

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.

## Section 7 Learning Objectives

1. Understand how to use CIS in Advanced Analytic Projects
2. Know where to find more information
3. Know how to extrapolate this process to other business cases

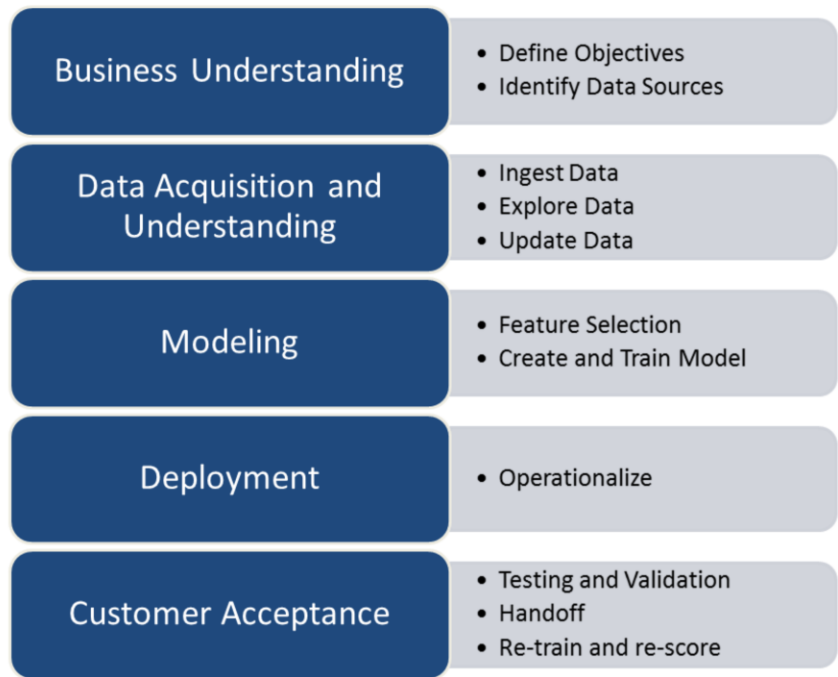


1. At the end of this Module, you will:
  1. Understand how to use CIS in Advanced Analytic Projects
  2. Know where to find more information
  3. Know how to extrapolate this process to other business cases

## The Data Science Process and Platform














## The Team Data Science Process



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 to management and monitor

# The Cortana Intelligence Platform

	Cortana, Cognitive Services, Bot Framework
	Power BI
	Stream Analytics
	HDInsight
	Azure Machine Learning (MRS)
	SQL Data Warehouse (SQL DB, Document DB)
	Data Lake
	Event Hubs
	Data Factory
	Data Catalog
	Microsoft Azure

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://caqs.azure.net/#gallery>

# Business Case

AdventureWorks is a company that makes and sells bicycles. The sales are conducted around the world. We also support our products. But as we've made more sales in the last 10 years, we've farmed out the support function to various companies that take in maintenance and support issues in call centers around the world.

We're growing. And now we want to take our bicycles to several large retailers, but a few of them want to know a lot about our churn rate.

For over 10 years, we've collected a lot of information about our customers and of course we know a lot about our products. But since we've outsourced our call centers, we don't own the databases that hold their data – they will give us an export, though. (They support multiple customers)

We're not sure about our churn rate – we have the data of who has and has not bought again, and we think we can get the data from the call centers for the complaints and repairs, but we need a way to analyze a lot of data that has different formats to find a prediction of who will churn and who will not.

Ideally we want a list of customers we think will churn, in a structured database we could share out to our potential resellers sales staff, so they know how to target at-risk and new clients.

More on our in-house data: <https://technet.microsoft.com/en-us/library/ms124501%28v=sql.100%29.aspx>



1. AdventureWorks Data Dictionary:  
[https://technet.microsoft.com/en-us/library/ms124438\(v=sql.100\).aspx](https://technet.microsoft.com/en-us/library/ms124438(v=sql.100).aspx)



# Business Case

AdventureWorks is a company that makes and sells bicycles. The sales are conducted around the world. We also support our products. But as we've made more sales in the last 10 years, we've farmed out the support function to various companies that take in maintenance and support issues in call centers around the world.

We're growing. And now we want to take our bicycles to several large retailers, but a few of them want to know a lot about our churn rate.

For over 10 years, we've collected a lot of information about our customers and of course we know a lot about our products. But since we've outsourced our call centers, we don't own the databases that hold their data – they will give us an export, though. (They support multiple customers)

We're not sure about our churn rate – we have the data of who has and has not bought again, and we think we can get the data from the call centers for the complaints and repairs, but we need a way to analyze a lot of data that has different formats to find a prediction of who will churn and who will not.

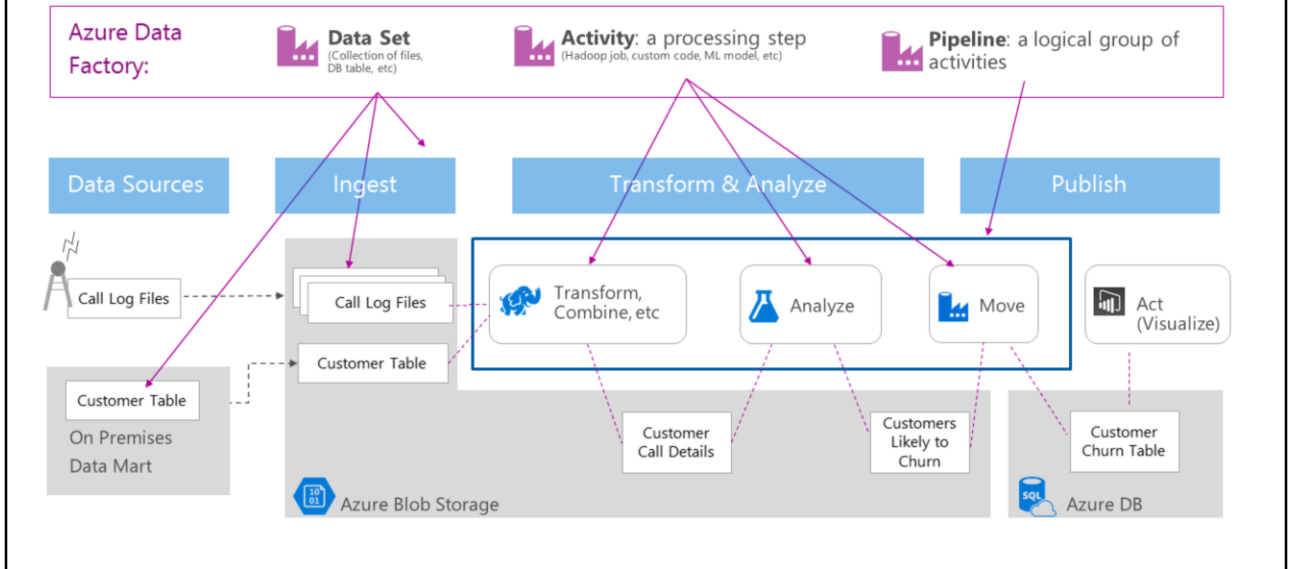
Ideally we want a list of customers we think will churn, in a structured database we could share out to our potential resellers sales staff, so they know how to target at-risk and new clients.

More on our in-house data: <https://technet.microsoft.com/en-us/library/ms124501%28v=sql.100%29.aspx>



1. AdventureWorks Data Dictionary:  
[https://technet.microsoft.com/en-us/library/ms124438\(v=sql.100\).aspx](https://technet.microsoft.com/en-us/library/ms124438(v=sql.100).aspx)

## Example - Churn



1. Video of this process: <https://azure.microsoft.com/en-us/documentation/videos/azure-data-factory-102-analyzing-complex-churn-models-with-azure-data-factory/>

# What to use for Data



1. A discussion of this graphic:  
<https://buckwoody.wordpress.com/2016/05/16/the-cortana-intelligence-suite-what-to-use-when/>

# What to use for Compute



Event Hubs



- High Throughput Data Ingestion System
- Great for IoT & Streaming Solutions
- Ingest up to 1 Million messages per second
- Fully Managed & Very Easy to setup
- Similar to Apache Kafka
- IoT Hub uses Event Hubs underneath the covers



Stream Analytics



- Complex Event Processing (CEP) Engine
- When you want to query your Real-time data, IoT, notification & alerting scenarios.
- SQL-like Language constructs
- Support for JSON, Delimited (eg: CSV) and Avro
- Open Source Equivalent: Apache Storm



Search



- Simple to build a great search experience into web and mobile apps
- Use with Azure SQL DB, DocumentDB, Table & Blob Storage
- Leverage advanced linguistic capabilities with deep understanding of 56 languages
- Simple to scale and manage
- Uses Machine Learning APIs to understand past user behavior and make recommendations



HDInsight



- Fully managed Spark & Hadoop on Azure
- Handles both, No-SQL & rectangular (relational) data
- Use it when you're trying to solve big data problems (handles > 1 PB of data)
- Use Data Lake Store or Blob Storage as your storage layer
- Delete & re-create your cluster without losing any data



Machine Learning



- Use it to perform predictive analytics
- SSIS-like drag & drop features
- Built-in Machine Learning Algorithms for Classification, Regression, Clustering & Anomaly Detection
- Support for R & Python to build custom models
- One-click Operationalization



Data Factory



- Orchestrator of your data pipelines
- Does not do any processing (except for Copy Activity)
- Use it to schedule your batch-style workloads
- Support for pulling data from various on-premise systems
- Not to be used for Real-time scenarios.
- Great for Calling & Re-training Machine Learning APIs

1. A discussion of this graphic:  
<https://buckwoody.wordpress.com/2016/05/16/the-cortana-intelligence-suite-what-to-use-when/>



- Select one of the following scenarios. Create a Business Case, a Solution Diagram, and a description of why you chose each technology in your solution and how the data flow path will work. Be as detailed as you can. You can submit three documents or including them all in one – Word, PDF, PowerPoint or Visio are all acceptable tools.
1. Using the Contoso Medical Scenario, find the Marketing Partners bullet. How could you use the CIS process and platform to assist in determining optimal promotions?  
<https://msdn.microsoft.com/en-us/library/ff650330.aspx>
  2. Contoso auto repairs wants to be able to predict the flow of repairs through their shops nation-wide, to properly staff, equip, set pricing and inventory for their operations. Which datasets do you think they need to collect to have this kind of predictive model? How would you go about

documenting and ingesting this data?

<https://msdn.microsoft.com/en-us/library/ee861194.aspx>

3. Contoso University wants to predict which students they should accept from high-schools around the country that will complete their degrees, and offer the best scores to the college. What processes can they use to determine these students, and which CIS platform elements could they use to create a yearly report for the Board of Admissions to give the most numerically accurate number? Describe your solution.



1. Understand how to use CIS in Advanced Analytic Projects
2. Know where to find more information
3. Know how to extrapolate this process to other business cases

© 2018 Microsoft Corporation. All rights reserved.

Questions?