

How to Evaluate Business Intelligence Solutions

For Microsoft Dynamics





Introduction

“Why can’t I access my data?” This is a common question among regular business users that rely on Microsoft’s Dynamics suite of enterprise resource planning (ERP) products. As one of the most well-respected technology companies on the planet, Microsoft’s current stack of business intelligence (BI) platform products, technologies and applications are impressive. However, it’s still not easy to access your data without a talented IT team possessing the required skill set or third-party solutions.

In this whitepaper, you will learn about what’s included in the Microsoft BI stack, common data frustrations faced by Dynamics ERP users, a comparison of your BI options (including out-of-the-box functionality) and finally, a complete framework for evaluating third-party BI solution providers.

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How Microsoft Delivers Business Intelligence

All Hail the BI Leader

Ranked by Gartner as a strong leader among BI solutions, Microsoft's approach has been to leverage the widely-used platform components that most companies already own and use on a daily basis – namely Office 365 (Excel), SQL Server, SharePoint and Azure.

Microsoft first started talking publicly about business intelligence way back in the late 90s, and today, some form of BI is integrated into all Dynamics ERP products themselves. OLAP cubes, for example, are a part of the role-based interfaces in AX 2009 and 2012. They come via a set of predefined metrics and Key Performance Indicators (KPIs). These metrics and KPIs are administered from the ERP application and integrated with the different role-based screens. The technology used behind the scenes is Microsoft SQL Server and Microsoft SQL Server Analysis Services (SSAS). Therefore, such a solution can be applied to any front-end that is compatible with Microsoft SQL Server.

What Microsoft has done then, is integrate familiar tools like Excel and SharePoint along with more power-user oriented tools like SQL Server, Analysis Services, etc. Although they have made incredible progression over the last few years, with data visualization from Power BI and the Dynamics 365 cloud, a lot of end users are still experiencing the same reporting troubles they always have.



Key Components of Microsoft's Complex BI Stack

Microsoft offers one of the broadest BI and database stacks of any vendor on the market, with strong individual components that can stand on their own. Here is an overview:

DATA PLATFORM

Runs on SQL Server or SQL Server Analysis

Core relationship and multi-dimensional database engines facilitate the retrieval and storage of data for reporting and analysis.

DATA INTEGRATION

Runs on ETL and SQL Server Integration Services

Platform services support the extraction, transformation and loading (ETL) of data from multiple sources to consolidate querying and analysis.

REPORTING PLATFORM

Runs on SQL Server Reporting Service

Consists of services and tools to enable designing, deploying, integrating and managing reports required to address information analysis.

DATA VISUALIZATION PLATFORM

Runs on Power BI and Excel

Self-service reporting and analysis tools for the end user.

COLLABORATION PLATFORM

Runs on SharePoint and One Drive

Enables web portals and cloud file sharing to present, access and share information.

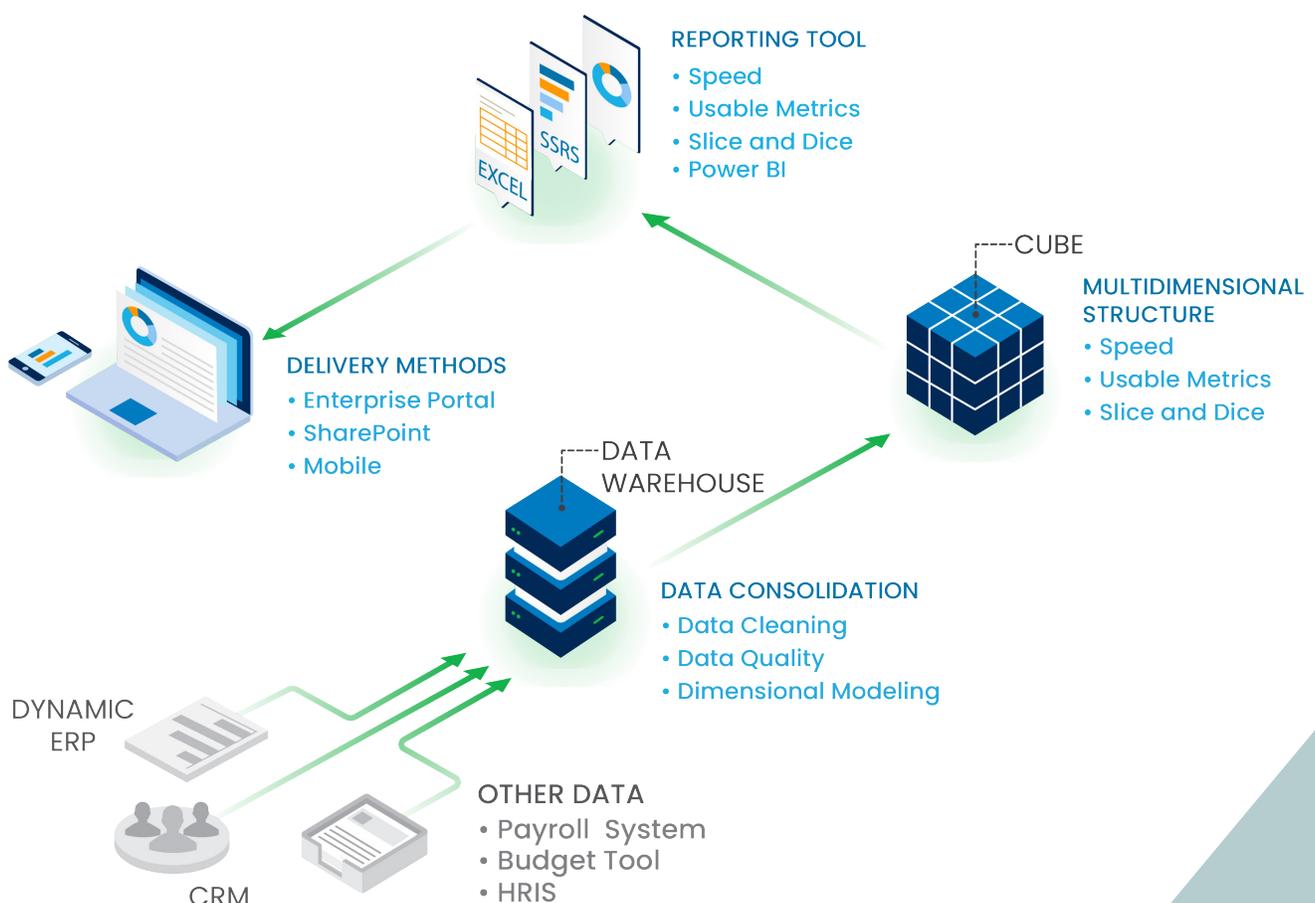
It is an impressive list, and most anybody in the Dynamics community will agree that Microsoft has the best business intelligence and reporting platform in the world. Enter the caveat – 'best' does not mean 'easy to use,' 'easy to customize' or even 'generally accessible' to business users. The ability to get the exact data you need in a business intelligence project is of vital importance to usability and success, but historically, this has been very hard to accomplish in any Dynamics ERP system because it requires substantial knowledge of the database language and deep development skills.

Skills Required to Access Your Data

To make the most of the platforms and tools listed above, it is recommended that a team be technically skilled, with a background in software development acquired through formal education (preferably certified in each application) and work experience. Microsoft itself recommends their BI stack be manipulated by professional organizations such as Independent Software Vendors (ISV's), Value Added Resellers (VAR's), Solution Integrators (SI's), IT Developers and Microsoft Developers who implement Microsoft Dynamics ERP.

What this means to an organization using a Dynamics solution, is that to create a usable BI environment, or even to perform ad hoc reporting (think GL sub-ledger report or trial balances during a month end close) **they must have these skills on staff to create and maintain information gathering or analytic capabilities.** If you don't have the skills in-house, then you are forced to rely on solution partners to make changes to your data structures.

Even with the skills in-house, a common complaint from Dynamics users is always around the time lag between an information request and its delivered date. The graphic below can help to explain that frustration:



This chart represents a simplified end-to-end BI ecosystem as it might exist when fully implemented.

The people who suffer most are the business users that BI was designed to help in the first place. The chart in the previous section shows how many different skill sets are required to make the technology work. To set up your business intelligence strategy in a Dynamics system, here are the major skills you need to have on your IT team:

1. Database Skills

Who understand how the database structure was built and why.

2. Technical Skills

Who can write SQL and MDX code in BIDS, can use Integration and Analysis Services and understand the principles of Data Warehousing and OLAP.

3. Reporting Skills

Who understand how the data should be presented and can use Reporting Services, Excel or a different, proprietary tool to write reports and build dashboards.

4. Data Delivery Skills

Someone who not only has user-experience design skills but understands the organizations' specific SharePoint implementation or yet another proprietary tool.

These proficiencies certainly exist in the Dynamics user community, but the problem comes when you bring these different skill sets into the same room in order to build a cohesive BI environment. They simply don't speak the same language and you end up with an understanding that is not shared across the organization at best or competing visions and priorities at worst. At the same time, it requires a huge investment of time and money to build a team like this, which is simply not realistic for most organizations.

Common Reporting Pains from a Dynamics ERP User

Business intelligence was designed to empower general business users who need to be able to use the data collected to support their organization and make decisions. When you don't have a readily available IT team, or the skills in-house to make Microsoft's BI stack work for you, your users are faced with growing pains and everyday challenges like these:

- Major delays and costs to produce financial reports
- Frequent data errors
- Reliance on partner to make changes to data structures
- Inability to include critical data in BI analytics
- Lack of self-sufficiency among users
- Lost hours and productivity in manual processes
- Increased risk to BI project due to time consumed and money spent
- Gap between business users and BI developers
- Time lag on users' ability to get data and make decisions

The good news is, there are plenty of BI options to choose from in the Microsoft Dynamics ecosystem that will alleviate these pains and risks. In the next section, you will learn about what out-the-box BI features are available and what third-party BI solutions can do to improve your user's experience.

Comparing BI Options for Microsoft Dynamics: Out-of-the-Box vs. Third-Party Solutions

Business Intelligence Features in Dynamics ERP Solutions

Your Dynamics ERP system comes with pre-built, out-of-the-box BI functionality, but it can be overwhelming for users to truly understand which features are most important for their organization's needs. Understanding the BI tools offered by Microsoft Dynamics will help you assess how your data, mobile needs and visualization options factor into your system and what resources you need to access it all.

Based on the drastic improvements over the last two years, most Dynamics ERP solutions come with a range of simple and advanced tools that can be used as a foundation for your BI strategy. The base systems typically include a mix of pre-built roles, ad hoc reporting, KPIs and visualizations.

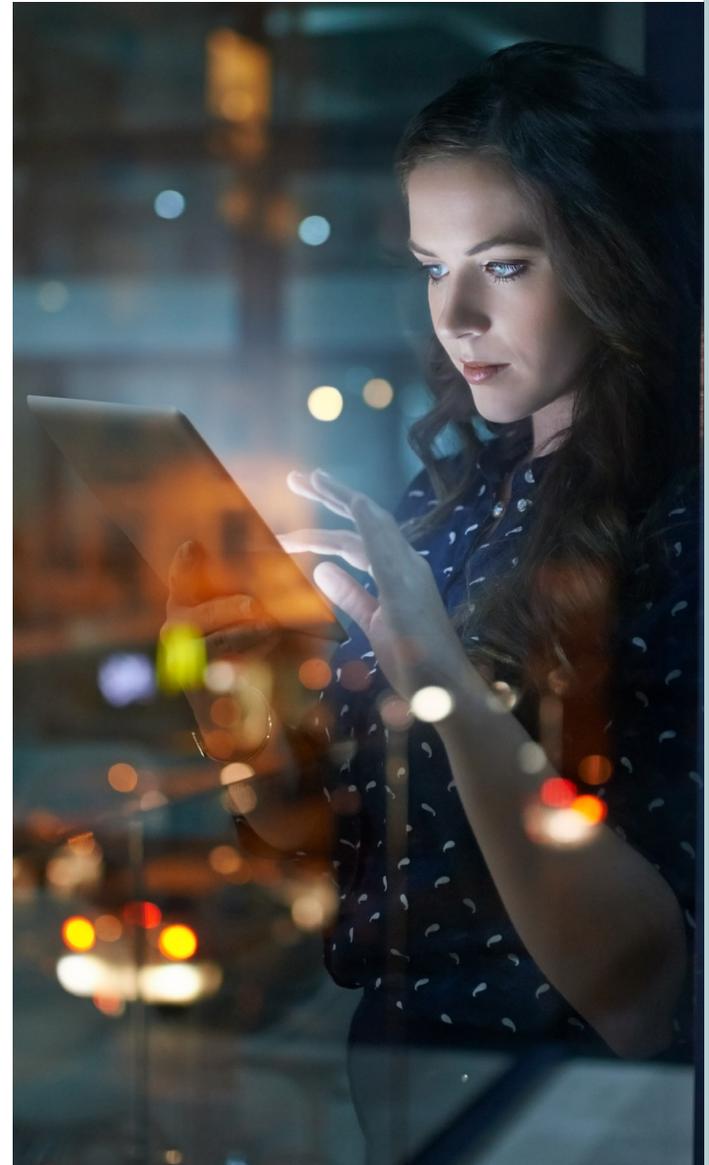
In terms of advanced BI features, Microsoft has equipped each solution with two powerful standalone solutions: Excel 2016 and Power BI.

Excel 2016 (Office 365)

Using Power Query (self-service ETL) and Power Pivot, you can mold your data in Excel, and explore and visualize it with Power Map, Power View, PivotTables and PivotCharts. From there you can interact with the resulting workbook on SharePoint, Power BI sites in Office 365 and in the Power BI Microsoft Store app.

Power BI

Available via desktop, mobile and cloud, Power BI is a modern data visualization tool that allows you to create and update collated data from multiple sources through highly functional dashboards,



reports and datasets. All Dynamics solutions include Power BI content packs that are equipped with basic dashboards to get you started.

The improvements made to each of these independent products in the last two years has been substantial, but there are still a lot of limitations that come with native BI. Here are some common complaints from Dynamics NAV users about these BI tools:

Question	Answer
<p>"Why can't I create my own dashboards in Power BI?"</p>	<p>Most business users can't create their own dashboards in Power BI without building a data model first or having a highly structured data warehouse and cubes to organize the data from tables.</p>
<p>"I can add multiple data sources but how do I link them?"</p>	<p>Adding a data source is simple; having your data sources link together is actually quite difficult. Things like item numbers, customer numbers and GL account don't always align perfectly across systems, which can cause huge headaches for those not intimately familiar with data modelling.</p>
<p>"My boss needs the latest financial reports – where can I find them in Power BI?"</p>	<p>You can't. Power BI does not include financial statements or paginated reports in general.</p>
<p>"Why can't I use any sort of date calculations like MTD or YTD in Power BI?"</p>	<p>In order to use data calculations, there needs to be a date calendar built into Power BI – and this isn't standard. Creating custom calculations are not quick and simple with native Power BI tools.</p>
<p>Other limitations include:</p>	<ul style="list-style-type: none"> • No support for history: any change to the data model forces a rewrite of BI metrics • No support for incremental updates of data • No support for data quality issues • No support for slowly changing dimensions • No ability to add other data sources; native BI in Dynamics is limited to the data in the ERP only • No way of manipulating data, since the fact table is the raw table from Dynamics itself • No ability to change the BI solution directly from within the ERP application. Use of the BI Studio developer tools in SQL Server is required • No accommodations for data model changes. Any change to the ERP data model will overwrite customizations to a cube • Inflexible security model: reporting data is invisible unless the user is licensed for the ERP module

Bottom line – as powerful as it is, if your BI solution is based on the out-of-the-box cubes, you become dependent on highly skilled Dynamics and SQL Server developers to build the environment, to implement changes, and to maintain it.

Third Party BI Solutions for Microsoft Dynamics ERP

Business intelligence is meant to allow flexibility, governance, and structure in the way data is configured and consumed. All Microsoft Dynamics ERP solutions are built to run your business processes smoothly, but that doesn't necessarily translate to effectively delivering quality data in an easy to consume format. These are complex systems and knowing where to find the data and how to assemble it takes a highly technical, specialized resource. And a lot of time.

There is an alternative and it is one that is enabled by Microsoft's own strategy. Microsoft has long been a 'best of breed' company. This means that they generally don't build the peripheral products that make their ERP systems work better. They concentrate on core ERP functionality and leave the 'accessories' up to the ISVs (Independent Software Vendors) who exist in the partner channel.

In the case of reporting and business intelligence, Microsoft has assembled some great tools which make a perfect platform for their ISV partners to **fill the gaps in functionality, user experience and self-sufficiency** – which is why there are a lot of ISV-created BI products on the market today.

Evaluating them can be a tricky proposition though. Since your Dynamics system is likely your primary source of business data, some important things to consider about the third-party solution you choose are:

- **Does the product make full use of the Microsoft BI stack?**

If the answer is 'yes' then you can be fairly sure that you are looking at a fun-fundamentally-sound product with a lot of power. If the answer is 'No', or 'Yes, but...' then you might be running the risk of adding unnecessary components to your final BI solution, or even chaining yourself to proprietary tools that result in dreaded 'vendor lock.'

- **How quickly does the product allow you to get value out of it?**

Will your team need to learn a new set of tools and technologies not only to customize and maintain your BI environment, but simply to start using it effectively from day one?

- **What is the implementation methodology of the vendor?**

Does the vendor follow a proven set of best practices that allow you to take business requirements and reliably turn them into end-user facing data structures?

There are a huge amount of different third-party business intelligence products on the market for Microsoft Dynamics ERP solutions, but not all of them provide the support you need to empower your users with analytics from day one. Use the framework in the next section to evaluate potential BI solutions and third-party vendors to get what you need.

Framework for Evaluating Third Party BI Solutions for Dynamics ERP

This software selection framework identifies the major topics to focus on when evaluating potential BI solutions for your Dynamics ERP system. Each topic includes important questions to ask about the solution during the process.

Technology

Using the Microsoft tools require a varied range of skillsets. Third party ETL tools can simplify data structuring and speed up the BI development process provided the vendor has the knowledge and experience to make proper use of Microsoft technologies.

Questions to ask a solution provider:

1. What tools and technologies are used to extract, transform and load (ETL) data from the raw data source(s) into the reporting environment?
2. Do the tools require special skills around SQL and Microsoft's SQL Server Data Tools (SSDT) for Visual Studio?
3. How steep is the learning curve for the technologies?
4. What are the typical vendor support requests that are generated by the technologies?

Customization & Ease of Use

The ability to make changes to a data warehouse or cubes without having to use programming language will reduce implementation and customization times by orders of magnitude. Examples include adding tables and fields from the ERP into the BI environment, consolidating data from multiple tables into single values, building metrics/KPI's, etc.

Questions to ask a solution provider:

1. How do I get the data that I need into my BI environment?
2. What is the process for extracting and cleansing the data from source systems?
3. What is the process for adding tables or fields from the ERP to the BI environment?
4. How do custom metrics and KPI's get built?
5. Is this something that a power user can do, or do I need developer skills?

Combining Multiple Data Sources

Not being able to add and consolidate multiple data sources regardless of type or origin would be a major flaw in any BI solution, and so most third-party tools have that ability – but there are vast differences in the methods used to accomplish this. Remember that it can be a complicated task and the solution you choose should make it as simple as possible.

Questions to ask a solution provider:

1. Can the BI project include more than one data source?
2. What is the method for adding a data source?
3. Which types of data sources can be added?

Documenting the Data Structure

Documentation of the source data behind a BI project is critical since it will be used as a new “system of record.” Unless this is done automatically, it can be a time consuming and expensive process.

Questions to ask a solution provider:

1. What is the process for documenting where the data in the data warehouse and cubes came from and how it was combined?

Handling Historical Data

Change is inevitable in every organization and both current and historical data is affected by it. If the solution does not have a built-in method to handle change over time, serious damage to data integrity can ensue.

Questions to ask a solution provider:

1. Can the solution handle historical data needs like slowly-changing dimensions (SCD)?
2. Can the solution generate surrogate keys?

What is a surrogate key? Surrogate keys are a necessary component of SCD's because they provide a buffer from operational changes like hiring new salespeople or changing product codes.

Process for Refreshing Data

Most BI technologies can refresh data from the database into cubes. The flexibility to update your BI environment with new or updated records (incremental loading, loading of specific data areas) is critical for large databases and for any BI environment that needs near real-time data.

Questions to ask a solution provider:

1. How do updates from the ERP to the BI projects get accomplished?
2. Does the entire data structure have to be loaded each time, or can it be done incrementally?
3. How much flexibility do I have to schedule updates?
4. Does this solution allow the ability to update the cubes while cubes are in use?

Implementation Processes

Implementation means how quickly the solution can be installed and rolled out to end users, as well as how quickly it can be customized to a specific environment. Money spent and time to value hinge on a solution that is usable from day one. Customizations need to be developed in an agile manner in order to comprehend the dynamic nature of BI and reporting needs. This is often an underrated feature in a BI solution.

Questions to ask a solution provider:

1. What methodology will be used for implementing the solution?
2. Is a set of reputable and proven best practices being followed?
3. How quickly can a usable solution be delivered?

More topics to consider:

Setting user security	Tracking of historical data changes
Pre-built cubes	Hierarchy management
Multiple environments	MDX formula library and ability to parameterize and re-use MDX formulas
Multiple concurrent developers	Staging database
Slowly changing dimensions	Error event tracking
Late arriving data handler	Surrogate keys
Paralleling and pipelining	Disaggregated security model

Easily Build Your Own Reports and BI Dashboards in Microsoft Dynamics – without the risk!

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