

MICHIGAN STATE

UNIVERSITY

Project Plan Presentation

DRIVEN-4 Connect Update and Upgrade

The Capstone Experience

Team DRIVEN-4

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

Project Sponsor Overview

- Operational support, technology implementation, process development, and strategic insight and direction
- Areas of expertise include PLM, IoT, and cybersecurity.
- Headquarters in Saint Joseph, Michigan



DRIVEN-4



Project Functional Specifications

- Customizing their data sent in and transmitted from the boards
- Better user interface on the home page of the web application for easier navigation
- Easier navigation to their firmware versions of the device, under device information
- Easier Data analysis interface
- One Super user admin account for whole application
- DRIVEN-4 Employee Account portal for the whole application
- Company Account admins/users for the whole application
- Easier billing information insights per device



Project Design Specifications

- Easy online application to manage PLM and IoT solutions
- Ability to access billing information, install firmware for various modules, and perform data analysis on logs sent back from the modules
- Four different user levels, two for DRIVEN-4 and two for outside companies



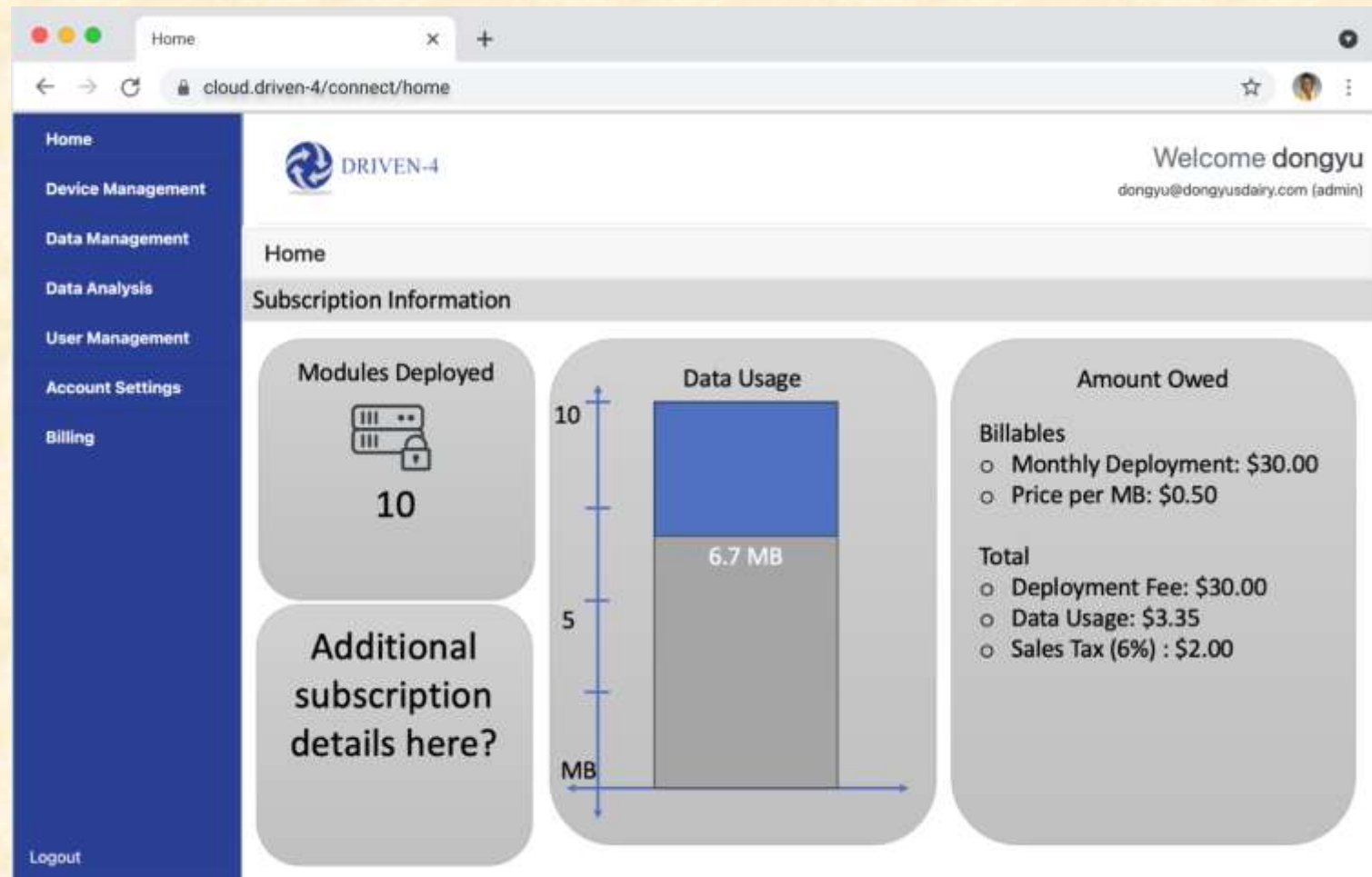
Screen Mockup: Home-Device Info

The screenshot displays a web application interface for 'DRIVEN-4'. The browser address bar shows 'cloud.driven-4/connect/home'. The user is logged in as 'dongyu' (dongyu@dongyudairy.com (admin)). The main content area is titled 'Home' and 'Device Status'. A table lists various devices with columns for Name, Status, Serial No., and IMEI. The table includes entries for 'facility', 'IT_office', 'Samsung S21', 'iPhone 15 Pro', 'Pixel Fold', 'North Warehouse', 'South Warehouse', 'HR_office', 'Bathroom', and 'Nothing Phone 2'. A sidebar on the left contains navigation links: Home, Device Management, Data Management, Data Analysis, User Management, Account Settings, Billing, and Logout. The table has 'Sort' and 'Filter' buttons and a pagination control showing '1 2 3 4 5'.

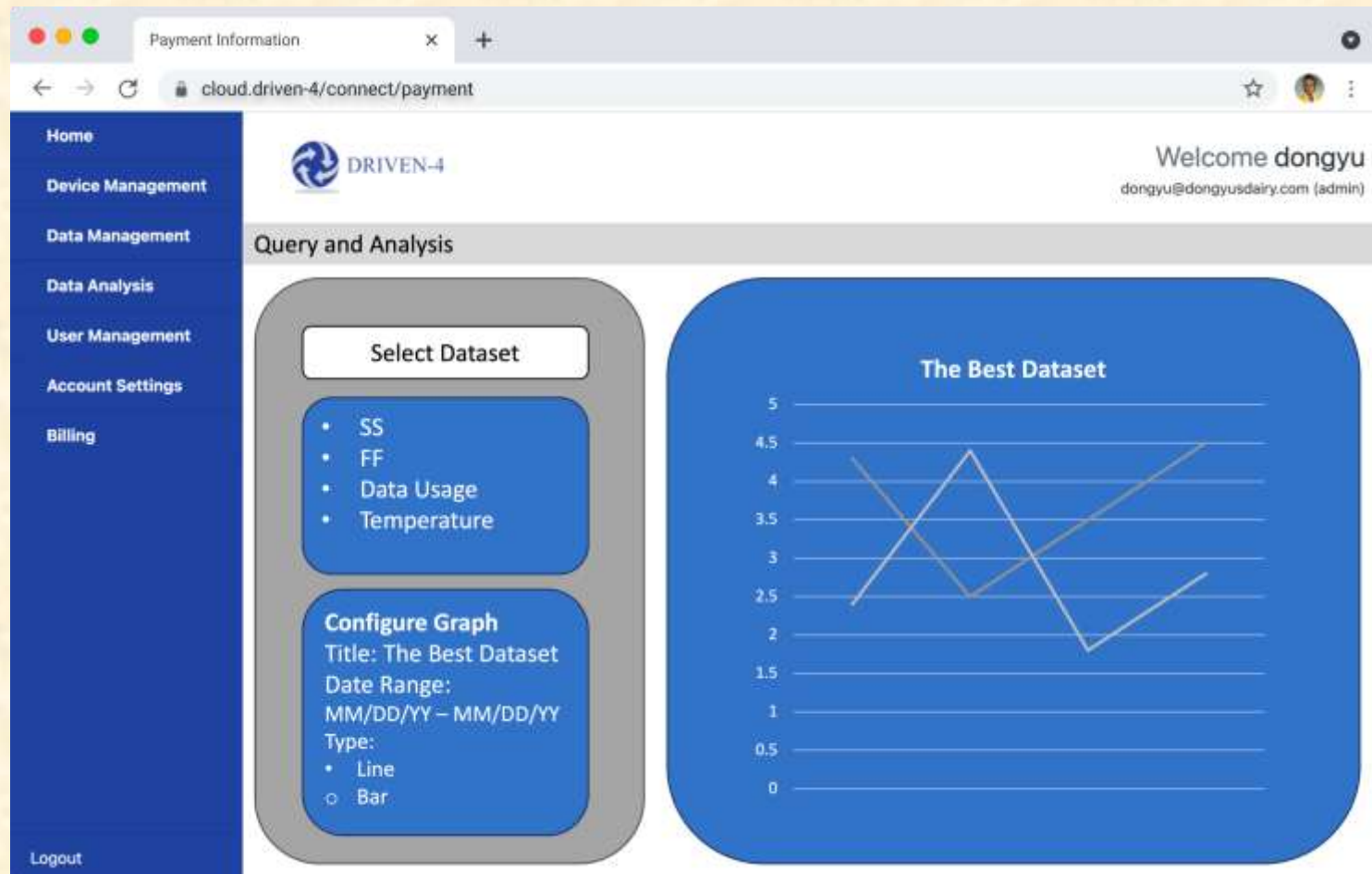
Name	Status	Serial No.	IMEI
facility	Active	WU5X9VHM9PER9A4N	350857120901940
<u>IT_office</u>	Idle	WSX3QRXM9PQS45XC	350857120904403
Samsung S21	Active	N/A	IMEI1234
iPhone 15 Pro	Idle	WSX3QRXM9PQS45XC	350857120904403
Pixel Fold	Idle	N/A	350857120901940
North Warehouse	Active	NTHWRH	350857120901940
South Warehouse	Idle	STHWRH	350857120904403
<u>HR_office</u>	Idle	HROFF	IMEI1234
Bathroom	Active	BTHRM	350857120901940
Nothing Phone 2	Active	NTHPHN2	IMEI1234



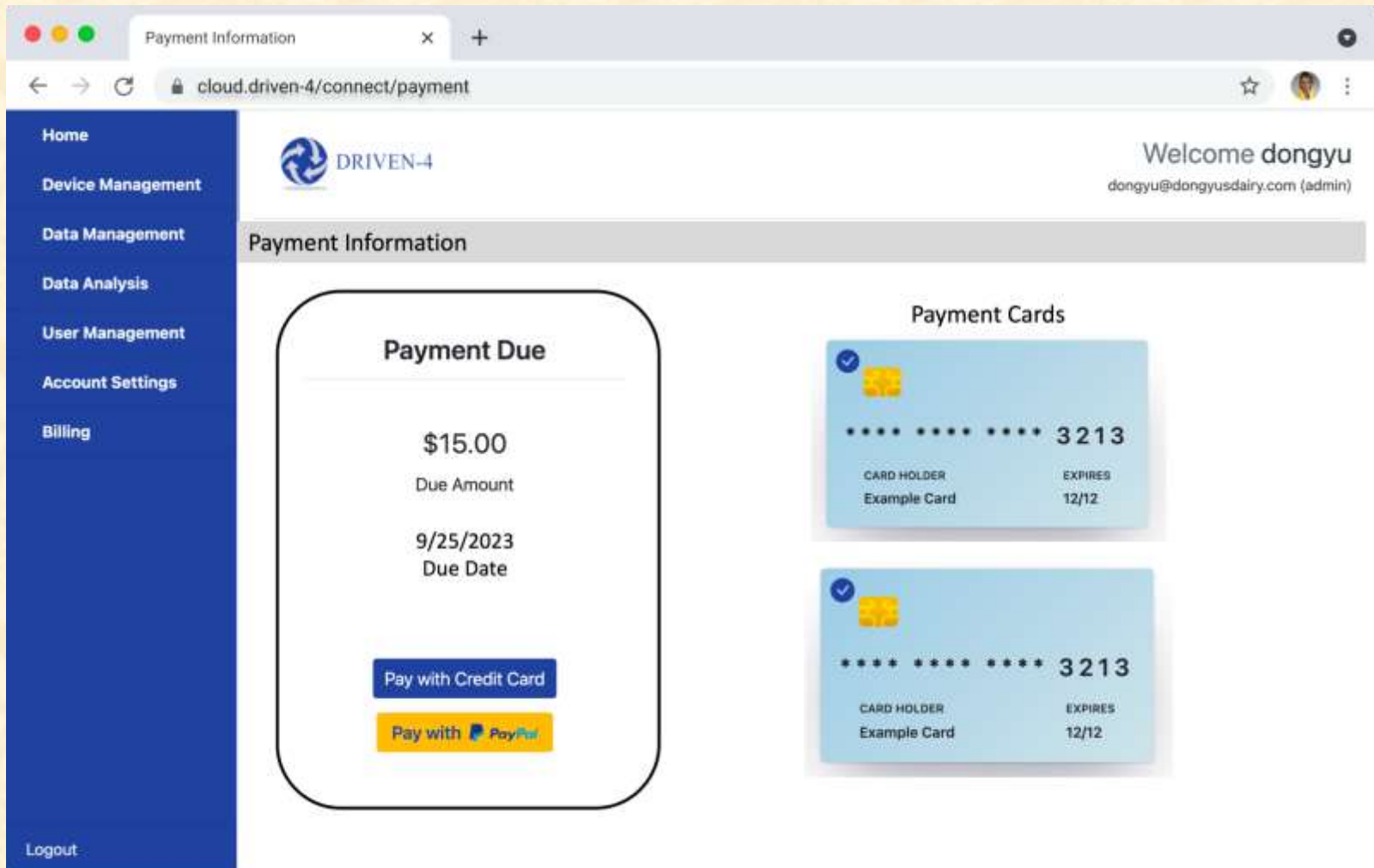
Screen Mockup: Subscription Info



Screen Mockup: Query and Analysis



Screen Mockup: Billing Information

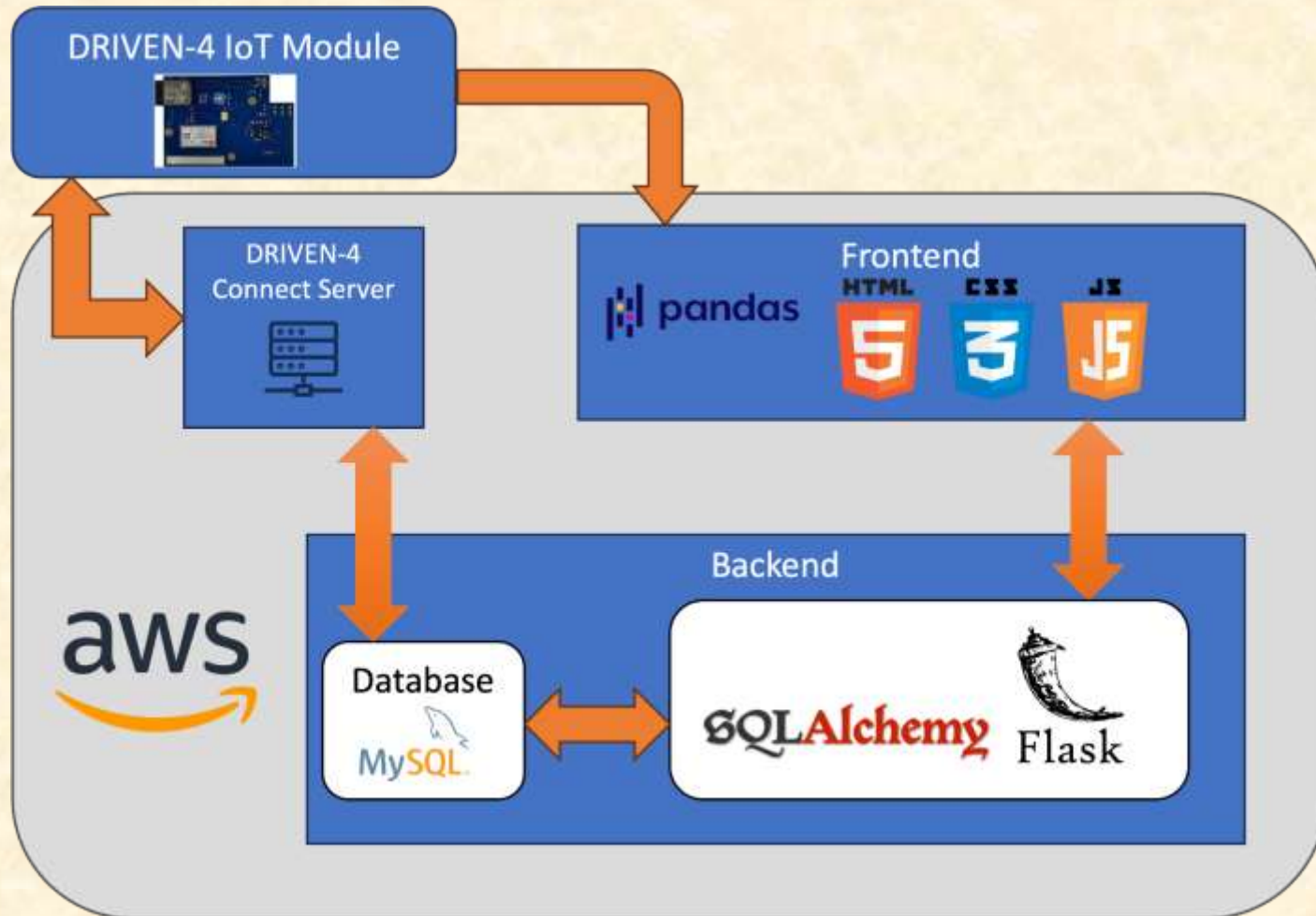


Project Technical Specifications

- HTML, CSS, and JS to improve upon user interface
- Flask and SQLAlchemy to update schema and SQL interface
- Customizable graphs of module data using Pandas
- FastAPI will update database and configuration of module boards



Project System Architecture



Project System Components

- Hardware Platforms
 - DRIVEN-4 Connect Module – Custom built board to transmit different readings and logs back to webapp
- Software Platforms / Technologies
 - HTML/JavaScript/CSS – Industry standard for designing websites
 - Flask – Framework used to route between web pages and provide connection to databases
 - MySQL/SQLAlchemy – Database and ORM engine
 - AWS – Cloud Computing service that hosts the webapp
 - Pandas– Frontend service to do analysis



Project Risks

- Update database schema and integrating ORM
 - Make database efficient to ensure speed and stability
 - Research SQLAlchemy for creating advanced queries
- Protecting sensitive customer information
 - Billing information and logins will be in a database
 - Research industry standards for how to securely store data
- Building new code on top of previous semester project
 - Base project was made by spring 2023 capstone members
 - Maintain constant contact with sponsor for project scope
- Creating responsive application
 - Need to make experience consistent across aspect ratios
 - Conscious testing using many variable display sizes



Questions?

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