

Design and Implementation of a Secure Web-Based Inventory Management System Using Python and Flask

By Callum Evans - 2116012

Introduction

Effective inventory management is vital across industries like healthcare and manufacturing. Traditional methods often suffer from inefficiencies and human error. This project explores the development of a secure, cloud-capable inventory management system using Python Flask and SQLite.

By integrating automation, real-time access, and cybersecurity best practices, the system aims to enhance reliability and protect sensitive data. As digital transformation continues, combining networking, cloud technologies, and security is essential for modern inventory solutions.

Aim

The overarching aim of this project is to develop a secure and efficient inventory management system that utilizes Python Flask for the web application framework, integrated with SQLite for database management, while implementing cybersecurity protocols to enhance data integrity and protection.

Methodology

A practice-based, mixed-methods approach was used to design and build a secure inventory management system using Flask and SQLite

- Qualitative: Informed design through best practices (e.g., OWASP), focusing on features like hashed passwords and access control. Informal feedback helped improve usability.
- Quantitative: Measured login success rates, CRUD accuracy, and error logs. Basic security tests (e.g., SQL injection attempts) were also performed.

System data and user input guided development. The method ensured a balance between technical security and user experience, within academic scope.

Results

The system was tested for core functions, security, usability, and cloud deployment.

- All features worked as expected
- Security controls blocked unauthorised access
- Interface was clear and user-friendly
- Azure Deployment Successful
- Logs captured all key user actions

Login and HTML Files

Login

Username:

Password:

• Invalid credentials.

