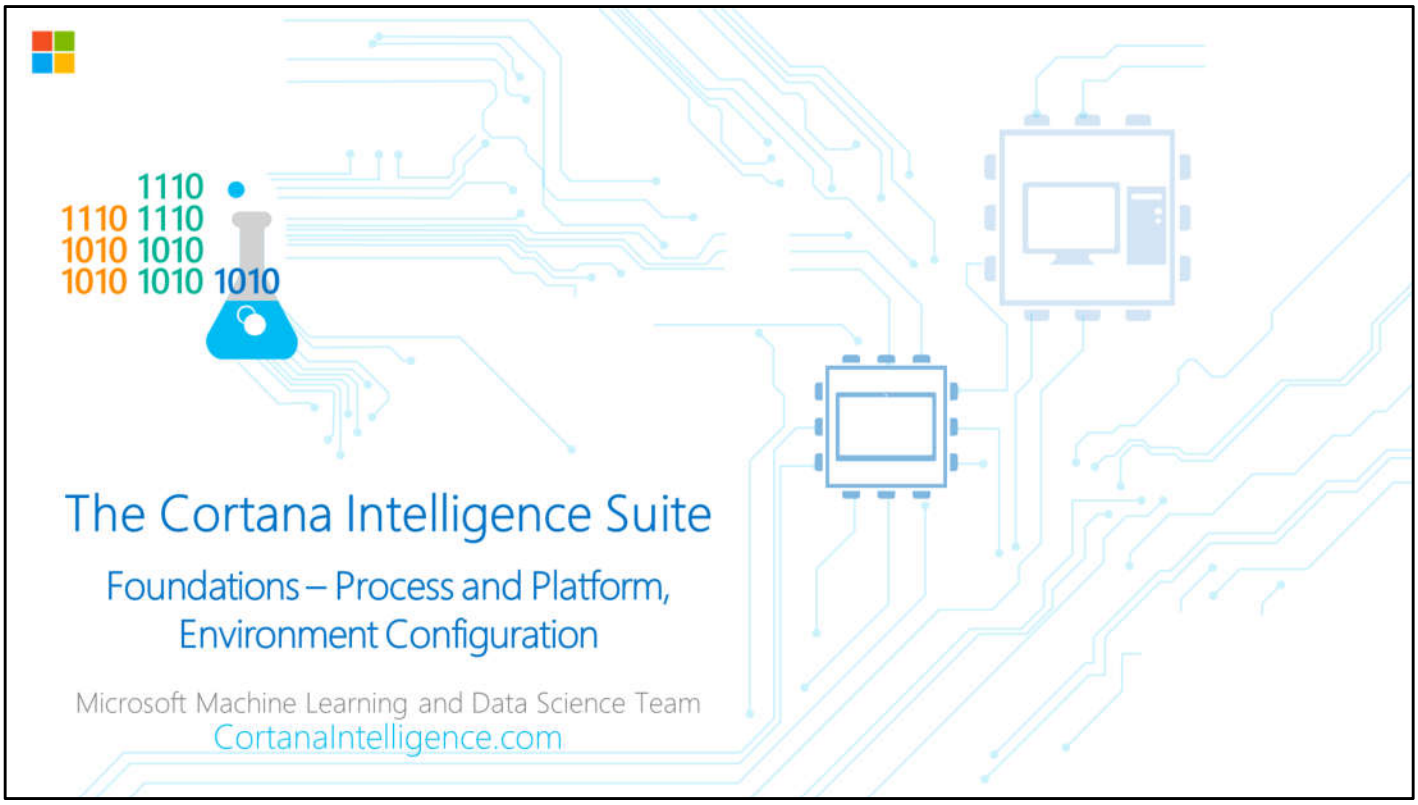
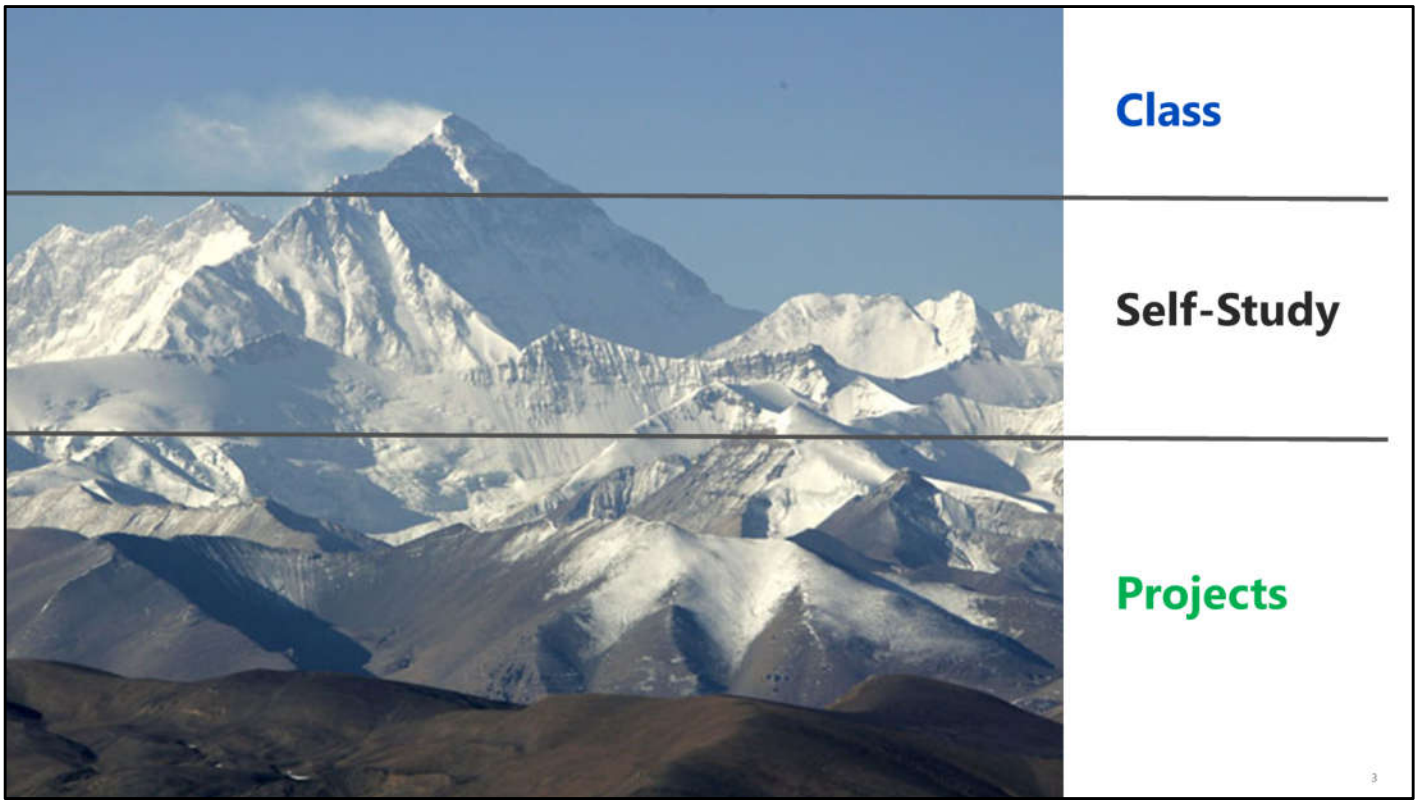


1. Main page: http://cortanaanalytics.com
2. To begin this module, you should have:
    1. Basic Math and Stats skills
    2. Business and Domain Awareness
    3. General Computing Background

NOTE: These workbooks contain many resources to lead you through the course, and provide a rich set of references that you can use to learn much more about these topics. If the links do not resolve properly, type the link address in manually in your web browser. If the links have changed or been removed, simply enter the title of the link in a web search engine to find the new location or a corollary reference.



There's a lot of information here. You'll get hands-on experience in class, with a chance to ask an instructor any questions you might have. However, this forms only a small part of learning so many technologies and processes.

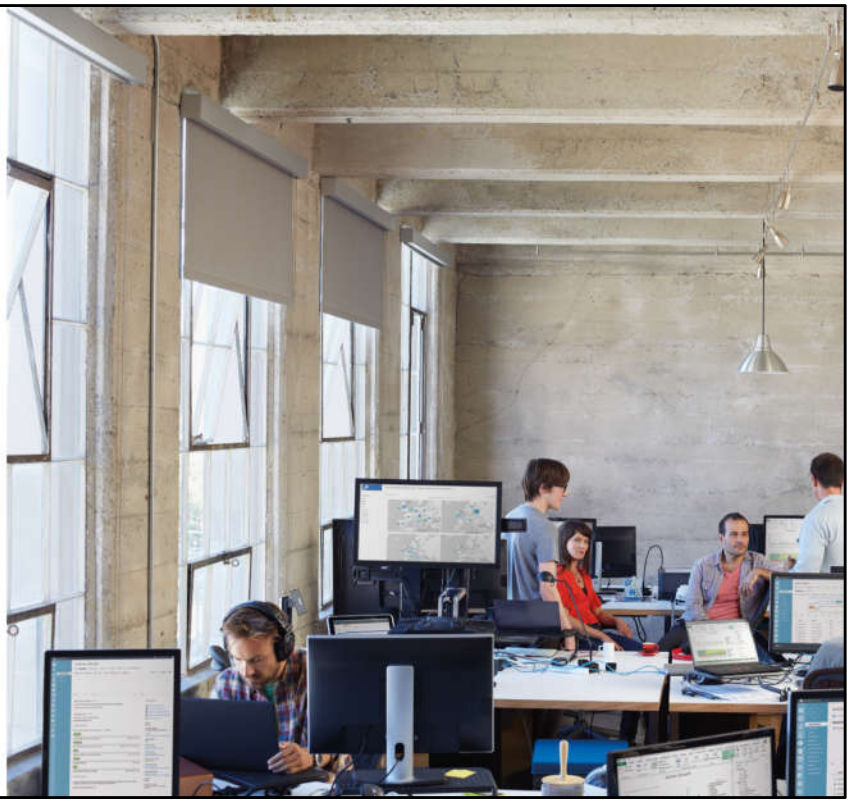
The next largest section of your learning is to read each and every reference in the student handouts. Many point to books, websites and entire courses you can take in each topic. You won't be expected to learn all of them at once – it's more common to pull out the sections you need when you do a project, and learn about that technology before you implement it.

You'll learn the most by actually creating and implementing solutions for your customers. You will do a quick design at the

end of this course, but that is a small sample of working with the technologies in a hands-on fashion. The good news is that you'll find everything you need to be successful in this course and these materials.

Introduction

- Class hours
- Facilities
- Meals and Breaks
- Internet and Azure Access
- Labs
- Feedback



There will be a general feedback form, but after each module you are asked if you can complete the objectives. If you cannot, let the instructor know.

There are a few things you need prior to coming to class:

• A background in data technologies, such as working with Relational and Non-Relational data processing systems

• A general level of predictive and classification Statistics

• A general understanding of Machine Learning

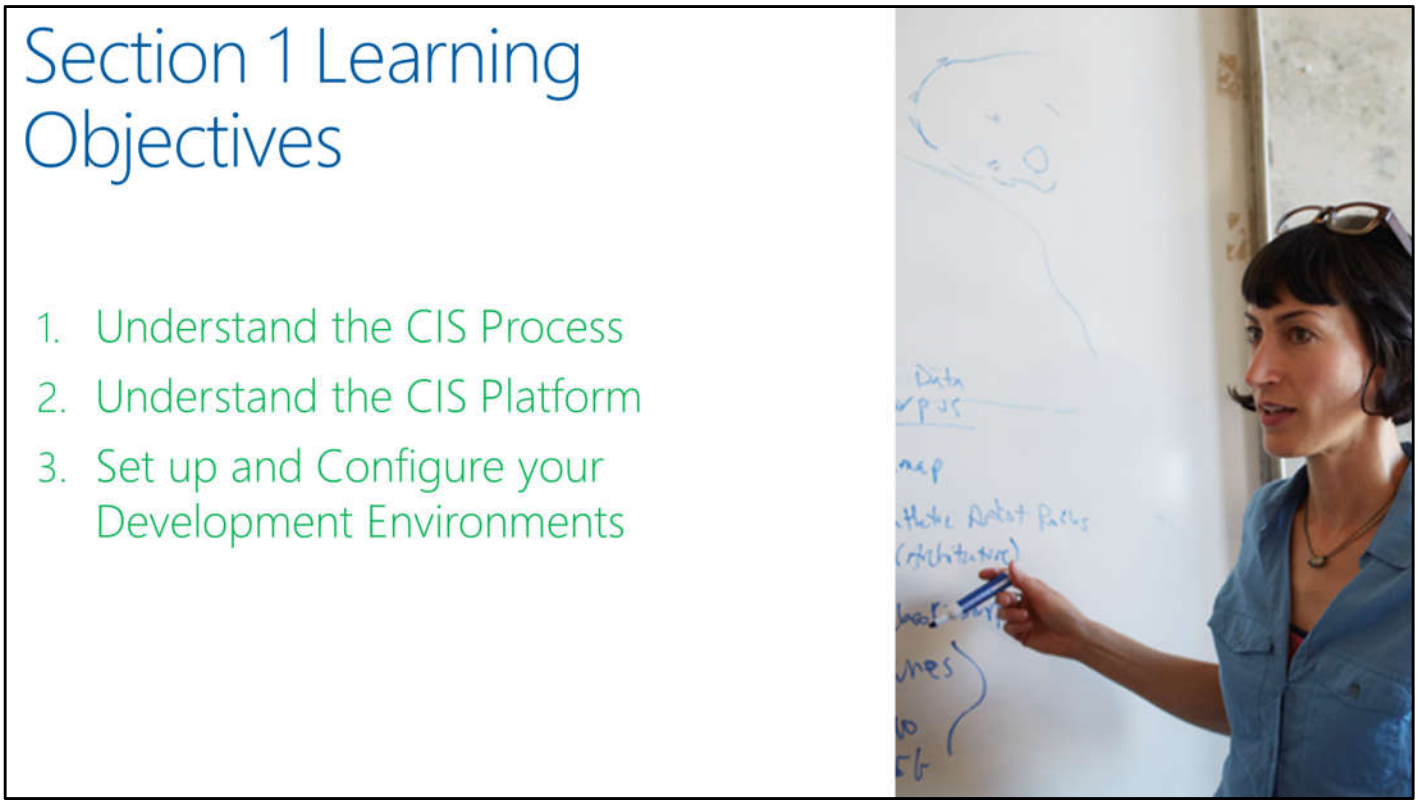
• A subscription to Microsoft Azure (this may be provided through your company or as part of your invitation)

We'll be using the Windows Data Science Virtual Machine (https://azure.microsoft.com/en-us/documentation/articles/machine-learning-data-science-provision-vm/#tools-installed-on-the-microsoft-data-science-virtual-machine) but you can also install things locally if you wish.

- A laptop with Visual Studio installed – the Community Edition (free) is acceptable – Version 2015 preferable (https://www.visualstudio.com/en-us/products/visual-studio-community-vs.aspx)
- Azure SDK and Command-line Tools installed (https://azure.microsoft.com/en-us/downloads/)
- Azure Storage Explorer (http://go.microsoft.com/fwlink/?linkid=698844&clcid=0x409)
- Power BI Desktop (https://powerbi.microsoft.com/en-us/desktop/?gated=0&number=1)

Session	Concepts	Technologies
Process and Platform Environment Configuration	The CIS Process, CIS Platform components, Tools installation and overview	CRISP-DM, CIS, Azure Portal, ADC Interface, Visual Studio Interface (and RTVS), Power BI Interface, Azure Machine Learning Interface, Azure PowerShell, Azure Storage Explorer
Data Discovery and Ingestion	Data sourcing, Feature selection techniques, Data cataloging, Data Ingestion, Data Exploration	Azure Data Catalog, Azure Storage, Techniques for discovery
Data Preparation	Data selection, including Features, Dimension reduction, Data processing, Data transformation and augmentation	Azure Data Factory, HDInsight
Modeling for Machine Learning and Data Mining	Algorithm selection and application, Parameter selection and adjustment	Azure Machine Learning, Microsoft R Server overview, Azure Data Factory
Business Validation and Model Evaluation	Business validation of report and results, Model testing and cross-validation	Azure Machine Learning, Microsoft R Server overview, Azure Data Factory, Business Validation, SQL DB, Azure Storage
Deploying and Accessing the Solution	Deploying the solution using Data Destinations, Deploying the solution using API's, Deploying the Solution using Queries and Reports	Azure Data Storage, SQL DB, Azure Machine Learning API, Cognitive Services API, HIVE, Power BI
Workshop recap	Mapping requirements to solution elements, What to use When	Understand when to use each component within CIS

1. Components and capabilities of Cortana Intelligence: https://www.microsoft.com/en-us/cloud-platform/what-is-cortana-intelligence-suite



1. At the end of this Module, you will:
    1. Understand the CIS Process
    2. Understand the CIS Components
    3. Set up and Configure your Development Environments

Module 1:
Understanding Cortana Intelligence

7

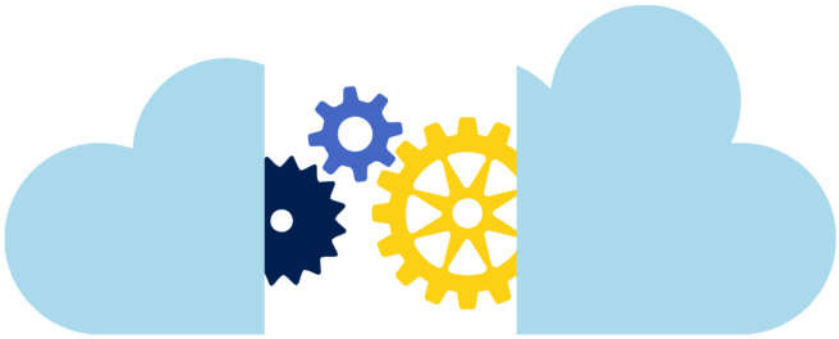
1. The official documentation for the Cortana Intelligence Suite: https://www.microsoft.com/en-us/server-cloud/cortana-intelligence-suite/
2. The Advanced Analytics Learning Portal: http://learnanalytics.microsoft.com/

Cortana Intelligence in a Sentence:

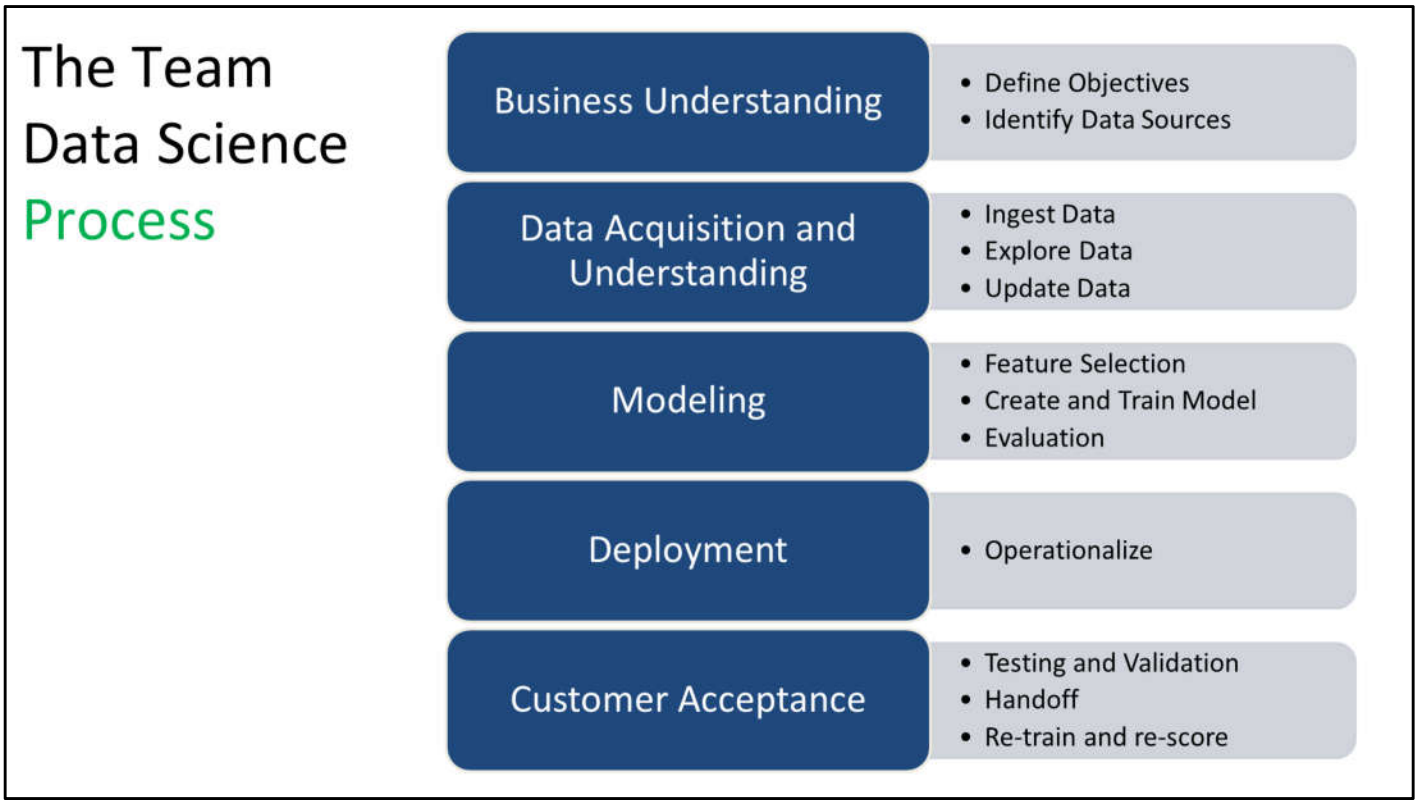
Cortana Intelligence is a Platform and a Process to perform advanced analytics from start to finish

1. What you can do with CIS: https://www.microsoft.com/en-us/server-cloud/cortana-intelligence-suite/why-cortana-intelligence.aspx
2. More about the process: https://channel9.msdn.com/Blogs/Seth-Juarez/Understanding-Data-Science-for-building-Predictive-Analytics-Solutions-by-Francesca-Lazzeri

The Data Science Process and Platform

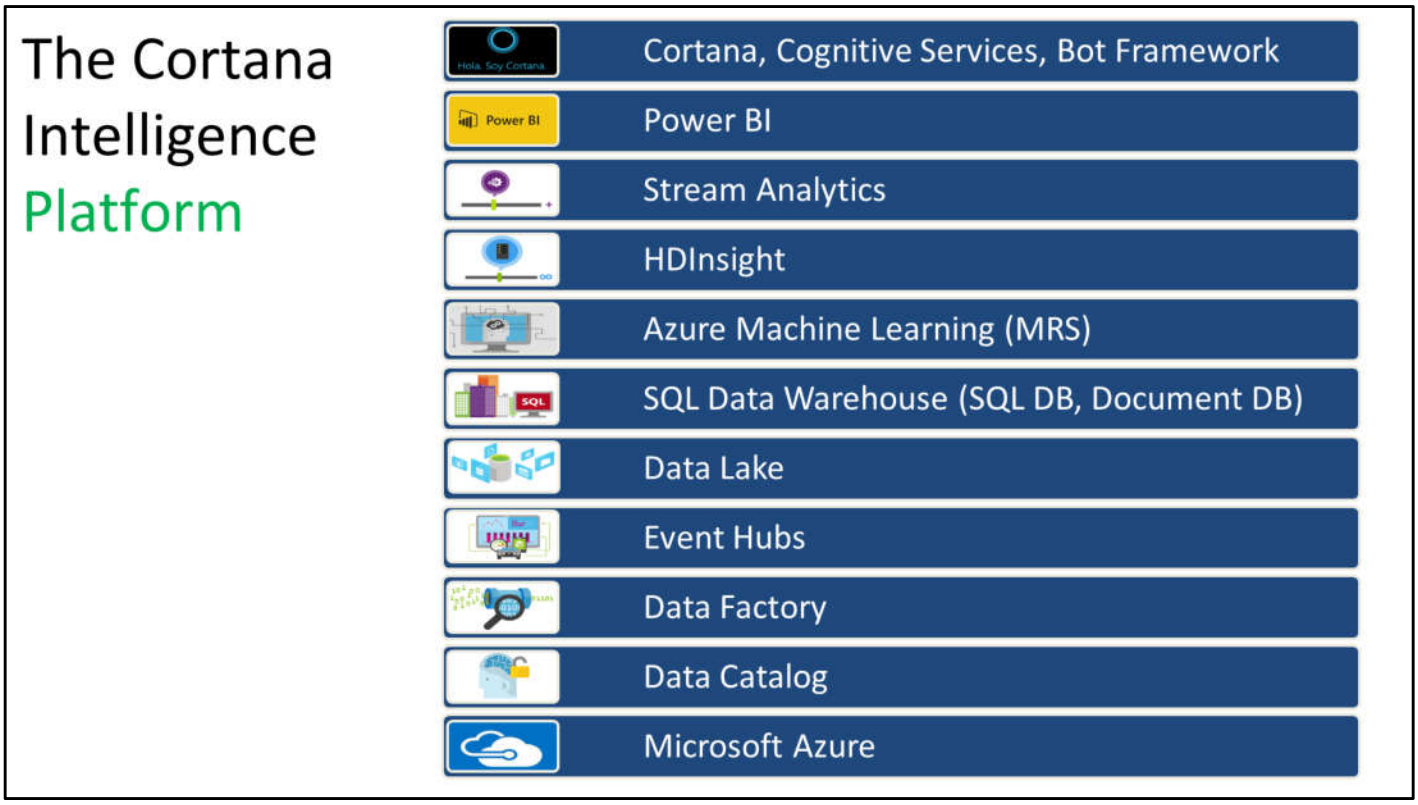


Great overview of the process and the platform: https://blogs.msdn.microsoft.com/azuredev/2017/02/19/the-data-science-process-with-azure-machine-learning/



1. This process largely follows the CRISP-DM model: http://www.sv-europe.com/crisp-dm-methodology/
2. It also references the Cortana Intelligence process: https://azure.microsoft.com/en-us/documentation/articles/data-science-process-overview/
3. A complete process diagram is here: https://azure.microsoft.com/en-us/documentation/learning-paths/cortana-analytics-process/
4. Some walkthrough's of the various services: https://azure.microsoft.com/en-us/documentation/articles/data-science-process-walkthroughs/
5. An integrated process and toolset allows for a more close-to-intent deployment

6. Iterations are required to close in on the solution – but are harder tio management and monitor
7. A great resource for a team involved in data science to get started: https://github.com/Azure/Microsoft-TDSP



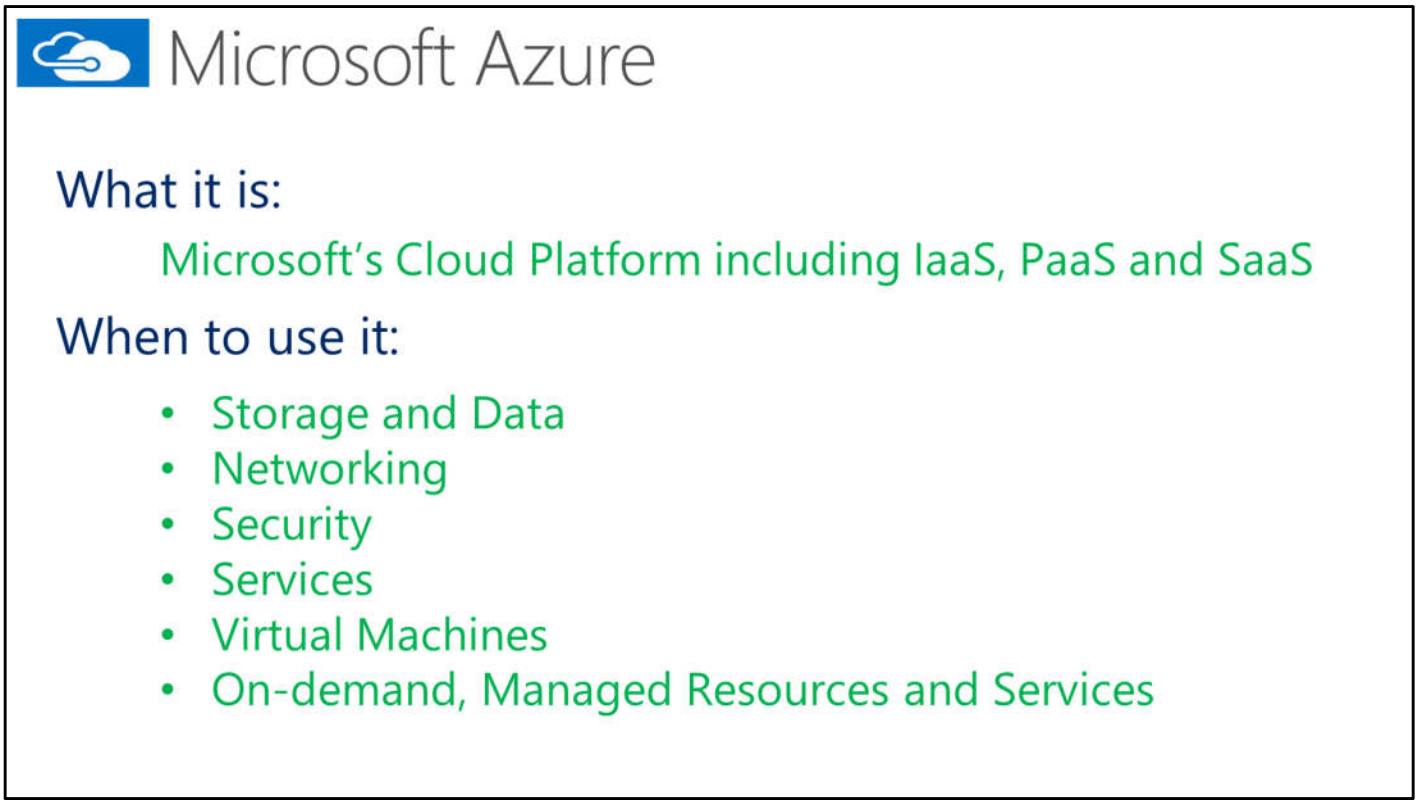
1. Platform and Storage: Microsoft Azure – http://microsoftazure.com Storage: https://azure.microsoft.com/en-us/documentation/services/storage/ (Host It)
2. Azure Data Catalog: http://azure.microsoft.com/en-us/services/data-catalog (Doc It)
3. Azure Data Factory: http://azure.microsoft.com/en-us/services/data-factory/ (Move It)
4. Azure Event Hubs: http://azure.microsoft.com/en-us/services/event-hubs/ (Bring It)
5. Azure Data Lake: http://azure.microsoft.com/en-us/campaigns/data-lake/ (Store It)
6. Azure DocumentDB: https://azure.microsoft.com/en-us/services/documentdb/ , Azure SQL Data Warehouse: http://azure.microsoft.com/en-us/services/sql-data-warehouse/ (Relate It)
7. Azure Machine Learning: http://azure.microsoft.com/en-us/services/machine-learning/ (Learn It)
8. Azure HDInsight: http://azure.microsoft.com/en-us/services/hdinsight/ (Scale It)
9. Azure Stream Analytics: http://azure.microsoft.com/en-us/services/stream-analytics/ (Stream It)
10. Power BI: https://powerbi.microsoft.com/ (See It)
11. Cortana: http://blogs.windows.com/buildingapps/2014/09/23/cortana-integration-and-speech-recognition-new-code-samples/ and https://blogs.windows.com/buildingapps/2015/08/25/using-cortana-to-interact-with-your-customers-10-by-10/ and https://developer.microsoft.com/en-us/Cortana (Say It)
12. Cognitive Services: https://www.microsoft.com/cognitive-services
13. Bot Framework: https://dev.botframework.com/
14. All of the components within the suite: https://www.microsoft.com/en-us/server-cloud/cortana-intelligence-suite/what-is-cortana-intelligence.aspx
15. What can I do with it? https://gallery.cortanaintelligence.com/

16. Getting Started Quickly: https://cags.azure.net/#gallery

Module 2:
The Cortana Intelligence Suite

12

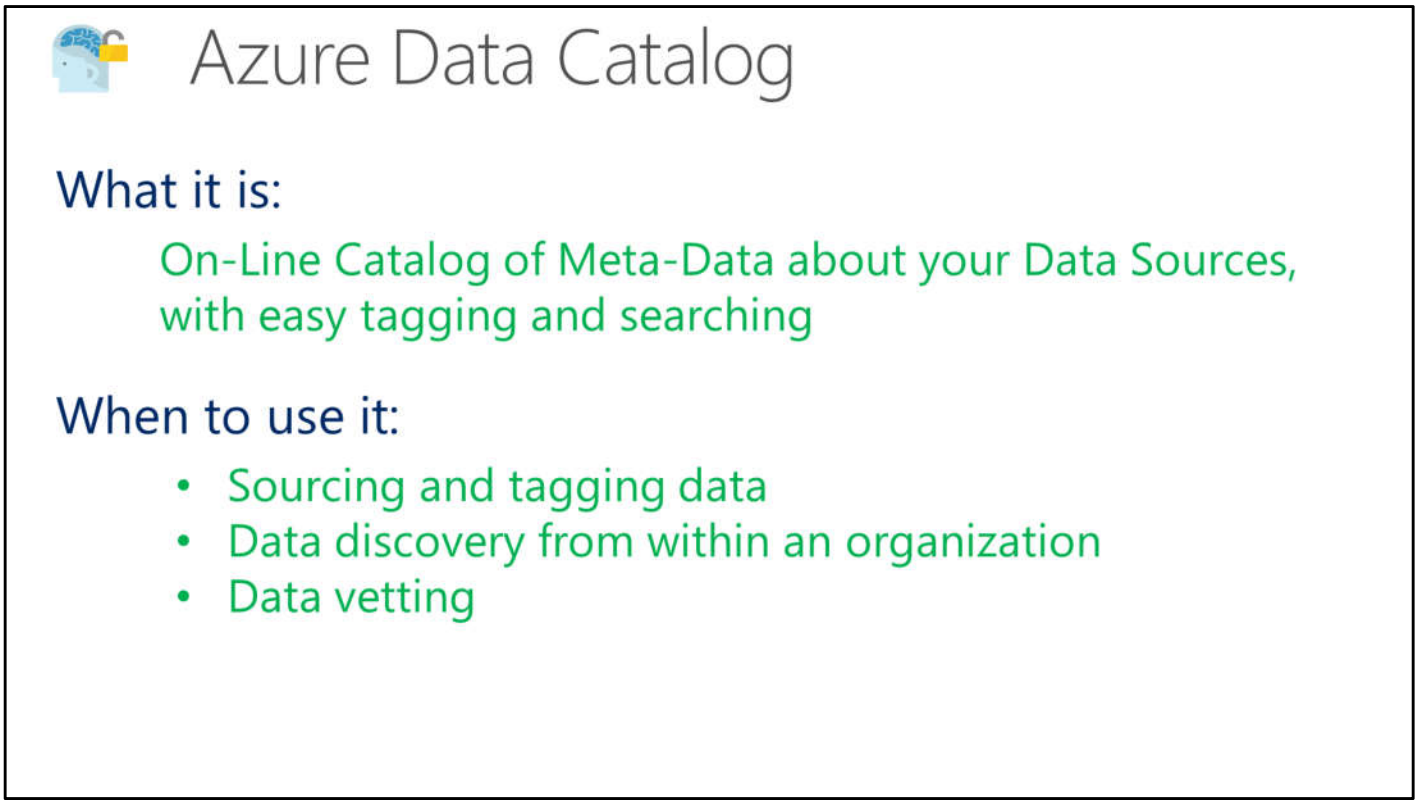
1. All of the components within the suite: https://www.microsoft.com/en-us/server-cloud/cortana-intelligence-suite/what-is-cortana-intelligence.aspx



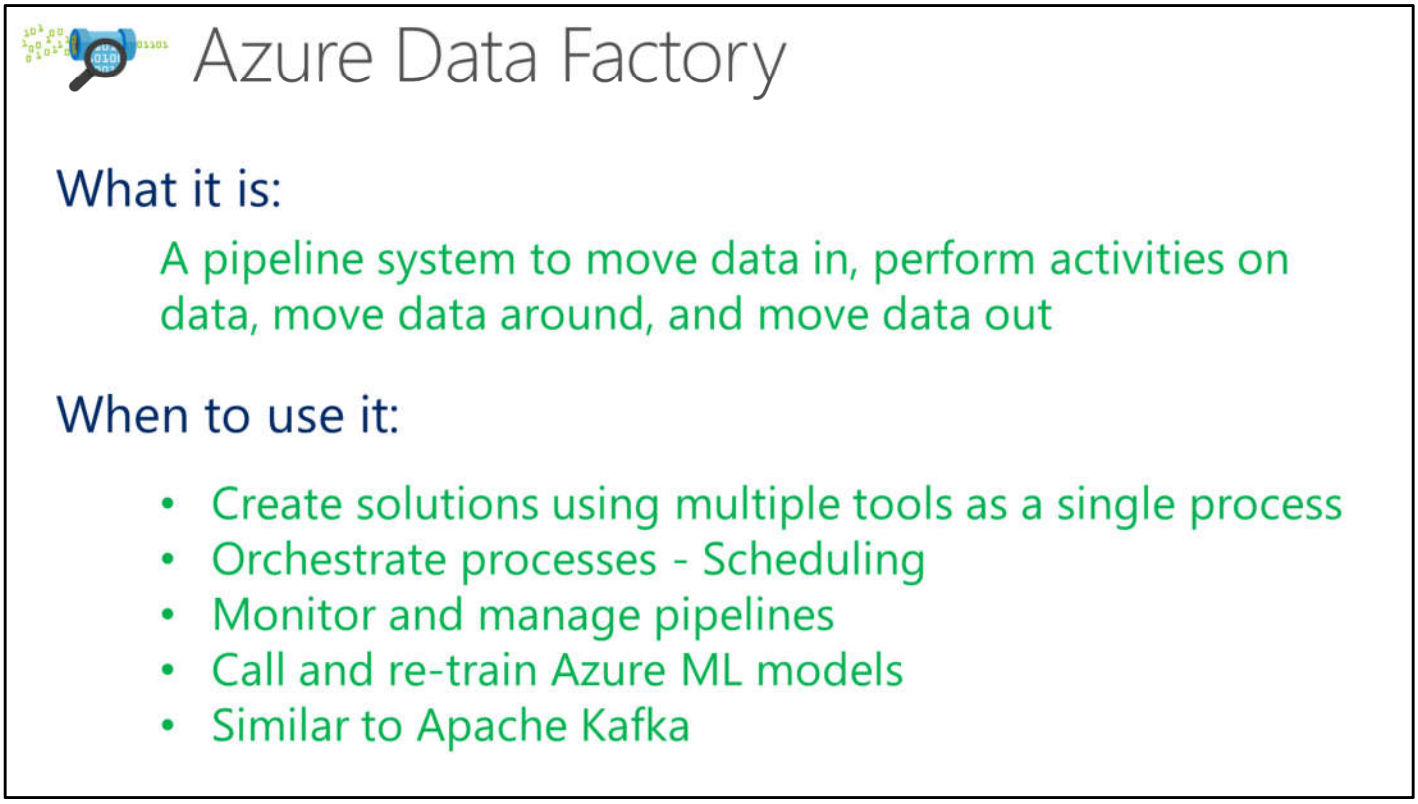
1. What you can do with it: https://azure.microsoft.com/en-us/overview/what-is-azure/
2. Platform: http://microsoftazure.com
3. Storage: https://azure.microsoft.com/en-us/documentation/services/storage/
4. Networking: https://azure.microsoft.com/en-us/documentation/services/virtual-network/
5. Security: https://azure.microsoft.com/en-us/documentation/services/active-directory/
6. Services: https://azure.microsoft.com/en-us/documentation/articles/best-practices-scalability-checklist/
7. Virtual Machines: https://azure.microsoft.com/en-us/documentation/services/virtual-machines/windows/ and https://azure.microsoft.com/en-us/documentation/services/virtual-machines/linux/
8. PaaS: https://azure.microsoft.com/en-

us/documentation/services/app-service/

1. Activate your Azure Subscription (Learn more here: https://docs.microsoft.com/en-us/azure/billing/billing-buy-sign-up-azure-subscription)
   1. Open the Azure Portal
   2. Create one empty Resource Group (More here: https://docs.microsoft.com/en-us/azure/azure-resource-manager/resource-group-overview)
2. Explain a situation where data was used in a new and unexpected way in a business or an organization
3. List three advantages to using a cloud or hybrid architecture
4. List three objections to hosting an application in the cloud, and three responses to those objections



1. Azure Data Catalog: http://azure.microsoft.com/en-us/services/data-catalog



1. Azure Data Factory: http://azure.microsoft.com/en-us/services/data-factory/

Event Hubs

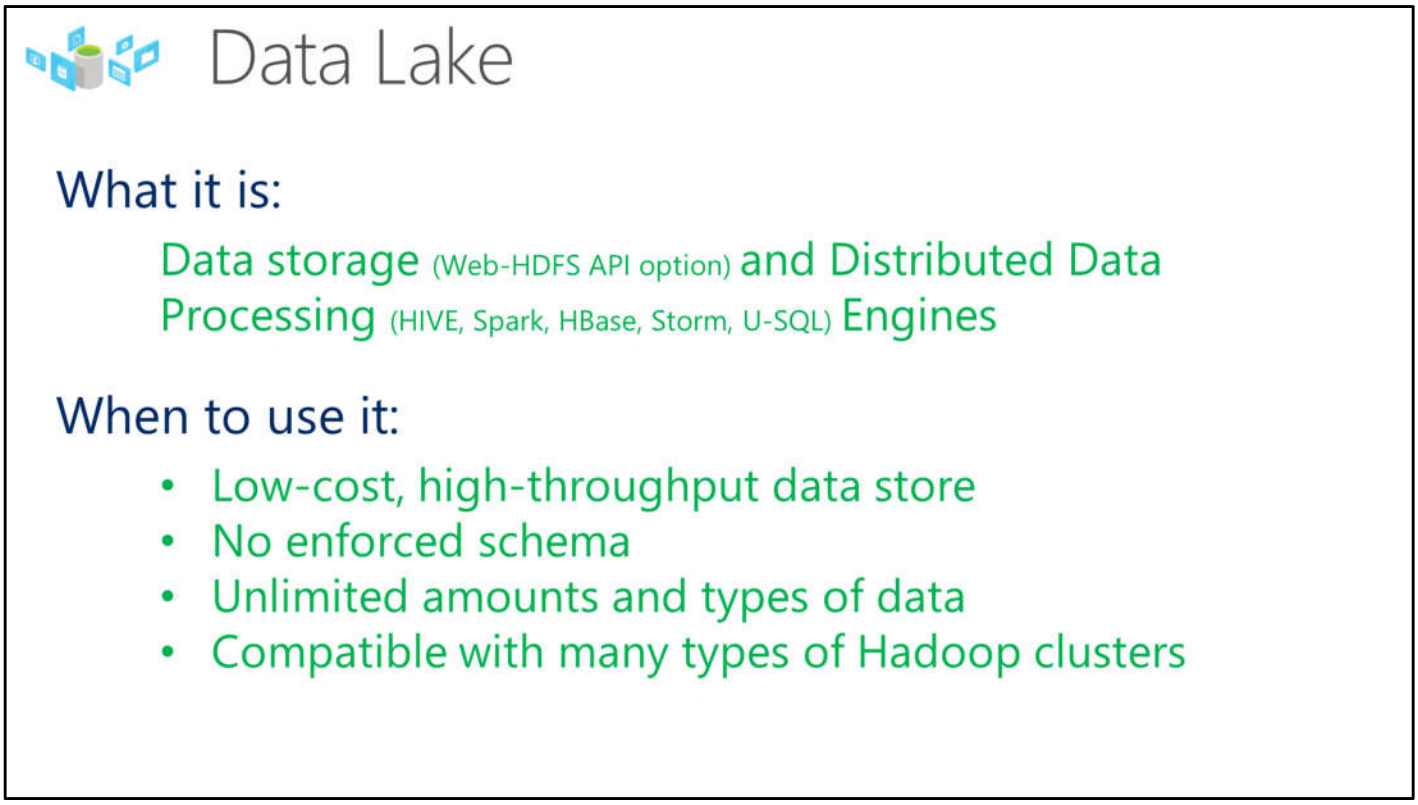
What it is:

A system to ingest data from the web, IoT, and apps at scale

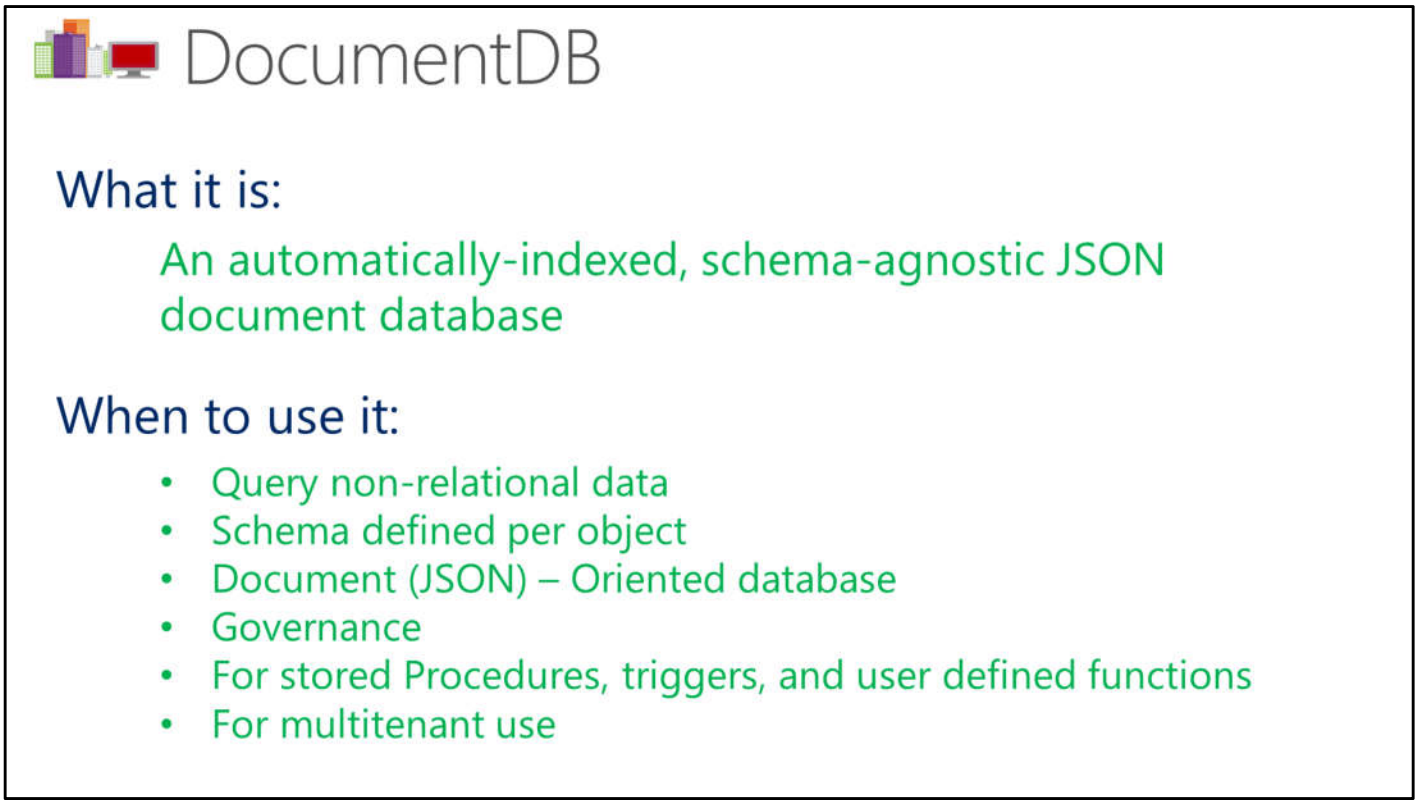
When to use it:

- To stream in large amounts of data
- With IoT workloads
- Use with variable or unpredictable large data loads

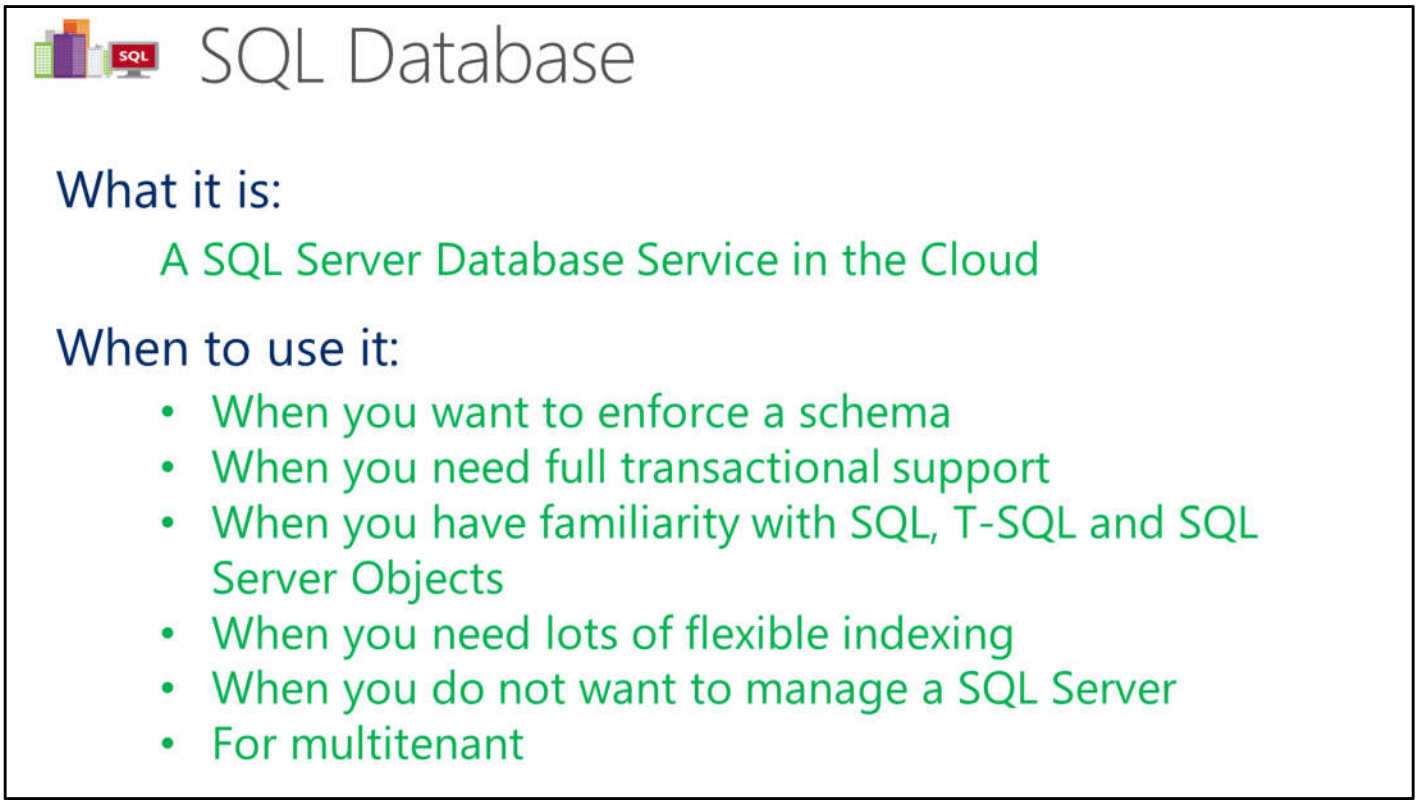
1. Azure Event Hubs: http://azure.microsoft.com/en-us/services/event-hubs/
2. Another, similar option, is IoT Hubs and Suite for device to device scenarios



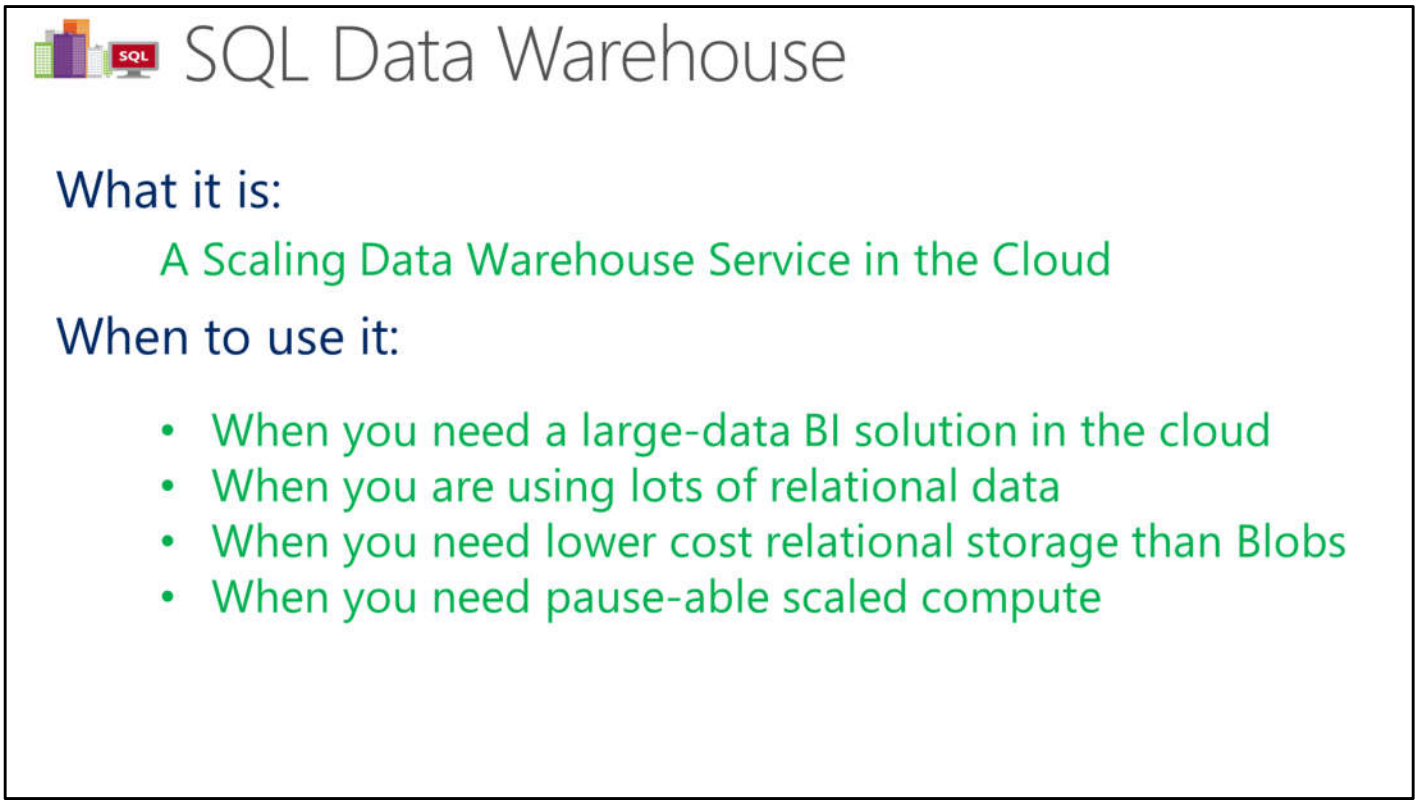
1. Azure Data Lake: http://azure.microsoft.com/en-us/campaigns/data-lake/



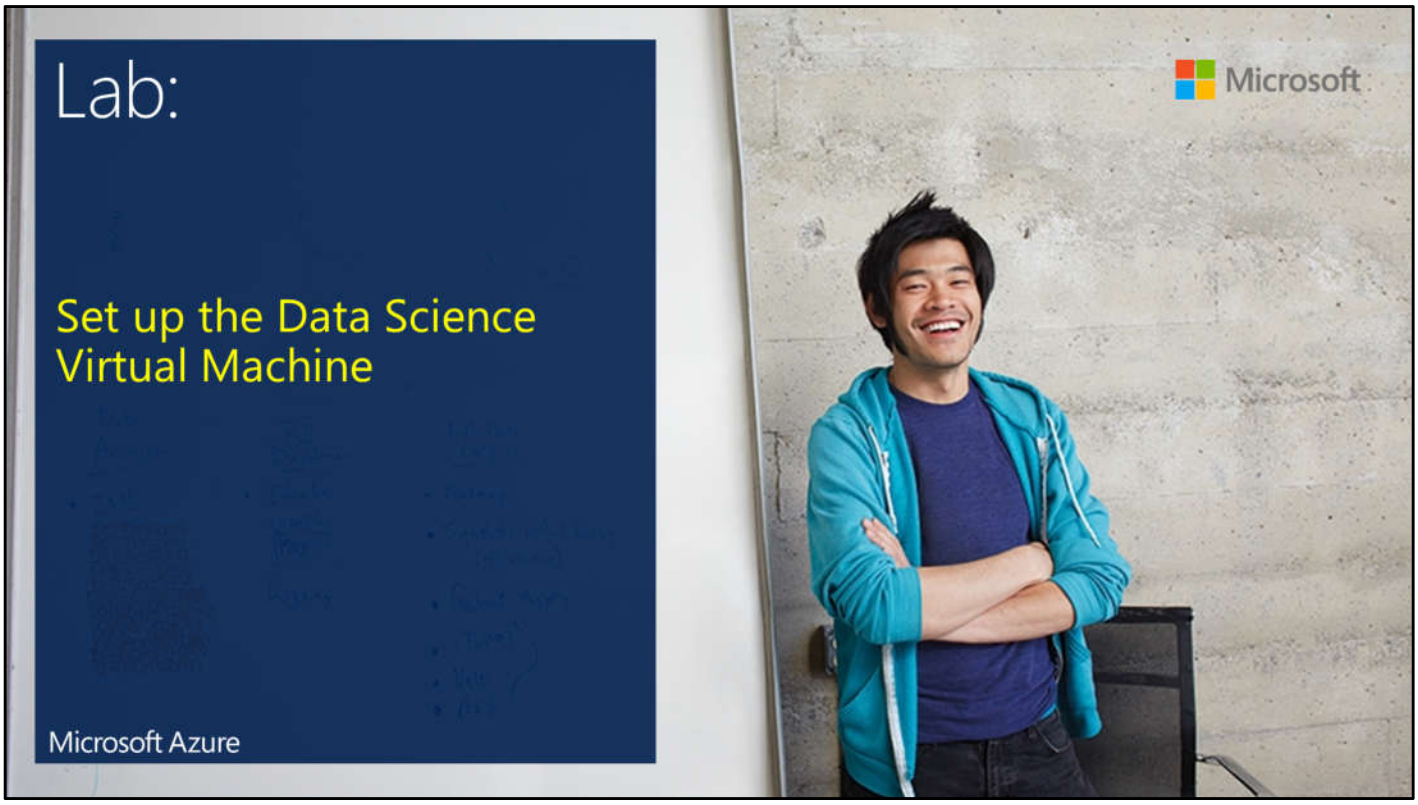
1. Azure DocumentDB: https://azure.microsoft.com/en-us/services/documentdb/?WT.srch=1&WT.mc_ID=SEM_JQ3fO8dU



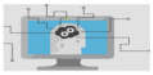
1. Azure SQL DB: https://azure.microsoft.com/en-us/services/sql-database/?b=16.18



1. Azure SQL Data Warehouse: http://azure.microsoft.com/en-us/services/sql-data-warehouse/



1. Log in to the Azure Portal
2. Deploy one Windows Data Science Virtual Machine (DSVM) – note your admin name and password
    1. Need help? Check here – except make sure you pick the Windows Data Science Machine! https://azure.microsoft.com/en-us/documentation/articles/virtual-machines-windows-hero-tutorial/
3. Start the DVSM
4. Connect to the DSVM and begin updating the Power BI, Visual Studio, and Windows environments
    1. Need help? Check here: https://azure.microsoft.com/en-us/documentation/articles/virtual-machines-windows-connect-logon/



Azure ML

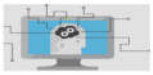
What it is:

A multi-platform environment and engine to create and deploy Machine Learning models and API's

When to use it:

- When you need to create web API's for consuming ML/DL models
- When you need to pass off Data Science workflows
- When you want to perform EDA in jupyter notebooks
- When you have R and Python experience on your Data Science team and want to integrate custom code

1. Azure Machine Learning: http://azure.microsoft.com/en-us/services/machine-learning/
2. Azure ML studio: https://studio.azureml.net



Microsoft R Server (MRS)

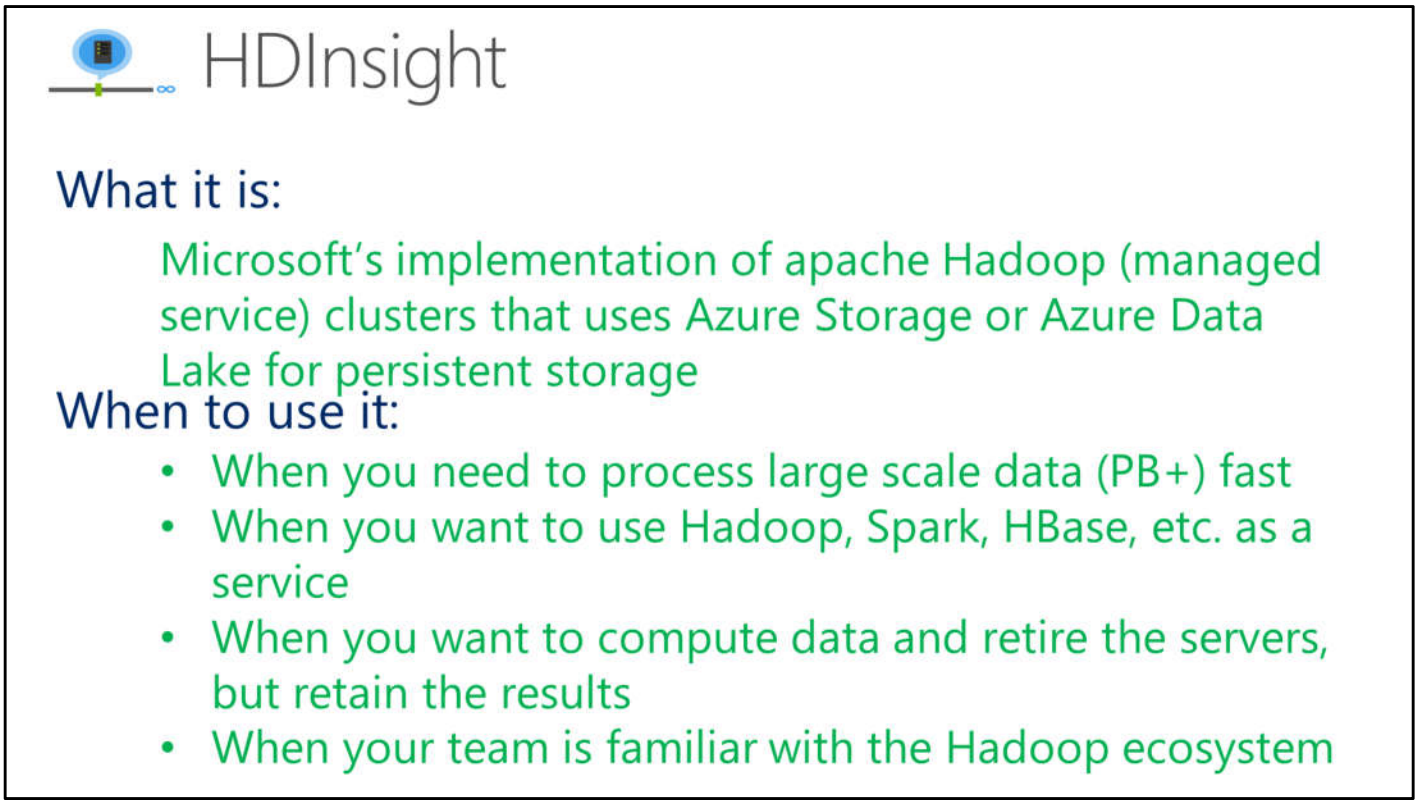
What it is:

A scalable, highly-performing R engine used in on-prem, in-cloud, and in-service areas

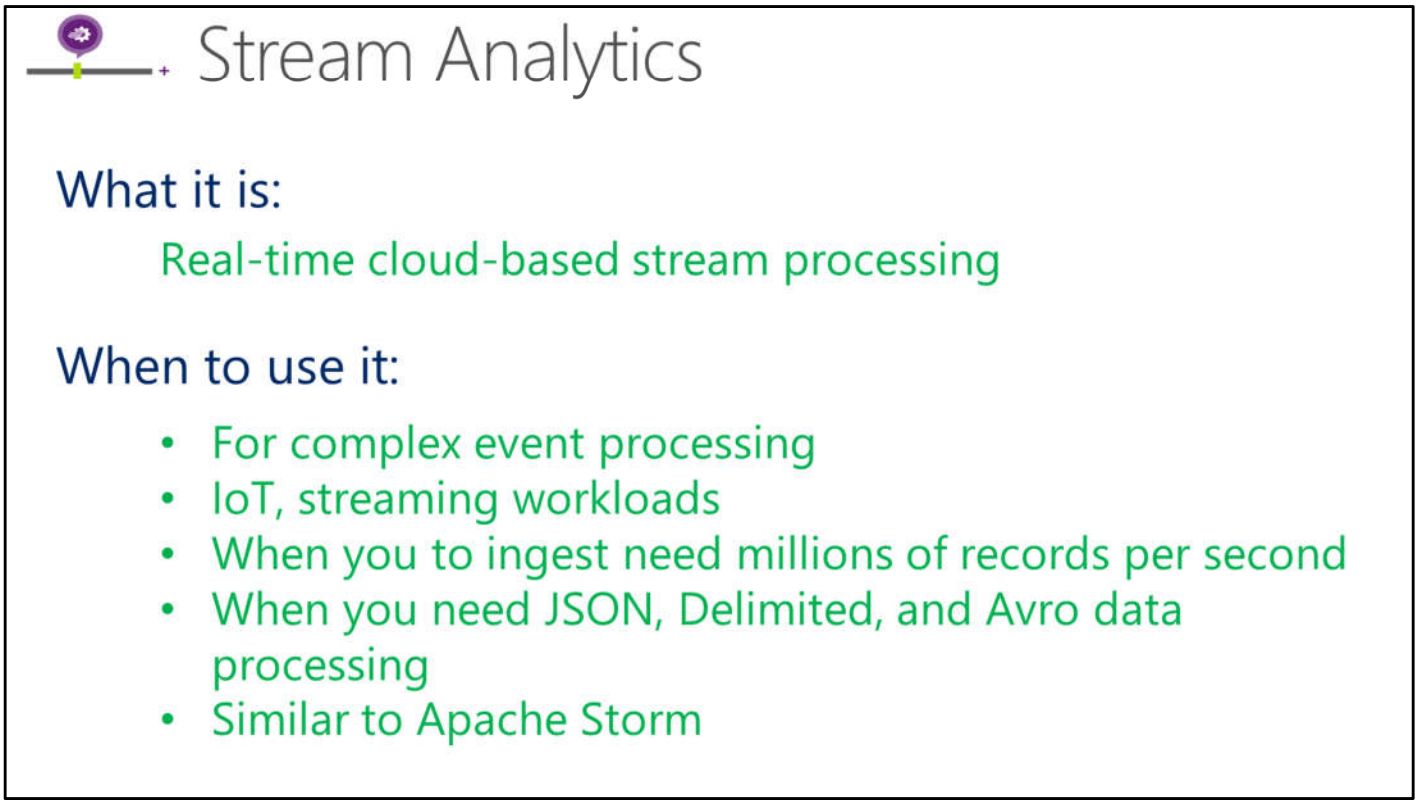
When to use it:

- When you need to use the R language and environment for data processing and analysis at scale
- When you want to perform out-of-core computation on datasets that do not fit into memory
- When you want to perform out-of-core computation in a distributed manner on an HDInsight cluster

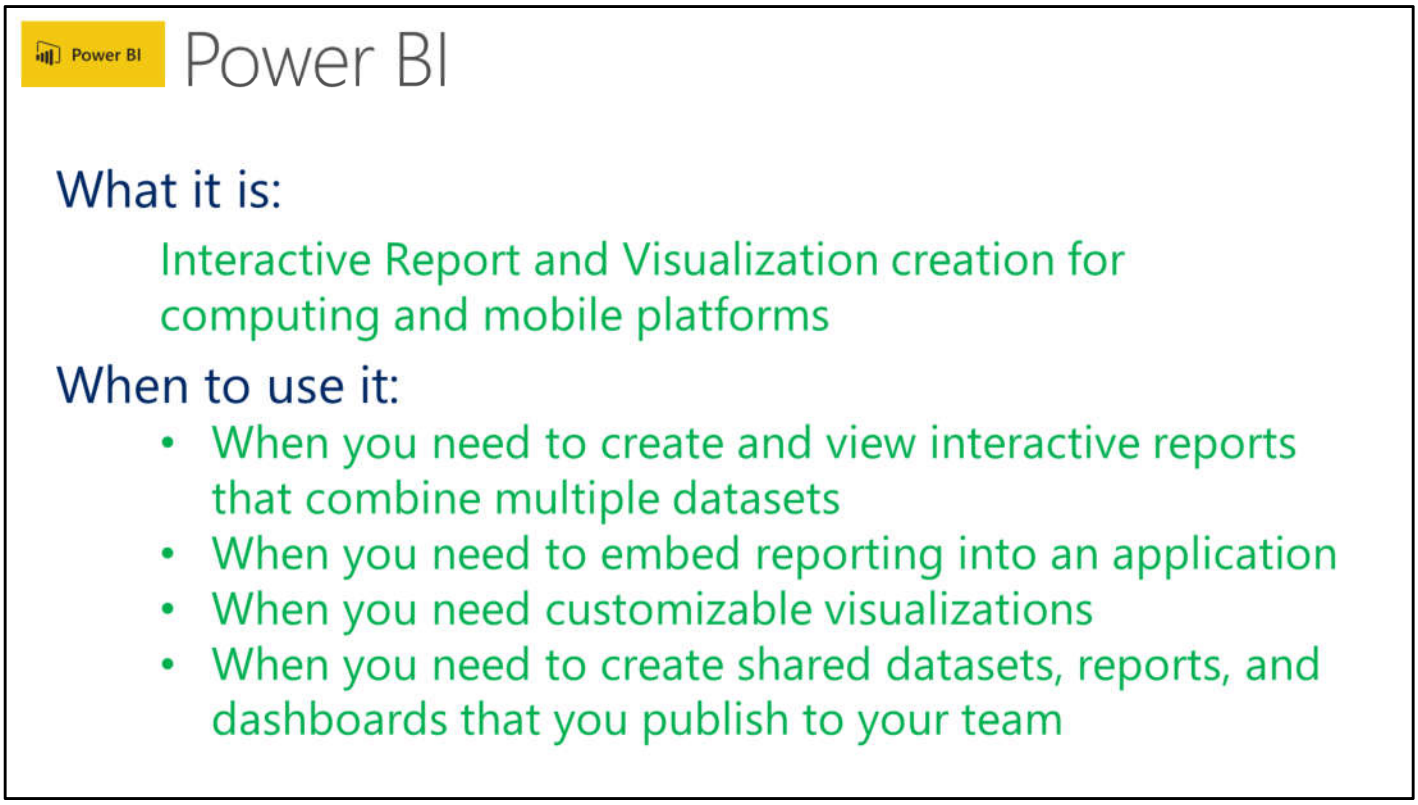
1. Microsoft R Server: https://www.microsoft.com/en-us/server-cloud/products/r-server/



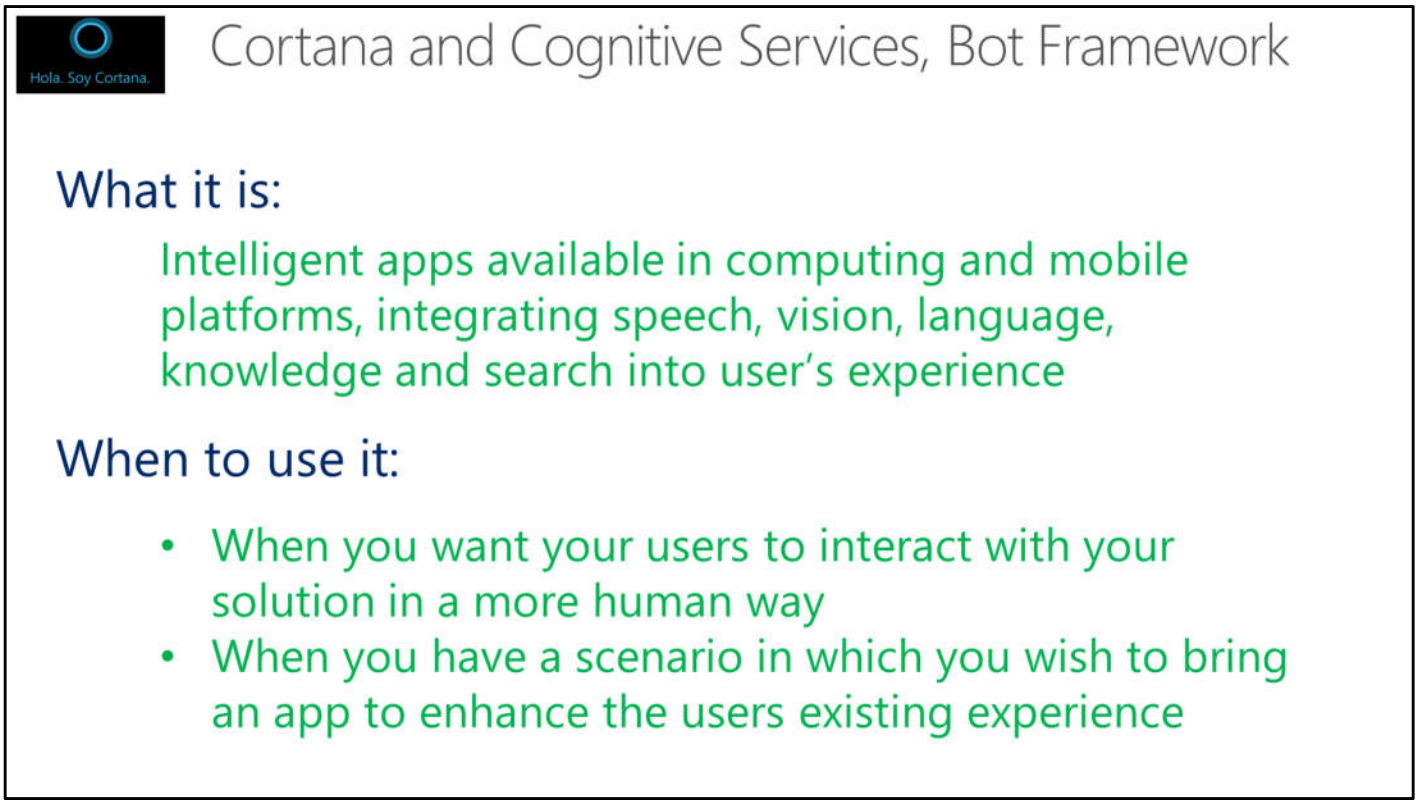
1. Azure HDInsight: http://azure.microsoft.com/en-us/services/hdinsight/



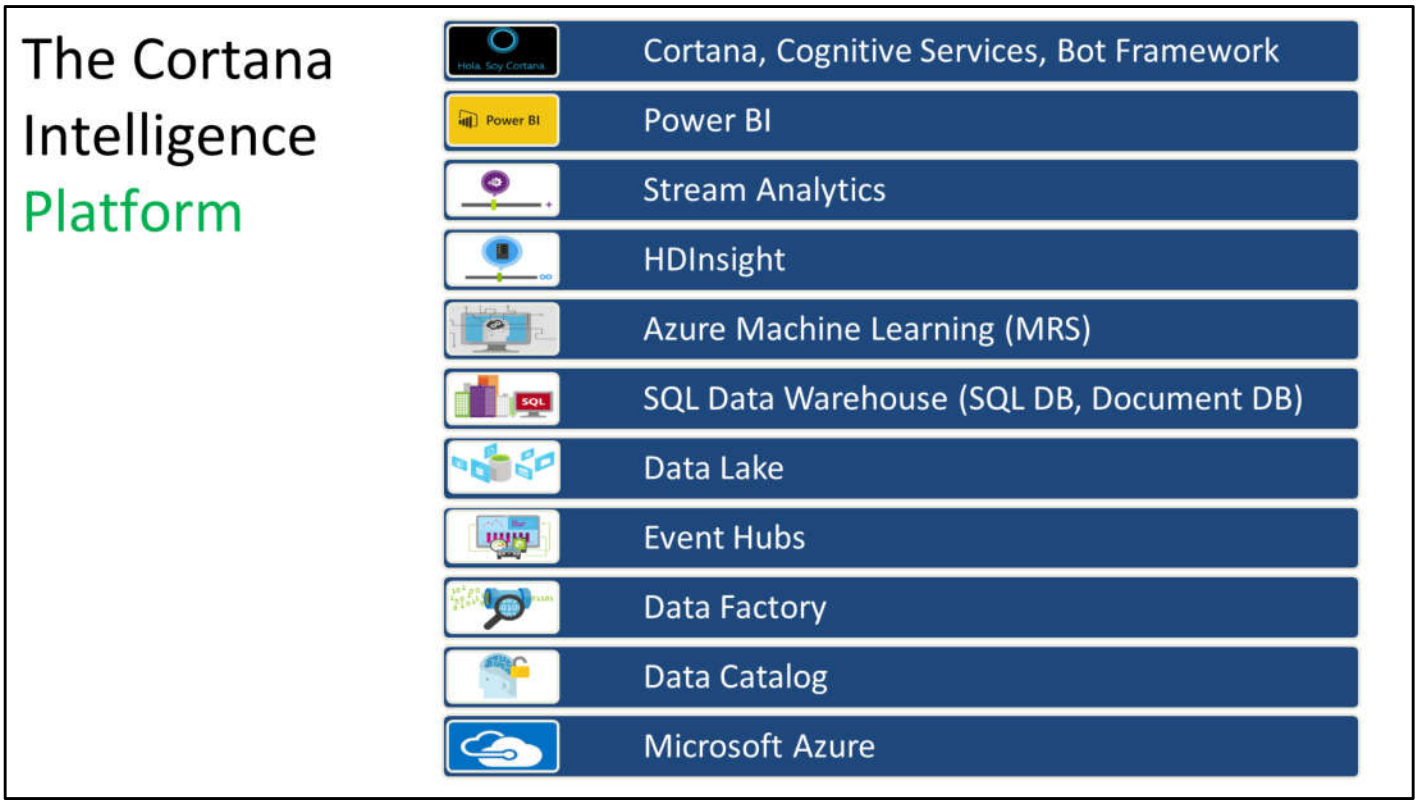
1. Azure Stream Analytics: http://azure.microsoft.com/en-us/services/stream-analytics/



1. Power BI: https://powerbi.microsoft.com/



1. Cortana: http://windows.microsoft.com/en-us/windows-10/getstarted-what-is-Cortana



1. Platform and Storage: Microsoft Azure – http://microsoftazure.com Storage: https://azure.microsoft.com/en-us/documentation/services/storage/ (Host It)
2. Azure Data Catalog: http://azure.microsoft.com/en-us/services/data-catalog (Doc It)
3. Azure Data Factory: http://azure.microsoft.com/en-us/services/data-factory/ (Move It)
4. Azure Event Hubs: http://azure.microsoft.com/en-us/services/event-hubs/ (Bring It)
5. Azure Data Lake: http://azure.microsoft.com/en-us/campaigns/data-lake/ (Store It)
6. Azure DocumentDB: https://azure.microsoft.com/en-us/services/documentdb/ , Azure SQL Data Warehouse: http://azure.microsoft.com/en-us/services/sql-data-warehouse/ (Relate It)
7. Azure Machine Learning: http://azure.microsoft.com/en-us/services/machine-learning/ (Learn It)
8. Azure HDInsight: http://azure.microsoft.com/en-us/services/hdinsight/ (Scale It)
9. Azure Stream Analytics: http://azure.microsoft.com/en-us/services/stream-analytics/ (Stream It)
10. Power BI: https://powerbi.microsoft.com/ (See It)
11. Cortana: http://blogs.windows.com/buildingapps/2014/09/23/cortana-integration-and-speech-recognition-new-code-samples/ and https://blogs.windows.com/buildingapps/2015/08/25/using-cortana-to-interact-with-your-customers-10-by-10/ and https://developer.microsoft.com/en-us/Cortana (Say It)
12. Cognitive Services: https://www.microsoft.com/cognitive-services
13. Bot Framework: https://dev.botframework.com/
14. All of the components within the suite: https://www.microsoft.com/en-us/server-cloud/cortana-intelligence-suite/what-is-cortana-intelligence.aspx
15. What can I do with it? https://gallery.cortanaintelligence.com/

16. Getting Started Quickly: https://cags.azure.net/#gallery

Module 3:
Setting up Your Development Environment

30

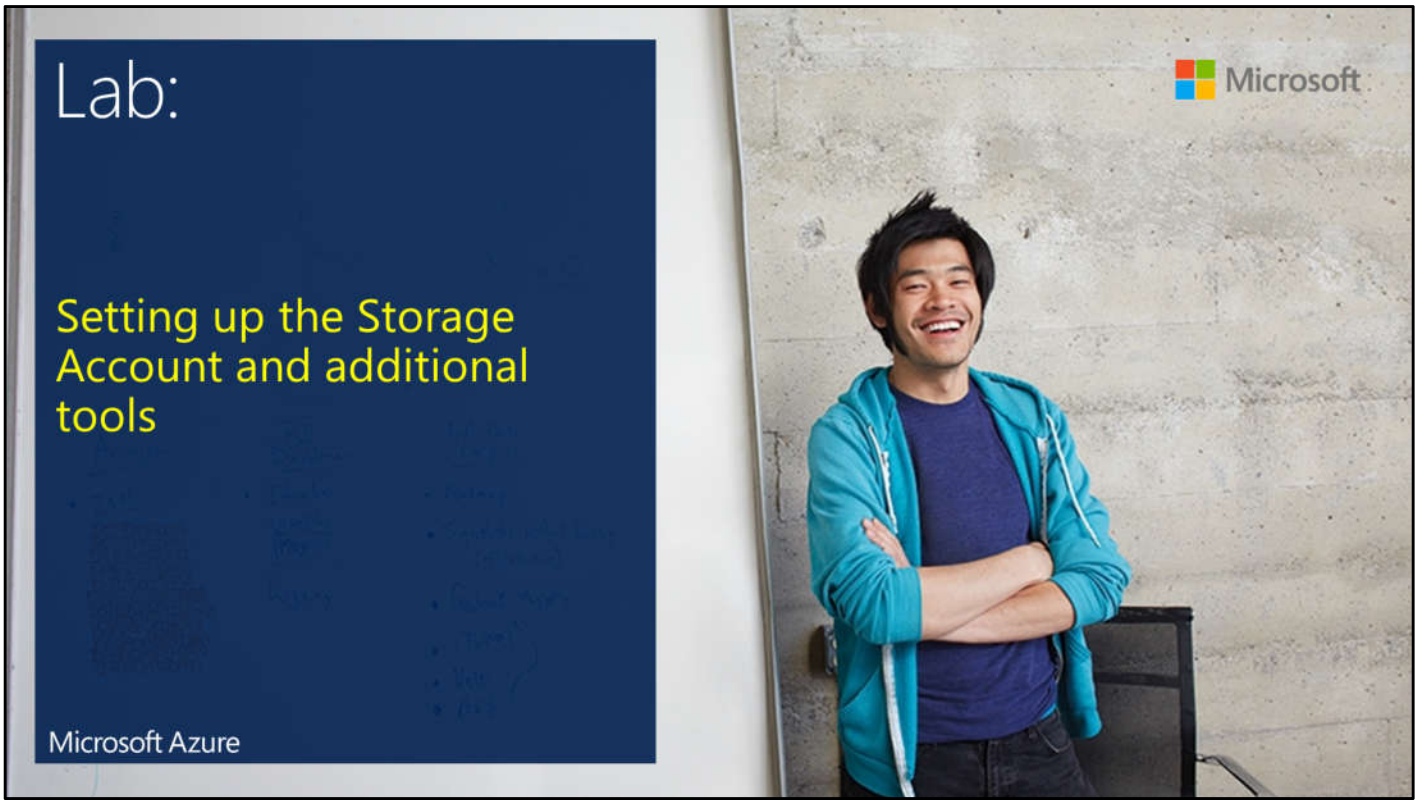
1. Using Azure for Dev/Test: https://azure.microsoft.com/en-us/solutions/dev-test/

Primary Development Tools:

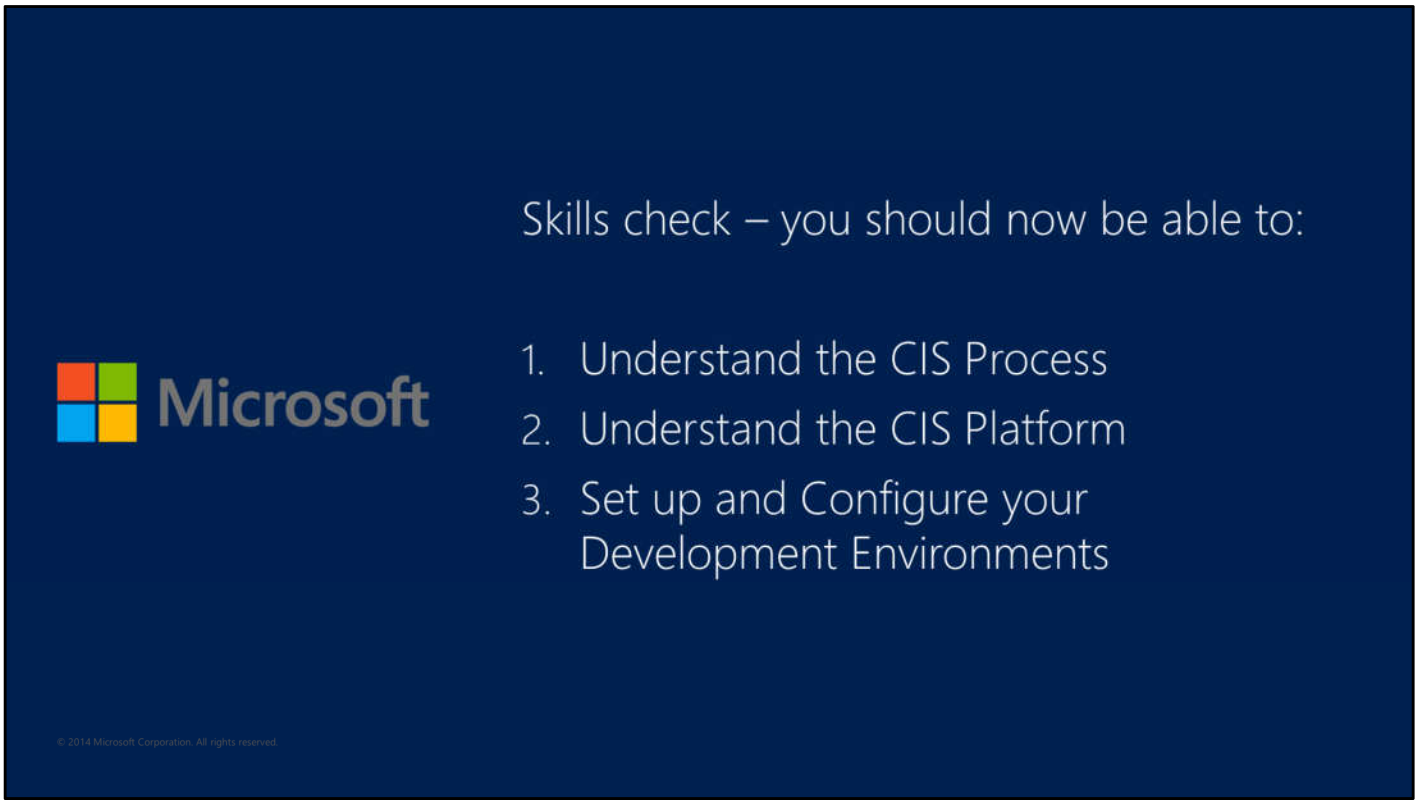
- The Azure Portal
- Azure SDKs
- Azure PowerShell and ARM Templates
- Azure Data Catalog
- Azure ML tools
- Visual Studio (plus PTVS and RTVS)
- Storage Explorer

1. The Azure Portal: https://portal.azure.com/ and OMS: https://azure.microsoft.com/en-us/documentation/articles/operations-management-suite-overview/ - also, customizations: https://www.youtube.com/playlist?list=PLFuGXEPUdlxLwxsfkvpdvAGInsLDfgvvC
2. Azure SDK: https://go.microsoft.com/fwlink/?linkid=518003&clcid=0x409
3. Azure Powershell: https://azure.microsoft.com/en-us/documentation/articles/powershell-install-configure/#what-is-azure-powershell and ARM Templates: https://azure.microsoft.com/en-us/documentation/articles/resource-group-overview/
4. Azure Data Catalog (use an inPrivate browser tab): http://azuredatacatalog.com
5. Azure Machine Learning: http://studio.azureml.net
6. Visual Studio Interface: https://msdn.microsoft.com/en-us/library/dn762121.aspx
7. Installing R Tools for Visual Studio (RTVS): https://www.visualstudio.com/en-us/features/rtvs-vs.aspx
8. Azure PowerShell: http://aka.ms/webpi-azps
9. Storage Explorer:

https://go.microsoft.com/fwlink/?linkid=698844&clcid=0x409



1. Create a Storage Account in the region closest to the class location – note the name and access keys
2. Connect to the Azure Data Catalog as described in the classroom login information
3. Connect to http://studio.azureml.net and create a free account for the class


Microsoft
Skills check – you should now be able to:
1. Understand the CIS Process
2. Understand the CIS Platform
3. Set up and Configure your Development Environments
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Questions?