

Integrating SAP Application Data With Azure

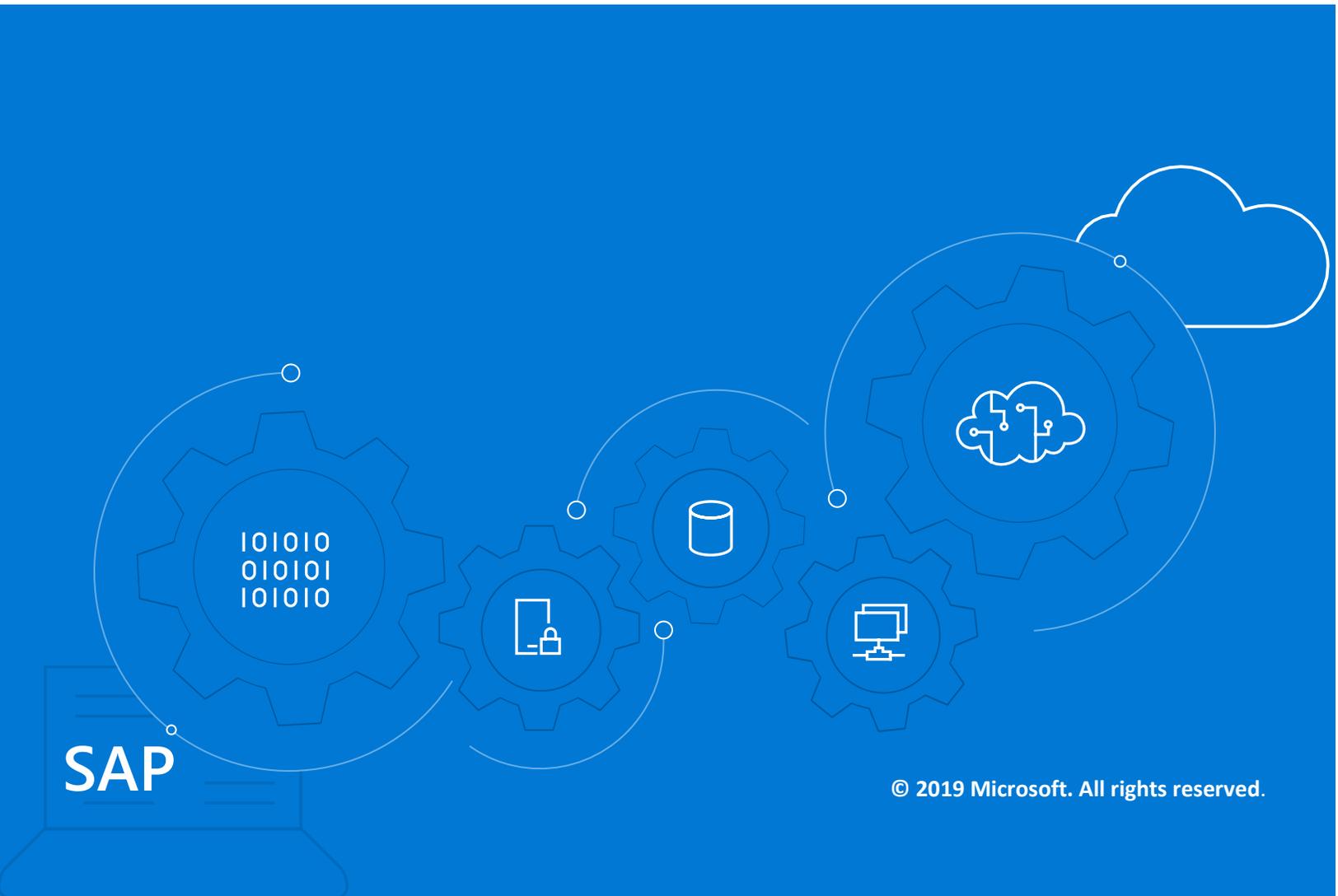


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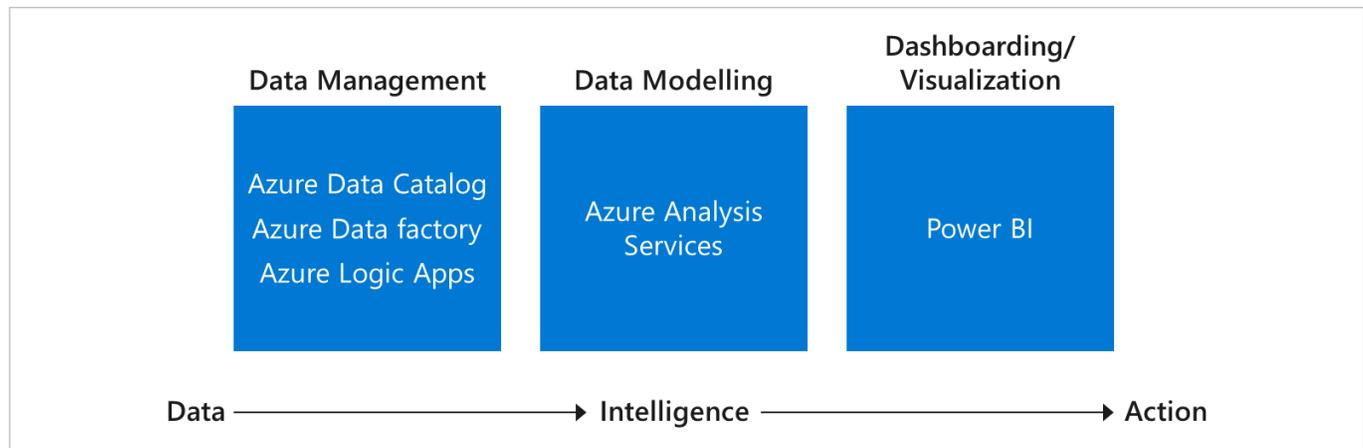
Introduction

Today's business landscape is primarily driven by data as powerful technologies reshape the underlying fabric of the economy. Driven by cloud computing, big data, mobile, IoT and artificial intelligence, the data driven economy is enabling organizations to make fact-based decisions that lead to better business outcomes. Data is growing exponentially, and organizations are focusing on harnessing insights from data across multiple sources, from mission-critical data in legacy systems to streaming data from IoT and Edge devices. According to IDC¹, the volume of actionable data will grow 9.6x from 2020 to 2025. Organizations are increasingly focused on driving better business outcomes by using data as a differentiated asset for innovation and competitive advantage. In fact, one Gartner survey² confirms that the role of CIO is [transitioning from controlling cost and engineering processes, to driving revenue and exploiting data](#). Such a strategy requires a modern platform that empowers their developers to rapidly prototype and scale data driven applications to help organizations reach their transformation goals. The need to make use of a scalable data architectures, along with mission-critical data in technologies such as SAP, is driving enterprise IT towards hyperscale cloud platforms such as Azure.

Azure provides a scalable platform for modern enterprises to build data driven applications with the necessary tooling to enhance business agility. [In today's competitive market, companies across many industries are focused on building intelligent applications taking advantage of the data inside their organization and modern technologies like machine learning and artificial intelligence. Azure cloud platform is designed to help these organizations by offering various data services, machine learning and deep learning models and powerful APIs to take advantage of cognitive and other AI based services.](#) Being an open platform with easy extensibility, Azure provides integrations to various third-party services and tools, giving customers flexibility to derive value from their data. For example, a retail organization can tap into big data and machine learning capabilities to streamline their operations and provide a much better shopping experience to their customers. A financial organization can use big data to cut down on the fraud and make the financial transaction much more efficient. In this whitepaper, we will help you understand how you can integrate your SAP application data with Azure Data Services to build innovative applications and derive business insights that can help your organization gain insights in today's data driven economy.

Azure Data Services for Business Insights

Azure provides a number of data services ranging from cloud storage to SQL/NoSQL databases to big data, along with various services to process the data. In this whitepaper, we are going to introduce how various Azure services can help organizations discover, make sense, process and use the data to gain competitive advantage and better ROI. The organizational data may be stored in Azure data services, SAP technologies or other third-party services and it is critical to bring them together to realize business value. The Azure services described in this whitepaper such as Azure Data Catalog, Azure Data Factory, Azure Logic Apps, Azure Analysis Services and Power BI play an important role in extracting the raw data to enable intelligent data driven decision making process. A typical workflow involving Azure services is as follows:



- Azure Data Catalog helps in data source discovery and in adding context to the data.
- Azure Data Factory through automated workflows can bring together all the data into a single version of the truth by combining it from various sources. When paired with solutions such as Azure SQL/HDInsight/Spark, the insights from big data can be made consumable using other tools.
- Azure Logic Apps can help develop workflows that work with Microsoft Business Applications and third-party data. Azure Functions, the serverless architecture for applications, can help in developing custom logic into the integration process.
- Using Azure Analysis Services, users can develop complex models on top of the data. When coupled with Microsoft Power BI, a self-service visualization tool, semantic models on top of data from various sources can add efficiencies to the process.
- Power BI can provide powerful visualization to gain insights including predictive and decision insights. These can also be made available through APIs for developers to build applications or integrate with other applications.

Even though these tools can work independently support the entire lifecycle of data flows as they traverse from raw data to intelligent insights and solutions.

SAP on Azure: Drivers for the data-driven enterprise

Microsoft and SAP have been working together to make SAP products deeply integrated and certified on Azure, making SAP products first class citizens on Azure. This partnership helps enterprise customers have a more seamless experience developing applications that integrates data from Azure's Data Services along with the data stored in SAP systems. With SAP on Azure, enterprises can use machine learning and artificial intelligence on data stored in mission-critical systems and other data sources without high operational costs as deeper integration leads to cost savings.

Why SAP on Azure?

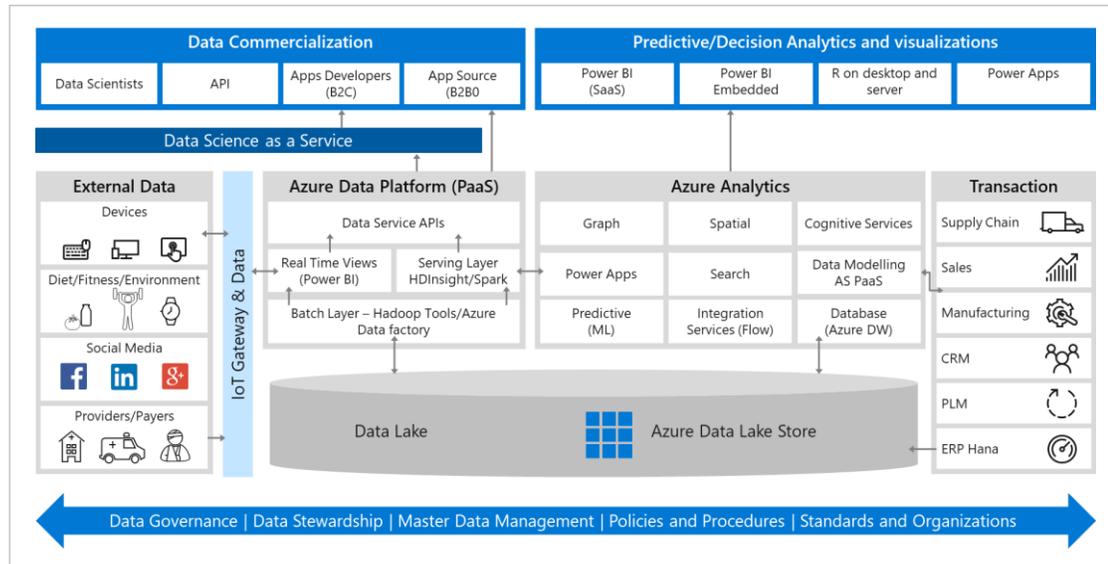
As enterprises pursue their data driven transformation, they find value in leveraging data in various Azure data services along with SAP data. A typical data migration may involve exporting SAP data onto an excel spreadsheet and then moving the data to Power BI service to visualize the data to gain insights. Apart from the operational and cost efficiencies in this process, this also leads to data silos and missed opportunities. To streamline the process, customers can use SAP on Azure with SAP HANA certified on-demand virtual machines such as Azure M-series or purpose built SAP HANA on Azure Large Instances. They can also tap into various Azure data services to make the process efficient and remove any data silos. Azure provides a robust enterprise grade platform that offers agility and scale needed for integrating with SAP technologies along with security.

Some benefits of running SAP applications on Azure are:

- **On-Demand and scalable:** Azure provides compute resources on-demand with a pay per use model. Enterprises can scale the resources up and down based on their usage needs. Additionally, Azure also offers purpose-built HANA large instances that can support large memory implementations.
- **Intelligent solutions:** By taking advantage of Azure data services, analytics service and tools like Power BI, users gain insights from their data.
- **Security and Compliance:** Azure makes it easy to protect your data and solutions using encryption, Azure Security Center and Azure Active Directory, which provides single sign on across multiple services, both on-premises and cloud. With a variety of industry compliance and trust certifications, Azure provides a complete compliance solution.
- **Global scale:** Azure has the largest footprint of any cloud providers with 54 regions to support any scale, enabling organizations to optimize for the best user experience and to meet local data residency requirements.
- **Enterprise-grade Resilience:** Azure provides enterprise grade resilience with redundancy and geo-replication with 99.99% SLA.
- **Lower TCO:** Azure also provides for a 60% cost reduction when compared to traditional, on-premise storage systems. By using SAP technologies on Azure, customers can realize 40-75% TCO cost savings in Dev and Test environments.

Azure and SAP Integration Architecture

The following diagram gives a high-level architecture for running SAP and third-party data within the Azure data platform and Azure Analytics Services to build intelligent solutions.



Azure Data Platform combines the business operational data with streaming and analytics data

- To provide a data science service which data scientists, developers and other enterprise applications can use
- An easy interface to access analyze, and visualize data to gain valuable insights

Whether it is about SAP applications or Azure Big Data services or Azure Analytics services or Azure Data Lake or external data sources, Azure makes it easy to manage the data and enforce policy and governance while providing developers with a seamless interface. With an easy extensibility of the data platform to bring together data from many sources and IoT Hub to collect data from various IoT devices, Azure is empowering customers to derive maximum value from their data.

In the rest of this whitepaper, we will go in depth about [integration of SAP data](#) with Azure's data services and how customers can derive business value from these integrations.

Azure and SAP Integrations

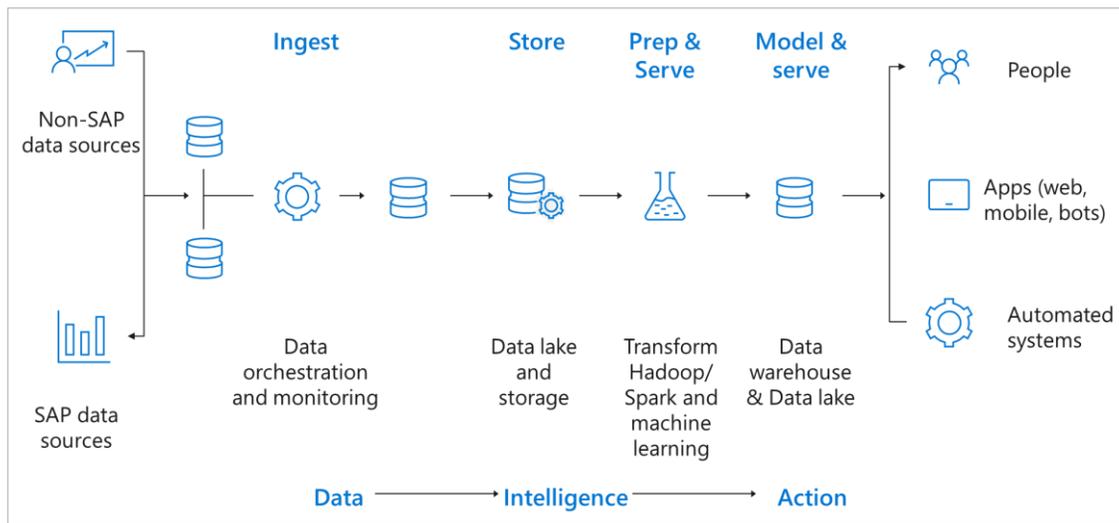
In this section, we will take a deep dive into the integration between SAP technologies and Azure. For various Azure services, we will talk about the customer experience with the service, its benefits and how it is integrated with SAP technologies. In this section, we will cover the following Azure services:

1. Azure Data Factory and SAP
2. Power BI and SAP
3. Azure Analysis Services and SAP
4. Azure Data Catalog and SAP
5. Using iPaaS to integrate Microsoft Business Apps With SAP
6. Azure Active Directory and SAP

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Azure Data Factory and SAP

[Azure Data Factory](#) (ADF) is a global scale data integration service that lets you integrate data from more than 70 data sources for both on-premises and Azure. Compared to other data pipeline products, ADF and its simple graphical user interface is mature and well-suited for enterprise data workflows, ADF’s enterprise grade security makes it an attractive option to manage, schedule and orchestrate complex data flows in an automated manner.



ADF ingests data from various data sources using data driven workflows and then processes and transform data using tools such as HDInsight and Spark. The results can then be published to Business Intelligence for consumption by Intelligent Solutions. [By using ADF’s automated pipelines, organizations can use data from various sources like SQL databases, Blob storage, SAP systems, etc., transform and analyze to gain insights on customer behavior such as customer churn and other risk factors. Similarly, when combined with other analytics services or machine learning services, ADF can provide powerful insights hitherto unavailable to customers.](#)

For example, [Anheuser-Busch InBev³](#), the beverage company that transformed itself into a technology company is using ADF with Power BI and other Azure services to break data silos and gain customer insights with global data. [Newell Brands⁴](#), an international consumer goods company, has their data spread over 47 siloed enterprise resource planning (ERP) systems. [By tapping into ADF, Azure Analysis Services, Power BI and other Azure services, they have gained critical insights for creating better marketing campaigns and ensuring the best possible in-store ad and product placement.](#)

Data Warehouse modernization in a traditional retailer is one more example where ADF is used to implement a cloud data lake and used with Power BI for business intelligence. There are many such use cases where ADF can work with other data sources, including SAP technologies, to deliver business value that was not available in traditional data warehouse use cases.

ADF copies data into Azure Data Lake, a data service in Azure that can be used to store and analyze data with no limits, so that there is one data source for all the data from disparate sources, helping in data governance. ADF is used when you want to transform all data together into a single source and then use visualization tools like Power BI or big data processing using Hadoop and Spark. If you want to build a data science platform for data scientists and developers in your organization, ADF is the right platform to bring all data together

Key Benefits

- Cloud based service with pay per use model
- Easily create, schedule and monitor data pipelines
- More than 70 data connectors to break down silos
- Orchestrate data integration workflows wherever the data resides
- Enterprise grade security
- HIPAA/HITECH, ISO/IEC 27001, ISO/IEC 27018, and CSA STAR certifications
- Multiple programming language support

Azure Data Factory and SAP Integration

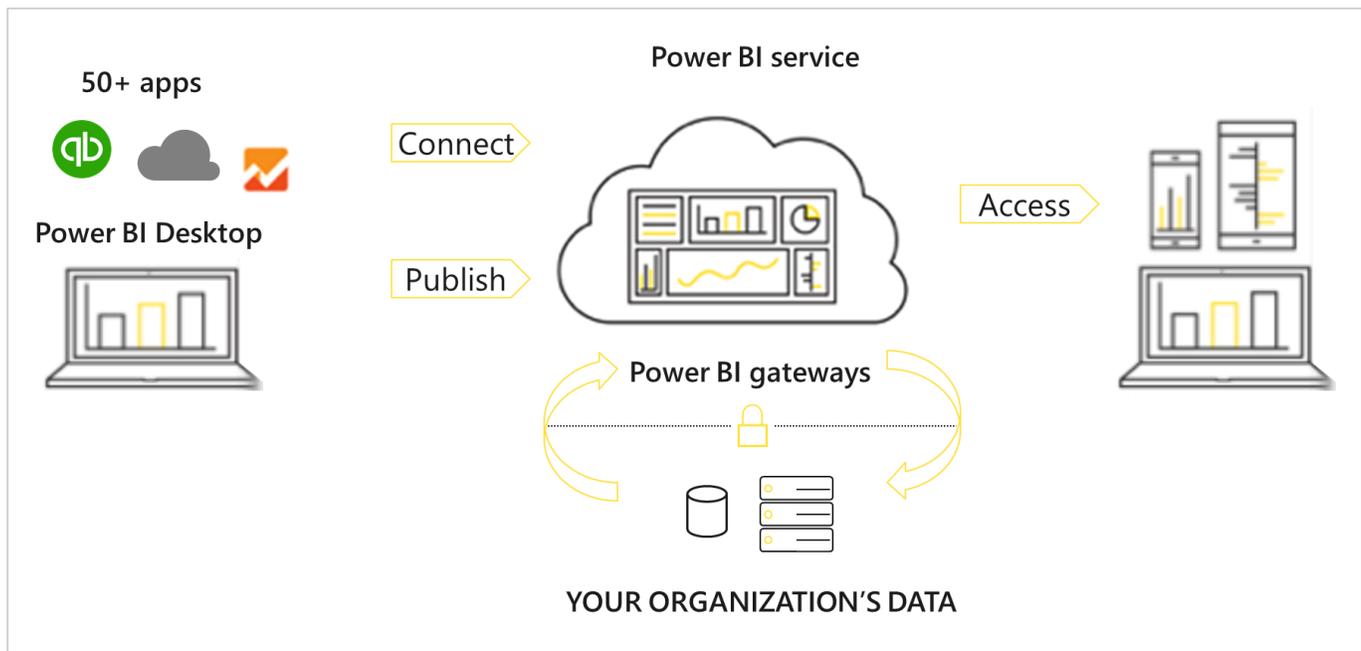
Azure Data Factory has high performance connectors to SAP Business Warehouse (BW), SAP Cloud for Customer, SAP ECC and SAP HANA.

- **SAP HANA connector** allows users to copy data from SAP HANA Database to supported data source. This includes copying data from any version of SAP HANA database, HANA information models and copying data using Basic Windows authentication. You can find more information on [copying data to SAP HANA](#) and [copying data from SAP HANA](#)
- **SAP Business Warehouse (SAP BW) connector** allows you to copy data from SAP BW to any supported data source. This supports SAP Business Warehouse version 7.x, copying data from InfoCubes and QueryCubes (including BEx queries) using MDX queries and copying data using Basic Windows authentication. You can find more information on [copying data from SAP BW](#)
- **SAP ECC Connector** allows copying data from SAP ECC (SAP Enterprise Central Component) to any supported sink store. SAP ECC exposes entities via OData services through SAP Gateway. SAP ECC Connector supports copying data from SAP ECC on SAP NetWeaver version 7.0 and above, copying data from any objects exposed by SAP ECC OData services (e.g. SAP Table/Views, BAPI, Data Extractors, etc.), or data/IDOCs sent to SAP PI that can be received as OData via relative Adapters and copying data using Basic Windows authentication. You can read about [how to copy data from SAP ECC](#)
- **SAP Cloud for Customer** ADF also supports copying data to and from SAP Cloud for customer. You can find more information in this [documentation](#). SAP integration with ADF ensures that users can derive insights from the operational data in SAP systems when used in conjunction with other data using batch execution feature in ADF

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Power BI and SAP

[Power BI](#) is an interactive visualization tool that connects directly to hundreds of data sources, including SAP, to provide insights across the entire organization. Whether you are a business user, analyst, IT or developer, Power BI brings together all the data that matters for your work under one visualization tool and helps users drive enhanced business outcomes. Power BI can be used together with ADF's batch execution feature to gain insight or it can be used directly with data sources to gain insights that are otherwise locked in data silos.



As shown above, Power BI is a cloud based service that helps users access visualizations and dashboards using data from multiple sources. Power BI provides a single pane of glass to monitor data and share reports. The visualizations and reports provide insights into your data and various KPIs that matter for your organization irrespective of where your data resides. Power BI platform comes with Power BI Desktop (shown on the left), a visualization and reporting tool and a mobile app for field users (shown on the right). A rich set of REST APIs that allow developers to access visualizations and data from Power BI in third party applications and services.

A good example for using Power BI with SAP technologies in the backend is Co-op⁵, a retailer in United Kingdom. Co-op uses Power BI to identify customer patterns and trends and to add their learnings from these trends to a local knowledgebase. For example, they found Co-op customers in quiet villages make time for conversation with store colleagues whilst busy Londoners prefer to get in and out efficiently and anonymously. Such insights provide the retailer a better understanding of their customers and empower them to add more value to their customers. Another example is to use information about current customers from SAP BW and use external data about prospective customers to gain insights that can be used in the sales process. A typical retailer has data from transactions, supply chain, buying behaviors, trends, multi-channel sales and global coverage. Power BI makes it easy to tap into the organization's data to gain insights which are not available otherwise.

There are many other examples where organizations can use data stored in various data sources to gain combined insights using Power BI. A sports team can tap into social media data using Power BI and transactional data to optimize supply chain to meet the demands. The ability to tap into various sources of data, including data residing in SAP systems, and using a single visualization tool like Power BI opens up new business opportunities that were not previously available.

Key Benefits

- On-demand and self service
- Built on top of global scale cloud with a consumption-based pricing model
- Integration with Azure Active Directory helps ensure security and governance
- Prebuilt dashboards and Reports for many data sources and applications
- Real time live dashboards
- Natural Language querying capabilities
- Deep integration to various Azure products and services including SQL Data Warehouse, SQLDB Stream Analytics, Azure Machine Learning, Office 365, Cortana
- Integration with SAP HANA, SAP BW and other SAP technologies

Power BI combined with Azure Data Factory provides a Data Science platform for your organization to work directly with various independent data sources as a powerful data visualization tool to help gain insights that were not previously available with siloed data sets. It can also work with Azure Analysis Services (described in another section below) to help gain insights from complex models built on streaming and other types of data.

Not all data resides in the cloud and some data is still present in enterprise data centers. Power BI report server can be hosted either on-premises or on virtual machines in Azure to deliver Power BI visualizations. Refer to this [documentation](#) to learn more about Power BI Report Server.

Power BI and SAP Integration

SAP HANA Connector

Power BI connectivity to SAP HANA provides interactive reports and advanced analytics without being constrained to just what's in the model or needing to navigate through complex technical schema. This connector helps import data and brings analytics and calculation views to users so that they can gain insights needed for their business. Another option available lets users take advantage of DirectQuery to query SAP HANA directly.

Some features supported in SAP HANA connector include

- The Power BI connector for SAP HANA uses the SAP ODBC driver, to provide the best user experience
- SAP HANA supports both DirectQuery and Import options
- Power BI supports HANA information models (such as Analytic and Calc views) and has optimized navigation
- With SAP HANA, you can also use the DirectQuery to connect to row and column in a table
- Includes optimized Navigation for HANA Models
- Power BI supports SAP HANA Variables and Input parameters

More information

- [Use SAP HANA in Power BI Desktop](#)
- [DirectQuery and SAP HANA](#)

SAP Business Warehouse Connector

SAP Business Warehouse (BW) integration with Power BI will help enterprises gain insights from the transactional data stored in the Data Warehouse. Enterprise data in SAP BW has been cleansed, transformed and modeled for use in Power BI for reporting, analytics and developing intelligent applications. This helps customers unlock insights from their mission-critical data.

The integration between Power BI Desktop and SAP BW is based on the so-called OLAP Business Application Programming Interface (OLAP BAPI). This interface allows third party apps and developers to access the data and metadata of SAP BW. Power BI Desktop invokes OLAP BAPI over SAP's RFC protocol and requires the NetWeaver RFC Library to be installed on Power BI Desktop. Due to the nature of the public interface of SAP BW, there are some limitations to features you can access using Power BI. DirectQuery is also supported from Power BI but there are some differences compared to other relational sources like SQL Server because SAP BW is OLAP/Multidimensional in nature.

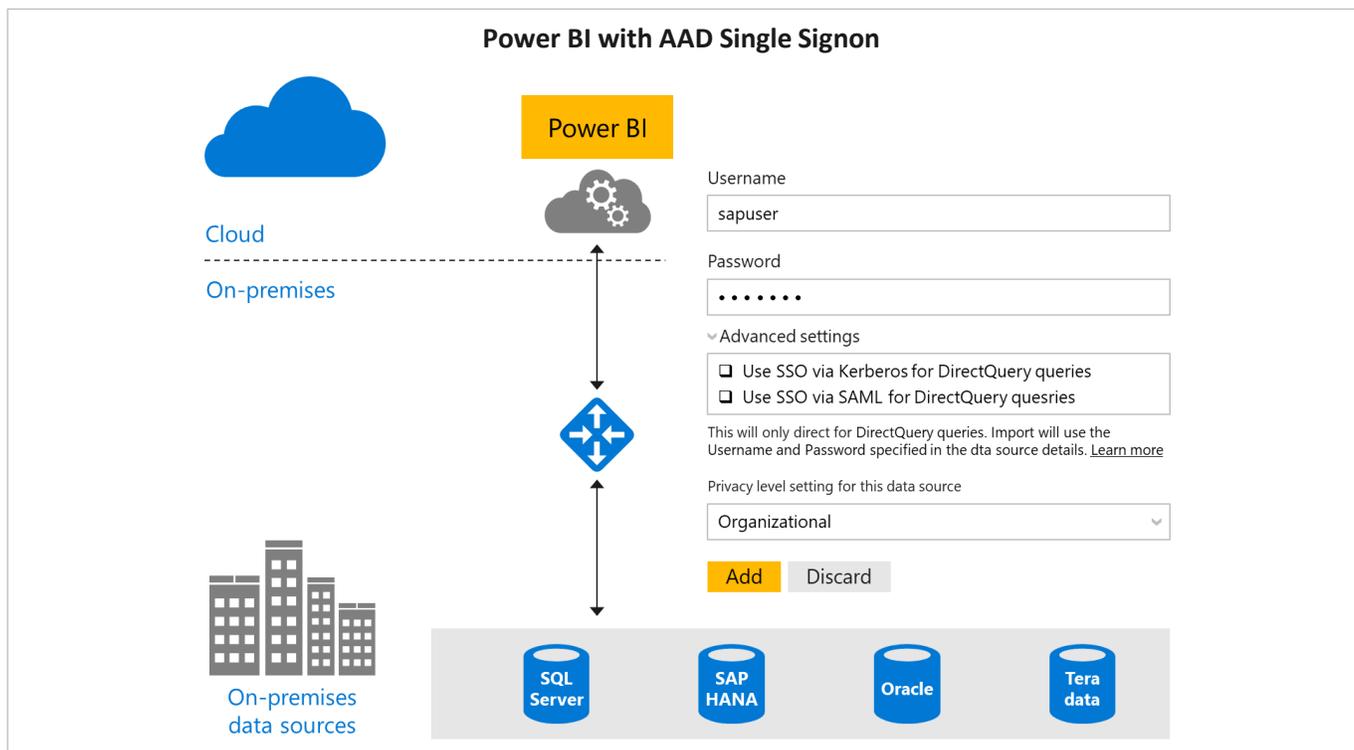
More information

- [Use the SAP BW Connector in Power BI Desktop](#)
- [DirectQuery and SAP Business Warehouse \(BW\)](#)

Power BI and Single Sign On

While using a powerful visualization tool like Power BI, it is also important to ensure that data governance and security is handled in accordance with enterprise governance policies. To ensure compliance with data governance, Power BI users can leverage Kerberos and SAML for Single Sign-On (SSO) to access reports and dashboards from on-premises data. This can also be used to do DirectQuery to On-Premises data sources like SAP HANA On-Premises. At present, SSO is supported for SAP HANA along with SQL Server, Teradata and Spark.

When a user interacts with a DirectQuery report in the Power BI Service, each cross-filter, slice, sorting, and report editing operation can result in queries executing live against the underlying data source. When a single sign-on is configured for the data source, queries execute under the identity of the user interacting with Power BI. This ensures that users only access data for which they have permissions, and that the security and data governance is properly enforced down to row level security.



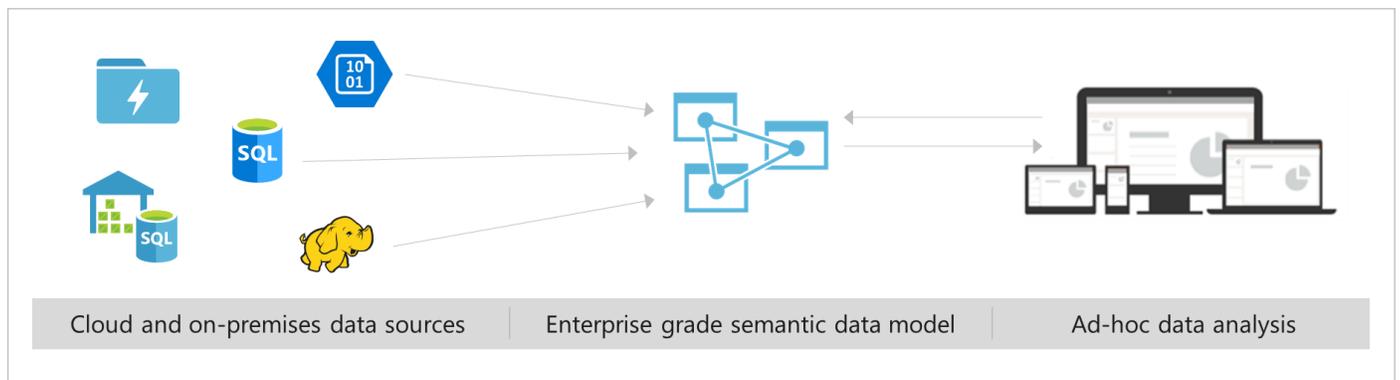
More information

- [Single sign-on \(SSO\) Overview](#)
- [Single sign-on \(SSO\) Kerberos](#)
- [Single sign-on \(SSO\) SAML](#)

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Azure Analysis Services and SAP

[Azure Analysis Services](#) (AAS) is a semantic layer on top of data sources providing an easy way for business users to model a business process. AAS uses data from many data sources to create a single version of the truth, a single trusted BI semantic model that can be tapped by business users using Power BI, excel or other data visualization tools. This allows business users to avoid tasks like data wrangling, data prep, and data modeling activities, making it easy for business users to gain insights from large and complex datasets. AAS lays between data sources and the reporting tools (see the diagram below), empowering business users to be more agile.



AAS can be consumed directly as a PaaS without having to manage a virtual machine. With 99.9% availability, users can access their data and insights anytime. AAS is also integrated with Azure Active Directory, providing enterprise class security and full control over data access. This helps deliver your BI applications quickly without having to worry much about security. While ADF helps bring various data sources together into a single view, Azure Analysis Services can help a single source for models that can act on multiple data sources. The insights from these models can be consumed using a visualization tool like Power BI or PowerApps. Traditionally, BI tools were used on Data Warehouse and other data sources to gain insights. By adding a semantic modeling layer between the data sources and the consumption layer, efficiencies can be increased. This semantic model layer also improves security, a much needed feature for enterprises.

Some of the customer scenarios where AAS is helpful are:

- Marketing and customer data is in Azure, sales and accounting data is on-premises. These data can be brought into a data warehouse on Azure. The data is accessed through AAS, refreshing at regular intervals, to feed into the BI semantic models built for the customer needs. This is a good cloud migration use case.
- Data could be stored in a data warehouse on Azure. A client's DAX queries can query the data warehouse using DirectQuery mode to provide the necessary data for to the client.

The same scenarios apply to data warehouse on-premises and it can be done using SQL Analysis Server deployed on-premises.

Key Benefits

- Cloud based consumption model without worrying about infrastructure management
- Easy scalability to match the business needs
- Integration with Power BI and other visualization tools
- Enterprise grade security with Azure Active Directory integration
- Support for various data sources including SAP HANA and SAP BW
- Supports tabular models at the 1200 and higher compatibility levels.
- DirectQuery, partitions, row-level security, bi-directional relationships, and translations are supported
- Analysis Service web designer, a browser based frontend to help developers build models, also supports DAX queries. DAX or Data Analysis Expressions is a formula language used to create and perform advanced calculations on data in tables and columns
- Scale out supports provide a way to distribute user queries among multiple query replicas in a query pool, reducing response times during high query workloads

Azure Analysis services is a powerful tool that can help you build complex models on data from various sources so that it can provide powerful insights to take fact-based decisions and actions. While Power BI provides efficient models to gain insights, Azure Analysis Services goes beyond what Power BI can provide to help you build larger, complex models on your data.

More information

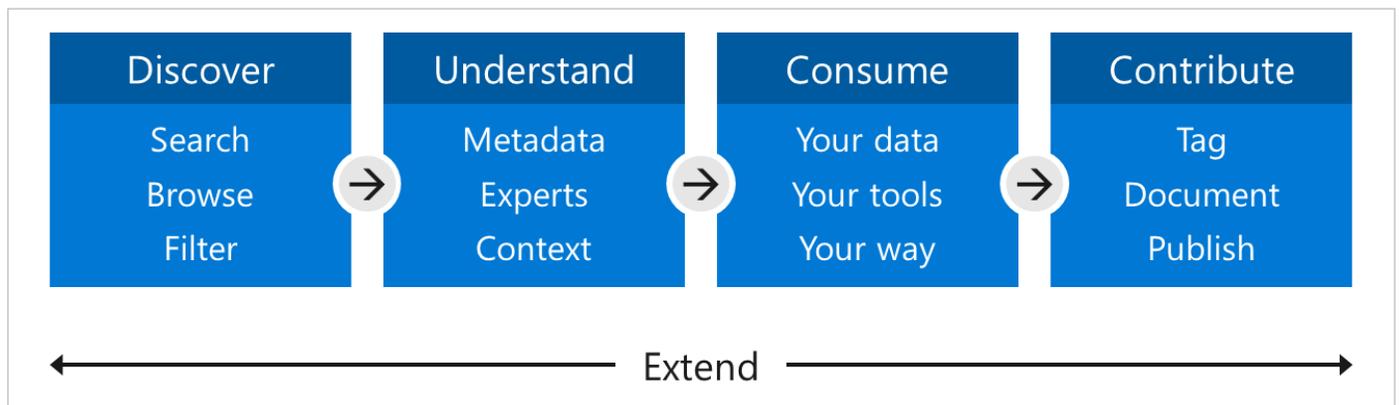
- [Azure Analysis Service documentation](#)
- [Data sources supported in Azure Analysis Services](#)

SQL Server Analysis Service (SSAS) has the same features as Azure Analysis service but for on-premises deployments. More information is available in the [documentation](#)

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Azure Data Catalog and SAP

[Azure Data Catalog](#) is an enterprise grade self-service platform that allows the discovery of data source and provides an easy way to understand the context of the data by using the metadata of data sources, thereby providing a seamless way to get more value from the organizational data assets.



Azure Data Catalog is an Azure-based service that offers:

- Data source discovery
 - One stop shop for all enterprise data sources
 - No data movement, no heavy upfront investment
 - Time to value in minutes
- Data from multiple sources, Structured and unstructured
 - On premises and in the cloud
 - Microsoft and non-Microsoft Including SAP HANA
- Consumption through multiple tools
 - Enabling publishing, discovery and consumption of data sources through various tools
- Powered by annotation crowdsourcing
 - Empowering any user to capture and share their knowledge about registered sources

Azure Data Catalog can be used by developers, business users, data science teams and IT professionals to discover, search and connect data for their respective needs. The use of crowdsourced annotations makes Azure Data Catalog more efficient in helping users develop and understand the data. Crowdsourcing also helps gain insights that will be unavailable to users of traditional systems. The integration with SAP HANA makes it easy for users to unlock insights from data stored in these systems.

Key Benefits

- Azure based service offering consumption-based pricing model
- Register enterprise data, make it easy for users to discover data and unlock its potential
- Data can reside anywhere
- IT can maintain control over data access to ensure security and compliance
- Crowdsourced annotation unlocks tribal knowledge to make data more understandable

More information

- [Data Catalog Documentation](#)
- [Supported data sources in Azure Data Catalog including SAP HANA](#)

Slaying Data Silos With Azure Data Catalog

The biggest problem faced by modern enterprise lies in breaking open the data silos and making it easy for users to make sense of the data or use it to build intelligent applications. Even with technologies like Data Warehousing and Data Lakes, most organizations struggle to avoid data silos. Data Lake is like a busy market street and Azure Data Catalog is critical to bring some semblance of order and help users to efficiently take advantage of the data. Enterprise users are always faced with doubts about whether their data-driven decisions are based on all the data or whether there are missed opportunities due to data silos, difficulty in discovering the data sources and making sense of these data sources so that they can be trusted. Azure Data Catalog solves this problem by breaking down the silos and bringing the app store approach to data discovery. The crowdsourcing component of Azure Data Catalog ensures that it is much easier to understand the data and unlock critical insights hidden in them.

Azure Data Catalog and SAP

Azure Data Catalog is integrated with SAP HANA as a data source

- It supports registering and discovering SAP HANA views and packages. You can register SAP HANA data sources using the Azure Data Catalog data source registration tool, and can annotate and discover registered SAP HANA data sources using the Azure Data Catalog portal

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iPaaS: Bringing Microsoft Business Apps Workflows With SAP

Azure's Integration Platform (iPaaS) offers an easy way to integrate Microsoft business applications with SAP technologies and other third party applications. Azure Logic Apps and other Azure services like Azure Functions and Azure Service Bus Messaging works together to provide this integration layer. Azure Logic Apps helps to implement and orchestrate visual workflows to leverage business processes using 100+ connections across different protocols, applications and systems running on Azure and on-premises. Azure Functions Service can then be tapped to bring custom logic, either as functions or Microservices, that is then leveraged by Azure Logic Apps. Azure Service Bus Messaging layer can then help decouple various steps in the integration process. If necessary, the API Management service can be used to handle http triggers.

Azure Logic Apps also connects Office 365 and Dynamics 365 applications with other enterprise applications, SaaS applications, SAP technologies and other third party applications. This helps bring business data stored in Office 365 and Dynamics 365 to work along with other data sources, making it easy to derive critical business workflows.

Azure Logic Apps Connector to SAP

[Azure Logic Apps](#) is the cloud based iPaaS offering that helps organization connect disparate data sources including SaaS and enterprise applications. By offering many out of the box integrations, Logic Apps lets you seamlessly connect data, applications and devices across cloud and on-premises to develop complex business workflows.

Key Benefits

- Simplify and implement complex, scalable integrations and workflows for enterprise applications on the cloud, on-premises and Office 365
- Brings speed and scalability into the enterprise integration space, Logic Apps scale up and down based on demand
- Easy user interface with designer
- Powerful management tools to tame the complexity
- Easy to automate EAI, B2B/EDI, and business processes

In this section, we will briefly discuss various integration that can help Azure Logic App work with SAP technologies. SAP ERP Central Component (ECC) connector allows Azure Logic Apps to connect to on-premises or cloud SAP resources from inside a logic app. The connector supports message or data integration to and from SAP NetWeaver-based systems through Intermediate Document (IDoc) or Business Application Programming Interface (BAPI) or Remote Function Call (RFC).

The connector allows following three operations:

- **Send to SAP:** Send IDoc or call BAPI functions over tRFC in SAP systems.
- **Receive from SAP:** Receive IDoc or BAPI function calls over tRFC from SAP systems.
- **Generate schemas:** Generate schemas for the SAP artifacts for IDoc or BAPI or RFC.

More information

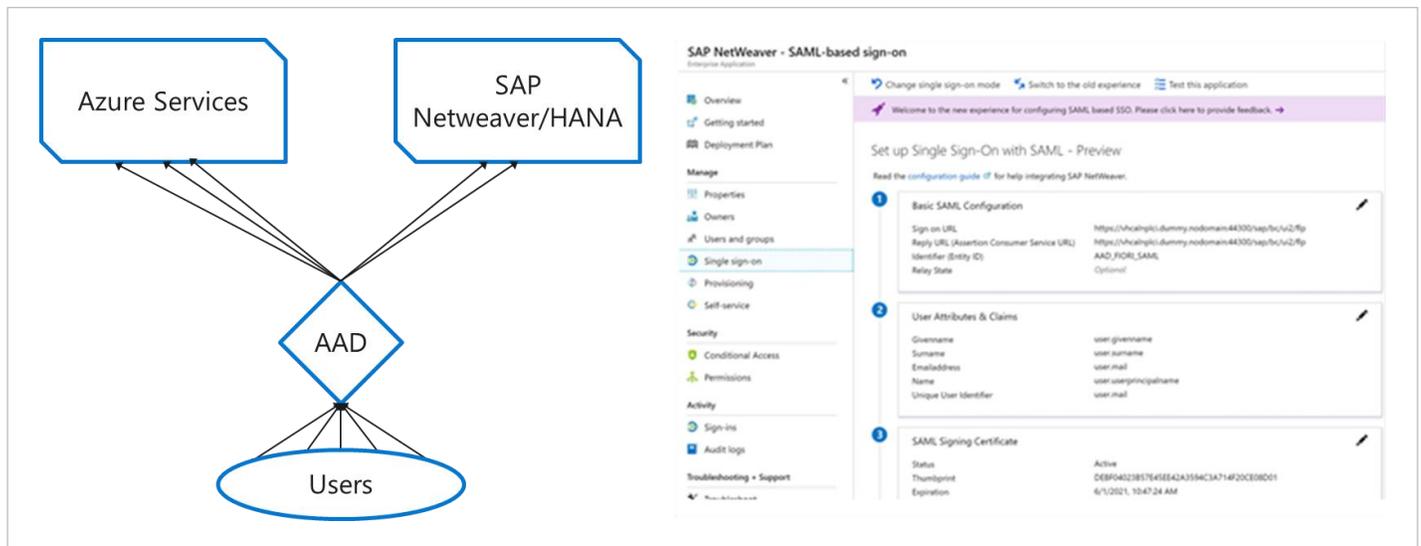
- [Azure Logic Apps documentation](#)
- [Connectors for Azure Logic Apps](#)
- [Connect to SAP systems from Azure Logic Apps](#)

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Azure Active Directory and SAP

Azure Active Directory (AAD) offers enterprise grade identity management and security needed to run SAP solutions on Azure. It provides a single sign-on using protocols such as OAuth 2.0, OpenID Connect, WS-Federation, or SAML 2.0 and it also enables Kerberos based authentication for other applications. AAD serves as the identity provider while SAP acts as a service provider, thereby giving users a single sign on across both SAP NetWeaver and Azure services. Since SAP NetWeaver is the technology foundation for many other SAP applications, Azure Active Directory is currently supported across SAP Cloud Platform, S/4HANA, C/4HANA, SAP Analytics Cloud. This integration is very critical because it lets users access all applications and data by signing in once. For enterprise IT, this provides an easy way to ensure that the organization’s authentication policies are easily enforced.

For an example is Rio Tinto⁶, a large mining company, that moved their SAP estate to Azure to digitally empower its 55,000 employees. Using Azure Active Directory, they are able to provide their employees easy access to their applications, thereby empowering them with better productivity while also ensuring security needed for large enterprises. When used with Microsoft Intune, Rio Tinto can enable their field workers to securely access applications and data using mobile devices. Azure Logic Apps Connector to SAP



Azure Active Directory provides

- A single sign-on using organization's email address or other unique identifiers so that users can log into SAP and other Azure services without having to manage multiple usernames and passwords
- IT can easily provision and deprovision access to applications and data based on the user or employee status
- IT can seamlessly ensure security and access governance across both SAP and Azure services in a centralized way
- AAD also enables support for Multi Factor Authentication (MFA) adding a layer of security around applications and data

Azure Active Directory uses high availability architecture ensuring that organizations can secure their data and applications on a global scale. Azure Active Directory offers the easy to use features customers have come to expect from cloud services, including self-service, Multi-Factor Authentication and reporting, and enterprise-grade security. For more information, refer to the tutorials provided below:

- [Setting up Azure Active Directory with SAP NetWeaver](#)
- [Setting up Azure Active Directory with SAP HANA](#)

Conclusion

In today's data-driven economy, organizations are mandated with building intelligent applications and making decisions that are based on hard facts. Plus, the competitive pressure to be agile and requirements for enterprise grade security and governance, are driving decision-makers to find platforms that can support their agile data needs. Today, modern enterprises collect and process large volumes of data compared to anytime in the past. IT leaders are required to strategize about taking advantage of this organizational data by breaking down the silos that exist inside their organizations. Enterprise data is spread out from legacy systems to mobile and IoT to cloud services. It is important for businesses to get more value out of this data, by not missing out on valuable insights due to data silos.

Azure is the right cloud platform to meet the demands of such data-driven enterprises. With the wide variety of services available in the Azure portfolio, organizations can easily bring all the data sources together including data residing in systems such as SAP, analyze the data, author, build models, deliver it for consumption by developer through an API and visualize using powerful and easy to use tools. Whether it is data commercialization using a Data Science as a Service platform or building a powerful predictive or decision analytics platform, Azure's diverse set of data and integration services such as Azure Data Catalog, Azure Data Factory, Azure Logic Apps, Azure Analysis Service and Power BI with its tight integration with SAP technologies, are well positioned to help enterprises in their data driven journey. Filly, Azure Active Directory provides the enterprise grade identity management and security that is critical for protecting valuable organizational data. This whitepaper has given you an overview on how these technologies can be used to gain useful insights or build intelligent applications in your journey to get the most value for your SAP data on Azure.

References

1. <https://www.forbes.com/sites/gilpress/2016/08/05/iot-mid-year-update-from-idc-and-other-research-firms/#515551655c59>
2. <https://www.gartner.com/en/newsroom/press-releases/2017-10-02-gartner-survey-of-more-than-3000-cios-confirms-the-changing-role-of-the-chief-information-officer>
3. <https://customers.microsoft.com/en-us/story/ab-inbev-consumer-goods-azure>
4. <https://customers.microsoft.com/en-us/story/newell-brands-consumer-goods-azure>
5. <https://customers.microsoft.com/en-gb/story/co-op>
6. https://azure.microsoft.com/mediahandler/files/resourcefiles/leveraging-sap-on-azure-for-business-transformation/Leveraging_SAP_on_Azure_for_Business_Transformation.pdf