Software Development

Module 1: YouthForce

Core Project

Marks	100
Due date	**11 December 2025 - 4:30pm**
Submission	**Submit the following via Moodle:** Source Code and Media Resources Presentation
Instructors	Matthew Brown Khanyiso Haman Tyhiesha Johnson

Case Study - ModernTech Solutions

Background

ModernTech Solutions is a software development company founded in 2010. Initially a small start-up with just 20 employees, the company has experienced rapid growth over the past decade, now employing 250 people across various departments including software development, quality assurance, customer support, sales, marketing, and human resources.

The company specializes in creating custom software solutions for the healthcare industry, with a focus on patient management systems and telemedicine platforms. Their success in this niche market has led to consistent year-over-year growth, with plans to expand into international markets in the near future.

As ModernTech Solutions grew, their HR processes didn't evolve at the same pace. The company started with basic spreadsheets to manage employee information and simple time tracking. Over time, they added more spreadsheets and ad-hoc solutions to handle new requirements, resulting in a fragmented and inefficient system.

Current Pain Points

1. Employee data is stored in multiple Excel files, with separate sheets for personal information, salary details, and employment history.
2. Time off requests are managed through a combination of emails and a shared calendar.
3. Payroll is calculated using a complex series of interconnected spreadsheets.
4. Performance reviews are documented in Word files and stored in a shared drive.

The Project

To address the above pain points, ModernTech Solutions has approved a project seeking your expertise as a team of front-end web developers to create a new HR system that is user-friendly for HR staff. At this stage, the new HR system should only consist of a web-based application with front-end implementation. The objective is to demonstrate this as a proof of concept with the potential for future development at a later stage.

Non-Technical Requirements

- Create a user-friendly interface that non-technical HR staff can easily navigate.
- Demonstrate how employee data can be centralized and easily managed in a digital format.
- Show how payroll calculations can be automated and how digital payslips can be generated.
- Illustrate an efficient system for managing time off requests and tracking attendance.
- The web application should be purely front-end, using dummy data to simulate functionality. You can also make use of local
- The interface should be responsive, as HR staff occasionally work remotely on tablets or smartphones.

Technical Requirements

- Use modern front-end libraries such as Bootstrap to implement a responsive design.
- Create and use dummy data for all functionalities.
- Ensure all data manipulations happen on the client-side.
- Ensure cross-browser compatibility.
- Follow best practices for code organization and commenting.

Bonus Requirements

The following requirements are not mandatory for the final web application. However, they provide an opportunity to demonstrate your ability to tackle out-of-scope challenges creatively, enhancing the overall user experience. You are encouraged to attempt these requirements to test and showcase your skills.

- Implement client-side form validation.
- Add data visualization for reports using dummy data (e.g., charts for attendance).
- Create a mock authentication system with hardcoded credentials.

Business Rules and Logic

To summarise the above requirements from a developer perspective, the following business rules and logic provides you with clear guidelines for the development and functionality of the HR web application, to ensure that all key requirements are met in a structured and logical manner.

Business Rules and Logic	Description
User-Friendly Interface	The HR web application must provide a well-styled interface where key HR functions—such as employee management, payroll processing, and attendance tracking—are clearly accessible and easy to navigate for all users.
Employee Data Management	Employee data, including personal information, salary details, and employment history, must be managed through the web application.
Payroll Calculations and Digital Payslips	Payroll calculations must be automated based on predefined rules and functions, such as hours worked and salary rates, with the web application able to generate digital payslips for each employee.
Time Off Request and Attendance Tracking	The web application must include functionality for employees to submit time off requests, which HR staff can approve or deny. The system must automatically update attendance records based on approved time off and track employee attendance accurately.
Front-End Implementation with Dummy Data	The front-end must simulate full functionality using dummy data, including employee records, payroll, and attendance, to demonstrate the application's potential without requiring a back-end connection.
Responsive Interface Design	The web application must be designed to be fully responsive, adjusting its layout and usability for various screen sizes, including tablets and smartphones, to ensure that HR staff can perform all necessary tasks regardless of the device being used.

Team Project Structure

For this assessment, you will be required to work as a team of 3 students maximum. Your instructor will assign you to teams after which you must internally formulate your individual roles and responsibilities. You are encouraged to work collaboratively to achieve the project deliverables.

Project Deliverables

By the end of this assessment, your team must produce the following deliverables:

- A functional front-end web-based application that addresses all technical and non-technical requirements.
- A repository of your source code.

- A brief presentation demonstrating your web-based application and how it addresses ModernTech Solutions' specific needs.

Additional notes

- Read the project brief carefully to ensure that you understand the project requirements.
- This is an open-book assessment and as such you are welcome to make use of all your teaching and learning resources, as well as any other online resources which may assist you in completing your tasks.
- If you are uncertain about any aspects of the assessment, feel free to reach out to your instructor for clarification.
- Ensure that you add comments to your source code where necessary. This will help your instructor to make sense of potentially complex code.
- For the final presentation, all students must participate. Ensure that you do not exceed the 5-minute time limit for your presentation.

Learning Outcomes

By the end of this assessment, you should be able to:

1	Analyse a case study and interpret requirements to apply your practical front-end web development skills.
2	Apply modern front-end development frameworks to build responsive, cross-browser compatible applications.
3	Adhere to best practices in front-end web development and code organization, structure, and commenting.
4	Implement effective client-side data handling and interactions.
5	Develop creative solutions to address additional or unexpected challenges.
6	Collaborate effectively within a team, sharing responsibilities and contributing to a collective goal.
7	Clearly present and communicate the functionality and value of the developed solution.