



Reimagine Data Repository Reports with Microsoft Power BI

Session 1039 – Friday, June 9, 2:10

Presenter: Ian Proffer

2023 **MUSE** Inspire Conference

June 7-10 Gaylord Rockies Resort & Convention Center | Aurora, CO



Session 1039 overview

- > About me
- > Our agenda:
 - > What is Power BI?
 - > Using Power BI with DR
 - > Real-world examples of Power BI reports



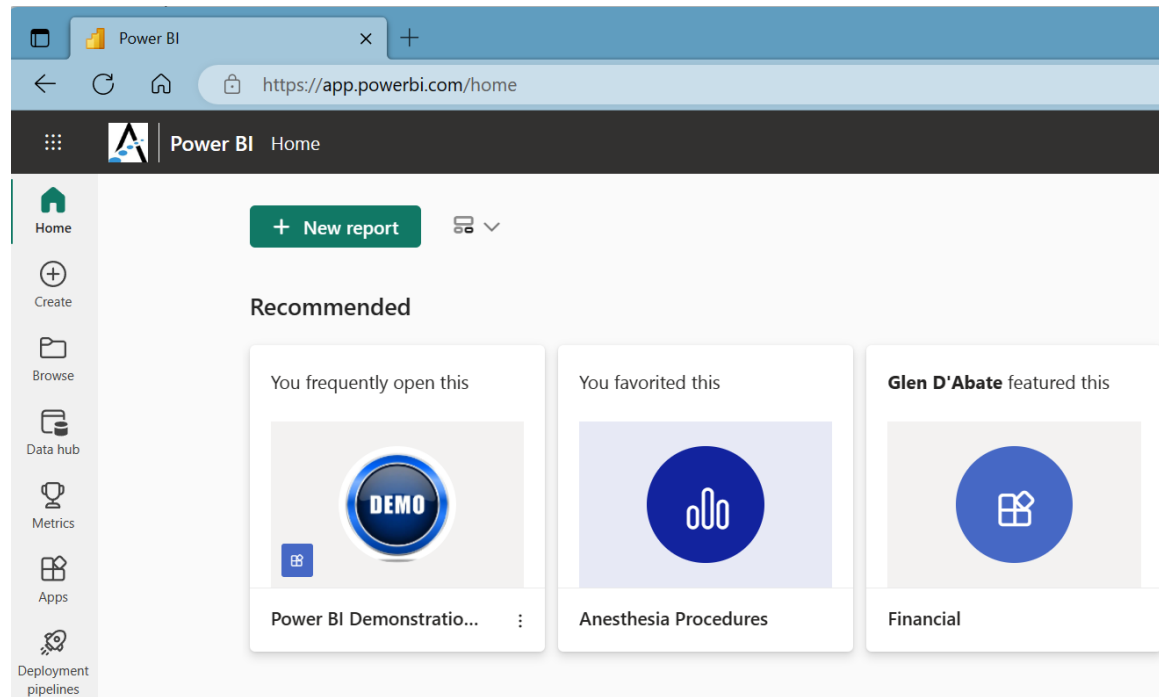
Power BI apps and services



Power BI Desktop

- > A Windows desktop application called **Power BI Desktop**

- > An online SaaS (Software as a Service) service called the **Power BI service**



Power BI apps and services

- > **Power BI Report Builder**, for paginated reports (think SSRS)
- > **Power BI Report Server**, an on-premises report server where you can publish your Power BI reports, after creating them in Power BI Desktop



Power BI Report Builder



Power BI Desktop



Power BI Desktop interface showing a report for 'Patient Census Example'. The report includes filters, summary cards, two pie charts, and a data table.

Select your filters below.

Location

- 1 West
- Hospice (Inpatient)
- Intensive Care Unit
- Postanesthesia Care Unit
- Post-partum

Service

- Cardiac Care
- Medicine
- Rehabilitation
- Transfer From Inpatient Stay

Obs Pt?

- N
- Y

Sex

- F
- M
- U

Summary Cards:

- 60 Patients
- 5.5 Average of LOS

Observation (Pie Chart): 55 (N), 5 (Y)

Gender (Pie Chart): 35 (F), 23 (M), 2 (U)

Patients by Location

Location	Patients	Avg LOS
1 West	54	6
Hospice (Inpatient)	2	3
Intensive Care Unit	1	9
Postanesthesia Care Unit	2	2
Post-partum	1	7
Total	60	5

Patients by Service

Service	Patients	Avg LOS
Cardiac Care	6	6
Medicine	52	5
Rehabilitation	1	9
Transfer From Inpatient Stay	1	4
Total	60	5

Patients by Attending

Attending	Patients	Avg LOS
Aaron Admit	1	4
Dr Drummond	1	4
Ed Caruso	1	8
James Layock	5	6
Johanna Artze	1	7
John Brach	1	2
Max ...	7	...
Total	60	5

Patient Summary

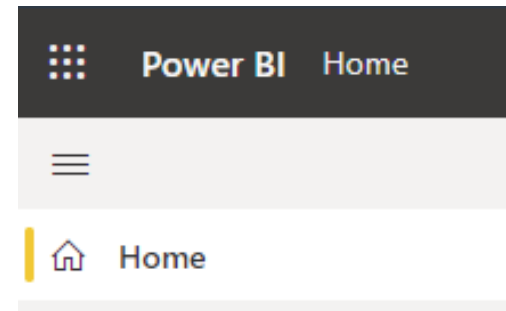
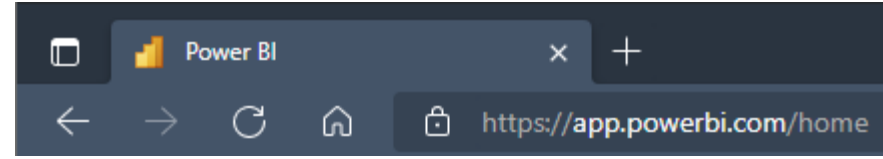
Room	Bed	Name	AccountNumber	DOB	Gender	Admitted	Sum of LOS
071315	14	Edison,Denise	AC0000001817	08/23/1970	F	06/17/19 08:00	8
071315	15	Collins,James	AC0000001836	01/28/1978	M	07/01/19 14:00	4
071315	16	Landry,Michael	AC0000001863	01/05/1960	M	08/28/19 09:08	6
071315	17	Mack,Ada H.	AC0000001885	05/18/1968	F	09/09/19 14:29	4
071315	18	Joy,Minnie	AC0000001894	05/01/1947	F	09/06/19 13:37	7
071315	19	Connor,Shannon	AC0000001897	05/01/1947	F	09/06/19 15:12	7
071315	21	Tully,Emma	AC0000001898	05/01/1947	F	09/06/19 16:16	7
1 LD	3	Test,Forkate	AC0000001782	01/01/1984	F	02/08/19 10:53	7
1H	2	Jones,Monica	AC0000001867	05/01/1947	F	08/29/19 13:34	5
1H	3	Smith,Brett	AC0000001873	05/01/1947	U	09/03/19 13:08	0
1W	4A	Brown,Arthur	AC0000001816	06/09/1954	M	06/16/19 10:53	9
1W	6	Paltrow,Bruce K	AC0000001861	02/01/1945	M	08/26/19 09:42	8
2015AMI	23	bridges,auria	AC0000001784	04/05/1967	F	04/29/19 08:00	7
2015AMI	25	Smith,Anthony	AC0000001794		M	06/11/19 12:13	4
2015AMI	26	Dunn,Maizie	AC0000001859	01/01/1980	F	08/23/19 15:22	1
2015AMI	27	Prince,Myra	AC0000001878	05/01/1947	F	09/04/19 15:08	9
2015AMI	28	Price,Debra H.	AC0000001889	06/14/2001	F	09/09/19 14:30	4
Total							327

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Power BI service

- > Where you publish dashboards and share them across your organization. Dashboards and reports connect to datasets that bring all the relevant data together in one place.
- > The service has some report creation abilities too but is more limited than Power BI Desktop.



https://app.powerbi.com/home

Power BI Home

Search

+ New report

New items saved to: My workspace

Recommended

You frequently open this

You frequently open this

You frequently open this

You frequently open this

You frequently open this

BAR Summary and Detail

Patient Census Example

Demo Visuals

PGC - OR Operational Dashb...

BAR Summar

Recent Favorites My apps

Filter by keyword Filter

	Name	Type	Opened	Location	Endorsement	Sensitivity
	OR Utilization-Demo	Report	4 days ago	Acmeaware PBI De...	—	—
	Acmeaware PBI Demo	Workspace	4 days ago	Workspaces	—	—
	Patient Census Example	Report	4 days ago	My workspace	—	—
	Patients by Diagnosis	Dataset	4 days ago	My workspace	—	—
	My workspace	Workspace	4 days ago	Workspaces	—	—
	PB101-Lab Demo	Report	4 days ago	My workspace	—	—
	PB101-Lab Demo	Dataset	4 days ago	My workspace	—	—

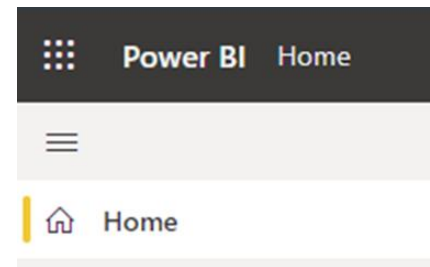


Working with Power BI

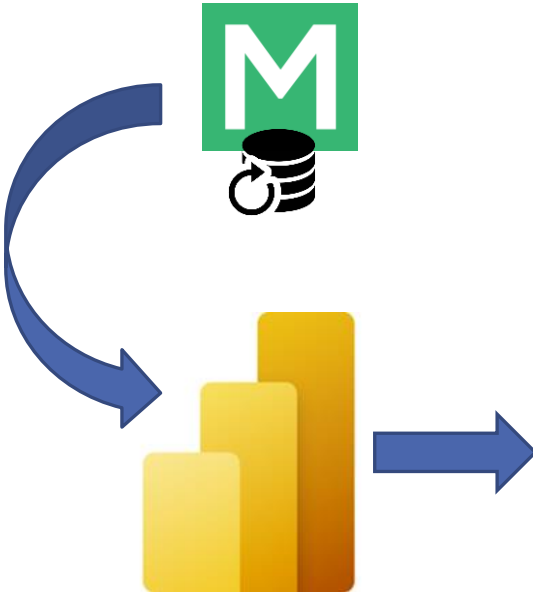
1. Connect to data sources and build your data model
2. Design your report visualizations
3. Share (publish) your report to the cloud



Power BI Desktop



Using Power BI with DR



Screenshot of a Power BI report titled "BAR Summary and Detail". The report is displayed in a browser window with the URL: <https://app.powerbi.com/groups/9ff42349-2091-4306-8710-dac22c6b7428/reports/d27bede2-1f75-4c8d-9096-20c27aa2b7ad/ReportSection?experience=po...>

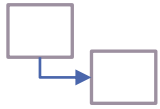
The report includes the following components:

- Summary Card:** Shows "1858 Total Accounts".
- Filters:** "Post Date" (11/30/2020 to 11/11/2021), "Account Status" (AR, UR, URAR), and "Account Type" (All).
- Table: Balance by Insurance**

PrimaryInsurance	Balance
SP	4,172,755.80
BCVT	1,563,364.87
MCD	887,156.02
MVP	832,976.30
CIGNA	758,319.67
MCR	748,540.73
TRIC	511,282.37
BCNMC	395,623.09
BCFEP	363,337.66
CBANMC	305,986.78
AARP	282,143.60
BCOS	257,623.12
CBAB	247,537.99
AETNA	169,455.50
LOOMIS	150,306.64
BCBANK	132,554.20
AET	119,795.51
GRWE	94,427.04
AFLA	89,487.27
Total	12,577,968.49
- Balance by Type:** A bar chart showing ArBalance, UrBalance, and BdBalance from Nov 2020 to Nov 2021.
- Balance by Location:** A pie chart showing the distribution of balances across various locations like PCU, MSUR, FBC, NUR, ICU, ER, DLI, and SS.
- Balance by FinancialClass:** A pie chart showing the distribution of balances across financial classes like SP, BC, CO, MCD, CG, MP, MCR, and TR.



Considerations for DR



What type of data model suits your needs?



Should you use import or DirectQuery to connect?



How will you query the data? Views, stored procedures, or embedded expressions?



For sharing in the cloud, you'll need the Power BI Gateway.



How will you handle scheduling data refreshes?

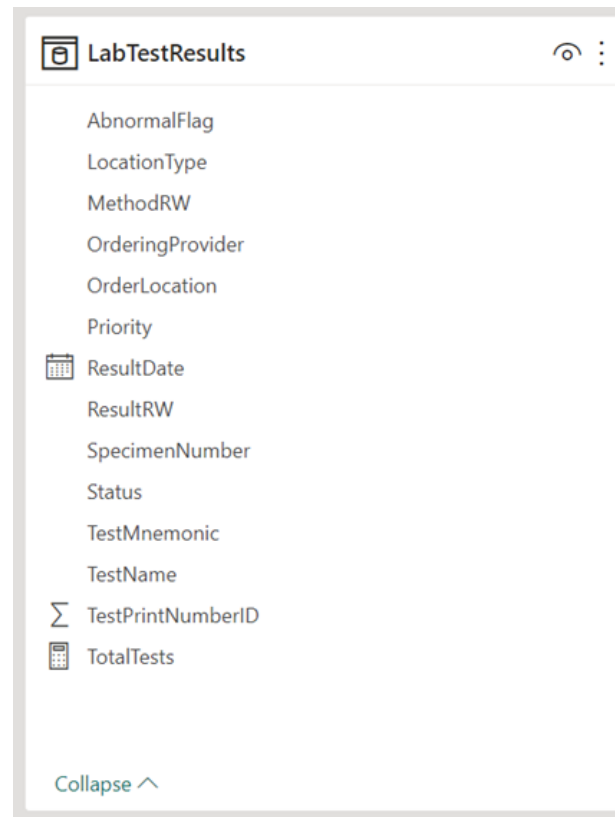
What is the data model?

- > *A data model* describes all the different data entities you have and the (potential) relationships between them.
- > The *model* in Power BI Desktop is comprised of data tables you define with one or more connections to any variety of data sources – but for us, primarily to the Data Repository SQL Server.



Data model examples

Should the data be “flat,” like a single table?



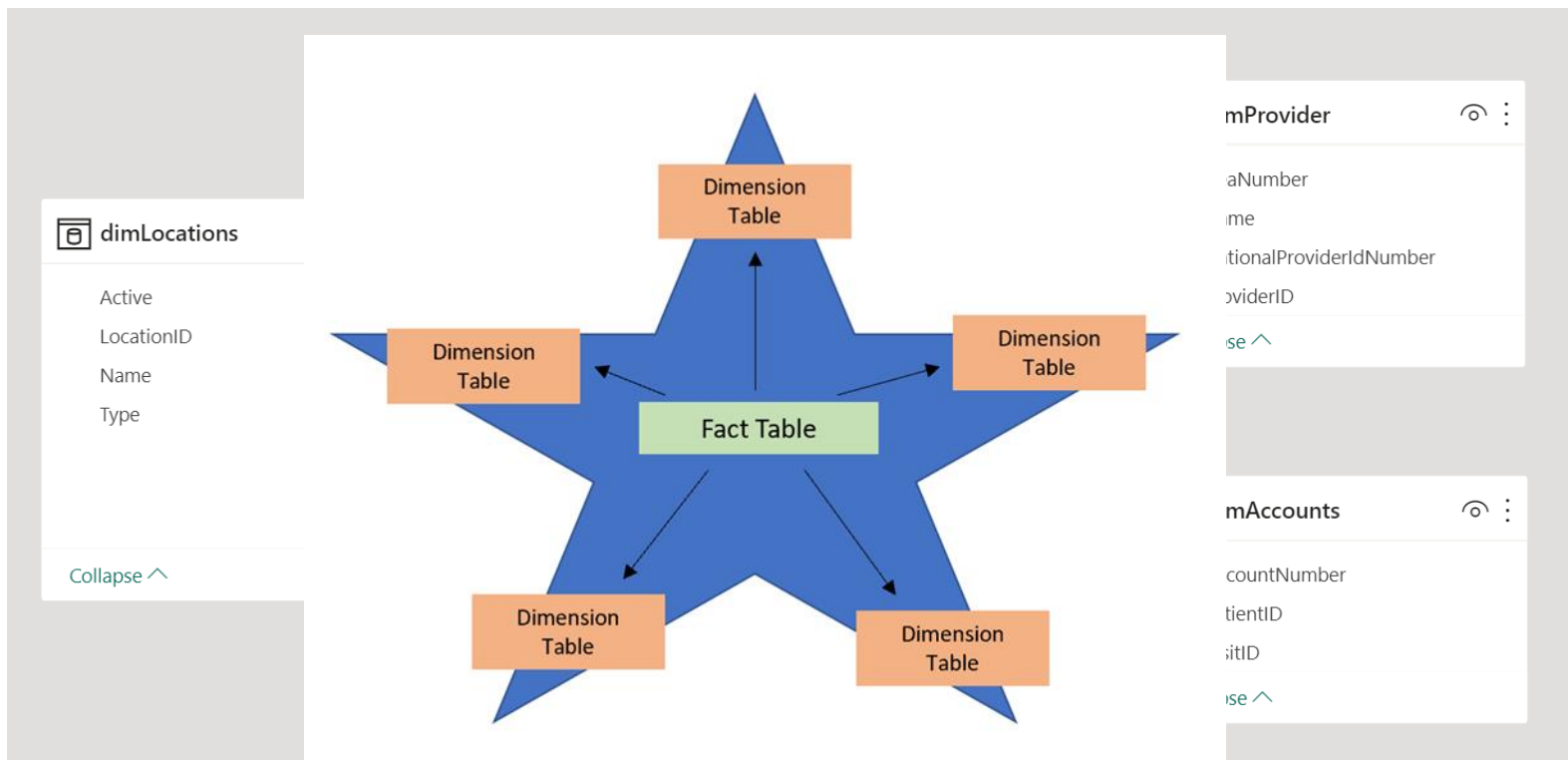
The image shows a screenshot of a data model for a table named "LabTestResults". The table is displayed in a list view with various attributes. The attributes are:

- AbnormalFlag
- LocationType
- MethodRW
- OrderingProvider
- OrderLocation
- Priority
- ResultDate (indicated by a calendar icon)
- ResultRW
- SpecimenNumber
- Status
- TestMnemonic
- TestName
- TestPrintNumberID (indicated by a summation symbol)
- TotalTests (indicated by a calculator icon)

At the bottom of the list, there is a "Collapse ^" button.

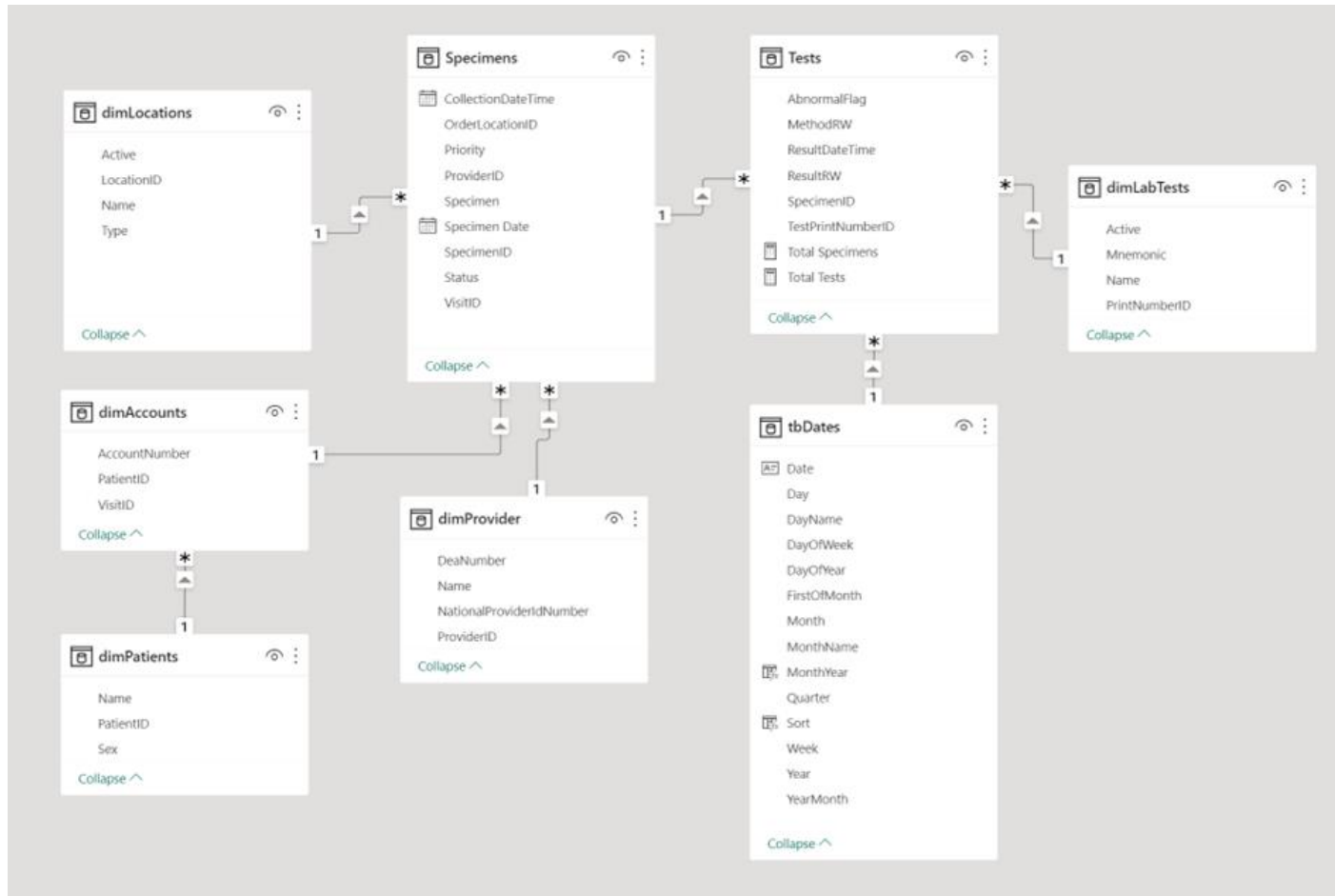
Data model examples

Should I use a star schema?



Data model examples

How about a snowflake schema?



Connecting to SQL Server

Import



- > Data cached on desktop and in Power BI service
- > 1 GB limit for non-premium license
- > Data is compressed for efficiency
- > Full use of DAX (data access expressions) function library
- > Data sources require periodic refresh

DirectQuery



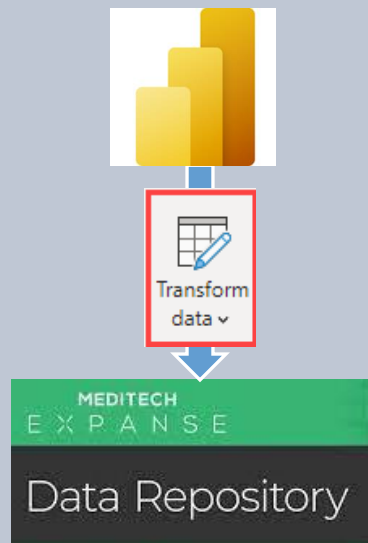
- > Always uses current data
- > Scalable, no 1GB limitation
- > Slower report performance than data import
- > Cannot combine data in Power Query
- > Many DAX functions unavailable



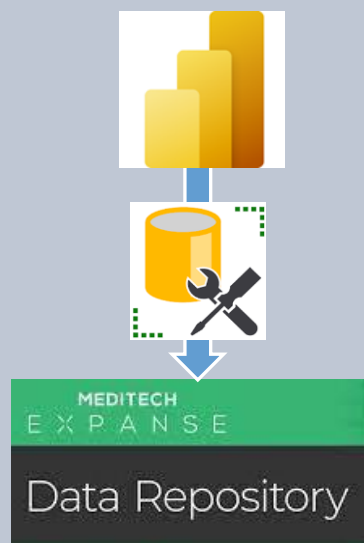
Accessing DR data with Power BI

Or...how to populate your data model.

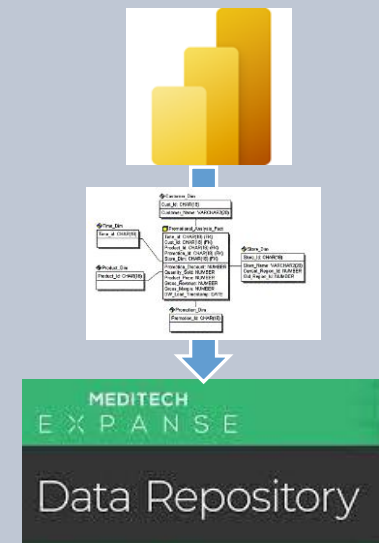
Direct to DR tables (No)



Via SQL object (Yes)

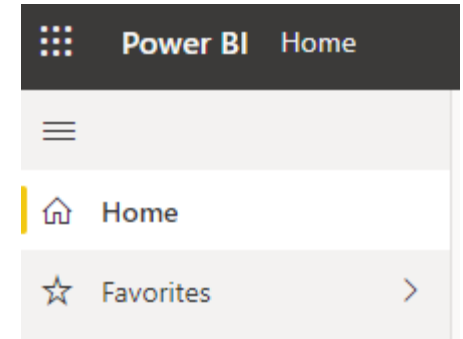


Via data mart (Yes)



Power BI online - user experience

- > Workspaces
 - > share the ownership and management of dashboards, reports, and datasets
 - > Use roles to determine permissions (manage, edit, view)
- > Apps
 - > Package related workspace reports to focus your users.
 - > Permissions granted per App for easier management, and can be further sub-divided into roles within and app
- > Dashboards
 - > Single-page canvas of tiles used to “tell the story”
 - > Allows drill-through to App or Workspace



Questions and discussion



- > About the Power BI applications and services
- > About using Power BI with Data Repository

Demo: using Power BI reports

Select your filters below.

Location

1 West

Hospice (Inpatient)

Intensive Care Unit

Postanesthesia Care Unit

Post-partum

Service

Cardiac Care

Medicine

Rehabilitation

Transfer From Inpatient Stay

Obs Pt?

N

Y

Sex

F

M

60
Patients

5.3
Average of LOS

Patients by Location

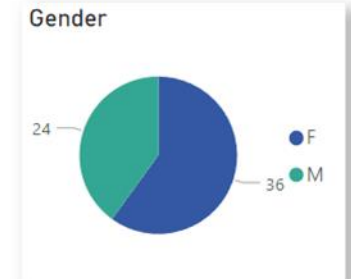
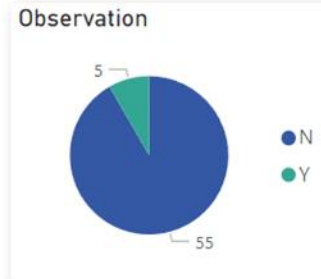
Location	Patients	Avg LOS
1 West	54	5
Postanesthesia Care Unit	2	6
Post-partum	1	6
Hospice (Inpatient)	2	7
Intensive Care Unit	1	8
Total	60	5

Patients by Service

Service	Patients	Avg LOS
Cardiac Care	6	5
Medicine	52	5
Rehabilitation	1	8
Transfer From Inpatient Stay	1	3
Total	60	5

Patients by Attending

Attending	Patients	Avg LOS
Aaron Admit	1	3
Dr Drummond	1	3
Ed Caruso	1	7
James Layock	5	7
Johanna Artze	1	6
John Brach	1	1
Kate Jenkins-Brown	7	6
Meditech Mt	43	5
Total	60	5



Patient Summary

Room	Bed	Patient	Acct #	DOB	Sex	Admitted	LOS
CQM.CERT	15	Whiteside,Kara	AC0000001860	10/11/1952	F	08/23/19 16:16	0
071315	21	Tully,Emma	AC0000001898	05/01/1947	F	09/06/19 16:16	6
ACUTE.CERT	53	Toomey,Shawn	AC0000001875	06/01/1970	M	09/03/19 05:00	9
CRT19	7	Thompson,Sally	AC0000001919	08/19/1946	F	09/15/20 14:37	1
CQM.CERT	13	Thompson,Andrew	AC0000001852	05/03/1985	M	07/29/19 13:16	5
1 LD	3	Test,Forkate	AC0000001782	01/01/1984	F	02/08/19 10:53	6
ACUTE.CERT	60	Summers,Allan H.	AC0000001884	04/16/1982	M	09/09/19 14:28	3
2015AMI	38	Summers,Allan H.	AC0000001905	04/16/1982	M	09/09/19 16:53	3
2015STK	21	Stroman,Al	AC0000001843	04/05/1967	M	07/11/19 04:00	3
CRT19	4	Steele,Debra H.	AC0000001888	07/27/1983	F	09/09/19 14:30	3
1H	3	Smith,Brett	AC0000001873	05/01/1947	M	09/03/19 13:08	9
2015AMI	25	Smith,Anthony	AC0000001794		M	06/11/19 12:13	3
2015STK	13	Short,Al	AC0000001866	04/05/1967	M	08/29/19 01:00	4
ACUTE.CERT	41	Saunders,Michelle	AC0000001824	02/18/1998	F	06/15/19 15:00	9
CQM.CERT	12	Ridgells,Patricia Proctor	AC0000001815	11/11/1988	F	06/10/19 13:00	4
ACUTE.CERT	52	Pry,Myra	AC0000001879	05/01/1947	F	09/04/19 15:52	8
2015AMI	27	Prince,Myra	AC0000001878	05/01/1947	F	09/04/19 15:08	8
2015AMI	28	Price,Debra H.	AC0000001889	06/14/2001	F	09/09/19 14:30	3



Open discussion

- > What questions do you have?



2023 MUSE Inspire Conference

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Our education sessions:

- 1044** - Migrating Reports to Expanse: Can we talk?
(Thursday at 3:10)
- 1039** – Reimagine DR Reports with Power BI (Friday at 2:10)
- 1046** - OR Utilization Analysis (Saturday @8:30)



Microsoft Power BI



Keep in touch!

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Our website: <https://acmeware.com>