



PREDICTING EMPLOYEE ATTRITION USING FUNCTION APP AND POWER BI

SUMMARY:

In order to predict employee attrition, the human resources team must make decisions in an organization. There are many complex, interrelated variables that impact the likelihood of employees quitting, which makes it extremely difficult to manually predict which employees will quit when they'll quit and why they'll quit, especially at scale.





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Problem statement

Client

It is critical to managing staff attrition to achieve low and healthy turnover rates to preserve organizational performance and, as a result, a competitive advantage. Data-driven decisions and function app have been introduced as a result of the pressure on HR departments to give value to the firm. High employee attrition rates are now seen as a problem for businesses, putting more pressure on HR teams to keep attrition.







Solution/ Architecture

Architecture



Following are the Azure service used to create the solution:

- Storage Account
- Function App
- Application insight
- Key Vault
- SQL Server
- SQL Database
- Analytic Service
- Power BI Desktop
- Storage Simulator





Power BI Dashboard



Single Employee







Technical Details and Implementation of solution

Git Repository

https://github.com/SandyGhule/PREDICTING-EMPLOYEE-ATTRITION-USING-FUNCTION-APP-AND-POWER-BI.git

Data Pattern

Following are the several parameters that will help us make the prediction. This data is available with the HR. Some of the questions we must ask employees as part of the survey include environmental satisfaction, job satisfaction, job involvement, and so on.

Employee No.	XXXX
Salary	Low/Medium/High
Age	22-60
DistanceFromHome	40-1
Education	Graduate/PostGraduate/PGDiploma
EnvironmentSatisfaction	0-5
JobInvolvement	0-5
JobLevel	EntryLevel/Intermediate/Experienced/Management/SeniorManagement
JobSatisfaction	0-10
Department	Sales/Engineering/Product/Support/Admin/IT/Finance/Management/Marketing
NumCompaniesWorked	0-8
PercentSalaryHike	0-50
PerformanceRating	Unacceptable/NeedsImprovement/MeetsExpectations/ExceedsExpectations/Out standing
RelationshipSatisfaction	0-5
TotalWorkingYears	0-40
TrainingTimesLastYear	10-120
WorkLifeBalance	Poor/Fair/Good
YearsAtCompany	0-30
YearsInCurrentRole	0-15
YearsSinceLastPromotion	0-10
YearsWithCurrManager	0-20

Storage Account

- To test on a local machine
- 1. Launch the Storage Emulator.
- 2. Open Storage Explorer and navigate to Blob Containers in developer storage.





👬 Microsoft Azure Storage Explorer

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Ċ,	 (Local and Attached)
•	 Cosmos DB Accounts (Preview)
	Storage Accounts
	 (Development)
	📄 Blob Containers
	Queues
	Tables

3. Right-click on Blob Containers and choose Create Blob Container. This opens a node that you can type the name for the container: import. Hit ENTER and the container details load.

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4. In Visual Studio, click the debug button or press F5 to start debugging.

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Toolt			ė	"Values": {
ŏx				"AzureWebJobsStorage": "UseDevelopmentStorage=true",
				"AzureWebJobsDashboard": "UseDevelopmentStorage=true"
				}
			[}	

5. Wait for the functions host to start running. The console eventually shows the text Debugger listening on [::]:5858 (your port may be different.)





6. In the Storage Explorer window for the import container, click the Upload button and choose the Upload folder... option.

🖻 import 🗙	
	ightarrow
Upload Download	Open
Upload Folder	
Upload Files	N

7. In the Upload Folder dialog, select the data folder that is provided with this tutorial. Make sure Blob type is set to Block blob and Upload to folder (optional) is empty. Click Upload.

Microsoft Azure Storage Explorer - Upload Files to Blob Container	\times
Upload folder	
Folder	
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Blob type	
Block Blob	•
✓ Upload .vhd/vhdx files as page blobs (recommended)	
Upload to folder (optional)	
Upload Cance	I

- 8. Confirm the files in the folder were processed by checking the logs in the function host console window.
- 9. Stop the debugging session
- 10. Delete the data folder and files from the storage emulator.
- On Azure Cloud
- 1. Create storage account on portal
- 2. Create container with name as import





Size Lease state 803 8 Available …

Blob type Block blob

Access tier Archive status

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Home > Storage accounts > fileprocess	orappstorage Containers >	
Container ····		
	$\overline{\uparrow}$ Upload $\stackrel{ightarrow}{\frown}$ Change access level $\stackrel{ightarrow}{\bigcirc}$ Refresh \mid $\stackrel{ightarrow}{\boxplus}$ Delete \rightleftharpoons Change tier \mathscr{S} Acquire lease \mathscr{S} Break lease \checkmark View snapshots	🗗 Create snapshot
Overview	Authentication method: Access key (Switch to Azure AD User Account)	
Diagnose and solve problems	Location: import	
Access Control (IAM)	Search blobs by prefix (case-sensitive)	Show deleted blobs

Modified

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Settings
Constraints
Shared access tokens
Constraints

Name

🗌 📄 Hr_Data.csv

- Properties
 Metadata
- Metadata





Function App

1. Inside Visual Studio, from the Solution Explorer right-click on the project name and choose Publish....



2. Choose Azure Function App, check Create New, and click Publish.

Connected Services Publish	Publish Publish your app to Azure or another host. Learn more
	Azure Function App C Create New Solect Eviction
	Publish

- 3. Give the app a unique name, choose your Subscription, and select the same Resource Group. For App Service Plan click New....
- 4. Give the plan a unique name, choose the Location, and pick Consumption for the Size. Click OK.
- 5. Back in the Create App Service dialog, click Create.

Bosch Global Software Technologies alt_future				n	
Home > FileProcessorApplication					
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,	🕂 Create 🖒 Refresh 🛛 📋	Delete			
Overview	Use your local development en	vironment to edit this Function App. This Function App w	vas created in a local environment and cannot be edited	in the Azure portal.	
 Activity log 					
Access control (IAM)	P Filter by name				
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Diagnose and solve problems	Name ↑↓	Trigger ↑↓	Status ↑↓	Monitor $\uparrow \downarrow$	
Microsoft Defender for Cloud	FileProcessEn	Blob	Enabled	Invocations and more	
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Deployment					
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- 6. The publish shows build output and eventually the text Publish completed. when it's done.
- 7. Open your Azure SQL Database in the Azure portal and navigate to Connection Strings. Copy the connection string for ADO.NET.
- 8. Navigate to the function app in the portal. Click Application settings.
- 9. Scroll to the Connection strings section. Click + Add new connection string. Type TodoContext for the name, paste the value from step 7 (be sure to update {your_username} and {your_password} to the correct values), and set the type to SQLAzure.

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Custom domains (classic)	Connection strings					
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- 10. Above the Connection strings section is Application settings. Note the AccountName from the AzureWebJobsStorage entry to get the storage account name.
- 11. Scroll to the top and click Save.





1. Create azure SQL database.

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Juery editor (preview)	Subscription (move)	: AA-AS-EIT2-DEV-Sandbox	P	ricing tier	: Basic		
Settings	Subscription ID	: 4300dd39-cd19-4fb6-be0c-a67e3623a2be	E	arliest restore point	: 2023-01-10 11:21 UTC		
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Sync to other databases	60%						
Integrations	50%						
	30%						
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- 2. Go to Query Editor and login with credentials
 - Home > AttritionRateDb (attritionratemeas

AttritionRateDb (attri
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Diagnose and solve problems
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3. Create table with following Query

```
CREATE TABLE [dbo].[EmpDatas](
   [Id] [int] IDENTITY(1,1) NOT NULL,
   [EmpId] [int] NOT NULL,
   [Salary] [nvarchar](max) NULL,
   [Age] [int] NOT NULL,
   [DistanceFromHome] [int] NOT NULL,
   [Education] [nvarchar](max) NULL,
   [EnvironmentSatisfaction] [int] NOT NULL,
```





[JobInvolvement] [int] NOT NULL, [JobLevel] [nvarchar](max) NULL, [JobSatisfaction] [int] NOT NULL, [Department] [nvarchar](max) NULL, [NumCompaniesWorked] [int] NOT NULL, [PercentSalaryHike] [int] NOT NULL, [PerformanceRating] [nvarchar](max) NULL, [RelationshipSatisfaction] [int] NOT NULL, [TotalWorkingYears] [int] NOT NULL, [TrainingTimesLastYear] [int] NOT NULL, [VearsAtCompany] [int] NOT NULL, [YearsAtCompany] [int] NOT NULL, [YearsSinceLastPromotion] [int] NOT NULL, [YearsWithCurrManager] [int] NOT NULL, [Prediction] [nvarchar](max) NULL)

Analysis Service

1. Create Analytic service in azure portal



2. Connect service through visual studio



3. Change server name localhost to server name and deploy the changes.





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4. Connect this analysis service with Power BI desktop tool

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Power BI Desktop

- 1. Open Power BI Desktop
- 2. Connect to Analysis service or Azure database
- 3. Create visuals according to need.







Challenges in implementing the solution

- Connect Power BI Desktop with the Analytic Service.
- I was facing issues with the SQL database connection.
- Collecting the parameters and manually creating the CSV file
- Creating different visuals in Power BI

Business Benefit

- If the company was aware of the risk of losing that resource ahead of time, they would plan ahead of time to intervene or have a road map of that resource being less critical in the upcoming project.
- Getting good visuals based on the respected data. Like we can compare the Job Satisfaction level with Salary and Promotions.
- The more years a person spends in a role, the more knowledge and expertise they acquire, which translates to higher productivity levels and an increase in revenue.
- Long-serving employees contribute to a great employee experience as they can mentor junior members of staff.
- Long-serving employees are usually well-aligned with the organisation they work for and share similar values and attitudes.
- when people join a company, different roles require different levels of training and it's highly expensive.
- Employee engagement is a concept that describes the emotional connection a person has with their place of work.
- Often, the longer your employees stay in your organisation the better they get at their job. Additionally, they may have also worked in several roles and consequently have a thorough understanding of how different departments work.
- Depending on a person's role it can take up to 8 months for them to reach an optimal level of productivity