



CLDV6212

# SUMMATIVE POE FINAL SUBMISSION

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Sekwena

IIE MSA MONASH RUIMSIG



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## GitHub Link:

<https://github.com/SekwenaBotshelo/CLDV6212-POE-Final-Submission-ST10445866.git>

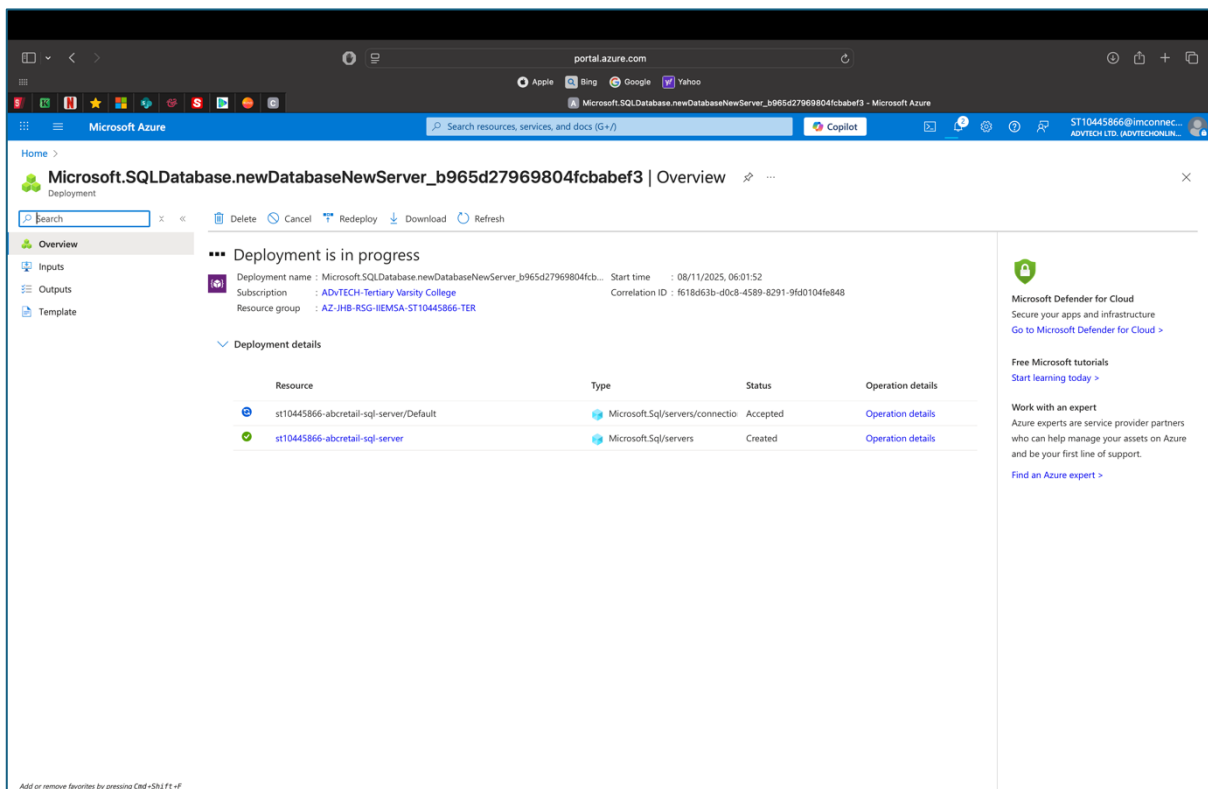
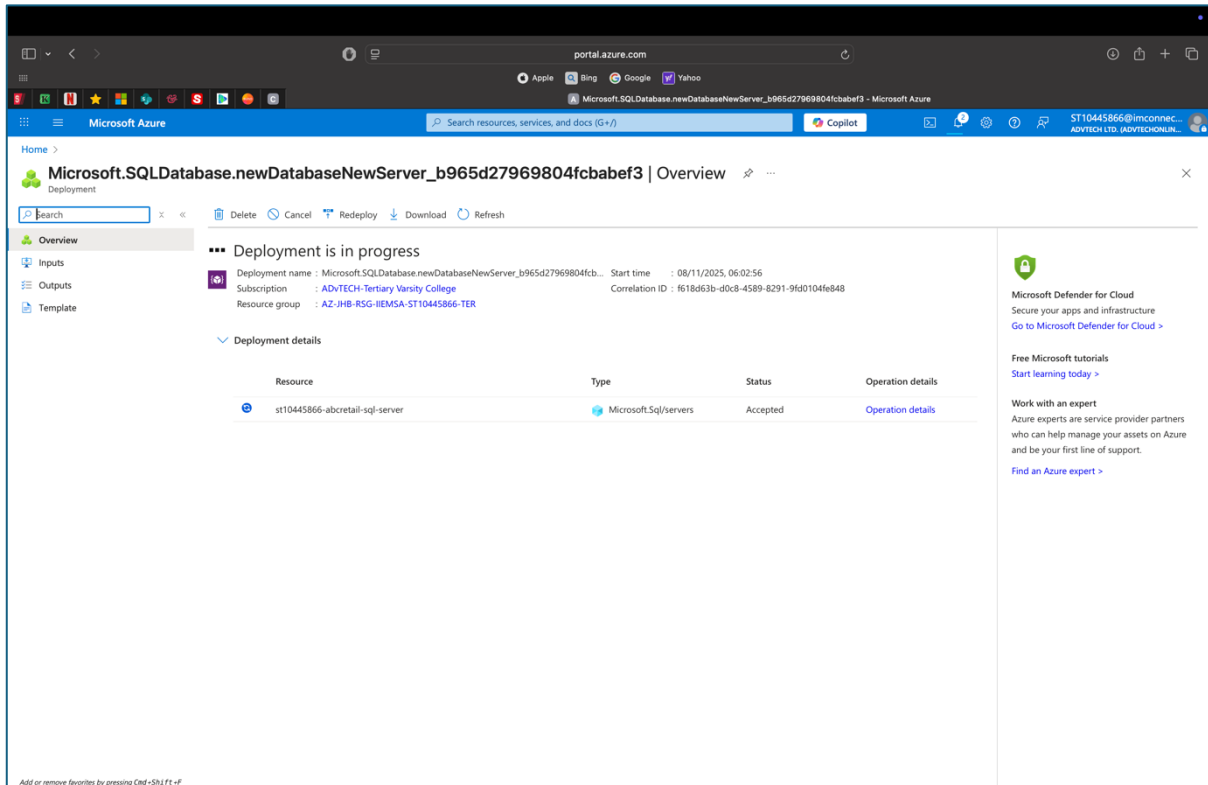
PLEASE NOTE THAT ALL PROJECT FILES WILL BE SUBMITTED ON ARC AS THEY ARE TOO LARGE TO BE COMMITTED ON GIT BUT (I.E., ABCRETAILER-ST10445866-POE, AND ABCRETAILER-FUNCTIONS), ANY AND ALL FILES TO BE COMMITTED ON GITHUB ARE THE FOLLOWING: AZURE SQL FOLDER AND THE WORD DOCUMENT.

## Web Application Link:

abcretailers-st10445866-a8hsdqdk2gbg0c4.southafricanorth-01.azurewebsites.net

# A. Create an Azure SQL Login Database

Screenshots on Azure SQL Database Creation:



portal.azure.com

Microsoft Azure

Home > Microsoft.SQLDatabase.newDatabaseNewServer\_b965d27969804fcbabef3 | Overview

Deployment

Search resources, services, and docs (G+)

Delete Cancel Redeploy Download Refresh

Overview

Inputs

Outputs

Template

Deployment is in progress

Deployment name : Microsoft.SQLDatabase.newDatabaseNewServer\_b965d27969804fcb... Start time : 08/11/2025, 06:01:39  
Subscription : ADYTECH-Tertiary Varsity College Correlation ID : 6f18d63b-d0c8-4589-8291-9fd0104fe848  
Resource group : AZ-JHB-RSG-IIEMSA-ST10445866-TER

Deployment details

Resource	Type	Status	Operation details
st10445866-abcretail-sql-server/Default	Microsoft.Sql/servers/connectio	OK	Operation details
st10445866-abcretail-sql-server	Microsoft.Sql/servers	Created	Operation details

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Microsoft Azure

Home > Microsoft.SQLDatabase.newDatabaseNewServer\_b965d27969804fcbabef3 | Overview

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Resource group : AZ-JHB-RSG-IIEMSA-ST10445866-TER

Deployment details

Resource	Type	Status	Operation details
st10445866-abcretail-sql-server/ST10445866-ABCretailDB	Microsoft.Sql/servers/databases	Accepted	Operation details
st10445866-abcretail-sql-server/Default	Microsoft.Sql/servers/connectio	OK	Operation details
st10445866-abcretail-sql-server	Microsoft.Sql/servers	Created	Operation details

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Home > Microsoft.SQLDatabase.newDatabaseNewServer\_b965d27969804fcbabef3 | Overview

Deployment

Search

Delete Cancel Redeploy Download Refresh

Overview

Inputs

Outputs

Template

✓ Your deployment is complete

Deployment name : Microsoft.SQLDatabase.newDatabaseNewServer\_b965d27969804fcb... Start time : 08/11/2025, 06:03:01  
Subscription : ADVTECH-Tertiary Varsity College Correlation ID : 6618d63b-d0c8-4589-8291-9fd0104fe848  
Resource group : AZ-JHB-RSG-IIEMSA-ST10445866-TER

Deployment details

Resource	Type	Status	Operation details
st10445866-abcretail-sql-server/ST10445866-ABCretailDB	Microsoft.Sql/servers/databases	Created	<a href="#">Operation details</a>
st10445866-abcretail-sql-server/Default	Microsoft.Sql/servers/connectio	OK	<a href="#">Operation details</a>
st10445866-abcretail-sql-server	Microsoft.Sql/servers	Created	<a href="#">Operation details</a>

Next steps

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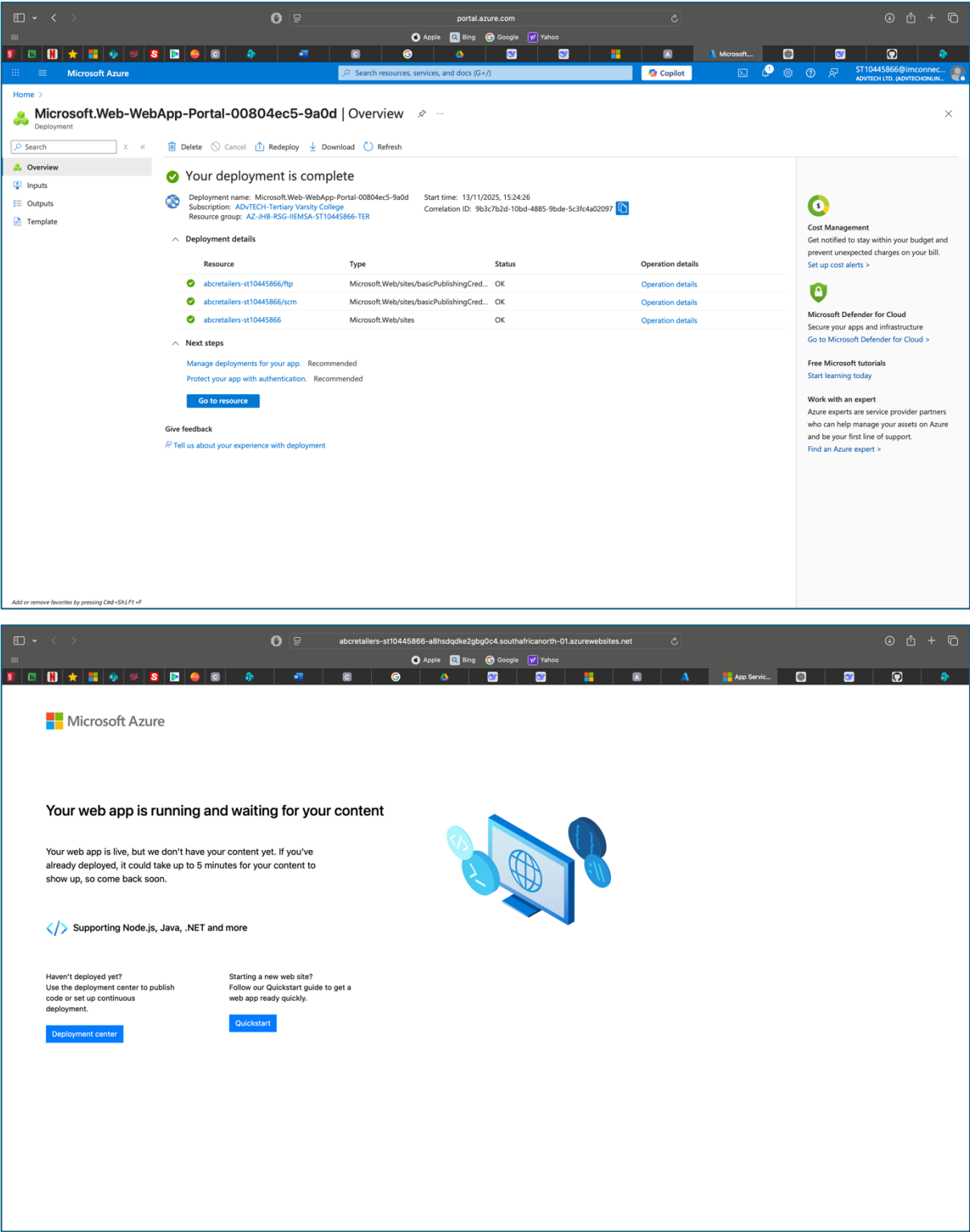
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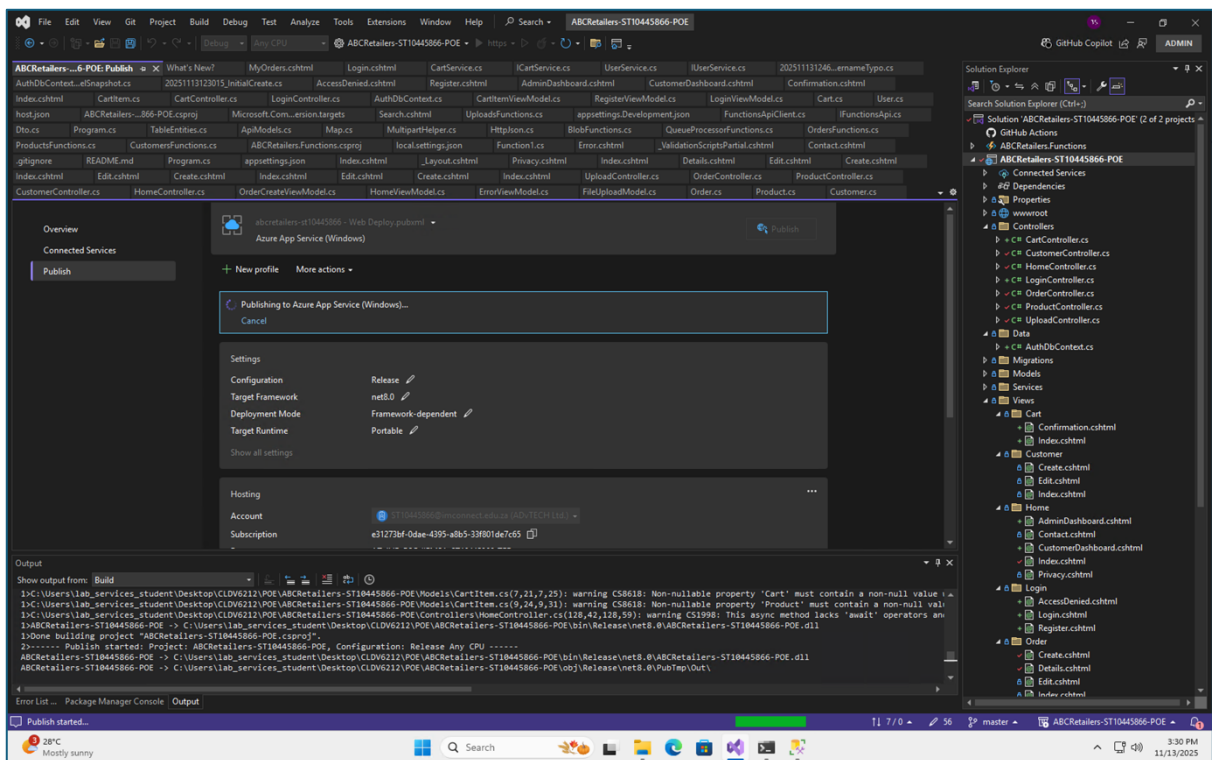
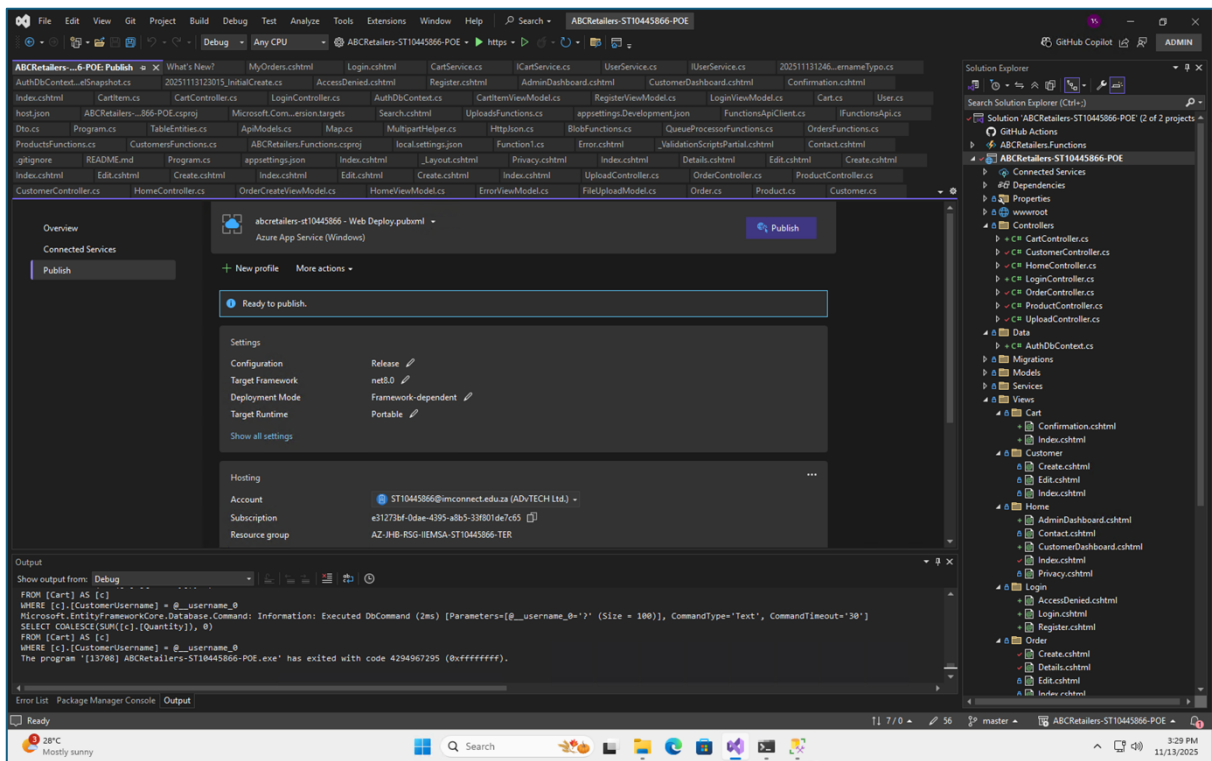
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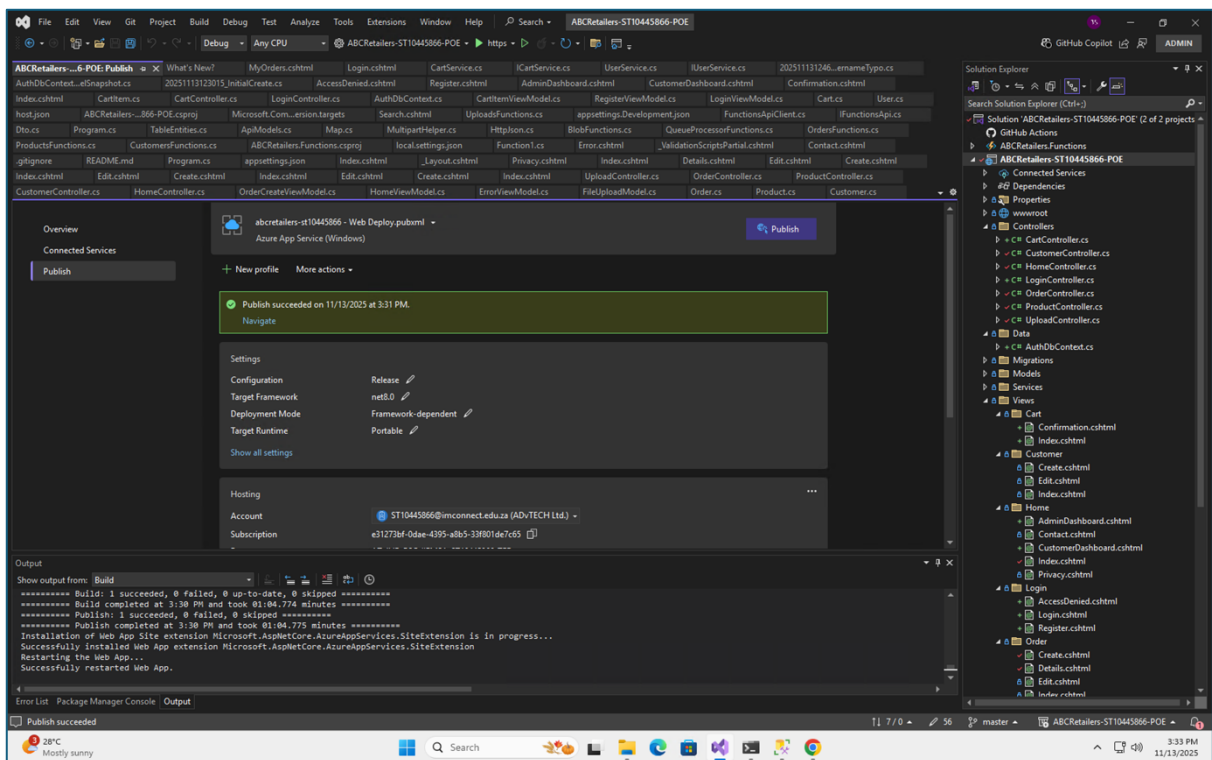
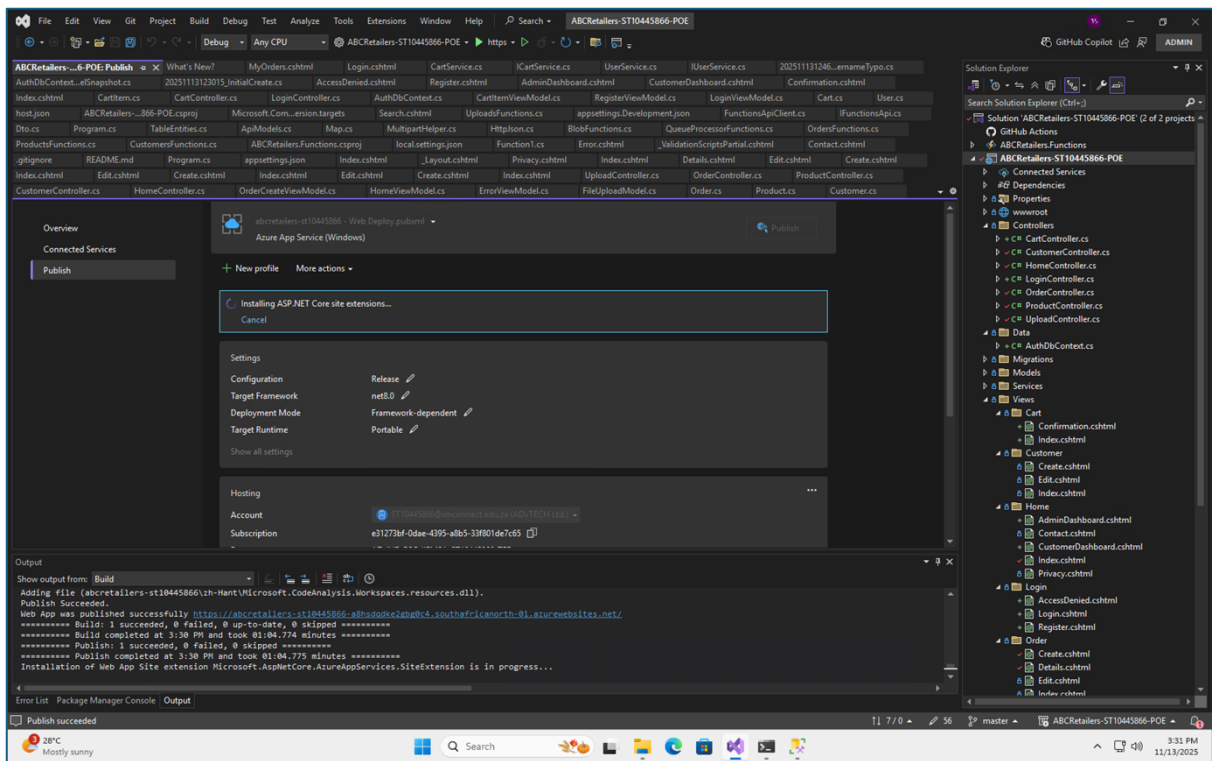
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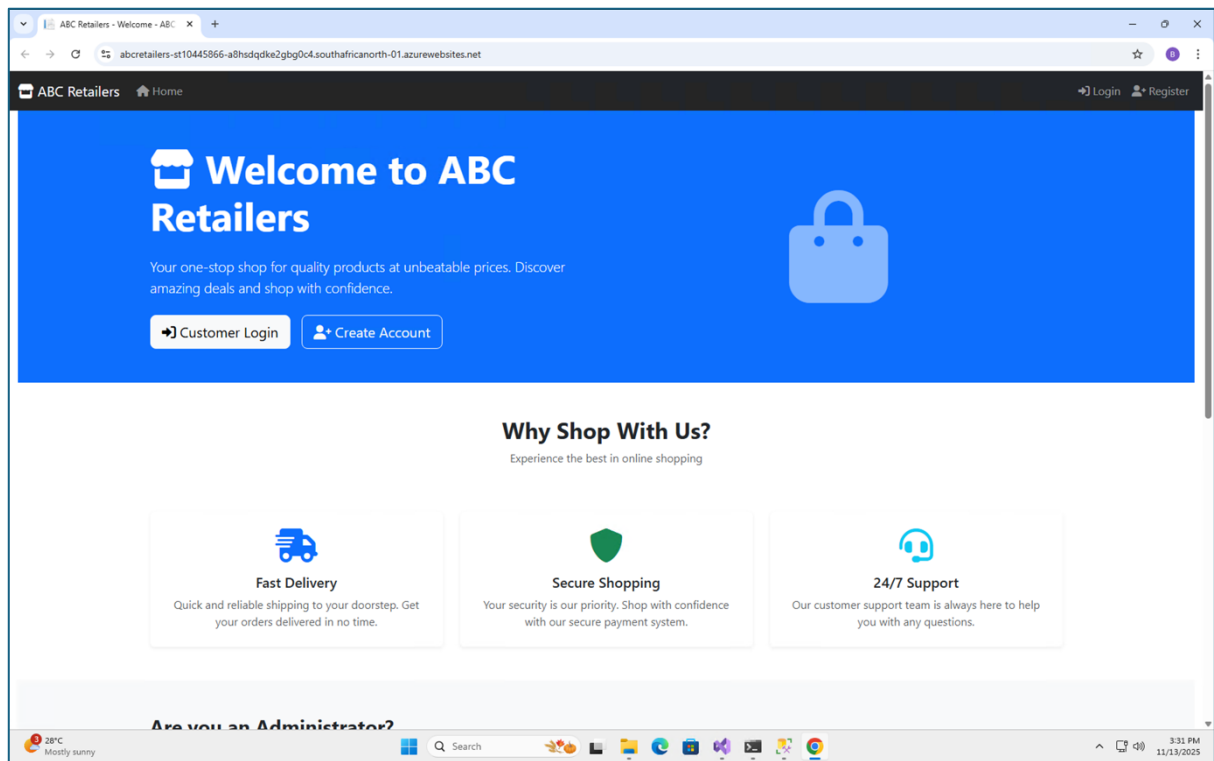
# Screenshot on Azure Deployment Process:

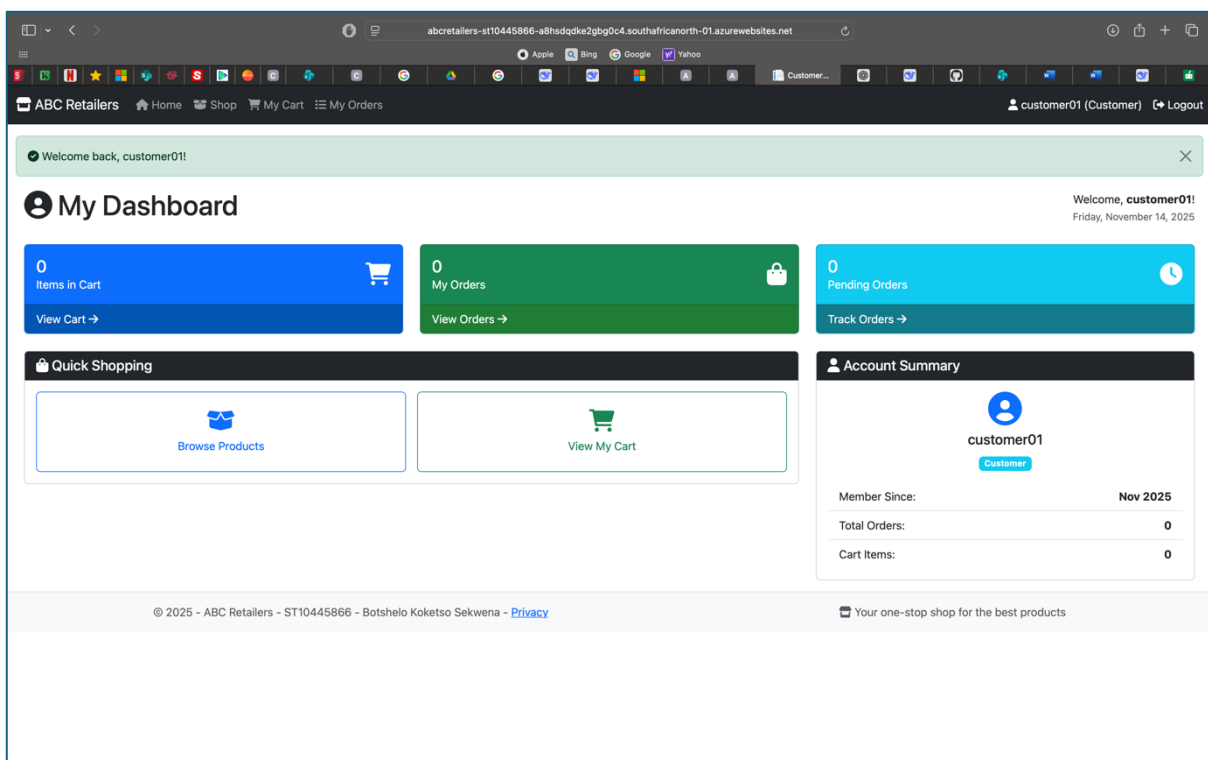
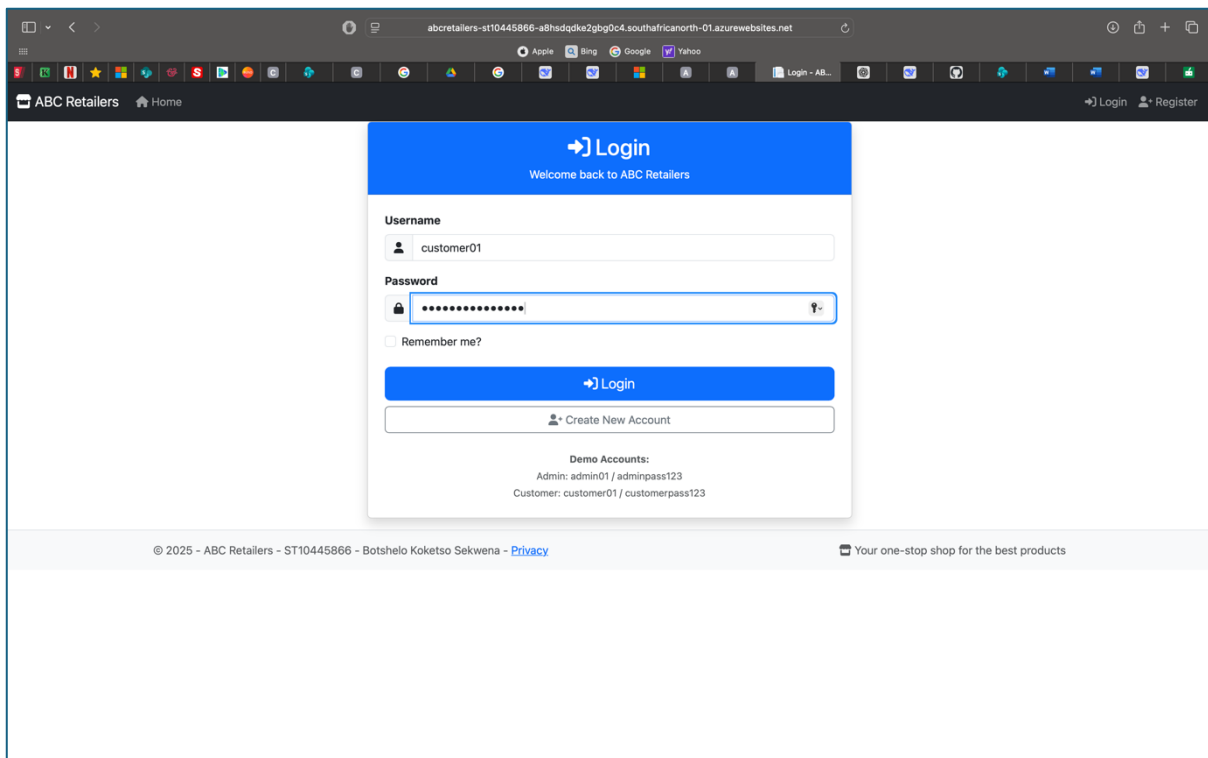


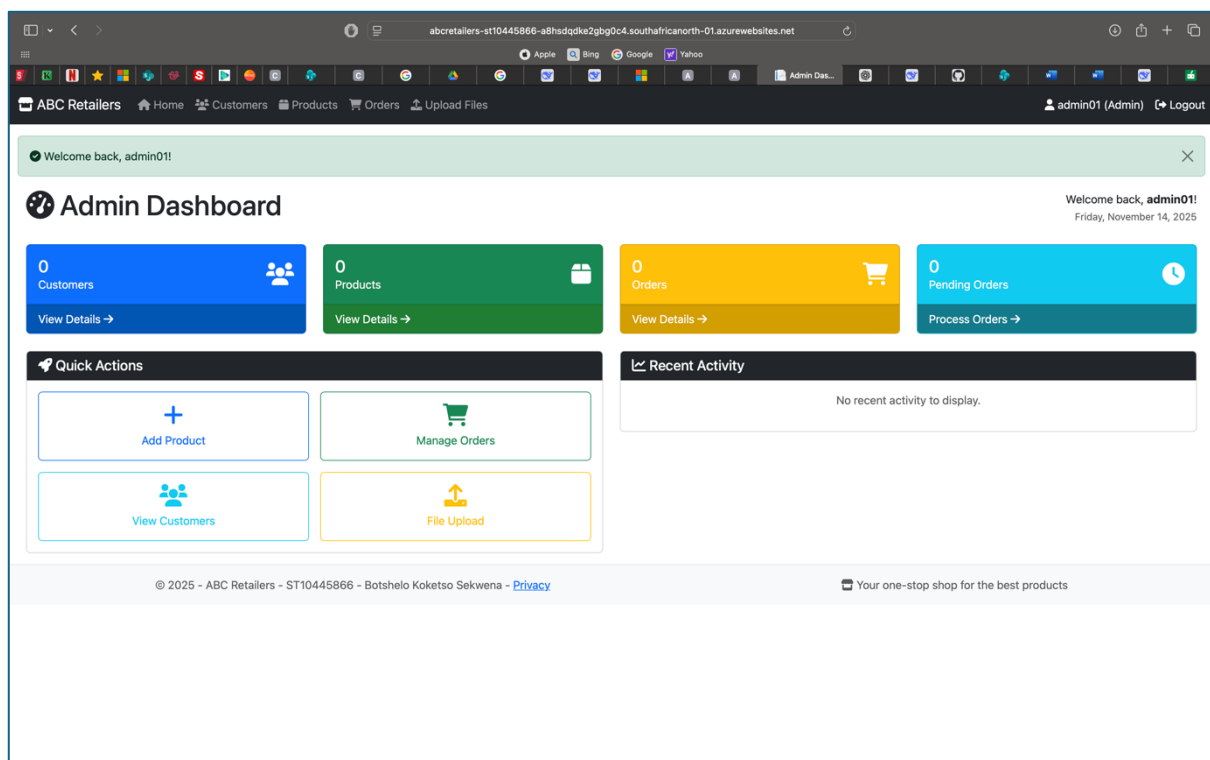
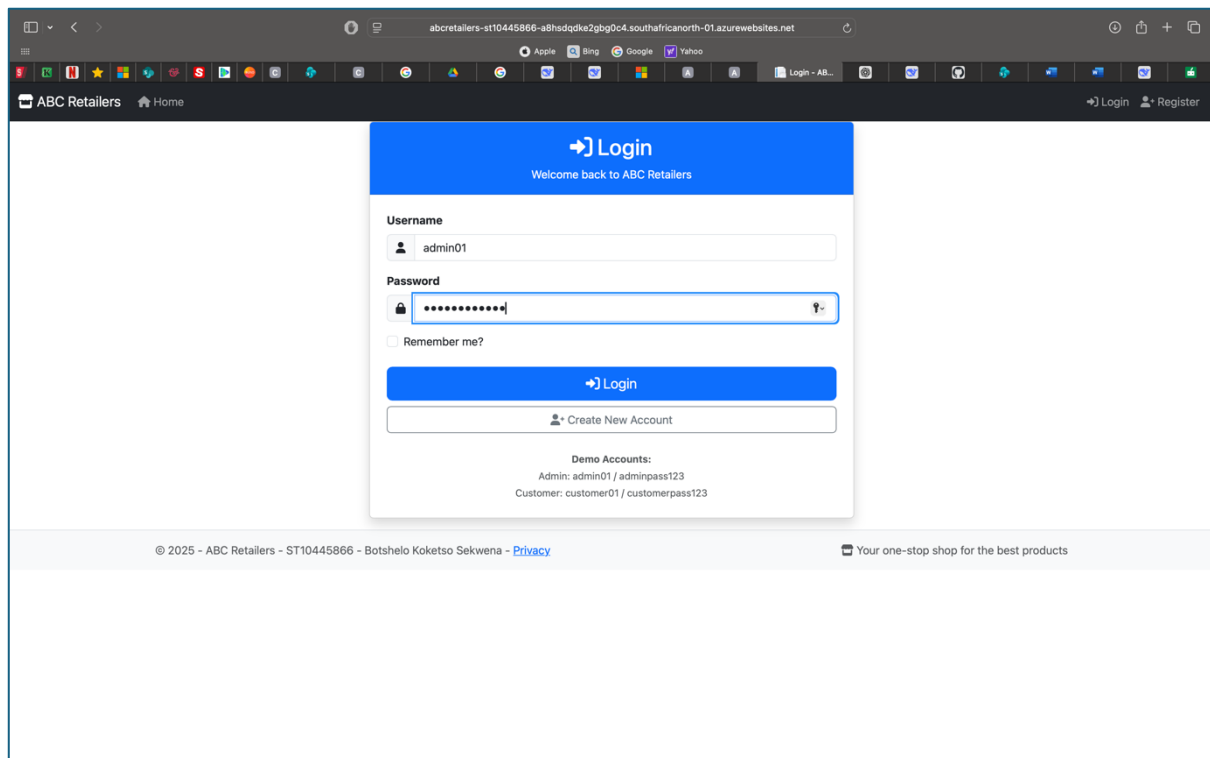












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## B. Document the technology choices for my solution

Component	Technology Choice	Hosting Model	Description
<b>Azure SQL Database</b>	Data Storage (Relational)	PaaS (Platform as a Service)	Primary database with full SQL capabilities for user authentication, shopping cart information, and application metadata
<b>Azure Functions</b>	Serverless Compute	PaaS (Platform as a Service)	Backend API services that manage file uploads, orders, customers, and product CRUD operations
<b>Azure Table Storage</b>	Data Storage (NoSQL)	PaaS (Platform as a Service)	Product catalogue, customer, and order data are stored in NoSQL using the Functions API
<b>Azure Blob Storage</b>	File Storage	PaaS (Platform as a Service)	Storage service via Functions API integration for product photos and proof of payment documents
<b>ASP.NET Core MVC Application</b>	Web Application Framework	IaaS/PaaS (Infrastructure/Platform as a Service)	The e-commerce platform's primary web application uses controller-based design.
<b>Azure App Service</b>	Web Hosting	PaaS (Platform as a Service)	The ASP.NET Core application's implied hosting platform with automated scalability and administration

<b>Distributed Memory Cache</b>	Session Management	IaaS (Infrastructure as a Service)	Session storage in RAM for temporary data and user authentication status
<b>HTTP Client Services</b>	API Integration	IaaS (Infrastructure as a Service)	Custom HTTP clients to connect to the backend API of Azure Functions

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## C. Motivate the Azure Services used for each application functionality

### 1. Session management and user authentication

- Secure user registration, authentication, and session persistence are necessary.
- Azure Service: Distributed Memory Cache + Azure SQL Database
- Motivation: Azure SQL Database ensures that user credentials are saved safely by offering enterprise-grade security with encryption both in transit and at rest. Complex user-role connections and ACID compliance for user management activities are supported by the relational structure.

### 2. Persistence of Shopping Carts

- Reliable shopping cart item storage with user association is a need.
- Azure Service: SQL Database in Azure
- Motivation: maintains user and cart item integrity while guaranteeing data consistency for cart operations with foreign key constraints. offers strong backup and recovery capabilities and supports transactional updates during checkout.

### 3. Management of Product Catalogues

- Scalable product data storage with adaptable schemas is necessary.
- Azure Service: Azure Table Storage through the Functions API
- Motivation: Provides economical storage at large scale, making it perfect for product catalogues with a variety of features. Adding new product attributes is simple and doesn't require database migrations thanks to the schema-less architecture.

### 4. System for Processing Orders

- High-volume order creation and progress monitoring are necessary.
- Azure Service: Functions API-based Azure Table Storage

- Motivation: It is ideal for order processing workloads since it is optimised for high-velocity data intake. offers configurable status tracking, quick writing, and effective splitting for order data.

## 5. Document Storage & File Upload

- Requirement: Safekeeping of product photos and documentation proving payment
- Azure Service: Functions API-based Azure Blob Storage
- Motivation: especially made for unstructured data, such as documents and pictures. offers secure access controls, tiered storage choices, and CDN connectivity for the best possible product image delivery.

## 6. Backend for Serverless APIs

- Requirements: Scalable backend services are necessary for business operations.
- Azure Functions: Azure Service
- Motivation: Makes it possible for microservices architecture to scale automatically in response to demand. The consumption-based pricing strategy effectively manages peak loads while cutting expenses during periods of low usage.

## 7. Hosting Web Applications

- Requirement: ASP.NET Core MVC application hosting that is dependable
- Azure Service: (implied) Azure App Service
- Motivation: Offers deployment slots, scaling, and automatic patching for managed hosting. For smooth operation, it is integrated with Azure SQL Database and other services.

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## D. Identify alternative Azure Technologies

### 1. A substitute for user authentication

- Azure SQL Database was the original
- Azure Active Directory B2C is an alternative.
- Motivation: AAD B2C offers enterprise-grade security, social identity provider integration, and pre-built authentication flows without requiring custom implementation. improves security compliance for user management while cutting down on development time.

### 2. A substitute for the shopping cart

- Azure SQL Database was the original
- Azure Cosmos DB with Session Consistency is an alternative.
- Motivation: Cosmos DB's single-digit millisecond latency and worldwide distribution make it ideal for cross-regional shopping cart operations. Users are guaranteed to view their own writes instantly thanks to the session consistency model.

### 3. A substitute for the product catalogue

- Azure Table Storage was the original
- Alternative: Cosmos DB plus Azure Cognitive Search
- Motivation: While Cosmos DB manages the product data storage, it offers sophisticated search features (fuzzy search, faceted navigation). Perfect for sophisticated product discovery in e-commerce apps.

### 4. An Alternative to File Storage

- Azure Blob Storage was the original
- Azure File Shares is an alternative.
- Motivation: More appropriate for programs that need shared access among several application instances or conventional file system semantics. supports legacy integration via the SMB protocol.



## 5. A Serverless Backend Alternative

- Azure Functions was the original
- Azure Container Apps are an alternative.
- Motivation: Preserves serverless scalability features while offering greater control over dependencies and the runtime environment. Better for intricate applications that need particular container setups.

## 6. A substitute for session management

- Distributed Memory Cache was the original.
- An alternative would be Redis's Azure Cache
- Motivation: enables distributed, permanent session storage that endures application restarts. improves efficiency in load-balanced scenarios by enabling session sharing among several application instances.

## 7. A substitute for web hosting

- Azure App Service was the original
- Azure Kubernetes Service (AKS) is an alternative.
- Motivation: Gives container orchestration precise control over networking, scaling, and deployment tactics. Better for intricate microservices designs that call for sophisticated DevOps skills.

These options show how various Azure services could meet the same needs with different trade-offs in terms of scalability, cost, complexity, and feature sets, enabling architectural choices based on particular business requirements and technical limitations.

(Kamil Mrzygłód, 2022) (Microsoft, n.d.)

# References

## Bibliography

Kamil Mrzygłód. (2022). *Azure For Developers*. Birmingham: <packt>.

Kamil Mrzygłód. (2022). Web Applications in Azure. In K. Mrzygłód, *Azure For Developers* (pp. 3-41). Birmingham : <packt>.

Kamil Mrzygłód. (2022). Using Azure Storage - Table, Queues, Files, and Blobs. In K. Mrzygłód, *Azure for Developers* (pp. 293-319). Birmingham: <packt>.

Kamil Mrzygłód. (2022). Deploying Web Applications as Containers. In K. Mrzygłód, *Azure for Developers* (pp. 67-91). Birmingham: <packt>.

Kamil Mrzygłód. (2022). Big Data Pipeline - Azure Event Hubs. In K. Mrzygłód, *Azure for Developers* (pp. 323-350). Birmingham: <packt>.

Kamil Mrzygłód. (2022). Real-Time Data Analysis - Azure Stream Analytics. In K. Mrzygłód, *Azure for Developers* (pp. 351-370). Birmingham: <packt>.

Kamil Mrzygłód. (2021). SQL in Azure - Azure SQL. In K. Mrzygłód, *Azure for Developers* (pp. 417-448). Birmingham: <packt>.

Microsoft. (n.d.). *Azure Products*. Retrieved from Microsoft:  
<https://azure.microsoft.com/en-us/products>