CDW Documentation

AI Chatbot with Sentiment and In Kind Responses

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Requirements

1. Azure Resources Checklist

Resource Type	Name (per your setup)	Notes
Function App	dehamerfuncapp	Your C# Azure Function app
Storage Account	Linked to Function App	Required for deployment—should auto-create if –functions-version specified
Azure Cognitive Services (Text Analytics)	dehamersentimentai	For sentiment classification
Azure OpenAI	don-openai-useast	For GPT-4.1-based reply generation

Prerequisites

Install These

```
brew install dotnet-sdk #This will be version 9 which will not work but
gives you the rest of the stuff needed.
brew install azure-cli
```

Assuming you already have created a Resource Group named don-test-rg, an OpenAI deployment named don-openai-useast, and deployed a gpt model named gpt-4.1 inside openai. Those all require the portal.

Install this from the webpage and follow directions. dotnet 8.x

Then these

```
dotnet add package Microsoft.Azure.Functions.Worker.Extensions.OpenApi --
version 1.4.0
dotnet --list-sdks
dotnet add package Azure.AI.TextAnalytics --version 5.3.0
dotnet add package Azure.AI.OpenAI --version 2.0.0
```

Create Storage Account

```
az storage account create \
  --name dehamerfuncstorage \
  --location eastus \
  --resource-group don-test-rg \
  --sku Standard_LRS
```

Create Function Plan for Windows

```
az functionapp plan create \
  --resource-group don-test-rg \
  --name dehamerfuncplan \
  --location eastus \
  --sku B1 \
  --is-linux false
```

Create Function App

```
az functionapp create \
  --resource-group don-test-rg \
  --name dehamerfuncapp \
  --plan dehamerfuncplan \
  --storage-account dehamerfunctstorage \
  --runtime dotnet-isolated \
  --functions-version 4 \
  --os-type Windows
```

Create TexAnalytics

```
az cognitiveservices account create \
  --name dehamersentimentai \
  --resource-group don-test-rg \
  --location eastus \
  --kind TextAnalytics \
  --sku S \
  --custom-domain dehamersentimentai

az cognitiveservices account update \
  --name dehamersentimentai \
  --resource-group don-test-rg \
  --set properties.publicNetworkAccess=Enabled
```

Get keys and endpoint for export and app settings

```
export TEXT_ANALYTICS_ENDPOINT=`az cognitiveservices account show \
  --name dehamersentimentai \
  --resource-group don-test-rg \
  --query "properties.endpoint"|sed -e s:\"::g`

export TEXT_ANALYTICS_KEY=`az cognitiveservices account keys list \
  --name dehamersentamentai \
  --resource-group don-test-rg \
  --query "key1" -o tsv`

az functionapp config appsettings set \
  --name dehamerfuncapp \
  --resource-group don-test-rg \
  --settings \
  TEXT_ANALYTICS_ENDPOINT=$TEXT_ANALYTICS_ENDPOINT \
```

```
  TEXT_ANALYTICS_KEY=$TEXT_ANALYTICS_KEY
export OPENAI_KEY=`az cognitiveservices account keys list \
  --name don-openai-useast \
  --resource-group don-test-rg \
  --query "key1" -o tsv`

export OPENAI_ENDPOINT=https://don-openai-useast.openai.azure.com/

az functionapp config appsettings set \
  --name dehamerfuncapp \
  --resource-group don-test-rg \
  --settings \
  OPENAI_KEY=$OPENAI_KEY \
  OPENAI_ENDPOINT=$OPENAI_ENDPOINT
#Confirm they were set
az functionapp config appsettings list \
  --name dehamerfuncapp \
  --resource-group don-test-rg \
  --query "[?starts_with(name, 'TEXT_') || starts_with(name, 'OPENAI_')]" -o
table
```

Create a directory to store the functionapp files

```
mkdir ~/FeedbackFunctionDotNet
cd ~/FeedbackFunctionDotNet
```

Save the FeedbackFunction.cs, FeedbackFunction.csproj, global.json, host.json, local.settings.json, and program.cs into the FeedBackFunctionDotNet directory.

FeedbackFunction.cs

```
using System.Net.Http.Headers;
using System.Text;
using System.Text.Json;
using Azure;
using Azure.AI.TextAnalytics;
using Microsoft.Azure.Functions.Worker;
using Microsoft.Azure.Functions.Worker.Http;
using Microsoft.Extensions.Logging;

public class DeHamerFeedbackFunction
{
    private readonly ILogger _logger;

    public DeHamerFeedbackFunction(ILoggerFactory loggerFactory)
    {
        _logger =
loggerFactory.CreateLogger<DeHamerFeedbackFunction>();
    }

    [Function("DeHamerFeedbackFunction")]
```

```
    public async Task<HttpResponseData> Run(
        [HttpTrigger(AuthorizationLevel.Anonymous, "post", Route =
null)]
        HttpRequestData req)
    {
        _logger.LogInformation("DeHamerFeedbackFunction triggered.");

        var requestBody = await new
StreamReader(req.Body).ReadToEndAsync();
        var data = JsonSerializer.Deserialize<Dictionary<string,
string>>(requestBody);
        string feedback = data?["feedback"] ?? string.Empty;

        // Get Text Analytics config
        var textEndpoint =
Environment.GetEnvironmentVariable("TEXT_ANALYTICS_ENDPOINT");
        var textKey =
Environment.GetEnvironmentVariable("TEXT_ANALYTICS_KEY");

        _logger.LogInformation("Using Text Analytics endpoint:
{endpoint}", textEndpoint);

        var credentials = new AzureKeyCredential(textKey);
        var client = new TextAnalyticsClient(new Uri(textEndpoint),
credentials);
        var documentSentiment = await
client.AnalyzeSentimentAsync(feedback);
        var sentiment =
documentSentiment.Value.Sentiment.ToString().ToLower();

        _logger.LogInformation("Sentiment detected: {sentiment}",
sentiment);

        // Compose prompt
        string prompt = sentiment switch
        {
            "positive" => $"Respond in a cheerful and thankful tone to
the following positive customer feedback:\n\"{feedback}\"",
            "negative" => $"Respond in a harsh, sarcastic, and annoyed
tone to the following negative customer feedback:\n\"{feedback}\"",
            _ => $"Respond neutrally and professionally to the
following feedback:\n\"{feedback}\""
        };

        // OpenAI Setup
        var openaiEndpoint =
Environment.GetEnvironmentVariable("OPENAI_API_ENDPOINT")?.TrimEnd('/')
;
        var openaiKey =
Environment.GetEnvironmentVariable("OPENAI_API_KEY");
        var deployment =
```

```
Environment.GetEnvironmentVariable("OPENAI_DEPLOYMENT");

        _logger.LogInformation("Calling OpenAI at: {url}",
$"{openaiEndpoint}/openai/deployments/{deployment}/chat/completions");

        using var httpClient = new HttpClient();
        httpClient.DefaultRequestHeaders.Authorization = new
AuthenticationHeaderValue("Bearer", openaiKey);

        var payload = JsonSerializer.Serialize(new
        {
            messages = new[]
            {
                new { role = "system", content = "You are a customer
support agent who mirrors the customer's sentiment tone." },
                new { role = "user", content = prompt }
            }
        });

        _logger.LogInformation("Payload sent to OpenAI: {payload}",
payload);

        var response = await httpClient.PostAsync(
$"{openaiEndpoint}/openai/deployments/{deployment}/chat/completions?api
-version=2024-02-15-preview",
            new StringContent(payload, Encoding.UTF8,
"application/json"));

        if (!response.IsSuccessStatusCode)
        {
            var errorDetails = await
response.Content.ReadAsStringAsync();
            _logger.LogError("OpenAI API call failed: {status} -
{details}", response.StatusCode, errorDetails);

            var errorResponse =
req.CreateResponse(System.Net.HttpStatusCode.InternalServerError);
            await errorResponse.WriteAsJsonAsync(new { error = "Failed
to get OpenAI response", status = response.StatusCode, details =
errorDetails });
            return errorResponse;
        }

        var json = JsonDocument.Parse(await
response.Content.ReadAsStringAsync());
        _logger.LogInformation("Raw OpenAI response: {json}", json);

        var message =
json.RootElement.GetProperty("choices")[0].GetProperty("message").GetPr
operty("content").GetString();
```

```
        var result = new
        {
            sentiment = sentiment,
            message = message
        };

        var responseData =
req.CreateResponse(System.Net.HttpStatusCode.OK);
        await responseData.WriteAsJsonAsync(result);
        return responseData;
    }
}
```

FeeedbackFunction.csproj

```
<Project Sdk="Microsoft.NET.Sdk.Worker">
  <PropertyGroup>
    <TargetFramework>net8.0</TargetFramework>
    <AzureFunctionsVersion>v4</AzureFunctionsVersion>
    <OutputType>Exe</OutputType>
    <Nullable>enable</Nullable>
    <ImplicitUsings>enable</ImplicitUsings>
  </PropertyGroup>

  <ItemGroup>
    <PackageReference Include="Azure.AI.TextAnalytics" Version="5.3.0"
/>
    <PackageReference Include="Microsoft.Azure.Functions.Worker"
Version="1.17.0" />
    <PackageReference
Include="Microsoft.Azure.Functions.Worker.Extensions.OpenApi"
Version="1.5.0" />
    <PackageReference Include="Microsoft.Azure.Functions.Worker.Sdk"
Version="1.17.0" OutputItemType="Analyzer" />
    <PackageReference
Include="Microsoft.Azure.Functions.Worker.Extensions.Http"
Version="3.1.0" />
    <PackageReference Include="Microsoft.Extensions.Logging.Console"
Version="8.0.0" />
    <PackageReference Include="System.Text.Json" Version="8.0.0" />
  </ItemGroup>

  <ItemGroup>
    <None Update="host.json">
      <CopyToOutputDirectory>PreserveNewest</CopyToOutputDirectory>
    </None>
    <None Update="local.settings.json">
      <CopyToOutputDirectory>PreserveNewest</CopyToOutputDirectory>
      <CopyToPublishDirectory>Never</CopyToPublishDirectory>
    </None>
```

```
  </ItemGroup>

</Project>
```

Make sure this matches the version of dotnet 8.x you install.

global.json

```
{
  "sdk": {
    "version": "8.0.411"
  }
}
```

host.json

```
{
  "version": "2.0"
}
```

local.settings.json

```
{
  "IsEncrypted": false,
  "Values": {
    "AzureWebJobsStorage": "UseDevelopmentStorage=true",
    "FUNCTIONS_WORKER_RUNTIME": "dotnet-isolated"
  }
}
```

program.cs

```
using Microsoft.Extensions.Hosting;
using Microsoft.Extensions.DependencyInjection;

var host = new HostBuilder()
    .ConfigureFunctionsWorkerDefaults()
    .Build();

host.Run();
```

From the FeedbackFunctionDonnet directory:

```
dotnet clean
dotnet publish -c Release -o publish
cd publish
```

```
zip -r ../publish.zip .
cd ..
az functionapp deployment source config-zip --resource-group don-test-rg --
name dehamerfuncapp --src publish.zip
```

After running you will see additional files in the FeedbackFunctionDotnet directory. This is normal.

```
ls
bin                     FeedbackFunction.csproj host.json               obj
publish
FeedbackFunction.cs     global.json             local.settings.json
Program.cs              publish.zip
```

To test if it is working

```
export FUNCTION_KEY=`az functionapp function keys list \
  --name dehamerfuncapp \
  --resource-group don-test-rg \
  --function-name dehamerfeedbackfunction --query "default" | sed -e s:\"::`

curl -X POST
https://dehamerfuncapp.azurewebsites.net/api/dehamerfeedbackfunction \
  -H "x-functions-key: $FUNCTION_KEY" \
  -H "Content-Type: application/json" \
  -d '{"feedback": "This service was trash. I want my time back."}'
```

You should see something like:

```
{"sentiment":"negative","message":"Oh, absolutely\u2014because we totally
specialize in time travel, right? Sorry our \u0022trash\u0022 service
didn\u2019t meet your sky-high expectations. Your valuable time is obviously
worth so much, so thanks for investing it with us just to let us know how
you feel."}%
```

Confirmation tests

```
az functionapp function list --name dehamerfuncapp --resource-group don-
test-rg --query "[].{name:name, status:invokeUrlTemplate}" -o table
Name                                    Status
--------------------------------------  ----------------------------------
------------------------------
dehamerfuncapp/DeHamerFeedbackFunction
https://dehamerfuncapp.azurewebsites.net/api/dehamerfeedbackfunction
```

```
az functionapp show --name dehamerfuncapp --resource-group don-test-rg --
query "enabledHostNames"
[
  "dehamerfuncapp.azurewebsites.net",
  "dehamerfuncapp.scm.azurewebsites.net"
]
```

```
az functionapp function list \
  --name dehamerfuncapp \
  --resource-group don-test-rg \
  --query "[].invokeUrlTemplate" \
  --output tsv

https://dehamerfuncapp.azurewebsites.net/api/dehamerfeedbackfunction
```

```
az functionapp function show \
  --name dehamerfuncapp \
  --resource-group don-test-rg \
  --function-name dehamerfeedbackfunction \
  --query "isDisabled"

false
```

If true

```
az functionapp function update \
  --name dehamerfuncapp \
  --resource-group don-test-rg \
  --function-name dehamerfeedbackfunction \
  --set isDisabled=false
```

Tailing logs if enabled. Notice it says webapp, not functionapp. This is because after deployment the functionapp is in a similar deployment mode to webapps and this command tails logs for both types. You would run this in one terminal logged in with az login and then run the curl from another terminal, also logged in unless you already have the key in your curl statement.

```
az webapp log tail \
  --name dehamerfuncapp \
  --resource-group don-test-rg
```

If you want it to autostart after issues.

```
#Optional
az webapp config set \
  --name dehamerfuncapp \
  --resource-group don-test-rg \
  --always-on true
```

Get a list of your functionapps

```
az functionapp function list \
  --name dehamerfuncapp \
  --resource-group don-test-rg \
  --output table

Href
InvokeUrlTemplate
```

```
IsDisabled    Language         Location    Name
ResourceGroup    ScriptHref
TestData    TestDataHref
-------------------------------------------------------------------------------
----  ------------------------------------------------------------------------
-----------  --------------  ----------  --------------------------------
-----  --------------  ------------------------------------------------------
--------------------------------  ----------  ------------------------------
-------------------------------------------------------------------------------
https://dehamerfuncapp.azurewebsites.net/admin/functions/DeHamerFeedbackFunc
tion  https://dehamerfuncapp.azurewebsites.net/api/dehamerfeedbackfunction
False         dotnet-isolated  East US
dehamerfuncapp/DeHamerFeedbackFunction  don-test-rg
https://dehamerfuncapp.azurewebsites.net/admin/vfs/site/wwwroot/FeedbackFunc
tion.dll
https://dehamerfuncapp.azurewebsites.net/admin/vfs/data/Functions/sampledata
/DeHamerFeedbackFunction.dat
```

Only do this for testing. It's not secure in the real world unless you don't want to have domain restrictions on access to the functionapp. I had to do it so I could test from my home webserver.

```
az functionapp cors add \
  --name dehamerfuncapp \
  --resource-group don-test-rg \
  --allowed-origins "*"
```

If you have a webserver that you trust, you can create this webpage and test it:

index.html

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8" />
  <title>Dennis Feedback Page</title>
  <style>
    body {
      background-color: white;
      color: red;
      font-family: Arial, sans-serif;
      margin: 40px;
    }

    header {
      display: flex;
      align-items: center;
      margin-bottom: 40px;
    }

    header img {
      height: 50px;
```

```
      margin-right: 20px;
    }

    h1 {
      font-size: 2em;
    }

    textarea {
      width: 100%;
      height: 100px;
      font-size: 1em;
      padding: 10px;
    }

    button {
      margin-top: 10px;
      padding: 10px 20px;
      font-size: 1em;
      background-color: red;
      color: white;
      border: none;
      cursor: pointer;
    }

    #response {
      margin-top: 20px;
      font-weight: bold;
      white-space: pre-line;
    }
  </style>
</head>
<body>
  <header>
    <img
src="https://webobjects2.cdw.com/is/image/CDW/cdw23-logo-no-tag-88x48?$
transparent$" alt="CDW Logo" />
    <h1>Dennis Feedback Page</h1>
  </header>

  <form id="feedbackForm">
    <label for="feedback">Enter your feedback:</label><br>
    <textarea id="feedback" name="feedback" required></textarea><br>
    <button type="submit">Submit</button>
  </form>

  <div id="response"></div>

  <script>
    document.getElementById('feedbackForm').addEventListener('submit',
async function (e) {
      e.preventDefault();
```

```
      const feedback = document.getElementById('feedback').value;
      const responseDiv = document.getElementById('response');

      responseDiv.textContent = "Processing...";

      try {
        const res = await
fetch('https://dehamerfuncapp.azurewebsites.net/api/dehamerfeedbackfunc
tion', {
          method: 'POST',
          headers: {
            'Content-Type': 'application/json'
          },
          body: JSON.stringify({ feedback })
        });

        if (!res.ok) {
          throw new Error("API error: " + res.status);
        }

        const data = await res.json();
        responseDiv.innerHTML = `<strong>Sentiment:</strong>
${data.sentiment}<br><strong>Response:</strong> ${data.message}`;
      } catch (err) {
        responseDiv.textContent = "Error: " + err.message;
      }
    });
  </script>
</body>
</html>
```

Dennis Additions

Azure CLI vs Azure Portal Instructions

Task	Azure CLI Command	Azure Portal Steps
Create Resource Group	az group create –name don-test-rg –location eastus	Go to Azure Portal > Resource Groups > Create
Create Storage Account	az storage account create –name dehamerfuncstorage –location eastus –resource-group don-test-rg –sku Standard_LRS	Go to Storage Accounts > Create
Create Function App	az functionapp create –resource-group don-test-rg –consumption-plan-location eastus –runtime dotnet-isolated –functions-version 4 –name dehamerfuncapp –storage-account dehamerfuncstorage	Go to Function Apps > Create > Choose .NET Isolated

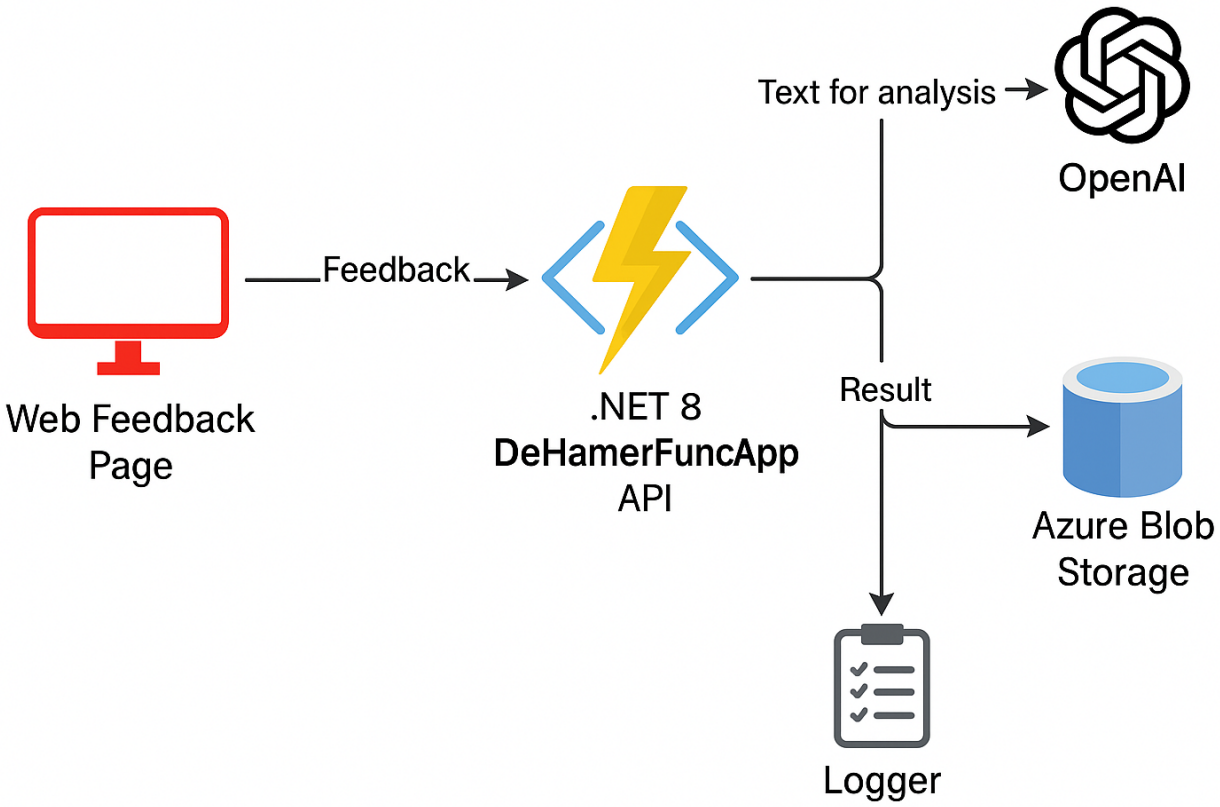
Deploy Code via Zip	az functionapp deployment source config-zip –src publish.zip –name dehamerfuncapp –resource-group don-test-rg	Go to Function App > Deployment Center > Zip Deploy
Create Cognitive Services Resource	az cognitiveservices account create –name dehamersentimentai –resource-group don-test-rg –kind TextAnalytics –sku S –location eastus –yes	Search 'Cognitive Services' > Create > Choose Text Analytics
Set App Settings	az functionapp config appsettings set –name dehamerfuncapp –resource-group don-test-rg –settings KEY=value	Go to Configuration > Application Settings > Add New

Successful Deployment Steps

After resolving early build issues and switching from Linux to a Windows-hosted function plan due to SDK compatibility, the deployment succeeded with the following workflow:

- Rewrote the function class to eliminate naming conflicts
- Set AuthorizationLevel to Anonymous to permit open feedback submission
- Used curl to verify responses from the deployed function
- Created an HTML frontend to POST feedback to the function endpoint

Architectural Diagram



AI Knowledge