CyberMLServiceSite - Project Documentation

Team Members:

1. Omar Elsayed Mahmoud

2. Ahmed Kamal Abdelmageed

3. Omar Abdelaziz Mahmoud

4. Osama Ashraf Eid Saleh

5. Abdullah Ahmed Ragab

1. Project Overview

CyberMLServiceSite is a web-based platform developed to track and register individuals interested in the field of cybersecurity.
The system also collects statistics about the interest levels in various cybersecurity tools. It provides a structured interface for users to register and specify their area of interest in the cybersecurity domain, enabling efficient data collection and analysis.
The project was designed with scalability and modern deployment practices in mind, utilizing Docker and GitHub for version control and containerization.

2. Objectives & Scope
The primary objective of CyberMLServiceSite is to facilitate user registration and data tracking for cybersecurity tool preferences.
The scope includes creating an intuitive front-end, a robust backend for managing user data, and a flexible architecture for deployment.

Key goals include:
- Providing an intuitive interface for user registration.
- Capturing and analyzing interest in cybersecurity tools.
- Offering scalability via Docker and GitHub CI/CD practices.
- Making deployment simple and portable through Docker images.

3. System Architecture
The system is built on a layered architecture using the .NET MVC framework with C#. Entity Framework is used as the ORM for database access.
The application consists of:
- Presentation Layer: HTML, CSS, and Razor views.
- Business Logic Layer: Controllers and Services in ASP.NET MVC.
- Data Access Layer: Entity Framework accessing a PostgreSQL database.
The entire system is containerized using Docker with a Dockerfile and docker-compose.yml for multi-service orchestration.
It includes Redis caching and PostgreSQL for persistent storage.

4. Key Features
- User registration form with fields related to cybersecurity interests.
- Data analytics on tool preference frequency.
- MVC-based structured code for maintainability.
- PostgreSQL as the main data store.
- Redis caching for improved performance.
- Dockerized architecture: Dockerfile + Docker Compose setup.
- Image published to Docker Hub for easy deployment.
- Version-controlled using GitHub.

5. Technologies & Deployment

Technologies Used:
- Frontend: HTML, CSS, Razor
- Backend: ASP.NET MVC (C#)
- ORM: Entity Framework
- Database: PostgreSQL
- Caching: Redis
- Containerization: Docker (Dockerfile + Docker Compose)
- Version Control: Git & GitHub
- Deployment: Docker image pushed to Docker Hub

Deployment Workflow:
1. Build and publish the .NET app using a multi-stage Dockerfile:
   - docker build -t cyberml-backend:latest .

2. Push the image to Docker Hub:
   - docker tag cyberml-backend:latest yourusername/cyberml-backend:latest
   - docker push yourusername/cyberml-backend:latest

3. Use docker-compose.yml to orchestrate services including
   - Backend service (web)
   - PostgreSQL database
   - Redis caching layer

4. Start the complete application with one command:
   - docker-compose up

5. Verify the application runs successfully and services are interconnected.

6. Project and Docker images are version-controlled and publicly available on:

   - GitHub: https://github.com/OmarElsayed3/CyberMLServiceSite

   - Docker Hub : https://hub.docker.com/u/omarelsayed3