

How to get data from D365 FO to Power BI?

Cutting-edge approach to extract, transform, and leverage data from Dynamics F&O, going beyond the conventional methods. Dive into advanced integration strategies, such as Dataverse, Azure Synapse, and Fabric integration with Power BI or SQL database to elevate your analytics game.

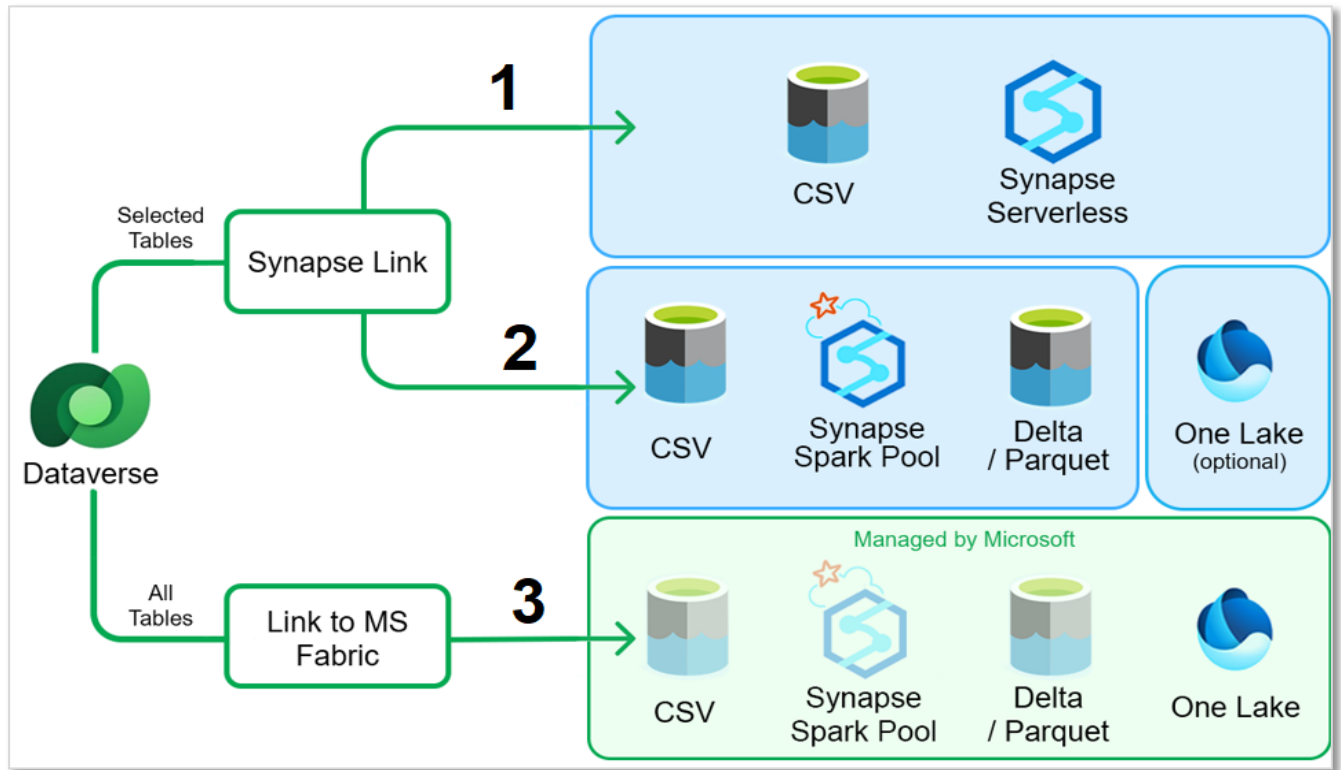
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ETL - EXTRACT TRANSFORM LOAD PROCESS FROM D365 FO

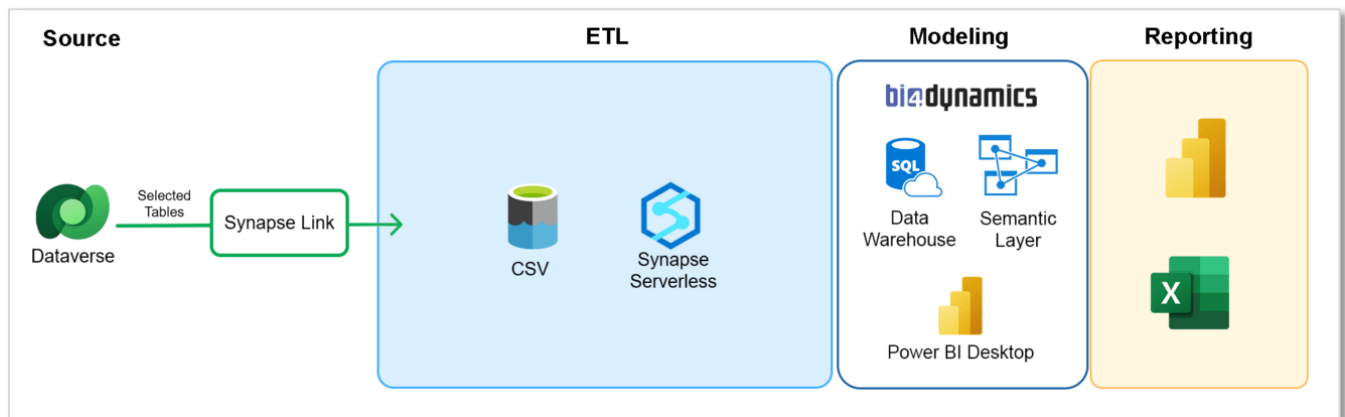
Introduction

D365 Finance and Operations data is not available to external tools due to security and performance reasons. Microsoft is providing the following ETL process options (extract, transform, load) to get data out of D365:



Option	Data Format	Installation & Management	Cost	Latency
#1: Synapse link	CSV files	The customer manually selects FO tables in Power Apps.	The most economical option is priced at 5\$ per TB of data processed.	Best latency among available options. On-Demand, delay up to 5 minutes.
#2: Synapse link with Spark Pool	Delta / Parquet	The customer manually selects FO tables in Power Apps.	Additional cost for Synapse Spark Pool, which is priced per hour.	Higher latency due to Spark conversion from CSV to Delta/Parquet format. Scheduled in 15 minutes.
#3: Link to MS Fabric	Delta / Parquet in OneLake	All Dataverse tables are selected by Microsoft, FO tabkes have to be selected manually in Power Apps.	The most expensive option: costs 40\$ per additional GB per month for database storage in Dataverse. Also, requires Fabric Capacity during the processing.	The highest latency due to the conversion process to One Lake. Scheduled in 60 minutes.

#1: Synapse link - Synapse Serverless



Data Flow:

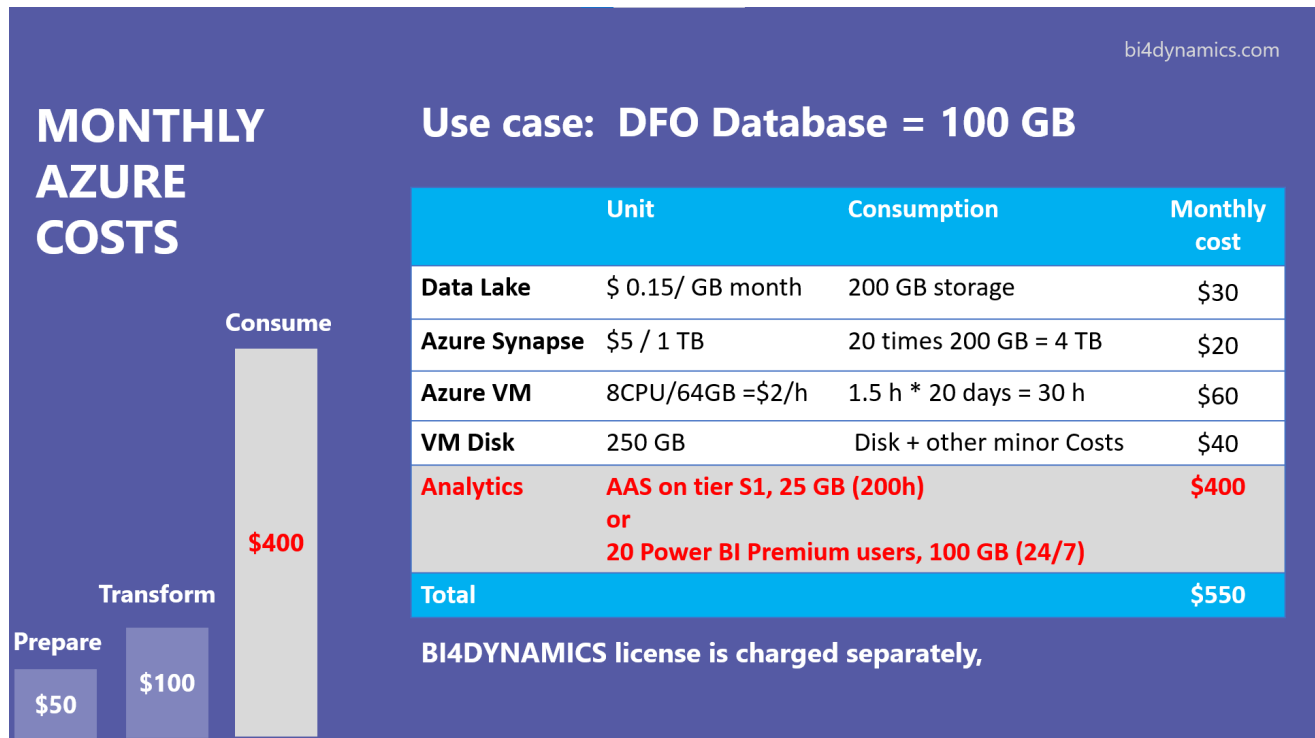
1. **From D365 FO to CSV files – Microsoft service:**
 - Utilizing Azure Synapse Link, managed by Microsoft at no additional costs.
 - Customers manually select D365 FO tables in Dataverse.
 - Microsoft Service generates CSV files into an Azure Storage Container.
2. **From CSV files to Data Warehouse – BI4Dynamics solution:**
 - Synapse Serverless reads these CSV files.
 - Inserts them into the BI4Dynamics Data Warehouse staging area.

A new solution from BI4Dynamics is available; the solution used in Export to DataLake will not work.

Key Features:

- **Data Format:** Synapse Serverless employs architecture like Export to DataLake, with different CSV formats and file structures.
- **Cost:** The most economical option: Synapse Serverless is priced at 5\$ per terabyte (TB) of data processed.
- **Complexity:** This option requires the transformation of CSV files, making it from a customer perspective more complex. However, with a BI4Dynamics license, customers get a fully automated solution.
- **Latency:** It boasts the best latency among available options of 5 minutes.

Verdict: This setup offers efficient data integration with cost-effectiveness, although it may require some complexity in development. However, it provides the advantage of optimal latency, which is crucial for real-time analytics and reporting.

Costs:

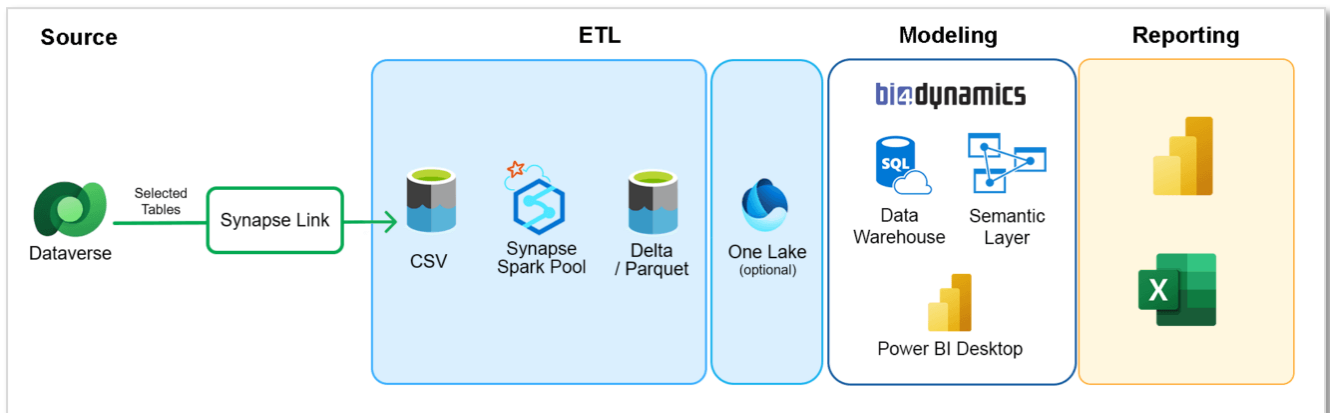
The table above shows the monthly Azure costs of Microsoft and these costs are not connected with the BI4Dynamics, the costs for BI4Dynamics depend on different parameters.

The table shows an example of database size in F&O of **100 GB** and the Azure costs in each step of our Data Transformation with Synapse Serverless architecture:

- **ETL** does not have a huge impact on the monthly total costs, since, **Data Lake** costs 20-30\$ per month, and the **Azure Synapse** costs 10-20\$ per month. This sums up to **50\$ per month**.
- Azure Virtual Machine (VM) for Data Warehouse with 8 cores and 64GB of memory costs **2\$ / per hour**. For eg. if you run it **1.5/hours** per day and **20 days**/per month it comes to a total of **30 hours** and will cost **60\$**. If you need a better in performance Azure VM will cost approx **100\$**.
- However, the costs for the Semantic layer are the ones that have the biggest impact on the total monthly costs. The service supports tier 2 with **25GB** of Disk space for (100h/2\$ per hour=**400\$**) or the cost for **20** users of Power BI Premium, 720h or 24/7 for a 100GB data model.

These costs could be much cheaper if a company has a smaller database or smaller number of users, but in our scenario, the total cost will be approx. **550\$** per month.

#2: Synapse link – Synapse Spark Pool



Data Flow:

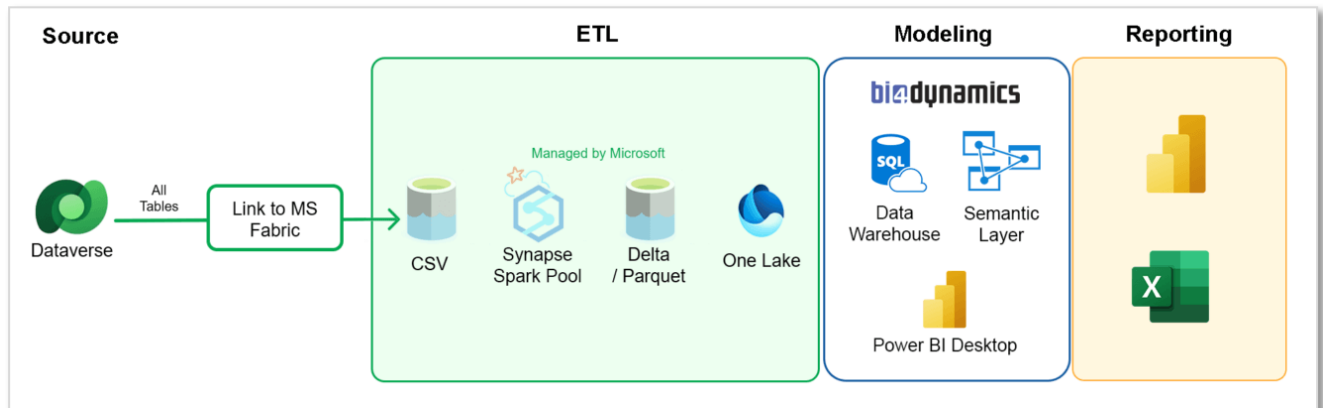
- From D365 FO to CSV files – Microsoft service:**
 - The same as it was described in option #1.
- CSV conversion to Delta/Parquet – Microsoft service:**
 - Synapse Spark Pool engine is utilized to transform these CSV files into Delta/Parquet format.
 - Files are linked in OneLake to act like SQL endpoint, available for many processing solutions (Power BI, data warehouse)
- From Delta/Parquet to Data Warehouse – BI4Dynamics solution:**
 - OneLake SQL endpoint acts as an SQL database and is used as the source for the BI4Dynamics Data Warehouse staging area.

Key Features:

- Data Format:** Delta/Parquet format, providing many advantages for further processing.
- Cost:** Utilizing Synapse Spark Pool incurs an additional cost (priced per hour). Refer to the Azure pricing page for details.
- Complexity:** Synapse Spark Pool transforms CSV files to Delta/Parquet files which gives a better starting point for building the BI model.
- Latency:** have higher latency compared to #1 due to the additional step of Spark conversion. Conversion from CSV to Delta/Parquet is scheduled in intervals, minimum is 15 minutes.

Verdict: This approach provides processing flexibility and the data format is great for further transformations; This comes with additional costs and potentially higher latency due to the Spark conversion process.

#3: Link to Microsoft Fabric



Data Flow:

1. From D365 FO to OneLake – Microsoft service:

- Using Link to MS Fabric, all tables are automatically selected.
- CSV conversion to Delta/Parquet - same as described in option #2, but managed by Microsoft.
- All tables are automatically transformed and stored in One Lake.

2. From OneLake to Data Warehouse – BI4Dynamics solution:

- OneLake SQL endpoint acts as an SQL database and is used as the source for the BI4Dynamics Data Warehouse staging area.

Key Features:

- **Data Format:** Utilizes Delta/Parquet format, providing flexibility for further transformation.
- **Cost:** The most expensive option. Costing 40\$ per month per additional GB for database storage in Dataverse. For example, with a 250 GB DFO database, BI4Dynamics typically uses 60-70% of the total size with is around 150 GB. This data will be compressed from 5 to 8 times during transformation to parquet format. Therefore, 30GB of space is required for the database storage in the Dataverse. The approximate storage cost is 1.200\$/ month. In addition to that Fabric Capacity has to be run during the refreshes of data in One Lake. Minimum tier F2 costs 0.44\$/hour.
- **Complexity:** simple installation and no management from the customer's end, as it's handled by Microsoft.
- **Latency:** Higher latency compared to the first and second approaches due to the conversion process to One Lake with 60-minute intervals.

Verdict: This approach is technically the best; It is closest to SQL replica (all tables in Fabric as SQL endpoint). Simple implementation comes with a much higher cost (can be prohibitively high) and potentially higher latency due to the conversion process. If the price and interval go down, this is the best option.

MODELING

After completing the ETL process, the modeling phase begins.

All options for extracting data from D365 F&O, lead to accessing transactional data that isn't optimized for analytics. At this stage, the choice lies between initiating modeling efforts or selecting from existing models or business intelligence solutions available on a market.

#1 BI4Dynamics Data Warehouse Automation

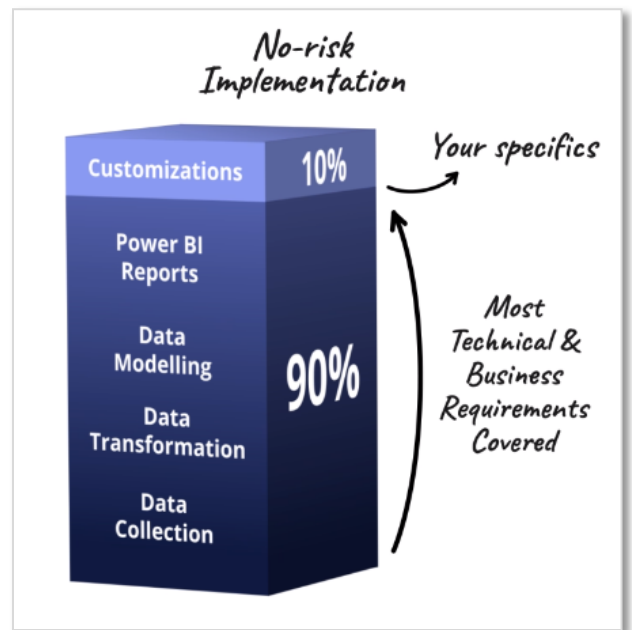
Data Warehouse Automation is a BI modeling process that automatically creates a Data warehouse without writing a line of code. Using BI4Dynamics templates for D365 F&O, 90% of BI project completion is available on day 1. BI4Dynamics brings a paradigm shift in business intelligence for Microsoft Dynamics.

Data transformation and modeling is the foundation of BI4Dynamics, where raw D365 FO data undergo automated processing with millions of rows of code on the BI server.

The model, built on best practices, includes immediately available

- **50 transactional** tables,
- **150-dimensional** tables and
- over **3000** immediately available KPIs.

This is empowering users to gain insights faster than ever before.



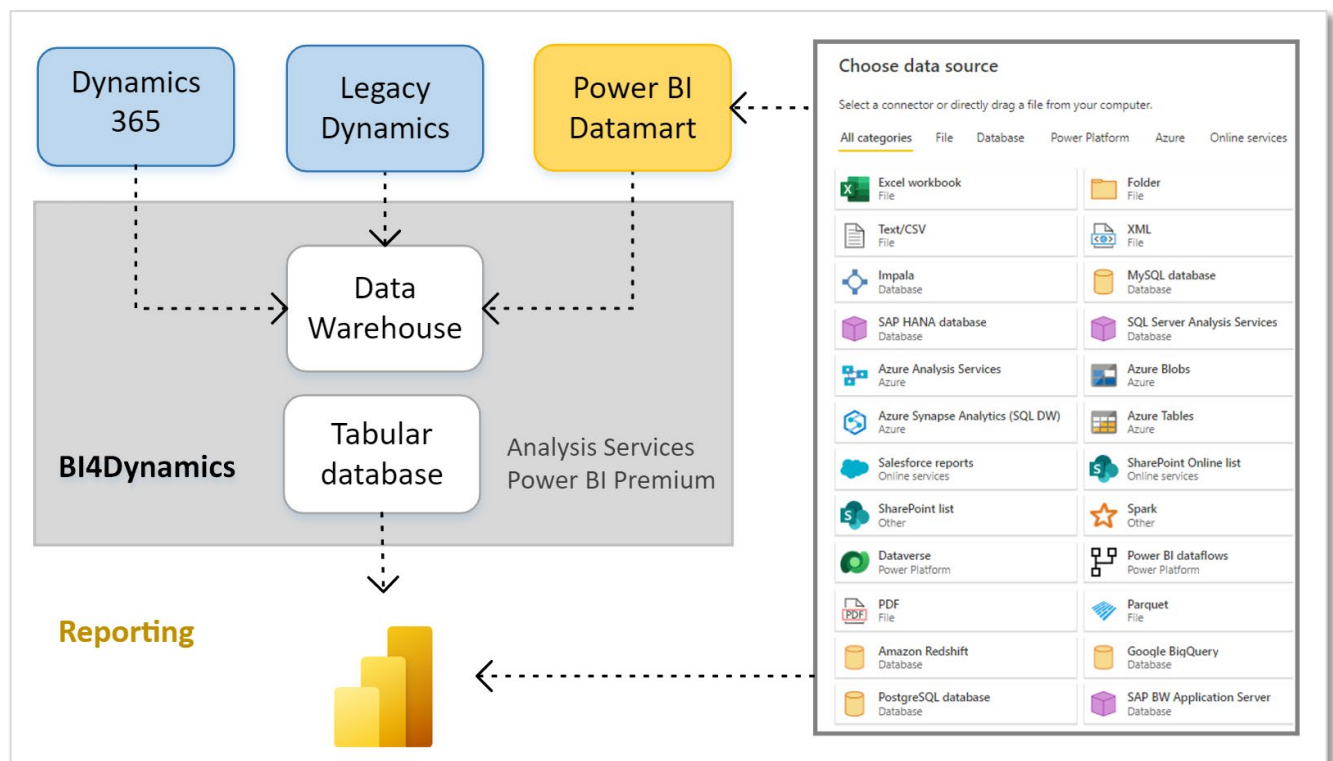
Best practice vs Customer specifics (year of experience vs days of customizations): Always best practices first. These present the technical foundation of the BI model and are not easy to replicate in a short time. Such functionalities are

- Integration of cloud and on-premises sources
- Unlimited global dimensions
- Corporate reporting currency
- Financial reporting for calendar and fiscal date hierarchy
- Microsoft Dynamics naming and process specifics

It is always much easier to add customers' specifics to the project than the other way around. Many times, less customization is required due to a broad starting point. Customizations are delivered by understanding Dynamics (usually explained by the customer). Modeling with the Data Warehouse Automation process is simple and powerful.

External data

BI4Dynamics engine seamlessly accommodates any data source, while the entire process remains fully automated, eliminating the need for BI developers' involvement in modeling. Development and customizations are facilitated through a user-friendly wizard, leveraging your existing D365 Finance and Operations knowledge. BI4Dynamics is optimized for performance, processing **terabytes of data** in just a couple of hours. It ensures powerful analysis at the document level without compromising on processing and querying speeds.



Data Warehouse deployment options

BI4Dynamics Data Warehouse can be deployed:

- **Virtual machine (VM)**

VM hosts an SQL server that is used for Data Warehouse. The Virtual Machine can be paused when data are not being processed in BI4Dynamics Data Warehouse. Most of the day since the data warehouse is built within a couple of minutes to a couple of hours.

- **On-Premises**

BI4Dynamics Data Warehouse can be processed on an On-Premises machine with an SQL server no matter where the source database is located. This option is good for companies with existing infrastructure.

Semantic layer

BI4Dynamics automatically also creates a Semantic Layer in the form of a tabular database. This layer adds additional transformation in the form of DAX expression, calculation groups, hierarchies, and others. Data in this database is highly compressed and in memory – ideal for fast querying and great user experience. The tabular database can be hosted in:

Hosting Environment	Advantages:	Disadvantages:
On-Premises	<ul style="list-style-type: none"> • An option if you have Hardware available or additional data sources On-Premises. 	<ul style="list-style-type: none"> • Only Local Access Is Available.
Azure Analysis Services	<ul style="list-style-type: none"> • When not used, can be switched off. With this, savings can be obtained. • Azure connection to the analysis database available – the data is accessible from anywhere. • Affordable for databases with up to 20 GB. 	<ul style="list-style-type: none"> • Paid per service (not per user). • Can be expensive for larger databases. • For mobile and web access, an additional cost of 10\$ / user/ per month for Power BI Pro services.
Power BI Premium	<ul style="list-style-type: none"> • Pay per user (not per server). • The server is available 24/7. • Very good performance for big databases (up to 100 GB). • Most affordable option for companies that have up to 20 users (compared to AAS). • Best performing option. • Ideal for companies that require mobile and web access. 	<ul style="list-style-type: none"> • Potentially higher cost with more than 20 users. • Costing 20\$/user/per month.

The BI4Dynamics implementation/costs are the same, regardless of the selected option.

#2 In-house Power BI modeling

Project implementation cycle

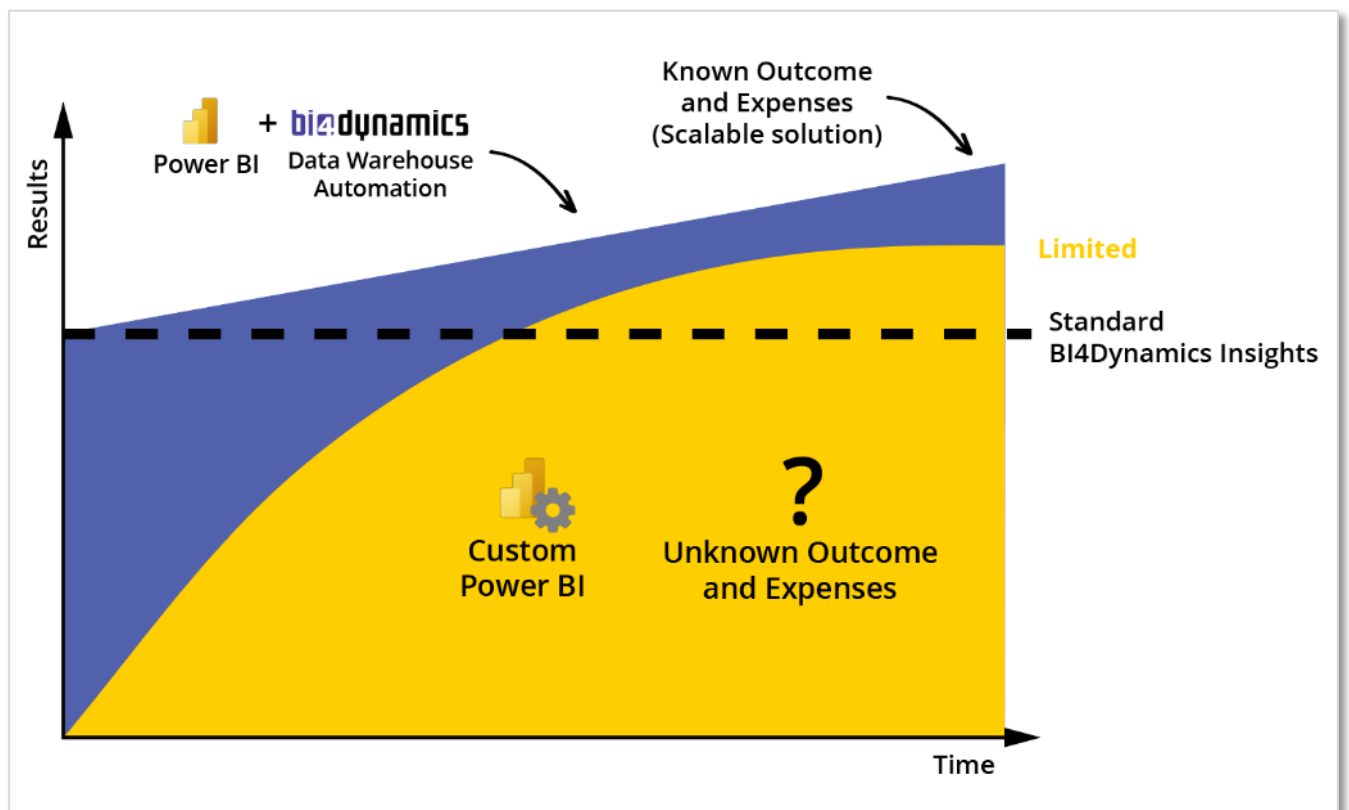
Opting for Power BI alone for modeling triggers a project implementation cycle primarily responsive to business demands. This approach may result in unpredictable outcomes and expenses, often costing more than out-of-the-box solutions such as BI4Dynamics, which offer anticipated results from day one.

Resource Intense project

Although Power BI's functionality improves and becomes more user-friendly, achieving high productivity requires additional skills, experience, and expertise. Incorporating multiple databases, companies, or even different versions of Dynamics introduces an additional layer of complexity to the modeling.

Data validation

BI4Dynamics automates data validation processes and flags any discrepancies in the data. With in-house modeling, data validation must be done with each major project update to ensure matching the data between BI and ERP systems. It's challenging to create a matching model that covers all specifics as non-item sales, charges, multiple discount types, cost posting in sales, etc. If data doesn't match, people might lose trust in the system and stop using it.



REPORTING IN POWER BI OR ANY OTHER TOOL

Benefit from BI4Dynamics's ready-to-use Semantic layer:

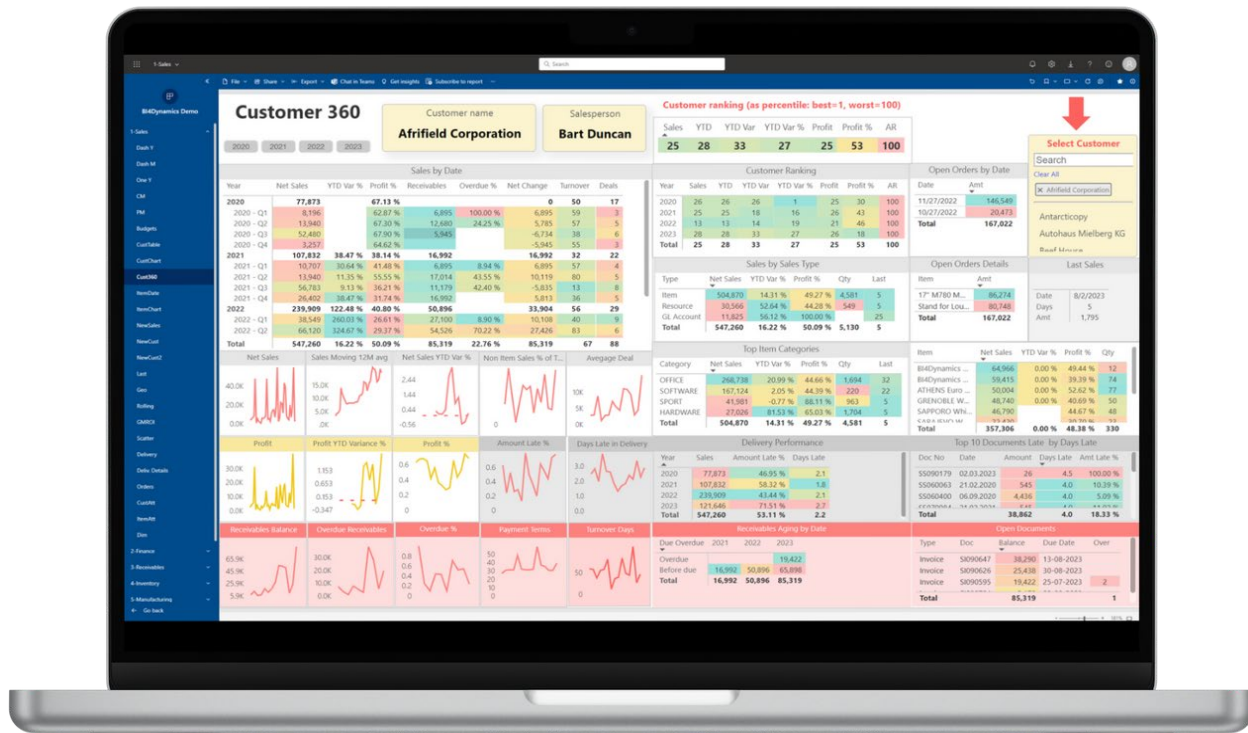
- ✓ Take advantage of the extensive **report Repository with over 150 customizable Power BI reports**, providing tailored insights for informed decision-making from day 1.
- ✓ Drag-and-drop from more than 3000 BI metrics (dimensions, measures) seamlessly integrated with the BI model covering your entire organization.
- ✓ Analyze multiple tenants and companies across the globe by using local and corporate currency for reporting.
- ✓ Use Unlimited global (financial) dimensions, plus calendar and fiscal dates with rich time intelligence.

Leverage all reports you see on the live demo, without the headache of starting from scratch.

Link: [Live Demo - BI4Dynamics - Business intelligence for Microsoft Dynamics](#)

Username: demo@bi4dynamics.com

Password: **PBIweLOVe**



POWER BI LICENSES COMPARISON

As users connect to the Semantic layer they can choose Power BI license depending on the available features and minimum requirements of the hosting environment:

Feature	Power BI in Microsoft Fabric free account	Power BI Pro	Power BI Premium per user	Power BI Premium per capacity (includes Microsoft Fabric)
Create reports with Power BI Desktop	●	●	●	●
Publish Power BI reports to share and collaborate		●	●	●
Advanced AI, dataflows, datamarts, and XMLA endpoint read/write			●	●
All users can consume Power BI content without a paid per-user license				●
Access to all the Microsoft Fabric workloads, including Data Factory, Data Engineering, Data Warehouse, Data Science, Real-Time Analytics, and Data Activator				●
Model memory size limit		1 GB	100 GB	400 GB
Refresh rate for Power BI datasets		8/day	48/day	48/day
Maximum storage (Power BI native storage)		10 GB/user	100 TB	100TB
Data security and encryption	●	●	●	●
OneLake storage, OneLake BCDR storage, OneLake cache, and networking				

Source: <https://powerbi.microsoft.com/en-us/pricing/#features-compare-charts>

BI4DYNAMICS 30-DAY TRIAL ON YOUR DATA!

For a limited time, **we are offering a complete onboarding experience free of charge.**

No obligations. We understand that you need access to your data now, and not months from now.

1. Introduction demo

Get a sense of how standardized solutions can lower your risk of implementation and bring BI to your organization in a matter of hours, not months. BI4Dynamics introduction demo is always tailored to your unique requirements and business processes.

2. Free trial installation

The very next day after installation you will have access to your Data Warehouse with more than a million rows of code, a Tabular model with 3000 BI fields that are ready to be accessed.

3. Power BI and Excel dashboards

The BI4Dynamics out-of-the-box offering includes more than 150 Power BI Dashboards for web and mobile usage and Excel reports that cover all standard application areas ([Sales](#), [Receivables](#), [Finance](#), [Inventory](#), [Purchase](#), [Payables](#)) and [Retail](#). The selection of predefined reports is [listed in our ebook](#).

4. Walk-through data

The session guided by a senior BI consultant, will **give you in-depth information about your business.** and **help you find unexpected events and trends** in your business.

5. Technical Session

To prove how you can **slash modeling costs** we will bring some of your specifics with our user-friendly customization wizard for no-code customization.

WHAT'S NEXT?

If you still have doubts and you are not sure which option is the most suitable for your company, do not worry! **We will be happy to assist you in the choosing procedure!**

Contact our team at sales@bi4dynamics.com

Or **request a demo** and **the free trial process** at www.bi4dynamics.com/free-trial