Project Plan Presentation
DSL IDE Test Harness

The Capstone Experience
Team Roosevelt Innovations Knowledge Science

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Project Sponsor Overview

- Roosevelt Innovations is a software provider for the dental insurance provider Delta Dental
- Located here in Okemos
- Delta Dental initially developed their own software for internal use
- Branched off in January 2022 to develop "company agnostic software" that can be used by any insurance company
Project Functional Specifications

• Allow actuaries to input their own measurements for their calculation models used to perform rate calculations
• Provide the ability for actuaries to perform mock rate calculations using their user defined measurements in their calculation modes
• Improve the proficiency and operation time for actuaries when testing their calculation models
• Decrease the possibility for calculation models to give companies an incorrect rate
Project Design Specifications

• Enhance the existing UI
  ▪ User Interface menu
  ▪ Differentiating User Inputs
  ▪ Testing Screen
  ▪ Results Page
Screen Mockup: Navigation Bar

The Capstone Experience
Screen Mockup: Input Classification
Screen Mockup: User Input
Screen Mockup: Results
Project Technical Specifications

- Use Angular framework to enhance the existing UI
- Host a Java microservice environment using Quarkus
- Use a REST API to request for a GRACE program from the microservice
- Use ANTLR to parse the GRACE file and populate the UI with user entry fields
- Use rate calculation services to perform mock rate calculations and send that data back to the UI to display to the user
Project System Architecture

Frontend Development

- Angular
- npm
- TypeScript
- HTML
- CSS

Backend Development

- Java
- API (REST)
- Roosevelt (simple. seamless. smart.)

Browser

Actuaries
Project System Components

• **Frontend Components**
  - Angular - is a TypeScript-based free and open-source web application framework. We will be using his framework for dynamically updating frontend components on the user interface.
  - HTML/CSS - These components are used for the styling and structure of the user interface.
  - NPM - is our package manager and installer.

• **Backend Components**
  - GRACE/ANTLR - a powerful parser generator for reading, processing, executing, or translating structured text or binary files.
  - Quarkus (Java) - Quarkus optimizes Java and makes it efficient for container, cloud, and serverless environments with memory consumption optimization and a fast response time.
  - Restful API - communicate via HTTP requests to perform standard database functions like creating, reading, updating, and deleting records.
Project Risks

• Dynamically generate Angular user interface
  ▪ When the user executes a rate calculation file an Angular page is generated dynamically to request information.
  ▪ Implement an Angular user interface that generates a variable number of labeled input boxes and records the user's input.

• Create a Java microservice to calculate rates for the GRACE IDE
  ▪ When the user inputs sufficient information, the application will send the data to our Java microservice where the rate will be calculated and made available to the user.
  ▪ Create a Java microservice that can perform some arbitrary calculation using values from the IDE and provide the result.

• Create GRACE files for testing purposes using the existing ANTLR grammar
  ▪ The GRACE IDE uses a language that only exists in this application and is not documented as extensively as the languages we have experience with.
  ▪ Create a small functional GRACE file that compiles in the IDE and results in a request to the user for at least one input.

• Design a user interface for users who may not be tech savvy
  ▪ The actuaries using the GRACE IDE may have very limited experience interacting with technical software, and IDE’s can present an overwhelming amount of information.
  ▪ Coordinate with actual actuaries at Delta Dental and Roosevelt Innovations to achieve a solution that fits their expectation. Their idea of a good experience is likely different than ours.
Questions?