

BUSINESS INTELLIGENCE

EGCO321 DATABASE SYSTEMS



KANAT POOLSAWASD
DEPARTMENT OF COMPUTER ENGINEERING
MAHIDOL UNIVERSITY

BUSINESS INTELLIGENCE (1)

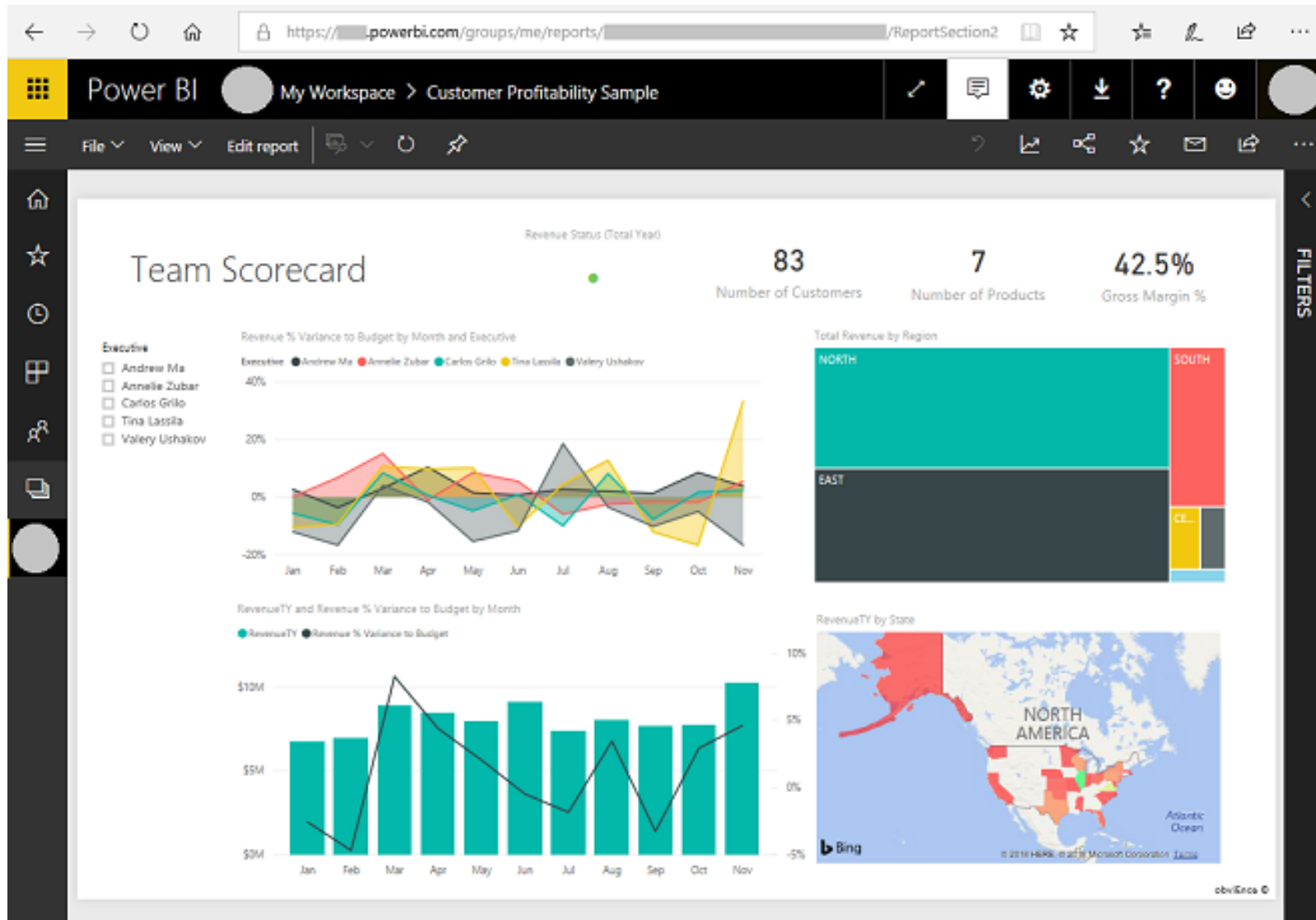
"BI results when organizational culture, business processes and technologies are designed and implemented with the goal of improving the strategic and operational decision-making capabilities of a wide range of internal and external stakeholders."

International Data Corporation (IDC)

BUSINESS INTELLIGENCE (2)

“Culture, processes and technologies to improve decision making for stakeholders.”

MICROSOFT POWER BI



WHAT IS POWER BI (1)

- Set of Business Intelligence and Analytical Services from Microsoft.
- It offers Interactive Visualization and advance analytics capabilities that empower everyone to take faster and smarter Realtime decisions.
- It is on the top of popular BI tools due to ease of use and interactive visualization.
- It offers self service analytics capability to end users to create reports and dashboards.

WHAT IS POWER BI (2)

- BI is a widely popular BI tool having customers ranging from students, startup , SME to large organizations.
- No programming skills are required.
- Any analyst can connect to any data source and quickly summaries findings in simple reports.

POWER BI - FEATURES

- Data Visualization
- Data Exploration
- Data Modeling
- Data Transformation
- Collaboration
- Mobile Access
- Natural Language Processing
- Real-Time Data

TYPE OF POWER BI

- Microsoft offers three types of Power BI platforms:
 - Power BI Desktop (Desktop Application)
 - Power BI Service (Software as a Service)
 - Power BI Mobile (For iOS and Android devices)

EXAMPLE OF BI

- SmartMedSupply for COVID-19
- <http://smartmedsupply.moph.go.th/newhomepage>

ระบบบริหารโลจิสติกส์เวชภัณฑ์

หน้าหลัก เกี่ยวกับเรา ขั้นตอนการทำงาน เวชภัณฑ์ที่ต้องการ [🛒 บริจาค](#)

Last updated :26 Oct 2020

จำนวนหน่วยบริการที่ขาดแคลน: **1169** จำนวนจังหวัด: **77**

ร้อยละปริมาณความต้องการเวชภัณฑ์รายจังหวัด

ร้อยละจำนวนหน่วยบริการจำแนกตามระดับความขาดแคลน

เพียงพอต่อการใช้

- มากกว่า 30 วัน
- ระหว่าง 15-30 วัน
- น้อยกว่า 15 วัน

กรองรายการเวชภัณฑ์

- Alcohol 70% , ลีटर
- Alcohol 95% , ลีटर
- Alcohol Gel, ลีटर
- Face shield, ชิ้น
- Hood covers, ชิ้น
- N95 Respirator medical grade, ชิ้น
- Non-sterile powder gloves, คู่
- Protective overall Industrial grade,...

กรองเขตบริการสุขภาพ และจังหวัด

- (01) เขต 1 เชียงใหม่
- (02) เขต 2 พิษณุโลก
- (03) เขต 3 นครสวรรค์
- (04) เขต 4 สระบุรี
- (05) เขต 5 รามบุรี
- (06) เขต 6 ระยอง
- (07) เขต 7 ขอนแก่น
- (08) เขต 8 อุตรดิตถ์

กรองภูมิภาค

- เหนือ
- ใต้
- กลาง
- ตะวันตก
- ตะวันออก
- ตะวันออกเฉียงเหนือ

กรองประเภทสถานพยาบาล

- โรงพยาบาล สังกัด มหาวิทยาลัย
- โรงพยาบาลเอกชน
- โรงพยาบาลใน สร.
- โรงพยาบาลนอก สร.
- โรงพยาบาลอก สบ.สร.
- โรงพยาบาลสังกัด กทม.
- ศูนย์บริการสาธารณสุข

กรองศักยภาพสถานพยาบาล

- A :[โรงพยาบาลศูนย์]
- F1 :[โรงพยาบาลชุมชนขนาดใหญ่]
- F2 :[โรงพยาบาลชุมชนขนาดกลาง]
- F3 :[โรงพยาบาลชุมชนขนาดเล็ก]
- M1 :[โรงพยาบาลส่งเสริมสุขภาพตำบล]

ปริมาณความต้องการเวชภัณฑ์ จำแนกรายรายการ

Product name	ปริมาณที่ต้องการ	สต็อก	จำนวนวันที่เพียงพอ
Surgical gown, ชิ้น	114,312	211,950	31.00
Alcohol Gel, ลีटर	4,777,832	9,709,445	37.12
Hood covers, ชิ้น	81,381	246,032	44.03
N95 Respirator medical grade, ชิ้น	80,382	483,654	59.94
Shoe covers, คู่	44,832	243,680	66.98
Alcohol 70% , ลีटर	3,068,300	23,212,028	85.60
Non-sterile powder gloves, คู่	59,162	721,978	88.59
Protective overall, ชิ้น	24,818	293,979	89.14
Face shield, ชิ้น	151,727	1,211,705	93.69
Protective overall Industrial grade, ชิ้น	11,614	125,796	98.74
Surgical mask, ชิ้น	960,000	674,797	117.77

รายการเวชภัณฑ์ที่ความต้องการมากที่สุด

Product name	ความต้องการ
Alcohol Gel, ลีटर	4,777,832
Alcohol 70% , ลีटर	3,068,300
Surgical mask, ชิ้น	962,038
Face shield, ชิ้น	151,727
Surgical gown, ชิ้น	114,312
Alcohol 95% , ลีटर	94,398

ความต้องการใช้เวชภัณฑ์เฉลี่ย (ต่อวัน)

Product name	Average daily usage
Surgical mask, ชิ้น	449,368
Alcohol 70% , ลีटर	271,167
Alcohol Gel, ลีटर	261,535
Alcohol 95% , ลีटर	45,573
Face shield, ชิ้น	12,933
Non-sterile powder glov...	8,150

ระดับความขาดแคลนเวชภัณฑ์จำแนกรายจังหวัด

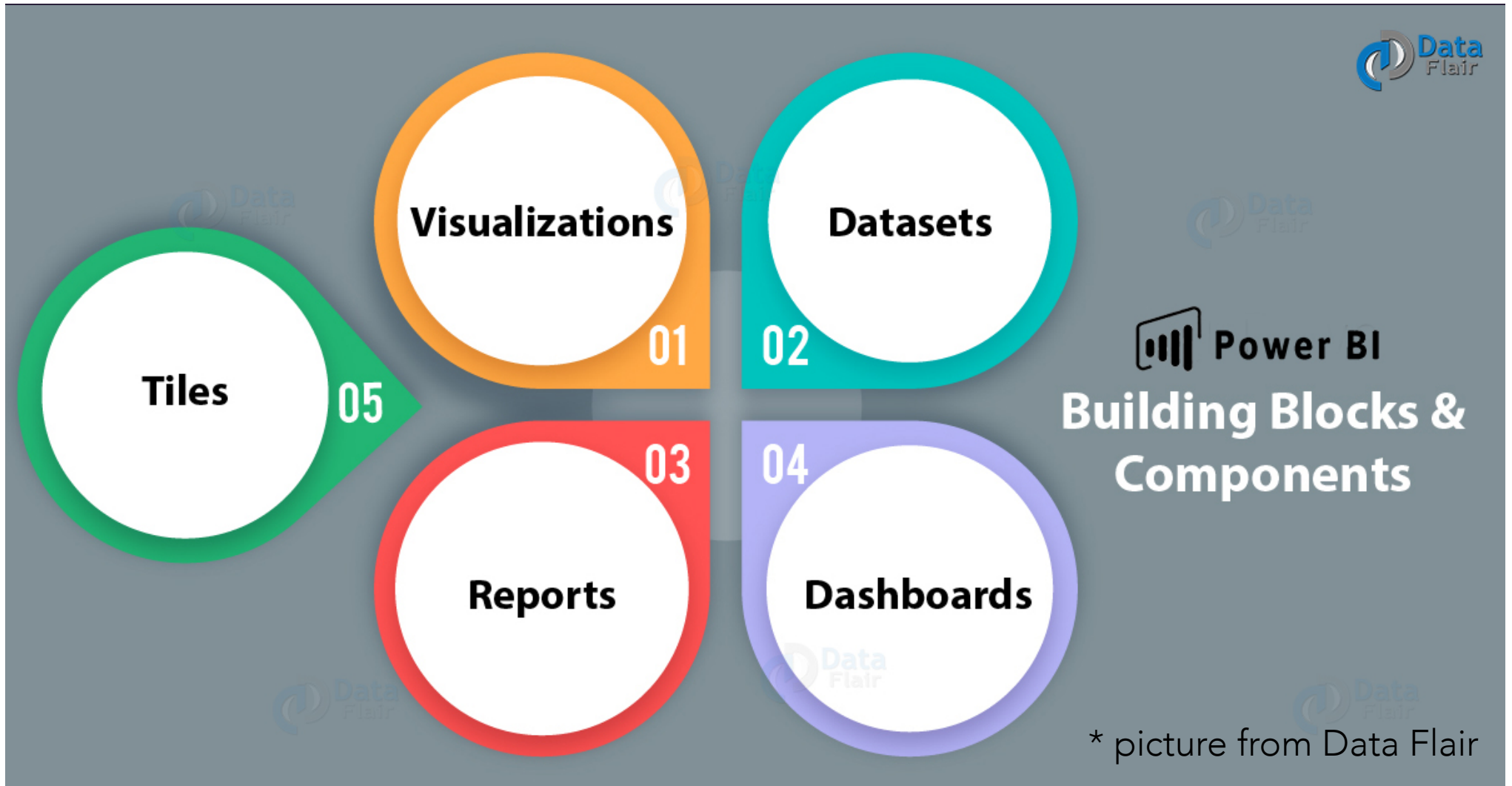
รายละเอียดความต้องการเวชภัณฑ์จำแนกรายสถานพยาบาล

Product name	ปริมาณที่ต้องการ	สต็อก	Alcohol 70% , ลีटर	ปริมาณการใช้ต่อเดือน	ปริมาณก
(01) เขต 1 เชียงใหม่	3,642	3,637,937	405,973		1
เชียงใหม่	178	22,445	9,675		
10713-โรงพยาบาลนครพิงค์					
11119-โรงพยาบาลจอนทอง					
11120-โรงพยาบาลเทพรัตนราชานุกูล เฉลิมพระเกียรติ ๖๐ พรรษา	0	180	5		
11121-โรงพยาบาลเชียงดาว					
11122-โรงพยาบาลดอยสะเก็ด					
11123-โรงพยาบาลแม่แตง					
11124-โรงพยาบาลสะเมิง					
11125-โรงพยาบาลฝาง	72	288	360		
11126-โรงพยาบาลแม่ออน	20	180	200		
11127-โรงพยาบาลพร้าว	0	283	113		
11128-โรงพยาบาลสันป่าตอง					
11129-โรงพยาบาลสันกำแพง	36	14	50		
11130-โรงพยาบาลสันทราย					
11131-โรงพยาบาลหางดง	4	148	152		

087-8214076, 085-8195219, 081-9385343

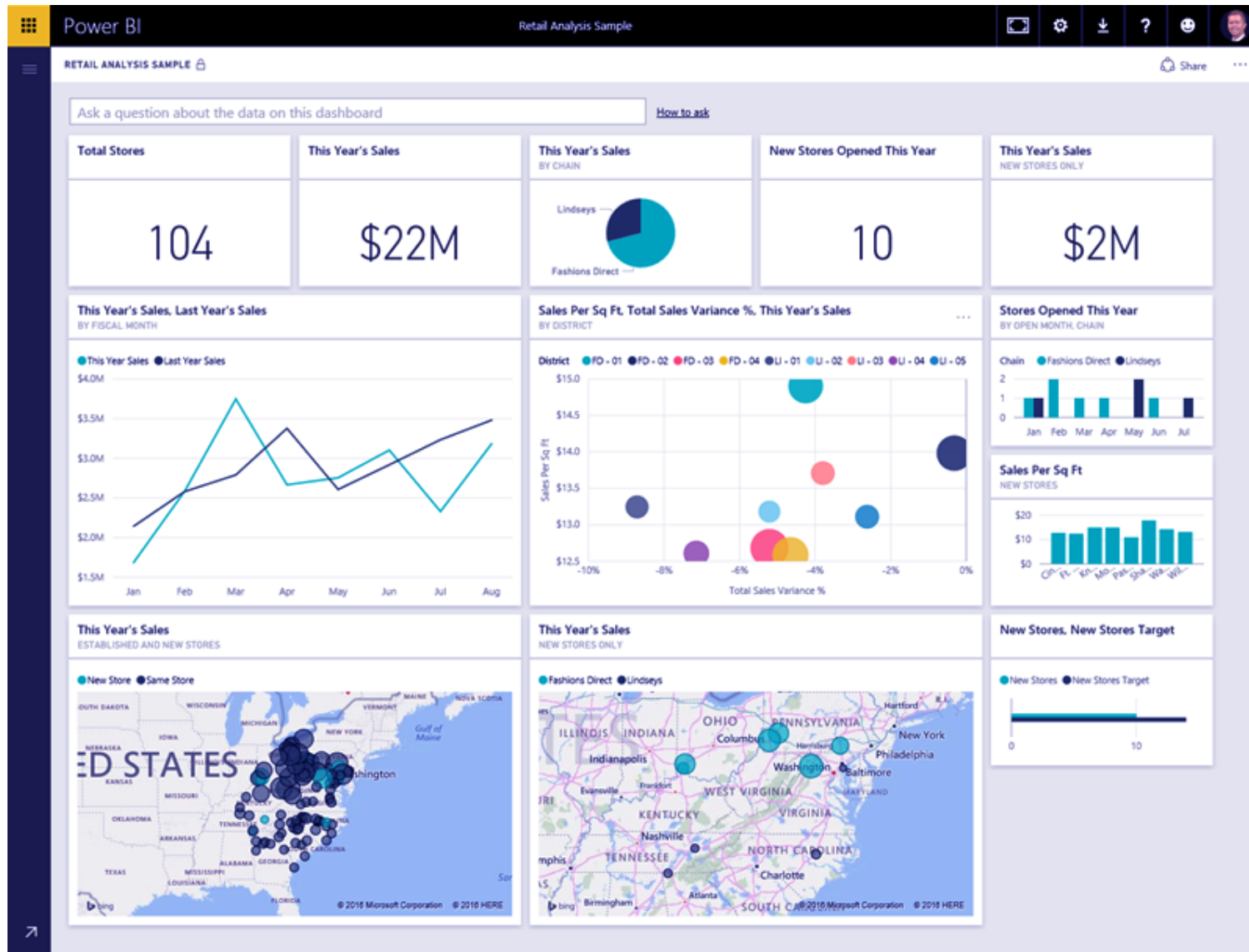
LogCOV Powered by คณะวิศวกรรมศาสตร์ มหาวิทยาลัยมหิดล และศูนย์เทคโนโลยีสารสนเทศและการสื่อสาร สำนักปลัดกระทรวงสาธารณสุข

POWER BI BUILDING BLOCKS



* picture from Data Flair

VISUALISATION



DATASETS

	B	C	D	E	F	G	H
1	Year	Month	Month Name	Calendar Month	Births	Births Per Day	Births (Normalized)
2119	2004	1	January	1/1/2004	2,937	94.7	2842
2120	2004	2	February	2/1/2004	2,824	97.4	2921
2121	2004	3	March	3/1/2004	3,128	100.9	3027
2122	2004	4	April	4/1/2004	2,896	96.5	2896
2123	2004	5	May	5/1/2004	3,008	97.0	2911
2124	2004	6	June	6/1/2004	3,047	101.6	3047
2125	2004	7	July	7/1/2004	2,981	96.2	2885
2126	2004	8	August	8/1/2004	3,079	99.3	2980
2127	2004	9	September	9/1/2004	3,219	107.3	3219
2128	2004	10	October	10/1/2004	3,547	114.4	3433
2129	2004	11	November	11/1/2004	3,365	112.2	3365
2130	2004	12	December	12/1/2004	3,143	101.4	3042
2131	2005	1	January	1/1/2005	2,921	94.2	2827
2132	2005	2	February	2/1/2005	2,699	96.4	2892
2133	2005	3	March	3/1/2005	3,024	97.5	2926
2134	2005	4	April	4/1/2005	3,037	101.2	3037
2135	2005	5	May	5/1/2005	3,231	104.2	3127
2136	2005	6	June	6/1/2005	3,163	105.4	3163
2137	2005	7	July	7/1/2005	3,119	100.6	3018
2138	2005	8	August	8/1/2005	3,156	101.8	3054
2139	2005	9	September	9/1/2005	3,439	114.6	3439

REPORTS

The screenshot displays the Microsoft Power BI Desktop interface. The title bar shows the window name "Getting Started Guide - Power BI Desktop". The ribbon includes tabs for File, Home, and a search icon. The Home tab contains various tool groups: Clipboard (Paste, Cut, Copy, Format Painter), External Data (Get Data, Recent Sources, Enter Data, Edit Queries, Refresh), Insert (New Page, New Visual, Image, Shapes), Visually (Text Box, Image, Shapes, Edit Interactions, Arrange, Alignment, Distribute), View (Page View), Relationships (Manage Relationships), Calculations (New Measure), and Share (Publish).

The main workspace contains three visualizations:

- Community well-being by State:** A map of North America with color-coded regions.
- Community well-being, Crime rate and Health care quality b...:** A stacked bar chart showing three metrics for various states. The legend indicates: Community well-being (teal), Crime rate (dark blue), and Health care quality (pink).
- Community well-being, Health care quality and Overall rank by State Code ...:** A bubble chart with Health care quality on the y-axis (0-30) and Community well-being on the x-axis (0-15). Bubbles are labeled with state codes: HI, AZ, VT, IA, MN, CO, DE, MT, WA, CA, MD, OR, KS, MI, VA.

The right-hand pane is divided into three sections:

- Visualizations:** A grid of visualization icons.
- Fields:** A search bar and a list of fields including RetirementStats and StateCodes.
- Filters:** A section for applying filters. Under "Page level filters", a filter is applied: "Community well-being is less than 16".

The bottom of the interface shows a page navigation bar with tabs for Page 1 through Page 6, with Page 5 selected. The status bar at the bottom left indicates "PAGE 5 OF 6".

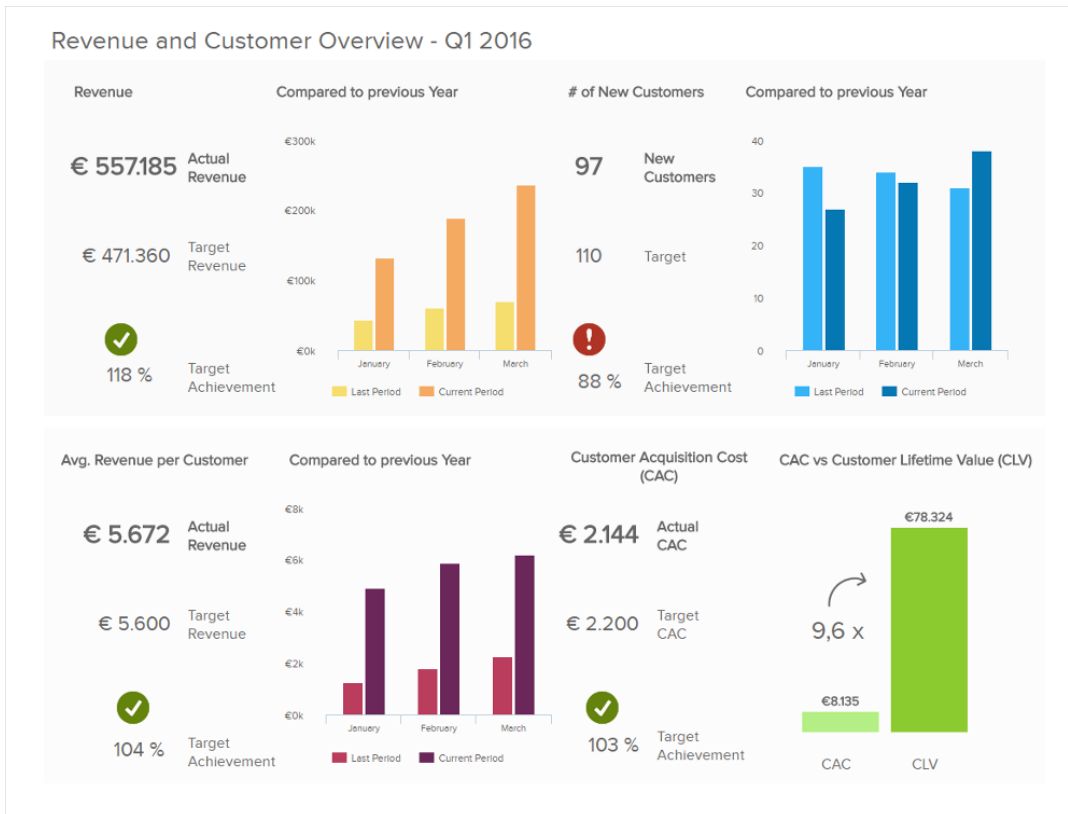
DASHBOARDS (1)

- Power BI dashboard is a gathering of visuals from a solitary page that you can impart to others. Frequently, it's a chosen gathering of visuals that give snappy understanding into the information or story you are attempting to exhibit.
- Dashboard needs to fit on a solitary page, frequently called a canvas. Consider it like the canvas that a craftsman or painter utilizes.
- Workspace where you make, consolidate, and adjust fascinating and convincing visuals. You can impart dashboards to different clients or gatherings, who would then be able to communicate with your dashboard when they're in Power BI benefit, or on their cell phone.

DASHBOARDS (2)

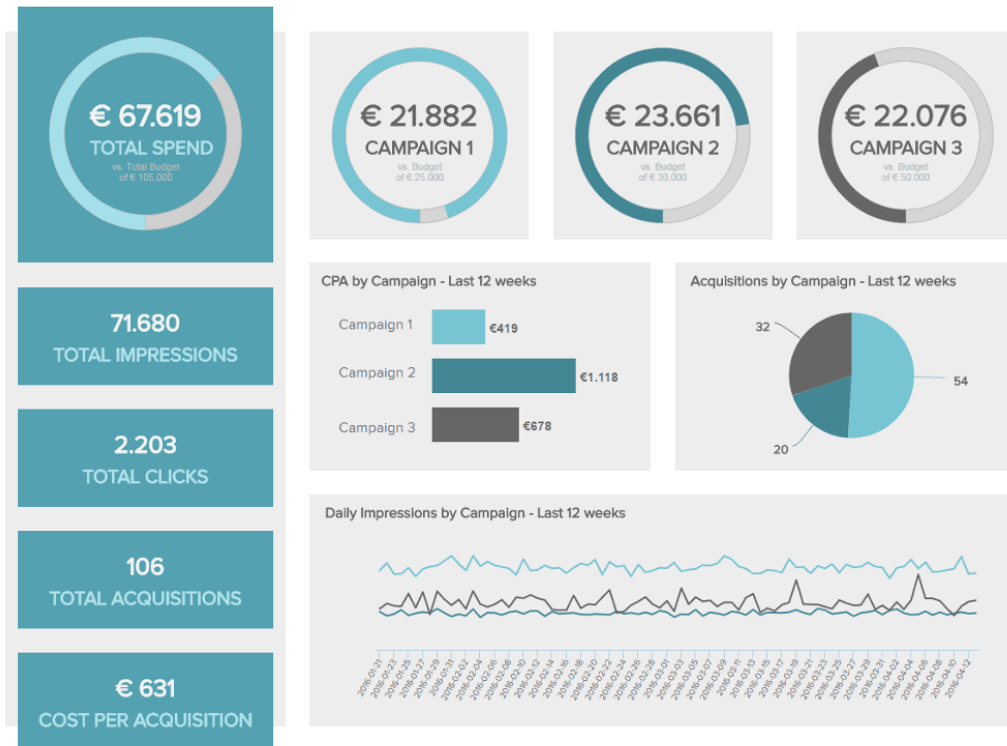
- There are several types of dashboards. Based on their purpose, they can be categorized into three main types:
 - Strategic Dashboard
 - Operational Dashboard
 - Analytical Dashboard

STRATEGIC DASHBOARD



- Dashboard for strategic planning
- Decision making at all levels.
- Focuses on displaying key organizational indicators or KPIs, making it easy to understand and see the organization's overall performance.

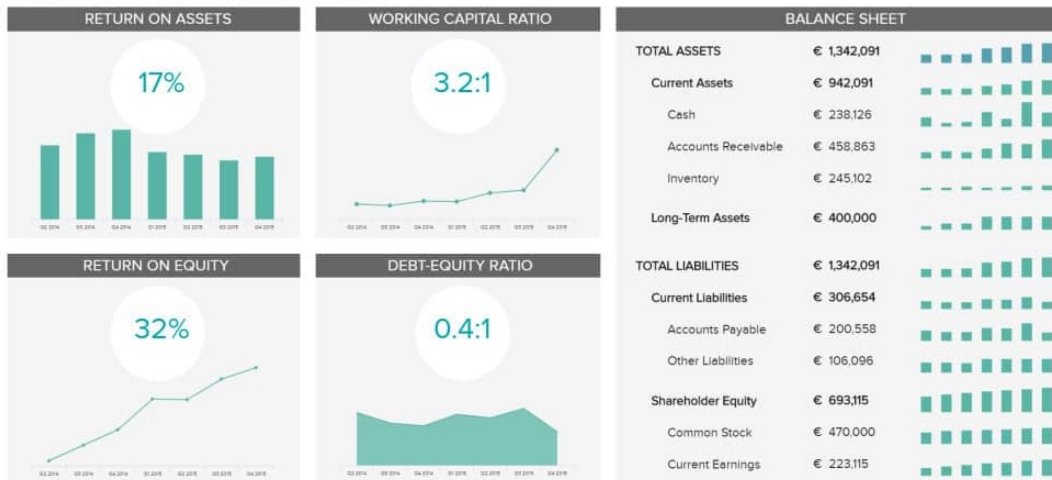
OPERATIONAL DASHBOARD



- Dashboard for management and team lead level.
- Monitors and controls task progress.
- Displays a current overview of an area or product line, and shows real-time results when issues arise.
- Typically, detailed data drilling is not required.

ANALYTICAL DASHBOARD

FINANCIAL PERFORMANCE DASHBOARD

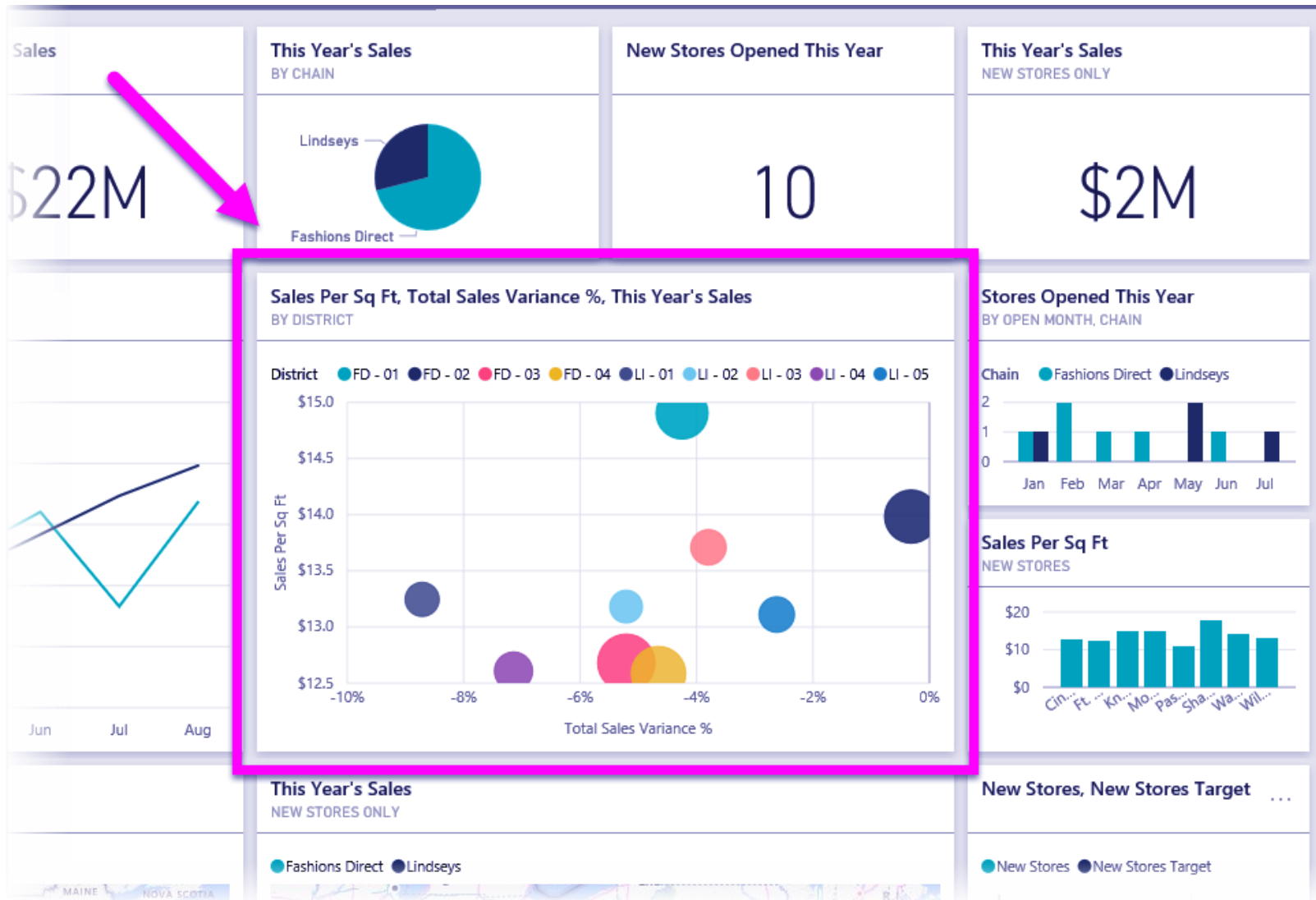


- Dashboard for analysis.
- Provides data from multiple perspectives, often without specific indicators.
- It includes a variety of data, such as historical data that can be filtered and compared, and emphasizes viewing the data from different analytical perspectives

SCORECARD

- A Scorecard in Power BI is a tool within the Power BI Service that allows organizations to track and measure key performance indicators (KPIs) and goals.
- Using the Power BI Goals feature, which includes scorecards, users can create interactive visualizations of organizational metrics, set targets, and monitor progress toward specific business objectives over time.
- Scorecards help teams focus on outcomes, provide insights into performance gaps, and drive data-informed decision-making.

TILES



MICROSOFT POWER BI (ONLINE)

<https://powerbi.microsoft.com> or <http://powerbi.com>



Enter your email, we'll check if you need to create a new account.

Email

kanat.poo@mahidol.ac.th

By proceeding you acknowledge that if you use your organization's email, your organization may have rights to access and manage your data and account. [Learn more about using your organization's email.](#)

By clicking Submit, you agree to these [terms and conditions](#) and allow Power BI to get your user and tenant details. [Microsoft Privacy Statement.](#)

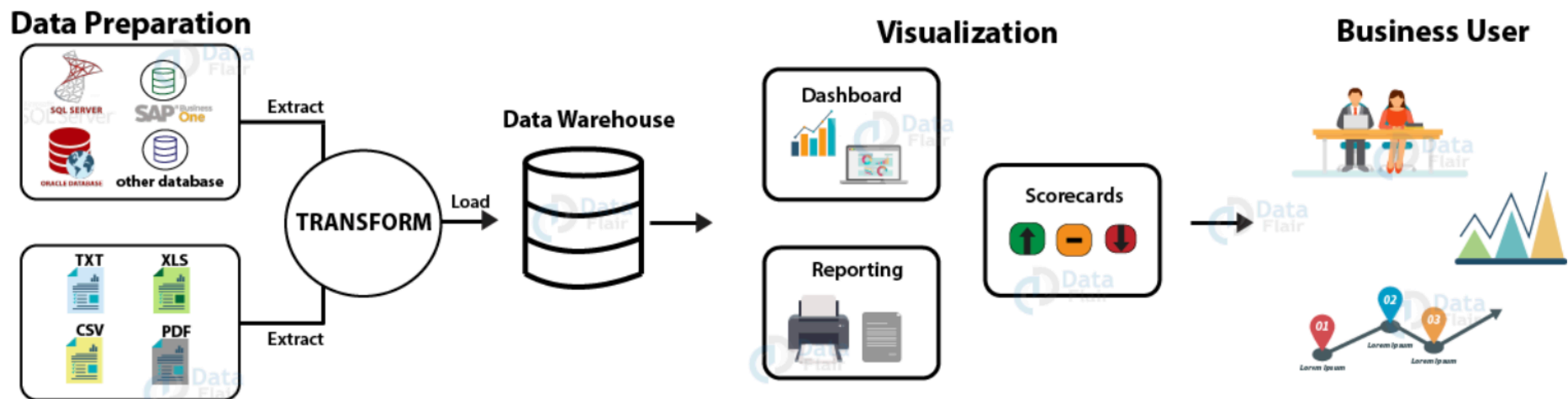
Submit



MICROSOFT POWER BI (ONLINE)

The screenshot displays the Microsoft Power BI online interface. At the top, the header includes the 'Power BI' logo, the text 'My workspace', a search bar with the placeholder 'Search', and a user profile picture. The left sidebar contains navigation options: 'Home', 'Create' (circled in black), 'Browse', 'OneLake data hub', 'Workspaces', 'My workspace', and 'Power BI'. The main content area is titled 'Add data to start building a report' and features four data source options: 'Excel (Preview)', 'CSV (Preview)', 'Paste or manually enter data', and 'Pick a published semantic model'. At the bottom, a message reads: 'Don't see the source you're looking for? [Download the desktop app.](#)'

POWER BI ARCHITECTURE



* picture from Data Flair

POWER BI PROCESS

- Connect to Data Source (Get Data)
- Clean Up (ETL: Power Query)
- Import
- Report (Visualization)
- Publish & Share

APPS

- Apps are packaged collections of related dashboards, reports, and datasets designed for easy sharing and collaboration.
- Apps allow organizations to create, distribute, and manage analytics content for different users or teams while ensuring data consistency and access control.
- Low-Code/No-Code Application Building: Easy to use with drag-and-drop functionality and pre-built components.

GETTING DATA

- Power BI can connect to wide variety of data sources, including on-premises databases, Azure storage, Excel worksheets and a large number of 3rd party services.
 - Clean and transform data with the Query Editor
 - Connect to advanced data sources and create transformations
 - “Massage” irregularly formatted data

POWER QUERY (1)

- Power Query is a data transformation and preparation tool (ETL) available in Microsoft Excel and Power BI.
- It allows users to connect to various data sources, clean, transform, and reshape data before analysis.
- Power Query is designed to automate repetitive tasks, such as data extraction, filtering, merging, and sorting, without needing advanced programming skills.
- In Excel, go to the Data tab and select "Get Data" (Power Query) to open Power Query.

POWER QUERY (2)

The screenshot displays the Power Query Editor interface. At the top, there is a ribbon with tabs: Home, Transform, Add column, View, and Help. The Home tab is active, showing various icons for file operations (Close & load, Get data, Enter data), options, parameters, refresh, advanced editor, and column management (Choose, Remove columns). The Transform tab is also visible, showing icons for row reduction (Keep, Remove rows), filtering, sorting, and combining.

Below the ribbon, the 'Queries [1]' pane on the left shows a single query named 'country_vaccinations_b...'. The main workspace displays a data table with the following columns: 'locat...', 'd...', 'vaccine', and 'total_vaccinati...'. The table contains 22 rows of data, all for 'Argentina', with dates ranging from 12/29/2020 to 1/3/2021 and various vaccine types (Moderna, Oxford/AstraZen..., Sinopharm/Beijing, Sputnik V). The 'total_vaccinati...' column shows values ranging from 1 to 46824.

On the right side, the 'Query settings' pane is open, showing the 'Properties' section with the query name 'country_vaccinations_...' and the 'Applied steps' section, which lists 'Source', 'Promoted head...', and 'Changed colum...'. The status bar at the bottom indicates 'Completed (0.13 s) Columns: 4 Rows: 99+'. The bottom right corner shows icons for 'Step', a grid, and a refresh icon.

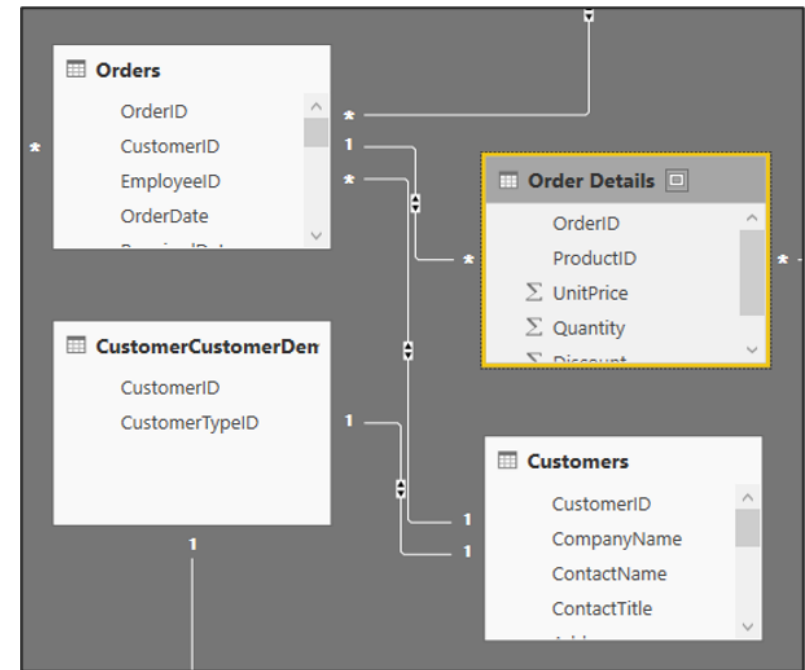
	locat...	d...	vaccine	total_vaccinati...
1	Argentina	12/29/20...	Moderna	2
2	Argentina	12/29/20...	Oxford/AstraZen...	3
3	Argentina	12/29/20...	Sinopharm/Beijing	1
4	Argentina	12/29/20...	Sputnik V	20481
5	Argentina	12/30/20...	Moderna	2
6	Argentina	12/30/20...	Oxford/AstraZen...	3
7	Argentina	12/30/20...	Sinopharm/Beijing	1
8	Argentina	12/30/20...	Sputnik V	40583
9	Argentina	12/31/2020	Moderna	2
10	Argentina	12/31/2020	Oxford/AstraZen...	3
11	Argentina	12/31/2020	Sinopharm/Beijing	1
12	Argentina	12/31/2020	Sputnik V	43388
13	Argentina	1/1/2021	Moderna	2
14	Argentina	1/1/2021	Oxford/AstraZen...	5
15	Argentina	1/1/2021	Sinopharm/Beijing	1
16	Argentina	1/1/2021	Sputnik V	43513
17	Argentina	1/2/2021	Moderna	2
18	Argentina	1/2/2021	Oxford/AstraZen...	6
19	Argentina	1/2/2021	Sinopharm/Beijing	1
20	Argentina	1/2/2021	Sputnik V	46824
21	Argentina	1/3/2021	Moderna	2
22	Argentina	1/3/2021	Oxford/AstraZen...	6

ONELAKE DATA HUB

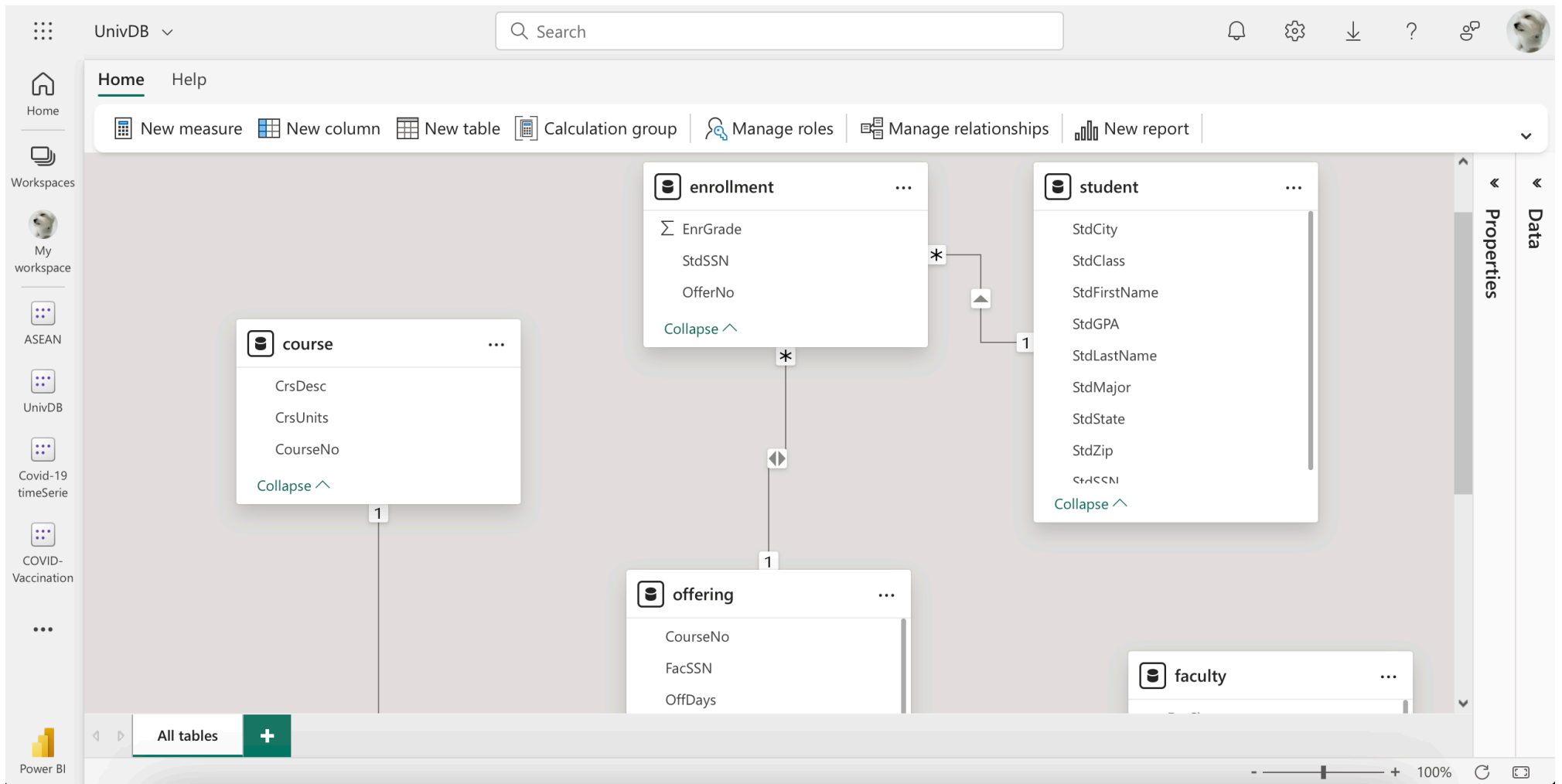
- Data Lake in Power BI typically refers to integrating Power BI with a data lake storage, commonly using Azure Data Lake Storage (ADLS).
- This allows users to centralize large datasets from multiple sources into a single, scalable storage.
- By connecting Power BI with a data lake, users gain robust capabilities to explore, transform, and visualize massive datasets without the need to import all data directly into Power BI.

DATA MODELING (1)

- Modeling is the technique of creating a logical connections and relationships between data sources.
- Create Calculated Columns
- Optimize data models for better visuals
- Create Measures and work with time-based functions
- Create Calculated Tables

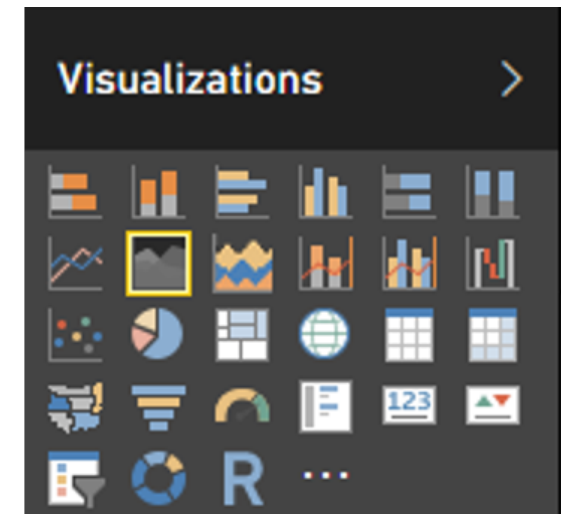


DATA MODELING (2)



VISUALISATION

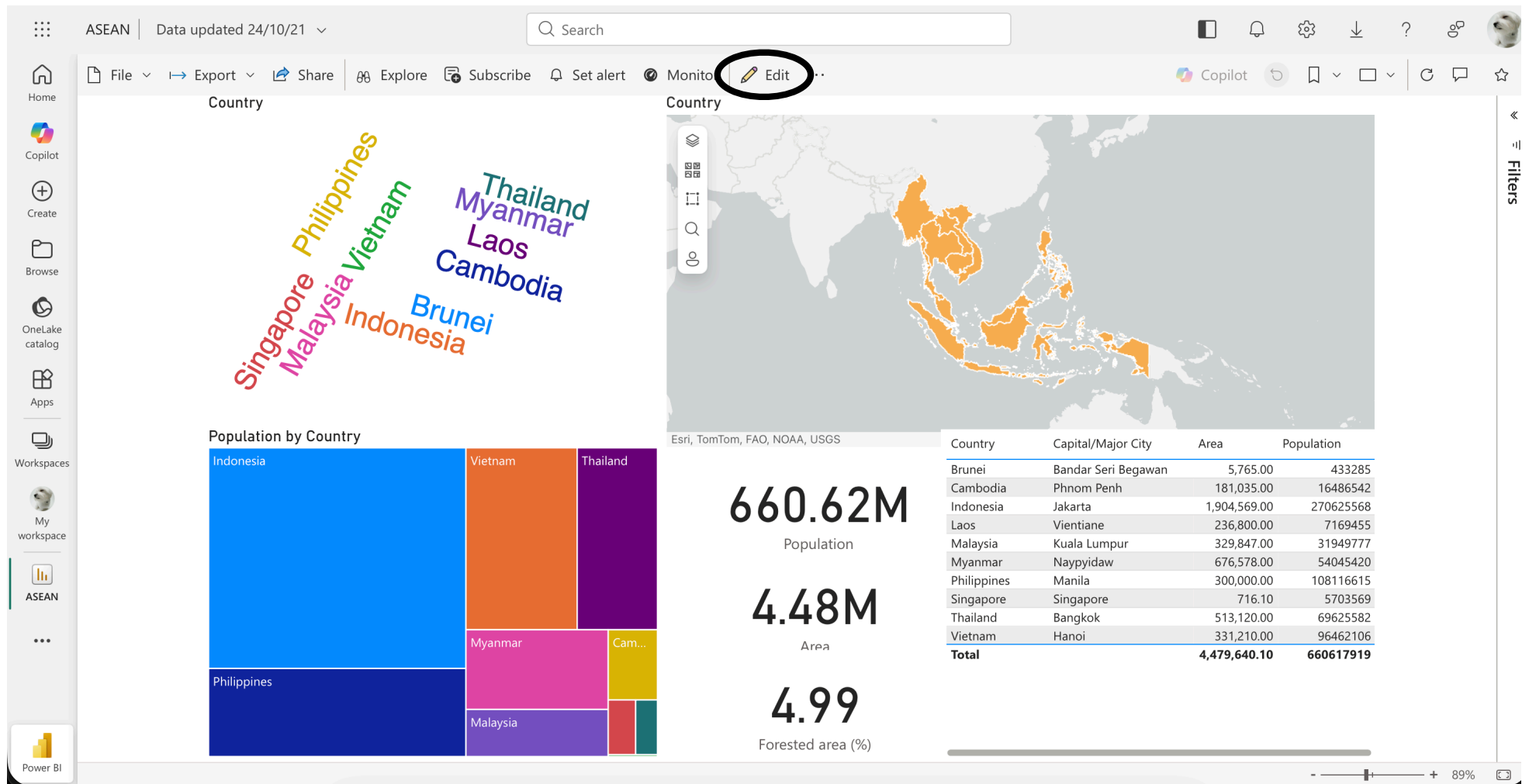
- A visualization is a visual representation of data, such as a chart, graph, map, or other “visual” representations of data.
 - Line, bar, pie, stacked
 - Matrix/pivots
 - Key performance
 - Tree maps
 - Geo and filled maps
 - Slicers/filters
 - Custom visualizations



DATA ANALYSIS EXPRESSIONS

- DAX is a collection of functions, operators, and constants that can be used in a formula, or expression, to calculate and return one or more values.
 - **Measure**
Calculation on a collection of rows AFTER aggregation.
 - **Calculated Column**
Calculation on each individual row BEFORE aggregation.

VISUALIZE DATA



CREATE PIVOT (MATRIX) TABLE

OneLake data hub



Pick a semantic model to use in your report

All

My data

Endorsed in your org

Filter by keyword

	Name	Owner	Refreshed	Location	Enc
⋮	ASEAN	Kanat Poolsawasd	24/10/21, 20:46:09	My Workspace	—
⋮	UnivDB	Kanat Poolsawasd	05/11/24, 23:13:24	My Workspace	—
⋮	country_vaccinations_by_manufact...	Kanat Poolsawasd	04/11/24, 15:57:28	My Workspace	—
⋮	SalesData	Kanat Poolsawasd	05/11/23, 18:48:30	My Workspace	—
⋮	Covid-19 timeSerie	SUPHAVIT NORKAEW	22/04/20, 07:19:40	BI project	—
⋮	COVID-Vaccination	Kanat Poolsawasd	15/11/23, 08:52:12	My Workspace	—
⋮	Population_Example	Kanat Poolsawasd	21/11/21, 22:15:04	My Workspace	—
⋮	ASEAN	Kanat Poolsawasd	05/11/23, 14:10		—

Auto-create report

Create a blank report

Auto-create report

Cancel

CREATE PIVOT (MATRIX) TABLE

The image shows the Microsoft Power BI interface. At the top, there is a search bar and navigation icons. Below that, a menu bar includes 'File', 'View', 'Reading view', 'Mobile layout', and 'Open data model'. The main workspace area contains a central canvas with the text 'Build visuals with your data' and a sub-instruction: 'Select or drag fields from the Data pane onto the report canvas.' To the right of the canvas are three panes: 'Filters', 'Visualizations', and 'Data'. The 'Visualizations' pane is active and shows a grid of visualization icons. A black circle highlights the 'Pivot table' icon in the 'Visualizations' pane. The 'Data' pane shows a data source named 'SalesData'. At the bottom, there is a status bar with 'Page 1' and a green plus sign icon.

CREATE PIVOT (MATRIX) TABLE

The screenshot displays the Microsoft Power BI interface. The main area shows a Pivot Table with the following data:

Product	Sum of Sales
Ink Jet	385
Arizona	55
California	110
Colorado	45
Utah	90
Washington	85
Mono Laser	330
Photo	300
Portable	195
Total	1210

The interface includes several panels:

- Filters:** Contains a search bar and three filter sections: "Filters on this visual" (Location is (All), Product is (All), Sum of Sales is (All)), "Filters on this page" (Add data fields here), and "Filters on all pages" (Add data fields here).
- Visualizations:** Contains a search bar, a "Build visual" section with a Pivot Table icon selected, and sections for "Rows" (Product, Location), "Columns" (Add data fields here), and "Values" (Add data fields here).
- Data:** Contains a search bar and a list of data sources under "SalesData": Location (checked), Product (checked), and Sales (checked).

The left sidebar shows navigation options: Home, Create, Browse, OneLake data hub, Workspaces (My workspace), and SalesData.

POWER BI - REPORT

The screenshot displays a Power BI report titled "ASEAN Report" with data updated on 12/6/20. The report is viewed in "Reading view" and includes a navigation pane on the left with options like Home, Favorites, Recent, Apps, Shared with me, Learn, Workspaces, My workspace, Dashboards, ASEAN.xlsx, Reports, ASEAN Report, Workbooks, Datasets, and Get data.

The main content area features a map of Southeast Asia, a bar chart titled "Population by Country", and a data table. The bar chart shows population values for Indonesia (660.62M), Area (4.48M), and Forested area (4.99%). The data table provides detailed statistics for each country.

Country	Population	Area	Forested area (%)
Indonesia	270625568	1,904,569.00	0.50
Myanmar	54045420	676,578.00	0.44
Thailand	69625582	513,120.00	0.32
Vietnam	96462106	331,210.00	0.48
Malaysia	31949777	329,847.00	0.68
Philippines	108116615	300,000.00	0.28
Laos	7169455	236,800.00	0.82
Cambodia	16486542	181,035.00	0.59
Brunei	433285	5,765.00	0.72
Singapore	5703569	716.10	0.23
Total	660617919	4,479,640.10	4.99

The right-hand pane contains a "Filters" section with a search bar and a filter for "Country is (All)". Below this are sections for "Filters on this page" and "Filters on all pages", each with an "Add data fields here" button. The "Visualizations" pane shows various chart types, and the "Fields" pane lists fields under the "ASEAN" dataset, including "Country" (checked) and "Population".

At the bottom of the report, a navigation bar shows "Page 1" and a "+" button, which is circled in red.

PUBLISHING & SHARING (1)

- Publish reports from Power BI Desktop to the Power BI Service
- Print and export dashboards
- Manually republish and refresh data
- Create and connect to content packs
- Integrate OneDrive for Business

PUBLISHING & SHARING (2)

Success! Your report is ready to share

Link you can send in email

<https://app.powerbi.com/view?r=eyJrljoiYz>

Copy

HTML you can paste into a website

`<iframe title="ASEAN" width="600" height`

Copy

Size 600 x 373.5 px

Placeholder image

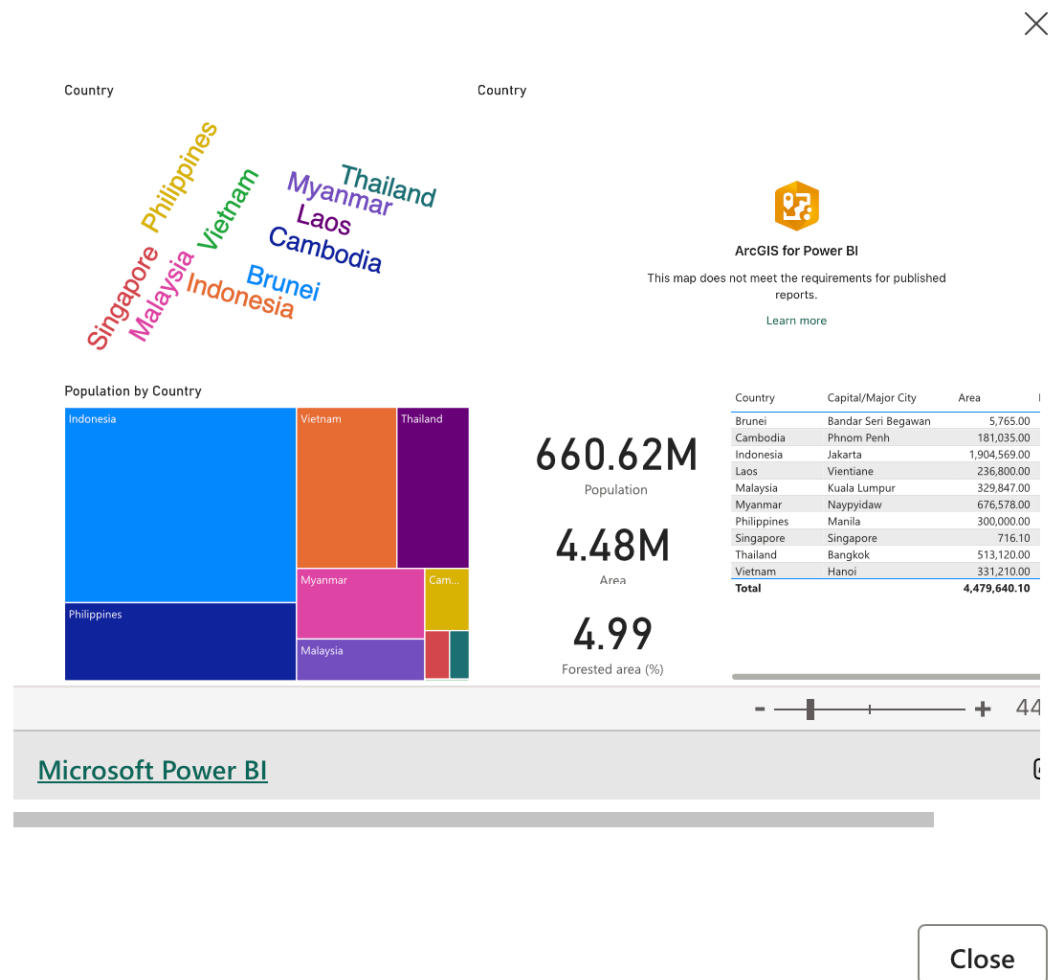


Upload

Delete

Default Page

Default



EXPORT REPORT (1)

The screenshot displays a Power BI report titled 'ASEAN' with data updated on 24/10/21. The interface includes a top navigation bar with a search box and various utility icons. A left-hand navigation pane lists options like Home, Copilot, Create, Browse, OneLake catalog, Apps, Workspaces, My workspace, and Power BI. The main content area features an 'Export' menu (circled in red) with options for 'Analyze in Excel', 'PowerPoint', and 'PDF'. Below the menu is a treemap chart titled 'Population by Country' showing segments for Indonesia, Philippines, Vietnam, Thailand, Myanmar, Malaysia, and Cambodia. To the right is a map of Southeast Asia with a 'Country' legend. Below the map is a table with columns for Country, Capital/Major City, Area, and Population. At the bottom, three large text elements display '660.62M Population', '4.48M Area', and '4.99 Forested area (%)'. The bottom right corner shows a zoom level of 89%.

ASEAN | Data updated 24/10/21

Search

File | Export | Share | Explore | Subscribe | Set alert | Monitor | Edit

Export menu options:

- Analyze in Excel
- PowerPoint
- PDF

Country

Population by Country

Country	Capital/Major City	Area	Population
Brunei	Bandar Seri Begawan	5,765.00	433285
Cambodia	Phnom Penh	181,035.00	16486542
Indonesia	Jakarta	1,904,569.00	270625568
Laos	Vientiane	236,800.00	7169455
Malaysia	Kuala Lumpur	329,847.00	31949777
Myanmar	Naypyidaw	676,578.00	54045420
Philippines	Manila	300,000.00	108116615
Singapore	Singapore	716.10	5703569
Thailand	Bangkok	513,120.00	69625582
Vietnam	Hanoi	331,210.00	96462106
Total		4,479,640.10	660617919

660.62M
Population

4.48M
Area

4.99
Forested area (%)

89%

EXPORT REPORT (2)

The screenshot shows the Microsoft Power BI interface. At the top, the report title is 'ASEAN' and the data is updated as of '24/10/21'. The main content area displays a report with a treemap chart titled 'Population by Country' and a table of data. The 'Export to PowerPoint' dialog box is open, and the option 'Embed report with the data filters you selected' is checked and circled in black.

Export to PowerPoint

Choose how to export:

Embed live data

Copy the report URL and paste it into your existing presentation or select Open in PowerPoint to create a new presentation.

Embed report with the data filters you selected

Report page link: <https://app.powerbi.com/groups/me/reports/328aef0d-02bc-4...> **Copy**

Open in PowerPoint **Cancel**

Population by Country

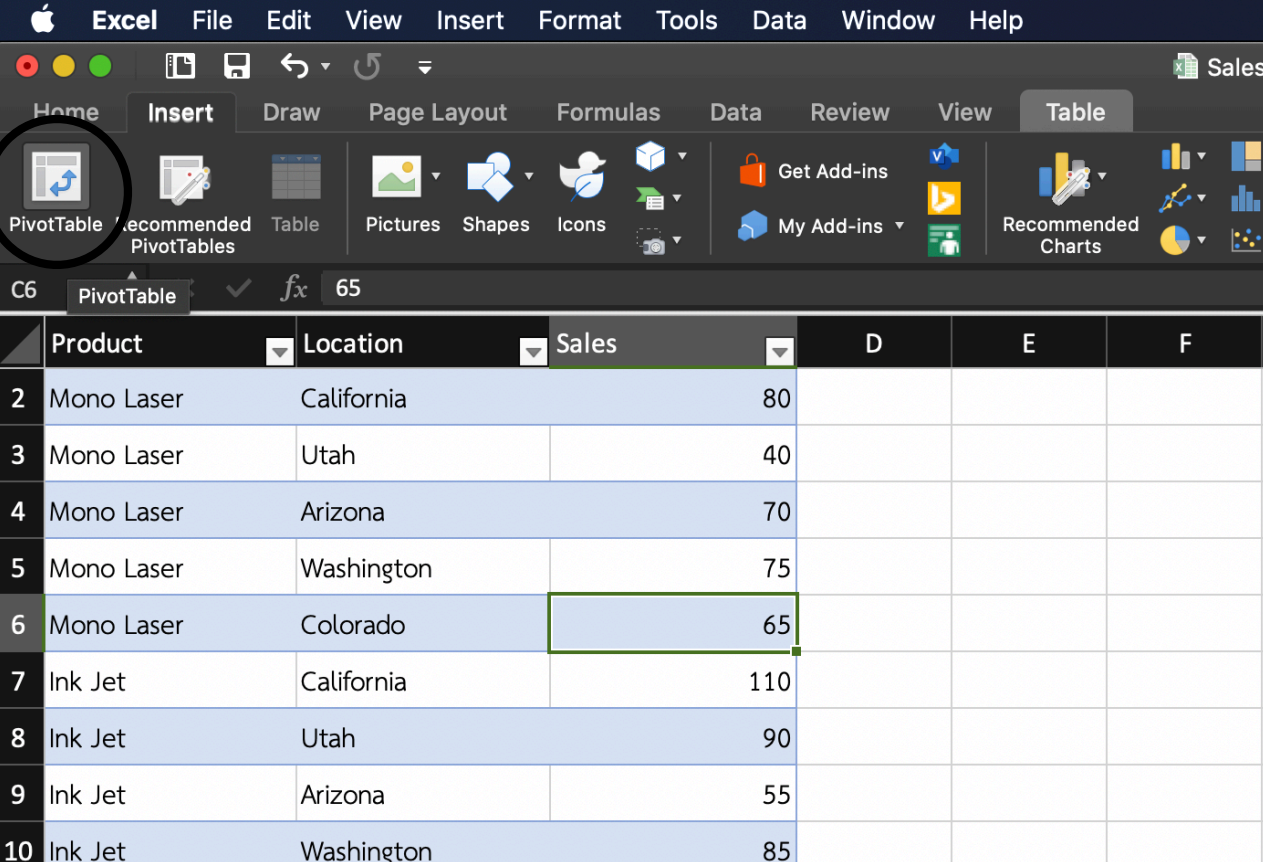
Country	Area	Population
Indonesia	4.40M	270625568
Philippines	4.99	108116615
Myanmar		5703569
Malaysia		7169455
Singapore		5703569
Thailand		69625582
Vietnam		96462106
Total	4,479,640.10	660617919

PIVOT TABLES IN EXCEL (1)

- Pivot tables are one of Excel's most powerful features. A pivot table allows you to extract the significance from a large, detailed data set.

PIVOT TABLES IN EXCEL (2)

- Click any single cell inside the data set.
- On the Insert tab, in the Tables group, click PivotTable.

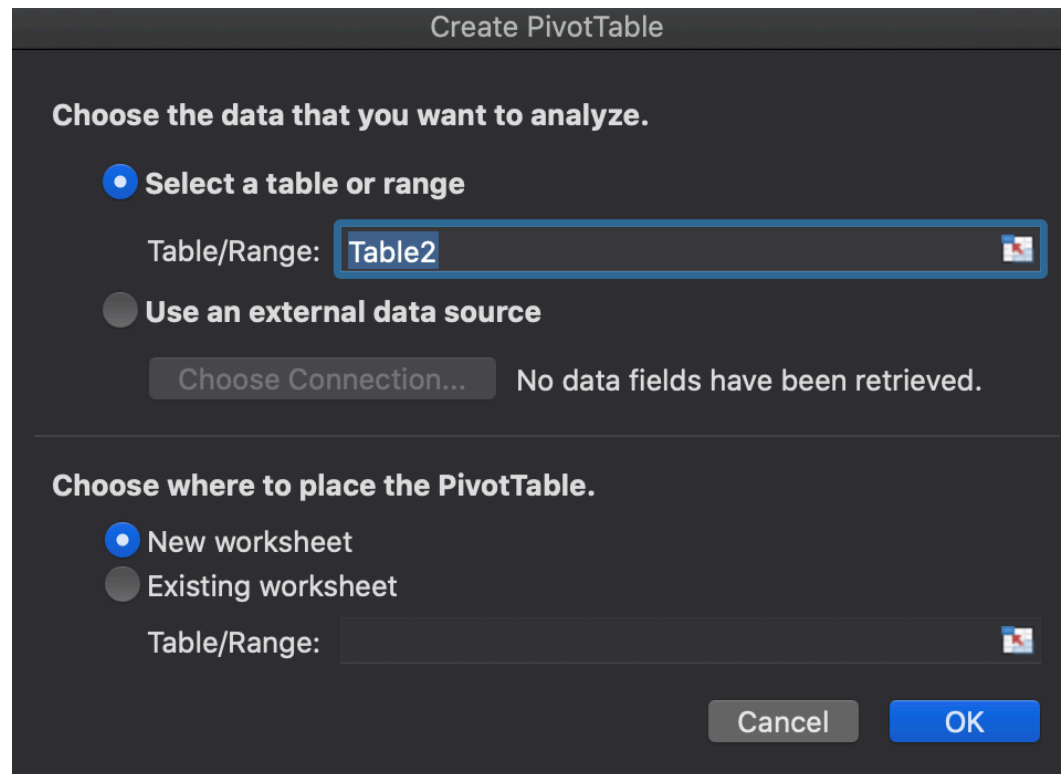


The screenshot shows the Microsoft Excel interface. The 'Insert' tab is active, and the 'PivotTable' button in the 'Tables' group is circled. Below the ribbon, the active cell is C6, containing the value 65. The data table below is as follows:

	Product	Location	Sales	D	E	F
2	Mono Laser	California	80			
3	Mono Laser	Utah	40			
4	Mono Laser	Arizona	70			
5	Mono Laser	Washington	75			
6	Mono Laser	Colorado	65			
7	Ink Jet	California	110			
8	Ink Jet	Utah	90			
9	Ink Jet	Arizona	55			
10	Ink Jet	Washington	85			

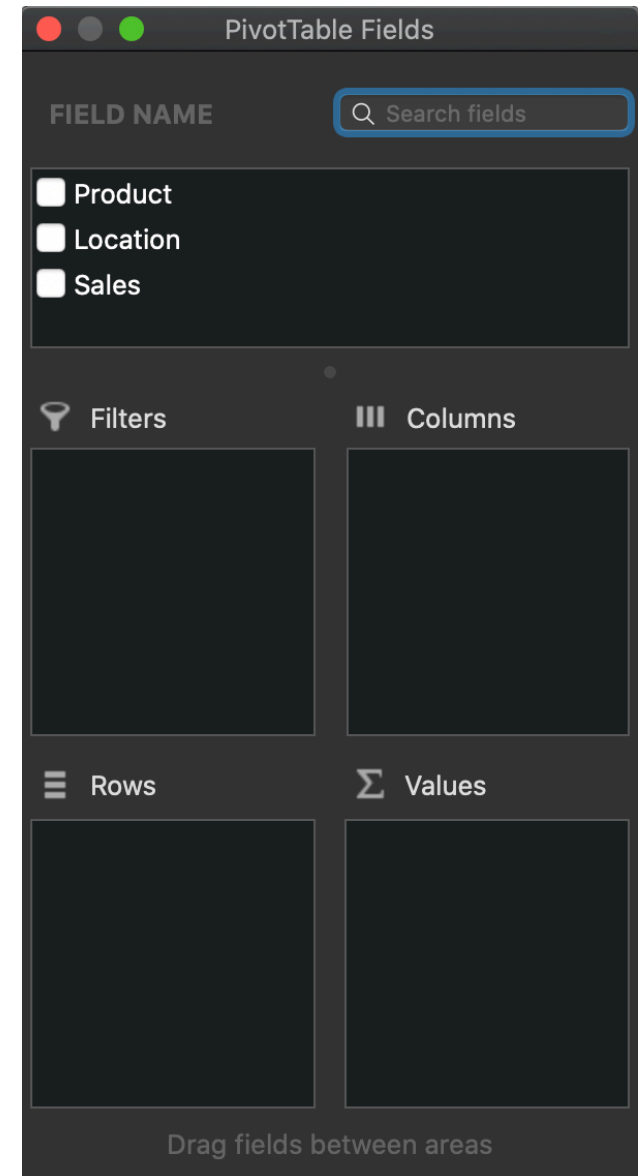
PIVOT TABLES IN EXCEL (3)

- The following dialog box appears. Excel automatically selects the data for you. The default location for a new pivot table is New Worksheet, and click OK



PIVOT TABLES IN EXCEL (4)

- The PivotTable Fields pane appears. To get the total amount exported of each product, drag the following fields to the different areas.



PIVOT TABLES IN EXCEL (5)

The screenshot displays the Microsoft Excel interface with a PivotTable and the PivotTable Fields task pane. The PivotTable is located in the range G3:K9 and summarizes sales data by product and location. The PivotTable Fields task pane on the right shows the configuration for the PivotTable, with Product, Location, and Sales fields selected. The PivotTable Fields task pane is configured as follows:

- Field Name:** Search fields
- Selected Fields:** Product, Location, Sales
- Filters:** (Empty)
- Columns:** Location
- Rows:** Product
- Values:** Sum of Sales

The PivotTable data is as follows:

Sum of Sales	Column Labels						
Row Labels	Arizona	California	Colorado	Utah	Washington	Grand Total	
Ink Jet	55	110	45	90	85	385	
Mono Laser	70	80	65	40	75	330	
Photo	60	60	85	50	45	300	
Portable	35	25	60	30	45	195	
Grand Total	220	275	255	210	250	1210	

PIVOT TABLES IN EXCEL (6)

The screenshot displays the Microsoft Excel interface with a PivotTable and a PivotChart. The PivotTable is located in the range A3:G9 and shows the sum of sales for various products across five locations. The PivotChart is a clustered bar chart located in the range D5:G15, showing sales for four products (Ink Jet, Mono Laser, Photo, Portable) across five locations (Arizona, California, Colorado, Utah, Washington). The PivotChart Fields task pane is open on the right, showing the configuration of the chart.

Row Labels	Arizona	California	Colorado	Utah	Washington	Grand Total
Ink Jet	55	110	45	90	85	385
Mono Laser	70	80	65	40	75	330
Photo	60	60	85	50	45	300
Portable	35	25	60	30	45	195
Grand Total	220	275	245	205	250	1195

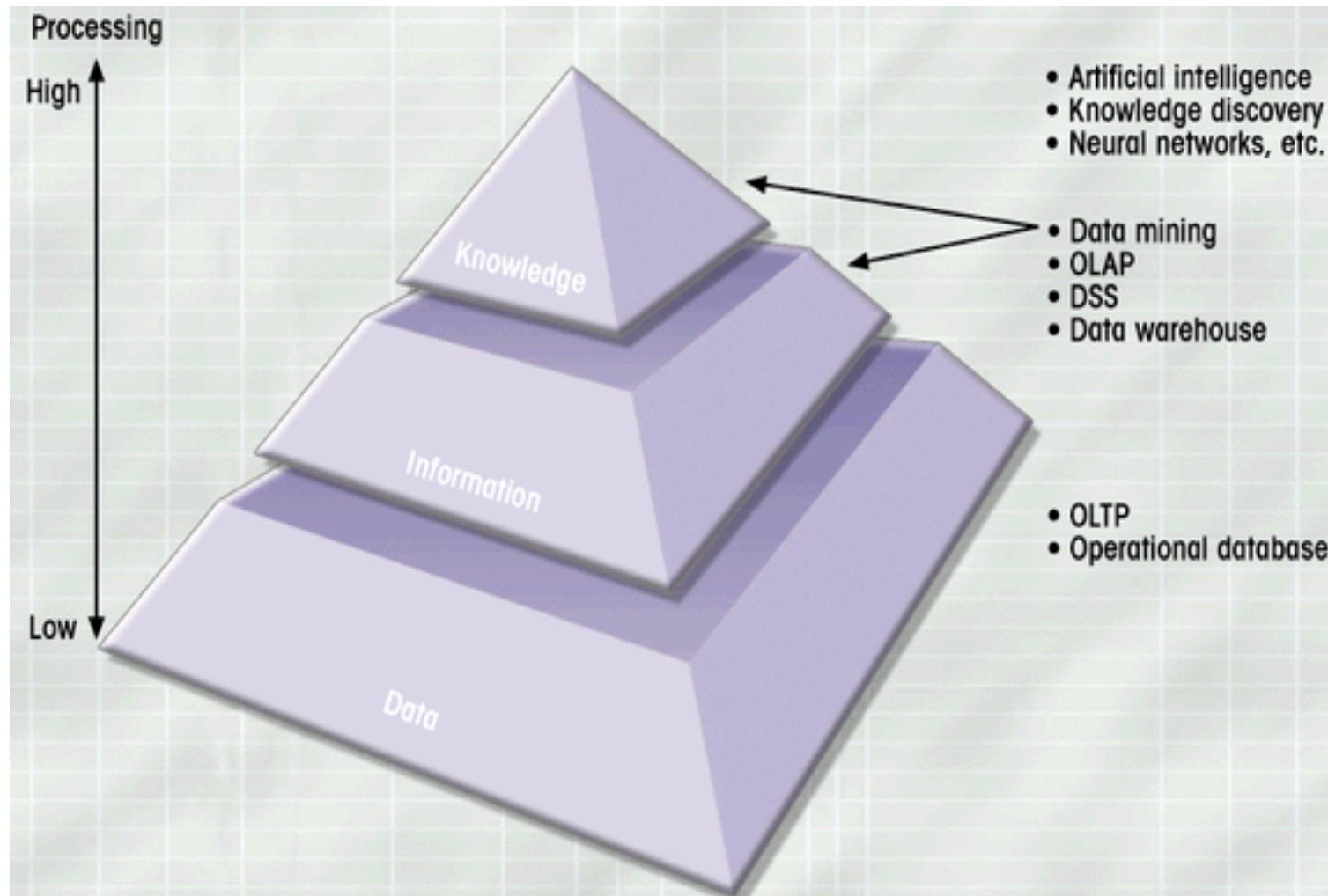
PivotChart Fields Task Pane Configuration:

- FIELD NAME:** Search fields
- Product:** Product
- Location:** Location
- Sales:** Sales
- Filters:** Location
- Legend (Series):** Location
- Axis (Categories):** Product
- Values:** Sum of Sales

DATA MINING

- Seeks to discover unknown data characteristics
- Automatically searches data for anomalies and relationships
- Data mining tools
 - Analyse data
 - Uncover problems or opportunities
 - Form computer models based on findings
 - Predict business behavior with models
 - Require minimal end-user intervention

EXTRACTION OF KNOWLEDGE FROM DATA



ASSIGNMENT 6 (1)

- ให้ดาวน์โหลดไฟล์ **country_vaccinations_by_manufacturer.csv** เพื่อใช้เป็นข้อมูลในไฟล์ในการสร้างรายงาน (Report) ของการฉีดวัคซีนในช่วงการระบาดของ COVID-19
- ข้อมูลดังกล่าวมีวัตถุประสงค์เพื่อใช้เป็นรายงานสรุปความคืบหน้าของการฉีดวัคซีนในแต่ละประเทศ/ทวีป ยี่ห้อของวัคซีนที่ฉีด/ประเภทของวัคซีน (mRNA / Viral Vector / Protein Subunit / Inactivated) ให้ค้นหาข้อมูลอื่นที่จำเป็น (ทวีป ประเภทวัคซีน และจำนวนประชากร) เพื่อใช้ประกอบการทำ Data Warehouse

ASSIGNMENT 6 (2)

- ให้แต่ละกลุ่มออกแบบ Star Schema สำหรับเก็บข้อมูลวัคซีนดังกล่าว
Deadline: 28 November 2025
- จัดทำข้อมูลเพื่อตอบคำถามต่อไปนี้
 - วัคซีนประเภทใดถูกฉีดมากที่สุด
 - ทวีปใดฉีดวัคซีน mRNA มากที่สุด
 - ประเทศใดมีอัตราการฉีดวัคซีนต่อจำนวนประชากร น้อย/มาก ที่สุด
 - อัตราการฉีดวัคซีนประเภท mRNA เปรียบเทียบกับ Inactivated Vaccine มีอัตราที่ เพิ่มขึ้น/ลดลง เมื่อดูรายไตรมาส

Deadline: 19 December 2025