2020 NWU – Dimension Data Collab

Project Brief

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1. Introduction

1.1. Purpose

The purpose of the document is to provide the Dimension Data project brief, background and expectations for the third year IT\ Computer Science students of North West University.

1.2. Background

Organisation X has just under 1 500 employees who work in the manufacturing industry. They are currently scouting for a team who will build a system that allows them to retrieve and maintain their data. As a proof of concept, they are willing to allow the dev team access to their anonymised employee data (in CSV format) that needs to be captured, maintained and retrieved when necessary. This data serves as the basis that the solution needs to be built off of.

2. Requirement

The scope of the project is limited to retrieving, capturing and maintaining data. The means to do this is open-ended. Organisation X have stated that they are open to the development of either an API or a web application to address the proof of concept.

The project should be approached from one of the following perspectives:

- Web Application Developer
- Web API Developer

The limit on technology is ASP.NET MVC Core. Please note that lean documentation of your solution is required.

2.1. Web Application Developer

The perspective of the web app developer would include the end-to-end development of a web app that allows for CRUD functionality of all data available, subject to row level security and role-based access control. The web application would also be required to include a data analytics tab that displays valuable, real-time information from the data.

The web application is subject to the following:

- A database being created to store the data
- The creation of a web application, subject to:
    - The implementation of a design pattern
    - The implementation of an architectural pattern
- The web application should contain register, sign in and sign out capability
- The web application should contain the following:
    - Row level security (RLS) view of data
        - This is data that can be viewed based on the user that has been signed in
    - Role-based access control (RBAC) view of data
        - This is data that can be viewed based on the role that a user has within the system or application
    - Create a new data record
    - Edit existing records
    - View the details of a record
    - Delete a record
    - There should also be a tab that incorporates real-time data analytics
        - As soon as data is added to the database, it should appear on the visuals in this tab

Please note that the user journey is an important aspect of this solution as it ensures that the user will remain motivated to use the solution.

2.2. Web API Developer

The perspective of the web API developer would include the end-to-end development of a REST API that allows for sending and receiving data.

The web API is subject to the following:

- A database being created to store the data
- The creation of a web API, subject to:
  - The implementation of a design pattern
  - The implementation of an architectural pattern
- The access to the API should be restricted through the use of authentication details
- The web API should contain the following:
  - Row level security (RLS) view of data
    - This is data that can be sent or received based on the user that has been signed in
  - Role-based access control (RBAC) view of data
    - This is data that can be sent or received based on the role that a user has
  - Get call
    - A get call retrieves data from the database and returns it to the user in JSON format
  - Post call
    - A post call sends data to the database and returns the result to the user either through status code or JSON format
  - Ability to view access on row level and role level
  - Ability to assign and revoke access on row level and role level

Please note that API documentation is very important as it helps the user understand and interact with the API.

2.3. Core Criteria

Detailed rubrics will be provided for the software and the documentation in two separate documents. As a guideline, the core functionality of the project is highlighted below.

2.3.1 *Web Application Developer*

Criteria for core functionality of web application approach.

Item
Full implementation of design pattern
Full implementation of architectural pattern
Database used and original dataset has been migrated into the database
Data is created in the database through the solution
Data is updated in the database through the solution
Data is deleted in the database through the solution
Data is retrieved in the database through the solution
Data analytics present
Row Level Security applied (without hardcoded values)
Role Based Access Control applied (without hardcoded values)
Sign in, sign out and register functionality built
Passwords are stored securely in the database. No passwords found in the code
SOLID principles adhered to
Source control has been used throughout the development phase
Documentation sufficiently outlines the solution and the user journey

Table 1 – Web Application: Guidelines for core functionality

2.3.2 *Web API Developer*

Criteria for core functionality of web API approach.

Item
Full implementation of design pattern
Full implementation of architectural pattern
Database used
Authentication method used to control access to the API
Data is created in the database through the solution
Data is updated in the database through the solution
Data is deleted in the database through the solution
Data is retrieved in the database through the solution
Original dataset has been migrated into the database
Row Level Security applied (without hardcoded values)
Role Based Access Control applied (without hardcoded values)
Passwords are stored securely in the database. No passwords found in the code
SOLID principles adhered to
Source control has been used throughout the development phase
Documentation sufficiently outlines the solution

Table 2 – Web API: Guidelines for core functionality