

MICHIGAN STATE

U N I V E R S I T Y

Project Plan Presentation

3D Analysis of Dental Patient History

The Capstone Experience

Team Delta Dental 3DADPH

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*From Students...
...to Professionals*

Project Sponsor Overview

- Dental Insurance Provider
- Processes millions of claims a year
- 90 million Americans covered by Delta Dental
- Delta Dental of Michigan is headquartered in Okemos, MI



Project Functional Specifications

- Processing millions of claims per year
 - Claims sometimes need to be reviewed
 - Either approved or denied by adjudicators
- Access to a patient's entire dental history
- Viewing and editing this data is time consuming
- The project will be able to
 - Upload and edit patient dental records
 - View a 3D mouth model of these dental records

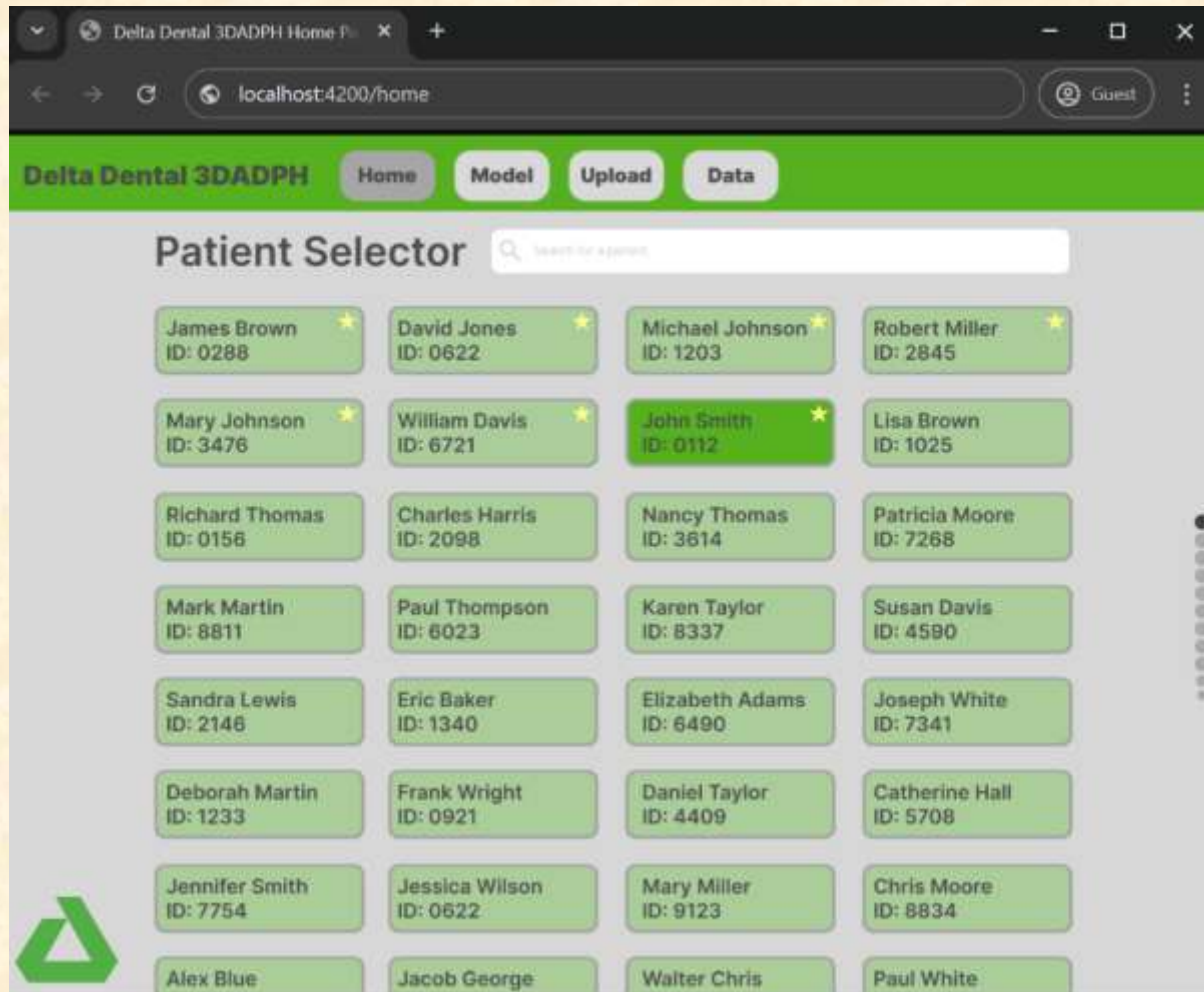


Project Design Specifications

- Upon entry to the application's home screen, you can search for a patient by name or ID
- When a patient is selected, the user is taken to the 3D model of their dental history
- The 3D model has information about past procedures performed
- Patient information can be edited and uploaded



Screen Mockup: Home Page



Screen Mockup: Mouth Model Page



Screen Mockup: Upload Claims Page

Delta Dental 3DADPH Claim U | x +

localhost:4200/upload Guest

Delta Dental 3DADPH Home Model Upload Data

Patient ID
Enter patient ID number

Procedure Date
Enter procedure date (MM/DD/YYYY)

Processing Date
Enter processing date (MM/DD/YYYY)

Procedure Code
Enter procedure code


Tooth Code
Enter tooth code

Tooth Surface
Enter tooth surface

Status
Enter completion status

Notes
Enter procedure notes

Submit

 **Upload CSV File**



Screen Mockup: Data View Page

Delta Dental 3DADPH Patient 1 x +

localhost:4200/data Guest

Delta Dental 3DADPH Home Model Upload Data

Patient Teeth Data

Enter a patient ID, procedure date, or procedure code.

Patient ID	Procedure Date	Processing Date	Procedure Code	Tooth Code	Tooth Surface	Status	Notes
1	2/15/2020	2/17/2020	D0120	10	None	Completed	Periodic oral eval.
1	5/10/2020	5/12/2020	D1110	N/A	None	Completed	Prophylaxis - adult
1	2/20/2021	2/22/2021	D1206	18	None	Completed	Topical fluoride varnish
1	3/12/2021	3/14/2021	D0274	14	None	Completed	Bitewing x-rays
2	1/05/2020	1/07/2020	D0150	3	None	Completed	Comprehensive oral eval.
2	4/16/2020	4/18/2020	D2392	2	Occlusal	Completed	Resin composite
2	6/03/2021	6/05/2021	D3310	5	None	Completed	Root canal treatment
2	8/11/2021	8/13/2021	D7140	7	None	Completed	Simple Extraction.
3	2/20/2020	2/22/2020	D0120	4	None	Completed	Periodic oral eval.
3	6/02/2020	6/04/2020	D1110	N/A	None	Completed	Prophylaxis - adult
3	1/15/2021	1/17/2021	D1206	19	None	Completed	Topical fluoride varnish
3	9/23/2022	9/23/2022	D0220	21	None	Completed	Radiographic image
4	1/22/2020	1/22/2020	D0150	9	None	Completed	Comprehensive oral

Team Delta Dental 3DADPH

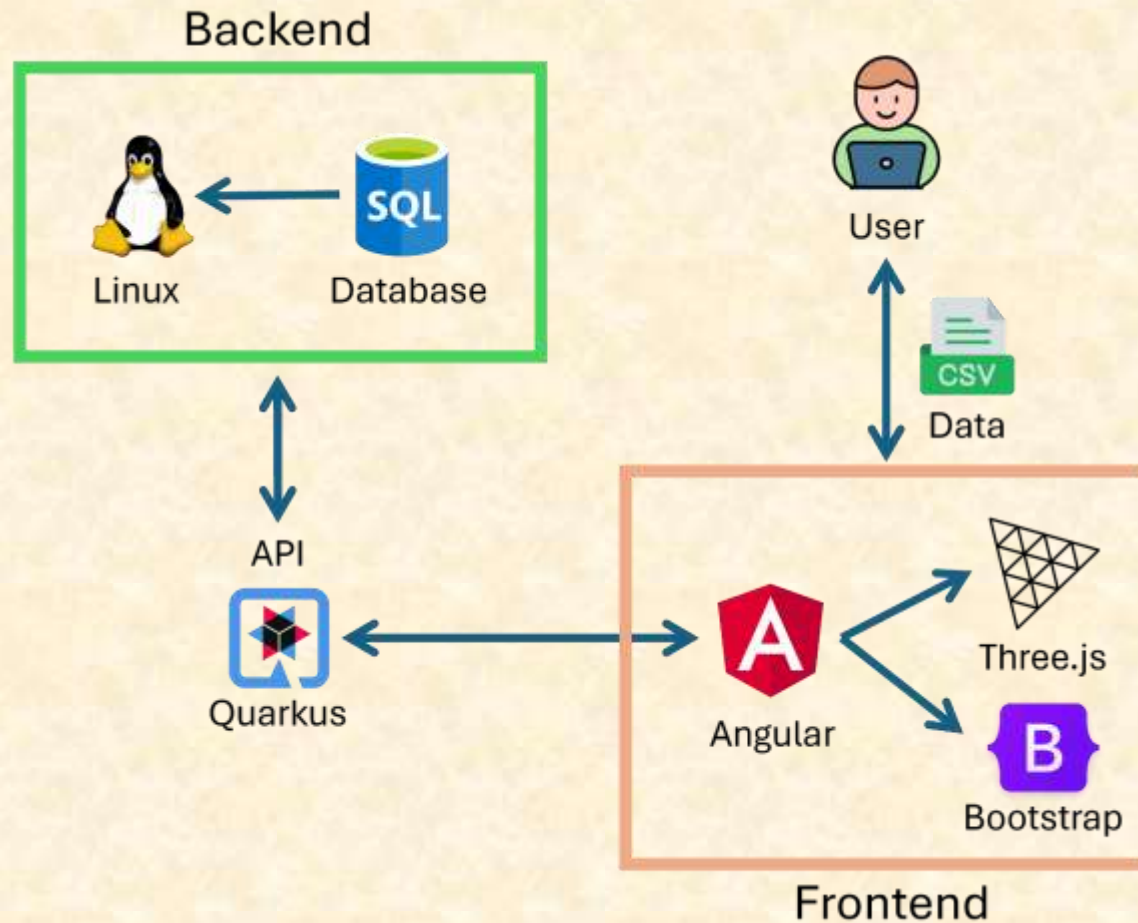


Project Technical Specifications

- Angular will serve as the frontend
 - Bootstrap provides preset style classes for the HTML elements
 - Three.js works with Angular to display the 3D model
- Java Quarkus allows Angular to connect to the database
- PostgreSQL database is hosted on a DECS Linux Virtual Machine
 - Two separate relations for patient information



Project System Architecture



Project System Components

- Hardware Platforms
 - DECS Linux VM
- Software Platforms / Technologies
 - Java Quarkus
 - PostgreSQL
 - Angular
 - Bootstrap
 - Three.js



Project Risks

- 3D modeling unique procedures
 - Making sure that the users can tell what procedures occur on which teeth
 - Speaking with the client and showing them various options for how procedures can be modeled on teeth
- Accuracy of the application
 - Adjudicators must use the app to approve or deny claims. To properly use the application the data must be accurate
 - Frequent communication with the client and testing
- Accounting for all procedure codes
 - There are 900 different codes for different dental procedures
 - Speak to the client and prioritize which procedures should have accurate displays



Questions?

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