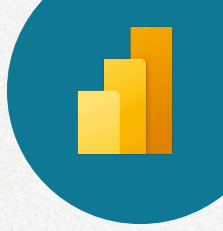




Microsoft Power BI

Performance Best Practices

A CTO Guide



Who This Guide is For?

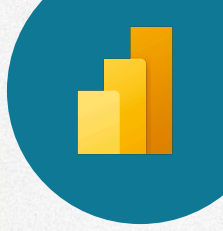
- Aimed at CTOs, IT leaders, and decision-makers overseeing business intelligence systems.

What You'll Learn?

- Key insights into optimizing Power BI for performance, scalability, and efficiency.

Introduction

- Power BI is like the engine that helps you drive your company's data decisions. When it's well-tuned, dashboards load quickly, reports are clear, and insights come right on time. If it's not optimized, it becomes slow and frustrating.
- So, improving Power BI performance helps you make optimal decisions while staying reliant, accurate, and hassle-free.
- As a CTO, you need to ensure Power BI scales smoothly, delivers quick reports, and integrates easily with other systems securely and efficiently - all while keeping budget and governance in check.



Power BI Performance Best Practices For CTOs

- Let's dive into the **best practices of Power BI** to keep your decisions simple and sustainable.

1. Optimizing Power BI for Business Scalability

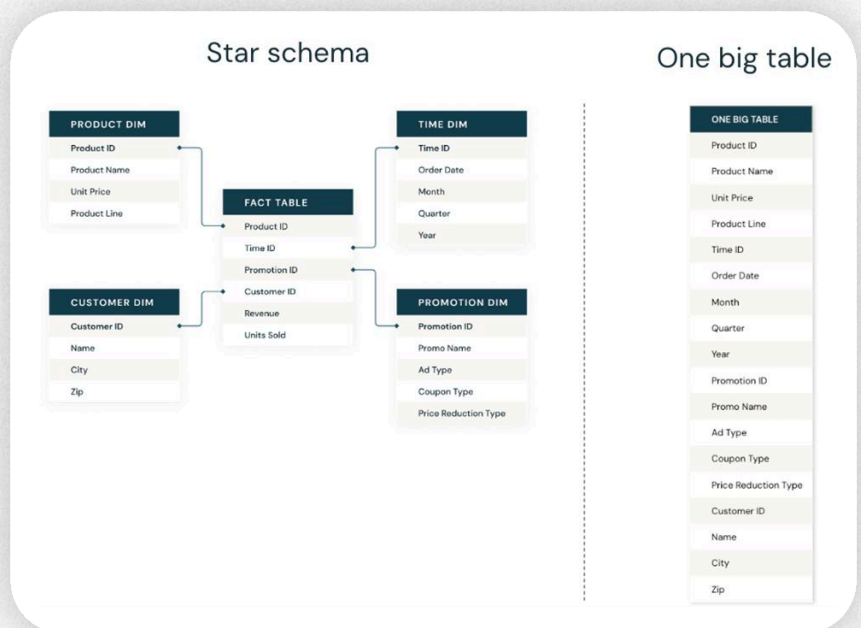
- As your business grows, so does your data complexity and reporting needs. Without a scalable Power BI setup, you'll face slow performance, fragmented reports, and inconsistent data across teams. If your dashboards struggle to handle large datasets or refresh times are increasing, it's time to optimize.

What's the Impact?

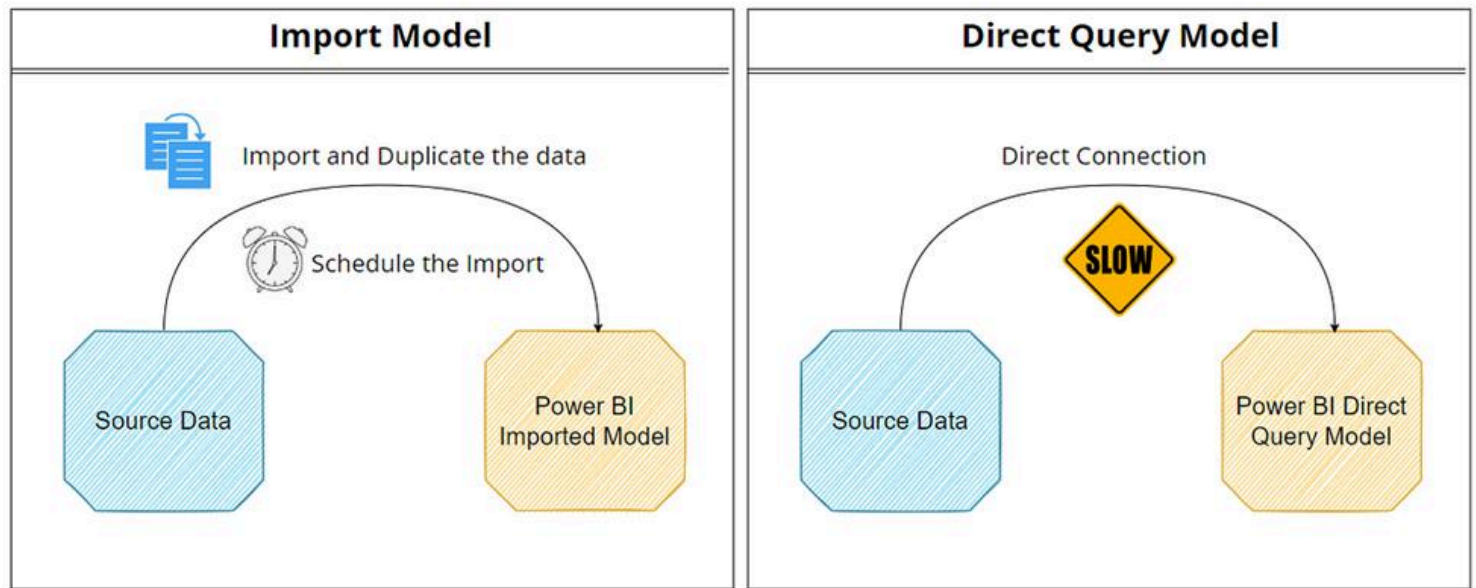
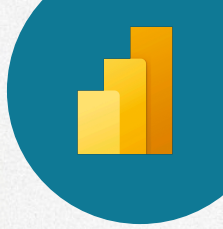
Enterprise-Ready Architecture

Design for Scale:

Implement Star Schema instead of a flat table design organize your data efficiently, like a well-ordered closet.

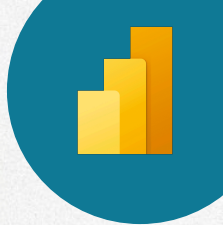


Avoid DirectQuery unless absolutely necessary — it's similar to streaming a 4K movie on weak Wi-Fi. Import Mode generally offers superior performance.



Choose the Right Capacity Model:

Model	Best For	Considerations
Power BI Pro (Shared Capacity)	Small teams	Limited scalability
Power BI Premium (Dedicated Capacity)	Enterprise & large datasets	Higher cost but better performance

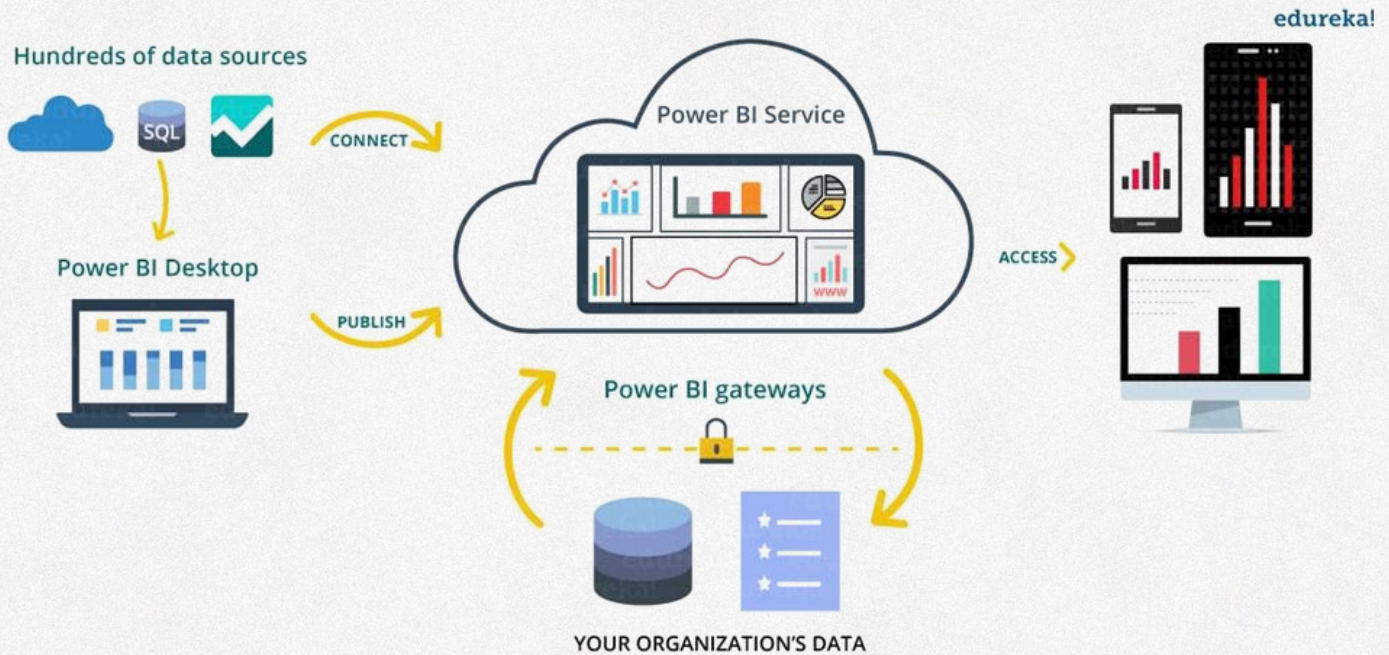
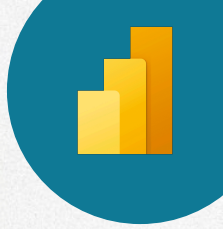


Power BI Pro		Power BI Premium	
Full Version		Requires Power BI Pro	
		Best for organizations with large data sets and many users	
Cost	PER USER	PER USER	PER CAPACITY
	\$10 / month	\$20 / month	from \$4,995 / month
Capacity	10 GB Upload up to 10 GB of data to the Power BI Cloud	License the capacity of your dashboards, datasets, and reports	Exclusive utilization of predetermined computing power
Licensing	Per person, unlimited	All users, unlimited	Unlimited
Features	Visualize Data Live Dashboards and Reports Share Insights across Organization Collaborate across Organization	Features of Pro PLUS Accelerate Access to Insights Unlock Self-service Data Prep for Big Data Simplify Data Management Access at Enterprise Scale	Features of Pro and Premium WITHOUT per-user licenses Dedicated Cloud Compute and Storage Resource

Centralized Datasets for Collaboration

Create a "Single Source of Truth":

- Store datasets in **Power BI Service** instead of creating multiple report versions across teams.
- Enable shared datasets so analysts work with consistent, up-to-date information.



What If Not Tried?

■ Slow Performance:

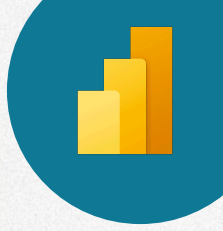
Flat tables and Direct Query overload your system, causing delays.

■ Data Inconsistencies:

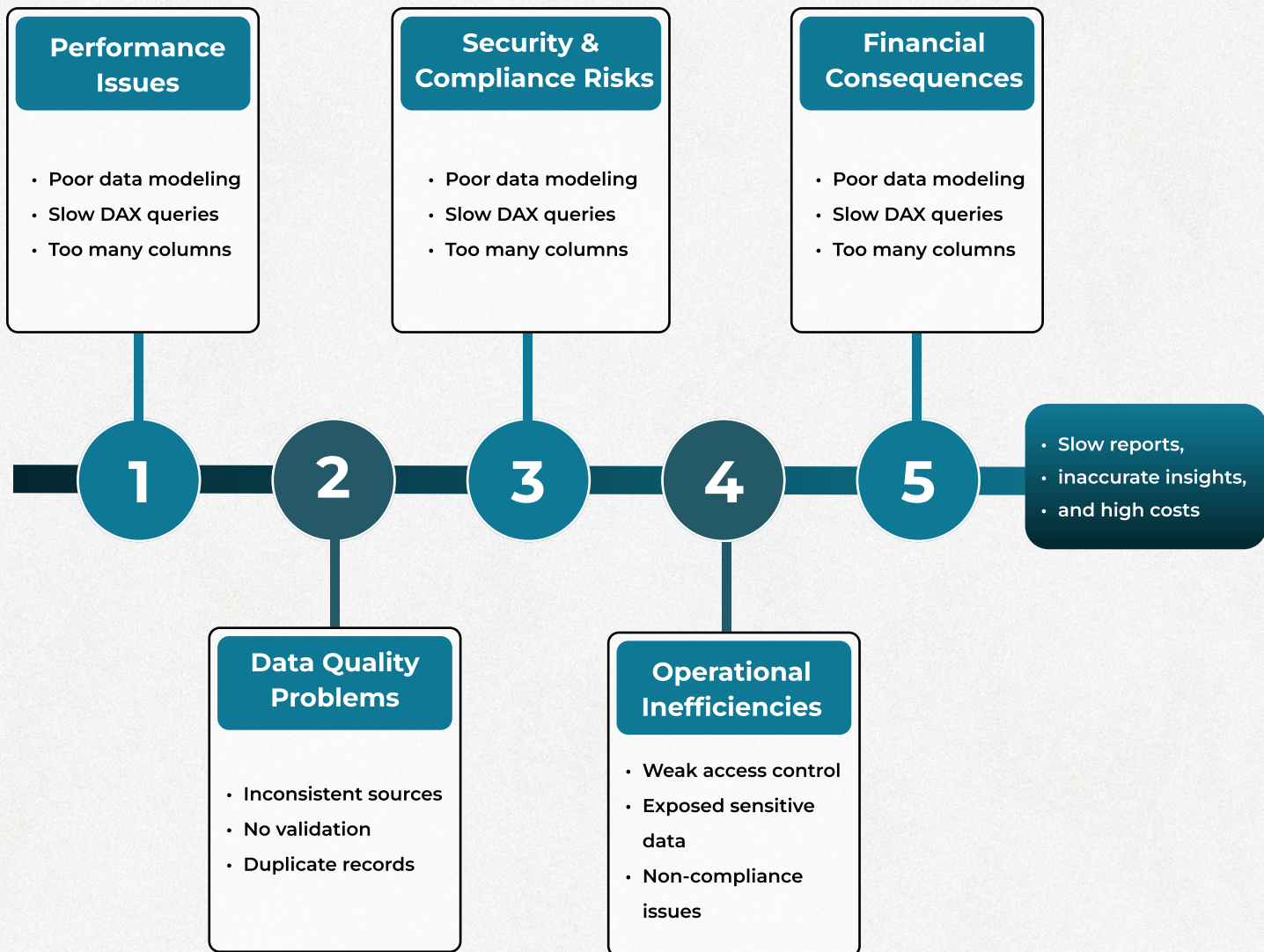
Multiple versions of reports lead to conflicting business decisions.

■ High Costs:

Paying for Premium capacity without optimizing usage wastes budget.

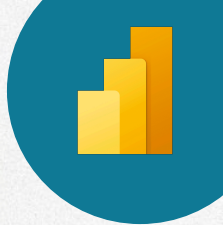


Impact of Not Following Power BI Best Practices



■ Why does this matter?

Imagine multiple teams working with different versions of sales data—your financial reports will not align, resulting in misaligned business decisions.

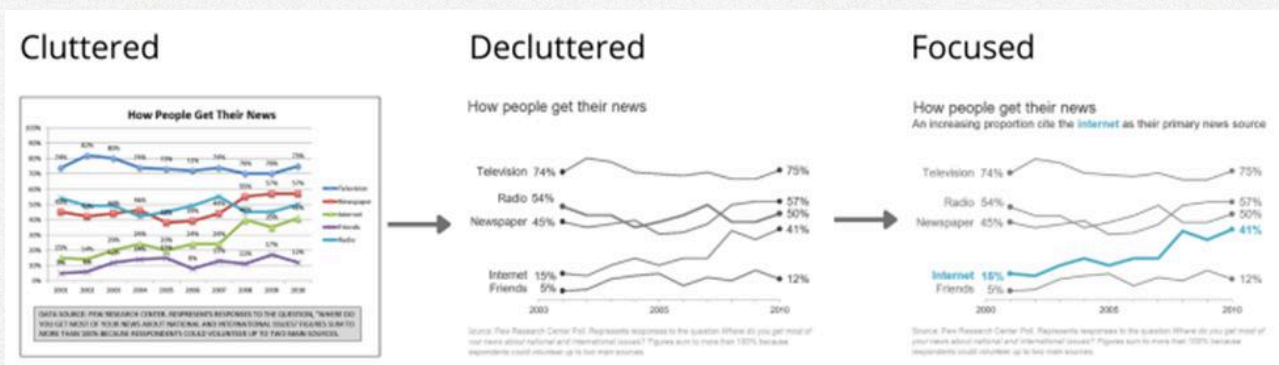


2.Enhancing Report Speed and User Experience

- A slow dashboard is like a website that takes 10 seconds to load—users lose patience and stop using it. If your reports take too long to load, executives and analysts won't rely on Power BI for decision-making.

What's the Impact?

- Limit dashboards to **8–10 visuals per page**. More visuals = **slower load times**.
- Replace heavy visuals (tables, maps) with **aggregated KPIs & charts**.

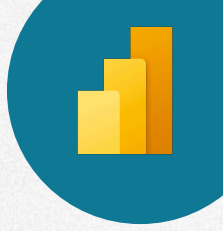


Optimize slicers and filters:

- Use hierarchical slicers instead of loading all filters at once.
- Avoid multi-column sorting—it increases query time.

Design for Actionable Insights:

- Show executives **trends, KPIs, and alerts** first—don't make them dig through data.
- Use **color coding** to highlight risks and opportunities.



Instead of a complex revenue breakdown, show:



Revenue Up 12% QoQ



Revenue Declined 5% in Asia

What If Not Tried?

■ Low User Adoption:

If reports are slow, executives stop using Power BI, preferring Excel instead.

■ Overloaded Reports:

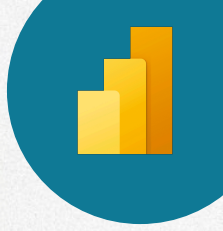
Too many visuals slow performance, making insights harder to find.

■ Delayed Decisions:

Slow reports lead to missed opportunities and reactive decision-making.

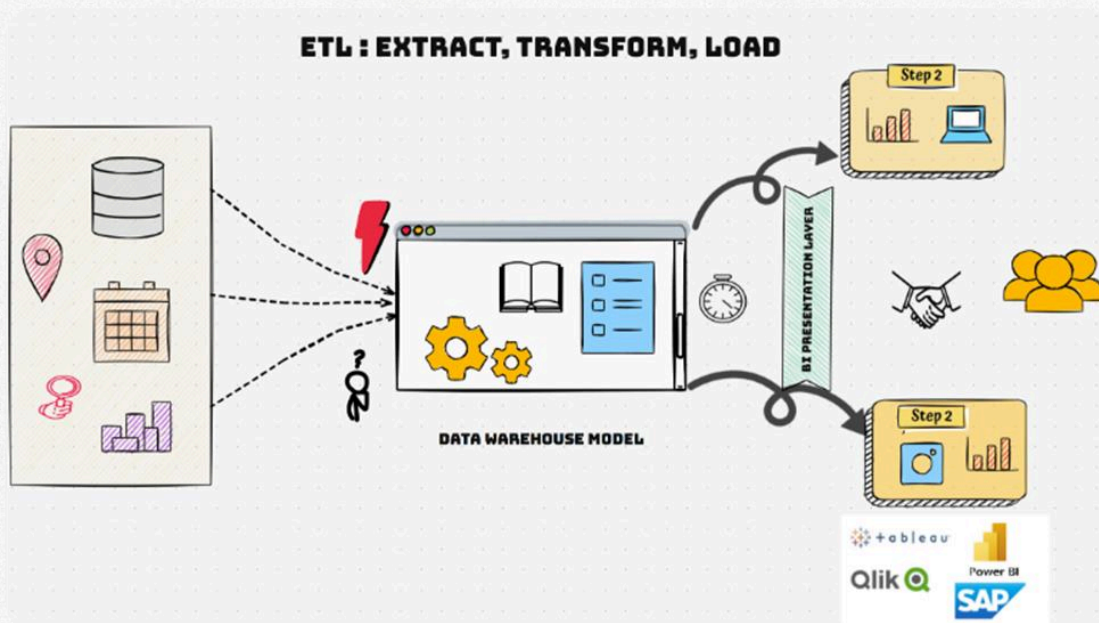
- A well-optimized dashboard should answer key business questions at a glance.

Also read – [Power BI design mistakes you should avoid](#)



Streamlining Data Integration and ETL Processes

- Think of ETL (Extract, Transform, Load) like fueling your Power BI engine—if the process is inefficient, performance suffers, refresh times increase, and business reports become unreliable.
- If your data refreshes are taking too long or your reports lag during peak hours, it's time to optimize your ETL strategy.



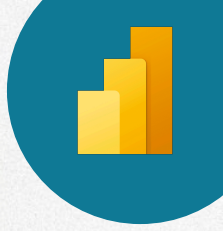
What's the Impact?

● Filter Data at the Source:

- Only load **relevant data** into Power BI—don't import an entire database just in case.
- Use **SQL views** to pre-aggregate data before it reaches Power BI.

● Enable Incremental Refresh for Large Datasets:

- Only load **relevant data** into Power BI—don't import an entire database just in case.
- Use **SQL views** to pre-aggregate data before it reaches Power BI.



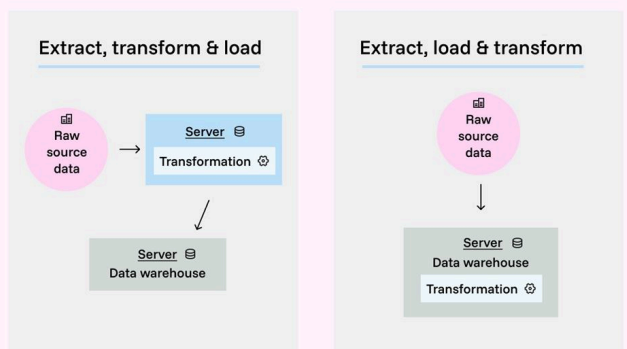
Automating Data Refresh

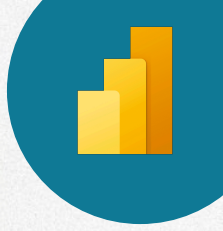
Report Type	Ideal Refresh Frequency
Executive Dashboards	Daily or Weekly
Operational Reports	Every Few Hours
Real-Time Reports	Direct Query (only if needed)

What If Not Tried?

- Slow Refreshes – Large datasets take hours to update, delaying insights.
 - Unnecessary Data Overload –
 - Importing entire databases instead of relevant data increases complexity and cost.
- System Strain – Overloaded ETL processes cause performance issues across multiple reports.

ETL or ELT?





4. Managing Costs and Resource Allocation

- Power BI is powerful, but mismanaged resources lead to wasted budget and slow performance. If you're noticing high Premium capacity costs without a clear ROI, it's time to optimize.

What's the Impact?

● Optimizing Power BI Premium Capacity

- **Monitor Usage with Power BI Metrics:**

- Identify underutilized reports & datasets to free up resources.
- Prevent overprovisioning by scaling Premium capacities dynamically.

● Reducing Dataset Size

- **Eliminate Unnecessary Data:**

- Remove unused columns, tables, and calculated columns.
- Use aggregations instead of storing detailed transactional data.

What If Not Tried?

■ **Budget Overruns :**

Paying for unused reports, excess storage, and underutilized compute resources.

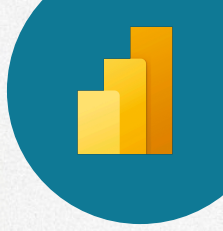
■ **Slower Performance :**

Overloaded workspaces lead to sluggish dashboards.

■ **Scalability Issues :**

Growth becomes costly and inefficient.

Think of it like cleaning out old files from your computer why store what you don't need?



5. Ensuring Data Governance and Security

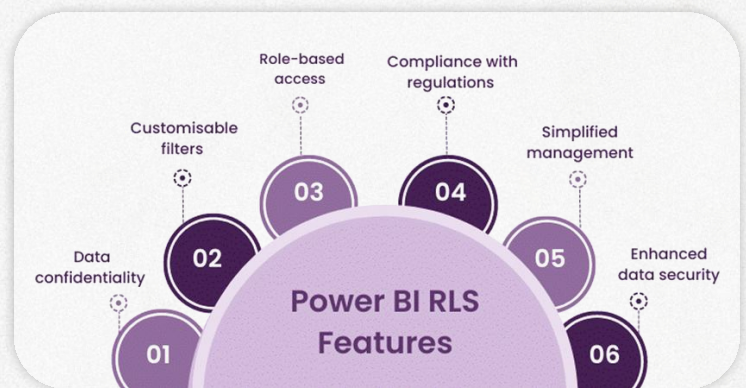
- Without governance, Power BI turns into a security and compliance nightmare. Data leaks and compliance violations become a serious risk when multiple teams create reports without access controls.

What's the Impact?

● Role-Level Security (RLS)

○ Monitor Usage with Power BI Metrics:

- Restrict data based on user roles to ensure sensitive data stays protected.
- A sales manager should see only their region's data, not global sales figures.



● Data Compliance & Governance Framework

○ Eliminate Unnecessary Data:

- Align with regulations like GDPR, HIPAA—especially for financial & healthcare sectors.
- Define workspace access policies to prevent unauthorized sharing of reports

What If Not Tried?

■ Data Breaches :

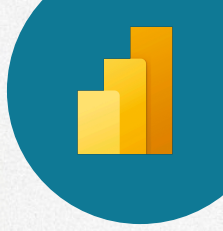
Unauthorized users access confidential data, risking company reputation and compliance penalties.

■ Lack of Accountability :

No tracking of who accessed or modified reports, leading to data-driven decisions.

■ Shadow IT Risks :

Employees create uncontrolled, duplicate reports, exposing the company to data inconsistencies.



6. Increasing Team Productivity with Standardized Processes

- If your teams spend more time formatting reports than analyzing data, you need standardization. The lack of reusable templates and inefficient collaboration slows decision-making.

What's the Impact?

● Reusable Templates

- Create standardized templates for common reports (Sales, HR, Finance).

● Cross-Team Collaboration & Training

- Use shared workspaces instead of emailing Excel files around.
- Provide regular Power BI training—an untrained team will never fully leverage the tool.

What If Not Tried?

■ Inconsistent Reporting :

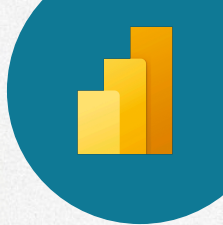
Different teams generate different versions of the same report, leading to conflicting data.

■ Inefficiency :

Analysts spend hours recreating dashboards, slowing down decision-making.

■ Underutilized Power BI :

Without training, employees never leverage its full capabilities, reducing its business value.



7. Monitoring and Continuous Optimization

- Even the best Power BI implementation degrades over time without proactive monitoring. If reports are slowing down or users are frustrated with wait times, it's time for continuous optimization.

What's the Impact?

● Performance Monitoring Tools

- Use Performance Analyzer to track slow visuals & queries.
- Optimize DAX formulas—SUMX inside a loop? That's a performance killer.

Power BI Analyser Tools						
Features Tools	DAX Tuning	Performance Issues	Sizes Compress	Unwanted Column	Unwanted Row	Relationship Issues
DAX Studio	★★★★★	★★★★★	×	×	×	×
Performance Analyzer in Power BI Desktop	★★★★★	★★★★★	×	×	×	×
Vertipaq Analyzer	×	★★★★	★★★★★	★★★★★	★★★★★	×
Power BI Helper	★★★★	★★	★★★★★	★★★★★	★★★★★	★★★★★
Power BI Field Finder	×	★	★★★★	★★★★	×	×

Ratings

★

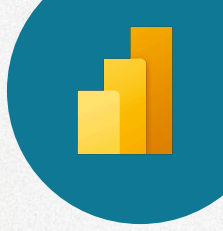
★

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HighestLowest



What If Not Tried?

■ Slow Dashboards :

Unoptimized DAX and bloated datasets lead to poor performance.

■ Capacity Overload :

Retaining too many outdated reports strains compute resources.

■ Lost Productivity :

Users waste valuable time waiting for reports to load.

8. Leveraging Advanced Analytics and AI Capabilities

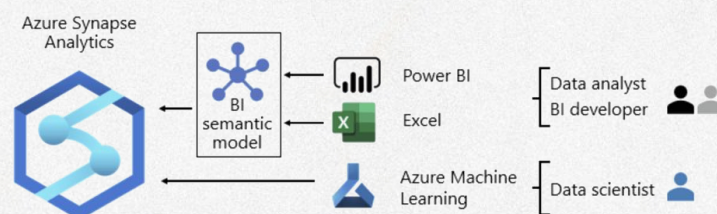
- Why settle for reporting the past when you can predict the future? If you're only using Power BI for basic reporting, you're missing out on AI-driven insights.

What's the Impact?

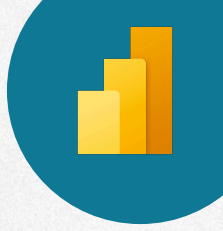
- AI Insights & Anomaly Detection → Detects business trends and outliers before they become problems.

● Integration with Azure

- Combine Power BI with Azure Machine Learning for predictive analytics.
- Use Synapse Analytics for big data scalability.



What If Not Tried?



■ Missed Business Opportunities:

Without predictive analytics, trends go unnoticed, impacting revenue

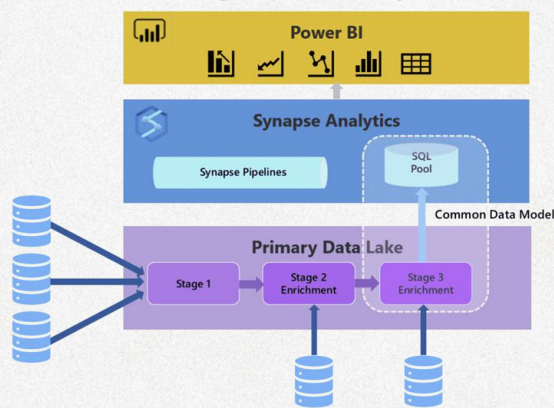
■ Reactive Decision-Making :

Executives only see what happened, not what will happen next.

■ Competitive Disadvantage :

Competitors leveraging AI insights will outpace your organization in innovation.

Standardize reporting data with Synapse Analytics



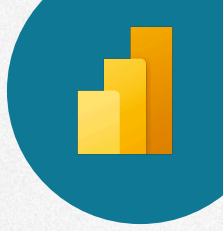
Final Thoughts: Make Power BI Work for Your Business

- Power BI is more than just a reporting tool—it's a strategic asset. Without proper governance, cost control, performance monitoring, and AI integration, its value diminishes. The best BI strategy is not just about building reports but ensuring they drive real business impact.

● Integration with Azure

- Scale your BI infrastructure efficiently.
- Deliver fast, intuitive reports that drive decisions.
- Keep costs under control while ensuring data security.

Want expert guidance?



Want expert

Guidance?

Let's optimize your Power BI environment
for peak performance!



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