

Azure Cost Optimization & UX Demo Platform

Project Documentation & Use Cases

Executive Summary

The **Azure Cost Optimization & UX Demo Platform** is a fully functional web application that demonstrates **Azure cost simulation**, **modern web development practices**, and **cloud deployment automation**. It combines **interactive tools**, **gamified learning**, and **professional UI/UX design** to provide value for **cloud professionals**, **developers**, and **Azure learners**. The platform is deployed on **Microsoft Azure** using **Terraform Infrastructure as Code** and is optimized for **performance**, **scalability**, and **security**.

1. Project Overview

1.1 Project Scope

- **Primary Goal:** Demonstrate Azure cost optimization via an interactive web platform.
- **Secondary Goal:** Showcase frontend development, UX design, and cloud infrastructure automation.
- **Target Audience:** Cloud professionals, developers, Azure learners.
- **Deployment:** Azure Virtual Machine provisioned via Terraform.

1.2 Technology Stack

- **Frontend:** HTML5, CSS3, JavaScript (ES6+), Tailwind CSS
 - **Charts & Visualization:** Chart.js
 - **Infrastructure:** Azure VM, Virtual Network, Security Groups
 - **Automation:** Terraform Infrastructure as Code
 - **Web Server:** Apache HTTP Server (Ubuntu 20.04 LTS)
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2. Functional Requirements

2.1 Cost Simulator Module

Purpose: Calculate and visualize Azure service costs in real-time.

Key Features:

- VM cost calculation for multiple types (B1s, D2s_v3, E4s_v3)
- Storage cost estimation for Standard HDD, SSD, Premium SSD
- Data transfer pricing (100GB–10TB range)
- Instant updates upon parameter changes
- Interactive cost breakdown charts (Chart.js)
- Optimization recommendations
- Exportable charts and data

Use Cases:

1. Pre-deployment cost estimation
 2. Optimization comparison
 3. Budget forecasting
 4. Educational learning tool
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2.2 Gamified Learning Quiz

Purpose: Teach Azure fundamentals through an interactive quiz.

Key Features:

- 5+ AZ-900 style questions
- Progress bar & question counter
- Achievement badges (Bronze → Master)
- Confetti animations for milestones
- Mobile-optimized
- Quiz restart option

Use Cases:

1. Skill assessment
 2. Training validation
 3. Competitive learning
 4. Progress tracking
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2.3 Administrative Portal

Purpose: Provide a secure administrative UI (demo mode).

Key Features:

- Login form (frontend only)
- Role-based access (future-ready)
- Session control UI
- Security feedback indicators

Use Cases:

1. Admin access demo
 2. User management (future-ready)
 3. System configuration
 4. Usage analytics (future-ready)
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2.4 Contact & Communication System

Purpose: Provide professional communication channels.

Key Features:

- Contact form with validation
- Integrated with Formspree
- Submission feedback messages
- FAQ section
- Corporate-style UI

Use Cases:

1. Customer support
 2. Partnership inquiries
 3. Feedback collection
 4. Technical assistance
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3. Non-Functional Requirements

(Performance, Usability, Security, Reliability, Maintainability, Compatibility — optimized for enterprise-grade deployment)

Highlights:

- **Performance:** Page load < 2s, chart render < 500ms
 - **Usability:** Mobile-first design, WCAG 2.1 AA accessibility
 - **Security:** HTTPS-ready, SSH key auth, input validation
 - **Reliability:** 99.5% uptime, graceful error handling
 - **Maintainability:** Modular architecture, Git-based workflow
 - **Compatibility:** Works on modern desktop & mobile browsers
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4. Use Case Scenarios

Business Use Cases

1. **Cloud Migration Planning** → IT managers estimate Azure costs before migration.
2. **Team Certification Training** → Managers track Azure knowledge progress.
3. **Client Demos** → Architects present cost benefits interactively.

Technical Use Cases

4. **Infrastructure Automation Showcase** → DevOps deploys the platform with one Terraform command.
5. **Web Development Portfolio** → Developers present responsive design and animations.

Educational Use Cases

6. **Azure Fundamentals Learning** → Students explore Azure pricing through simulations and quizzes.
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5. Success Metrics

- **Performance:** Page load < 1.5s, quiz completion > 80%
 - **Technical:** 99% uptime, zero security breaches
 - **Business:** \$7.30/month hosting cost, full feature delivery, positive user feedback
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6. Technical Architecture

Frontend: HTML5, Tailwind, JavaScript (modular)

Infrastructure: Azure VM (Standard_B1s), Terraform IaC

Deployment Pipeline: Local dev → Terraform provisioning → Automated deploy → Testing → Monitoring-ready

7. Risk Assessment

- **Single VM Limitation** → Can scale to multi-VM with load balancing
 - **Security Vulnerabilities** → Mitigated with HTTPS, regular updates
 - **Cost Overruns** → Using B1s VM to minimize costs
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8. Conclusion

This platform effectively demonstrates **Azure cost simulation, gamified learning, and modern UX design** — serving as a **portfolio project, educational resource, and client presentation tool**. Its modular design ensures **easy scaling, security, and maintainability**, making it adaptable for both **business and academic use**.