**PROJECT REPORT OF INDUSTRY ORIENTED HANDS ON EXPERIENCE (IOHE)**

**ON**

Equity Award Tracker

**submitted in partial fulfilment of the requirements for the award of degree of**

**BACHELOR OF ENGINEERING**

**In**

**COMPUTER SCIENCE AND ENGINEERING**

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# DECLARATION

I hereby certify that the work which is being presented in the project report entitled “Equity Award tracker” in partial fulfilment of requirement for the award of the degree of Bachelor of Engineering (Computer Science and Engineering) submitted in the department of Computer Science and Engineering at Chitkara University Institute of Engineering and Technology, Chitkara University, Punjab, India, is an authentic record of my own work carried out under the supervision of Mr. Dickson Nadar The matter presented in this project report has not been submitted in any other university/institute for the award of any degree.

Place: Rajpura Name: Ishan

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This is to certify that the above statement made by the candidate is correct to the best of my knowledge and belief.

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# ACKNOWLEDGEMENT

I would like to express our sincere gratitude to everyone who contributed to the successful completion of our project, “Equity Award tracker”.

Firstly, I am deeply grateful to Mr. Dickson Nadar, our project supervisor, for her invaluable guidance, encouragement, and insightful suggestions throughout the project. Her expertise and constructive feedback helped me overcome numerous challenges and made this project a learning experience.

I am equally thankful to the Department of Computer Science and Engineering, Chitkara University Institute of Engineering and Technology, for encouraging industry-oriented learning and offering a platform to apply theoretical knowledge to practical scenarios.

A special thanks to my professors and academic mentors whose foundational teaching helped me build the skills necessary for this project. I would also like to acknowledge the support of my peers and family, whose encouragement helped me stay focused and motivated throughout this journey.

This project has been a valuable learning experience that has helped shape my professional competencies and prepared me for future challenges in the software testing domain.

# ABSTRACT

The Equity Award Tracker (EQT) is a sophisticated web application designed to revolutionize the management of employee equity awards through real-time tracking and visualization. This project addresses the critical need for a centralized, secure platform to monitor vested and unvested shares while providing an intuitive user interface.

## Introduction

In today’s corporate world, equity compensation has become a vital component of employee remuneration, especially in startups and tech companies. Equity awards, including stock options and Restricted Stock Units (RSUs), provide employees with ownership in the company, aligning their interests with long-term company performance. However, while equity is a valuable benefit, it often comes with complex rules and timelines, such as vesting schedules, that many employees struggle to understand and track effectively.

Equity compensation typically involves conditions where a certain percentage of the stock is "vested" over time. For instance, a common vesting schedule might involve 25% vesting after one year (a cliff), followed by monthly or quarterly vesting of the remaining shares over the next three years. To further complicate matters, the value of equity awards fluctuates based on the company’s stock price, making it difficult for employees to estimate the true worth of their compensation at any given time.

The purpose of this project is to create a **Simple Equity Award Tracker** — a lightweight, full-stack web application that provides employees with a **clear and accurate view of their equity compensation**. The application will help employees:

* View details of their equity awards (e.g., stock options, RSUs).
* Track vesting schedules and see how many shares have vested to date.
* Monitor the current value of vested equity based on **live stock market prices**.
* Receive **notifications** when shares vest or when there are significant changes in stock price.

## Methodology

The development of the **Equity Award Tracker** followed a streamlined, modular approach based on the **Software Development Life Cycle (SDLC)**, ensuring efficient planning, development, and delivery of the application. The methodology consisted of the following key phases:

**1. Requirement Analysis**

* Defined the core functionalities: user authentication, equity award tracking, vesting schedule visualization, and real-time stock value calculation.
* Consulted with project mentors and analyzed similar tools to gather functional requirements.

**2. System Design**

* **Architecture**: Designed a client-server model using Angular for the frontend and .NET Core Web API for the backend.
* **Database**: Created schema with tables for employees, equity awards, vesting schedules, and stock prices using SQL Server/SQLite.
* **UI/UX**: Wireframes were created for the dashboard, login page, and stock value page using Bootstrap for responsive design.

**3. Development**

* **Frontend**: Built using Angular for dynamic content and Bootstrap for styling.
* **Backend**: Developed RESTful APIs with .NET Core, implementing JWT authentication for secure access.
* **Database Integration**: Used Entity Framework Core for CRUD operations and data persistence.

**4. API Integration**

* Integrated with external APIs (Yahoo Finance or Alpha Vantage) to fetch live stock prices.
* Backend logic calculates the current value of vested equity based on these prices.

**5. Testing**

* Conducted manual testing for functionality, data accuracy, and API responses.
* Verified login security, stock price calculations, and vesting logic.

## 3. Tools and Technologies

* **Angular**: A robust TypeScript-based framework for building dynamic single-page applications (SPAs). Angular facilitates efficient data binding, component-based architecture, and seamless integration with RESTful APIs.
* **CSS**: Utilized for styling the application, ensuring a responsive and visually appealing user interface. CSS frameworks like Bootstrap can be incorporated to expedite design processes and maintain consistency across components.
* **ASP.NET Core**: A cross-platform, high-performance framework for building modern web applications and APIs. It serves as the backbone of the backend, handling HTTP requests, routing, and middleware integration.
* **C#**: The primary programming language for developing the backend logic, including API controllers, business services, and data processing routines.
* **Visual Studio Code** : **VS Code** is a free, cross-platform code editor developed by Microsoft, supporting a wide range of programming languages and offering features like syntax highlighting, IntelliSense, and integrated Git control. Its lightweight design and extensive extension marketplace make it a popular choice among developers for efficient and customizable coding experiences.
* .**NET SDK 8** : The .NET 8 SDK is the latest Long-Term Support (LTS) release from Microsoft, offering a stable and high-performance platform for building modern applications. It includes enhancements such as improved garbage collection, new globalization modes for mobile apps, and advanced source generators for COM interop and configuration binding. Additionally, .NET 8 introduces C# 12, bringing new language features that enhance developer productivity.
* **NPM**:**(Node Package Manager)** is essential for Angular development, as it manages the installation of Angular CLI and other necessary packages. It simplifies project setup by handling dependencies and scripts, ensuring a streamlined development process.

## 4. Implementation

* **User Authentication**: Implemented using JWT tokens. Only authenticated users can access their data.
* **Equity Award Management**: Created API endpoints to fetch and display a list of equity awards for each user along with their vesting schedules.
* **Vesting Tracker**: Implemented logic to compute how many shares have vested based on grant date and vesting rules (e.g., 25% annually for 4 years).
* **Stock Price Integration**: Integrated with Yahoo Finance API to fetch current stock prices and calculate the value of vested equity.
* **Notifications**: Built basic logic to notify users about vested shares or significant stock price changes.
* **Dashboard**: Developed a simple, clean dashboard to display real-time data on equity, vesting schedules, and total value.

## 5. Major Findings/Outcomes/Output/Results

* Successfully built a working prototype of the Equity Award Tracker.
* Key outcomes:
* Employees can securely log in and view their equity awards.
* Real-time calculation of vested equity based on live stock price.
* Vesting schedule visually represented.
* Stock price changes and vesting notifications improve user awareness.
* Improved understanding of real-world stock compensation tracking and enterprise-level full-stack development.

## 6. Conclusion and Future Scope

### **Conclusion**

The Equity Award Tracker achieves its goal of providing a transparent, efficient, and easy-to-use platform for employees to track and understand their equity compensation. It ensures that employees stay informed about their vested shares and current value based on real-time data.

### **Future Scope**

* Add graphical visualizations for equity growth over time.
* Support multiple stock symbols for diversified grants.
* Allow exporting reports (PDF/Excel) for equity statements.
* Implement email/SMS notifications for major stock events or vesting dates.
* Include admin panel for HR to manage grants.
* Enhance security with role-based access control.

## 7. References

* [Microsoft Documentation - ASP.NET Core](https://docs.microsoft.com/en-us/aspnet/core/)
* Angular Official Documentation
* [Yahoo Finance API](https://www.yahoofinanceapi.com/)
* [Alpha Vantage API](https://www.alphavantage.co/)
* JWT.io for Authentication Concepts - <https://jwt.io>
* Stack Overflow and GitHub for community support

## 8. Appendices

* **Appendix A**: Details the technologies used, including Angular, CSS, ASP.NET Core.
* **Appendix B**: Illustrates the client-server model and RESTful API interactions within the application.