20: ⊞July 2011 Case Count	11 Cancelled	BAugust 2011 Case Count	Cancelled	. September Case Count	2011 Cancelled	Calendar 2011 Case Count	Calendar 2011 Cancelled
Row Labels	T	Within A Day		Within A Day		Within A Day		
Bed Shortage	8	8	94	94	73	73	175	175
ICU/HDU Bed Shortage	3	3	8	8	5	5	16	16
Ward Bed Shortage	5	5	86	86	68	68	159	159
Clinical	115	79	53	39	105	63	273	181
Operation not Required	85	52	28	20	75	37	188	109
Patient Unfit	30	27	25	19	30	26	85	72
■D.N.A.	6	6	6	6	8	8	20	20
Did Not Arrive	6	6	6	6	8	8	20	20
Equipment	1	1					1	1
Failure/Unavailable	1	1					1	1
■Non-Clinical	121	63	105	58	59	27	285	148
List Overrun	8	8	3	3	6	6	17	17
No Surgeon/Anaesthetist	4	4	29	21	6	3	39	28
No Theatre Staff	5	5	3	3			8	8
Other	19	14	8	7	8	5	35	26
Patient Cancelled/Refused Operation	85	32	62	24	39	13	186	69
Grand Total	251	157	258	197	245	171	754	525

Again, the numbers are good.

And again, we can click on a specific cell for more detail. This is called *drillthrough*.



#### And the raw atomic data:

А	В	С	D	E F	G
Data returned for 'List Cancellation text	[[Measures].[Cancelled Within A Day],[Canc	ellation Type].[Cancellation Gro	up Desc].&[N],[Cancellation Type].[Cancellation Desc].&[N1],[Calendar].[Y	-M-D].[Month].&[2	011-07-01T00:00:00])
[\$Theatre Case].[Case Patient MRN] 💌	[\$Theatre Case].[Case Operation Status] 🔄	[\$Theatre Case].[Case Date] 💌	[\$Theatre Case].[Case Cancellation Text]	💌 🖃 [\$Cancellati	[\$Cancellatic 💌
H515567	No Operation	20110731	Insufficient time	1 List Overrun	Non-Clinical
H712314	No Operation	20110715	Lack of time	1 List Overrun	Non-Clinical
H511789	No Operation	20110726	Lack of time	1 List Overrun	Non-Clinical
H241373	No Operation	20110717	Insufficient time in session	1 List Overrun	Non-Clinical
H211298	No Operation	20110712	Out of time for session	1 List Overrun	Non-Clinical
H243273	No Operation	20110711	Out of time	1 List Overrun	Non-Clinical
H767100	No Operation	20110716	Cancelled and Pt not brought to theatre as previous Pt had complications	1 List Overrun	Non-Clinical
H98381	No Operation	20110716	No time left in session - previous patient overran with problems	1 List Overrun	Non-Clinical

This demonstrates that everything we could do by interrogating the data warehouse directly using the tools in SQL Server, we can also do using Excel 2010 on the desktop.