# Architecture

## Application Components

### GPT Orchestrator

[Azure Function](https://learn.microsoft.com/en-us/azure/azure-functions/functions-overview)

The main orchestrator function app that handles the processing of requests, retrieval of data, and orchestration of prompt workflows.

### ChatGPT-X

[Azure Web App](https://learn.microsoft.com/en-us/azure/app-service/overview)

Web application deployed for user interaction (including Teams integration).

### Azure OpenAI Service

Deploy and manage OpenAI models such as GPT-3.5/4/4o for handling advanced natural language processing tasks such as content generation, summarization, extraction, and automation, all within the secure and scalable Azure cloud environment.

### Azure Cosmos DB

Stores and manages structured data, including Plans, prompts, user interactions, and external system data.

## Sequence Diagram

``` mermaid

sequenceDiagram

participant User

participant AppService as ChatGPT-X

participant GPTOrchestrator as GPT Orchestrator

participant SemanticKernel as Semantic Kernel

participant OpenAI as Azure OpenAI

participant CosmosDB as Azure Cosmos DB

participant ExternalService as External Systems

User->>AppService: Submits Query/Request

AppService->>GPTOrchestrator: Sends query details and Plan

GPTOrchestrator->>SemanticKernel: Orchestrates Plan execution

SemanticKernel->>CosmosDB: Retrieve necessary data (e.g., history, user inputs)

SemanticKernel->>ExternalService: Retrieve external data (FHIR, Epic, Availity)

ExternalService->>SemanticKernel: Returns external data (if applicable)

SemanticKernel->>OpenAI: Execute prompts in Azure OpenAI

OpenAI->>SemanticKernel: Return LLM response

SemanticKernel->>GPTOrchestrator: Aggregate and process responses

GPTOrchestrator->>AppService: Return processed data to GPT-X

AppService->>User: Display results to the user

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## Azure Services

* **[Azure Subscription](https://learn.microsoft.com/en-us/azure/cost-management-billing/manage/create-subscription)**

**Purpose:** The environment where all resources will be created and managed.

* **[Azure Resource Group](https://learn.microsoft.com/en-us/azure/azure-resource-manager/management/manage-resource-groups-portal)**

**Purpose:** Logical grouping of all Azure resources for easier management.

* **[Azure Key Vault](https://learn.microsoft.com/en-us/azure/key-vault/general/overview)**

**Purpose:** To store secrets such as connection strings, account keys, and credentials securely.

* **[Azure Cosmos DB](https://learn.microsoft.com/en-us/azure/cosmos-db/introduction)**

**Purpose:** NoSQL and vector database to store large-scale, distributed data.

* **[Azure Storage Account](https://learn.microsoft.com/en-us/azure/storage/common/storage-account-overview)**

**Purpose:** To store binary large objects (e.g., files, logs) used in the application.

* **[Azure Function App](https://learn.microsoft.com/en-us/azure/azure-functions/functions-overview)**

**Purpose:** Serverless compute service to run functions in the cloud.

* **[Azure Web App](https://learn.microsoft.com/en-us/azure/app-service/overview)**

**Purpose:** Host web applications or APIs for the GPT-X service.

* **[Azure App Service Plan](https://learn.microsoft.com/en-us/azure/app-service/overview-hosting-plans)**

**Purpose:** Defines the underlying resources that the web apps and function apps will use.

* **[Azure Application Insights](https://learn.microsoft.com/en-us/azure/azure-monitor/app/app-insights-overview)**

**Purpose:** To monitor and provide insights into the performance and usage of the application.

* **[Azure Document Intelligence (Form Recognizer Cognitive Service)](https://learn.microsoft.com/en-us/azure/applied-ai-services/form-recognizer/)**

**Purpose:** To extract structured data from documents, such as OCR (Optical Character Recognition) processing.

* **[Azure Speech Service](https://learn.microsoft.com/en-us/azure/cognitive-services/speech-service/overview)**

**Purpose:** Provides speech recognition, text-to-speech, and speech translation capabilities.

* **[Azure OpenAI Services](https://learn.microsoft.com/en-us/azure/cognitive-services/openai/overview)**

**Purpose:** Deploy and manage OpenAI models such as GPT-4o/4o-mini for handling advanced natural language processing tasks such as content generation, summarization, extraction, and automation, all within the secure and scalable Azure cloud environment.

* **[Azure AI Search](https://learn.microsoft.com/en-us/azure/search/search-what-is-azure-search)**

**Purpose:** Store and query vectorized data from the GPT-X application.

## Service Accounts and Keys

**Key Vault Secrets created during installation**:

* `ToFInstallationId`: Installation ID (12-digit random number).
* `ToFInstallationGuid`: Installation GUID.
* `ToFSubscriptionId`: Azure Subscription ID.
* `ToFResourceGroup`: Resource group name.
* `CosmosDBKey`: Key for accessing the Cosmos DB account.
* `StorageAccountConnection`: Connection string for the Azure Storage account.
* `OCR4ImagesKey`, `Speech Service Key`, `OpenAI Service Keys`, etc., for accessing respective services.