# Final Internship Report

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## Abstract

This report summarizes my 8-week internship experience at YULCOM Technologies Inc., a Montreal-based IT consulting and software development firm. During the internship, I worked as a full-stack developer on a healthcare management application, contributing to both front-end and back-end components. The core technologies used included React for the front-end, Django for the back-end, and PostgreSQL for database management. Throughout the internship, I progressively took ownership of key modules such as appointment scheduling, patient profile management, and role-based user interfaces. I also played a role in identifying bugs, refining APIs, and proposing a testing strategy for quality assurance.

This report also outlines my technical tasks, challenges encountered, and how I addressed them through independent learning, collaboration with team members, and application of knowledge gained from my coursework at Vanier College. It also discusses how my understanding of the company, my role, and the software development lifecycle evolved over the course of the internship. Through this experience, I developed practical skills in version control, debugging, API integration, and DevOps tools, while improving my communication and teamwork abilities in a professional environment.

## 1. Company and Department Overview

YULCOM Technologies Inc. is a Montreal-based IT firm specializing in software development, digital transformation, and IT consulting services. The company serves both public and private sectors, including clients in education, health, and government. Internally, YULCOM maintains a collaborative, agile work environment with small cross-functional teams.

I was part of a development team working on a healthcare management system aimed at streamlining patient data handling, appointment scheduling, and biometric monitoring. My supervisor was Mr. Komi, and I worked closely with developers like Qiutian and Eric throughout the internship.

## 2. Project Summary and Technical Scope

My primary project involved building and enhancing features in a full-stack web application using:

* **Frontend:** React (with hooks and component-based architecture)
* **Backend:** Django (Django REST Framework)
* **Database:** PostgreSQL
* **Tools:** Git, Bitbucket, Postman, Docker, pgAdmin, VS Code

My contributions included:

* Implementing appointment creation, editing, and calendar view features
* Creating UI components for user roles and filtering logic
* Developing APIs for patient profile management and password change
* Designing a basic testing strategy (manual + E2E)
* Fixing frontend and backend bugs involving API payloads and visit counters
* Collaborating on UI improvements to improve user experience

## 3. Technical Challenges and Solutions

### 1. API Integration and Data Mismatches

One of the recurring challenges involved integrating React front-end components with Django REST API endpoints. On multiple occasions, the API calls failed due to **data mismatches**, such as incorrect field names or missing required values (e.g., patient UUIDs during appointment creation).

**Solution:**  
I used **Postman** to test the endpoints in isolation and inspect the exact structure of expected payloads. I also traced the React components to identify which values were being passed to the backend. After debugging and aligning the API contract between frontend and backend, I implemented validation checks and refactored state management in React to prevent null or undefined values.

### 2. UI Logic and State Management in React

While building and improving modules such as the appointment form, vital signs interface, and visit counters, I often encountered **unexpected UI behavior**—especially due to improper state handling or asynchronous rendering issues.

**Solution:**  
I deepened my understanding of **React Hooks**, such as useEffect, useState, and useContext, to manage component lifecycle events correctly. In complex forms, I refactored the logic into modular components and used local states combined with controlled inputs to ensure a predictable UI. I also used console.log and browser dev tools extensively to debug rendering order and state updates.

### 3. Bitbucket Repository Push Failures

Midway through the internship, I encountered an issue where my Git pushes were being blocked due to the **Bitbucket repository exceeding its storage limit**. This halted the normal deployment process and blocked updates to devlopment branches.

**Solution:**  
I immediately informed my supervisor and worked with the team to isolate which files were consuming excess storage. We removed unnecessary cache and artifact files, and for final feature pushes, I shared the local working copy with a colleague (Qiutian) for manual upload. I also compressed images and implemented .gitignore rules to avoid committing build artifacts.

### 4. Docker Environment Failures

Toward the final phase, I faced **Docker build errors** that prevented the Django application from launching in the containerized development environment. These issues stemmed from outdated Docker images and corrupted cache layers.

**Solution:**  
I manually cleaned up Docker containers and images using the command line and created custom **shell scripts** to automate cache removal and container rebuilds. These scripts proved useful for other team members facing similar issues. I also adjusted Docker configuration files to ensure consistent image tagging and volume mapping.

### 5. Implementing Secure Profile and Password Update Features

Creating the **profile update** and **password change** APIs presented security and functionality challenges. I had to ensure that only authenticated users could access or modify sensitive data, while also preserving the structure and integrity of the user database.

**Solution:**  
Using Django REST Framework’s authentication and permission classes, I built secure API views and serializers with proper error handling. On the frontend, I implemented form validation and masked password inputs. I also made sure to verify the old password before accepting any password change requests, following best practices in user authentication.

### 6. Appointment Calendar Visualization and Recurring Appointments

Visualizing appointments in a calendar view and supporting recurring appointments proved to be a complex task due to inconsistent data structures and lack of existing logic for recurring entries.

**Solution:**  
For the calendar, I mapped appointment data to a custom-rendered React calendar UI and used color-coding to differentiate services. For recurring appointments, I began drafting logic to duplicate appointment entries based on user-selected intervals, while ensuring the backend remained flexible for future extensions. Although not fully implemented, this laid a foundation for upcoming development.

## 4. Growth of Understanding and Role Progression

At the beginning of my internship, I saw myself mainly contributing small UI improvements. However, as the internship progressed, I became more confident in owning larger features end-to-end. I moved from relying heavily on team guidance to independently identifying bugs, proposing feature implementations, and participating in review discussions.

This shift also deepened my understanding of how real-world software teams function balancing deadlines, testing, design constraints, and code maintainability. I was no longer just writing code but contributing to the product’s usability and reliability.

## 5. Application of Academic Learning

Several aspects of my college coursework directly contributed to my performance:

* **Web Programming:** Gave me strong fundamentals in HTTP, RESTful APIs, and JavaScript — critical for React and Django development.
* **Database:** Helped me understand relational schemas and use tools like pgAdmin and raw SQL for debugging queries.
* **System Development:** Provided Agile methodology concepts and system design principles which were reflected in how our team handled sprints and Git flow.
* **Programming Concepts I and II:** Made it easier to understand Django’s class-based views and models.
* **Cyber Security:** Helped me be aware of security concerns that need to be addressed while developing secure web applications. Here I use password protected update with authentication.

## 6. New Knowledge Acquired During Internship

Despite a solid academic foundation, I had to learn a number of skills on the job:

* **React Advanced Concepts:** Hooks, prop drilling, state management across components
* **DevOps Tools:** Docker scripting, environment cleanup, and image configuration
* **Test Automation Basics:** Research into tools like Cypress and Playwright for E2E testing
* **Security Best Practices:** Safeguarding password updates and authentication handling
* **Inter-service Communication:** How API endpoints interact with each layer of the stack in production

## 7. Communication and Team Collaboration

Throughout the internship, I collaborated with developers and supervisor. Daily work involved using G Suite for communication and Bitbucket for code reviews. My supervisor, Mr. Komi, provided consistent feedback and delegated meaningful tasks. I also consulted team members like Qiutian for design guidance and helped newer developers (e.g., Eric and Zafer) with setup and debugging.

These interactions taught me how to express technical questions clearly, give and receive feedback professionally, and adapt based on real-time feedback.

## 8. Conclusion

This internship has been a transformative experience. I’ve grown from a student developer into a more confident and capable contributor. The blend of technical tasks, infrastructure challenges, and collaborative workflows gave me an authentic look into the day-to-day life of a software developer. I leave this experience more equipped: technically and interpersonally to take on professional challenges in the IT industry. I’m truly grateful for everyone who helped me have this experience.