

MICHIGAN STATE

UNIVERSITY

Project Plan Presentation

The Capstone Experience

Team RPM

Thomas Huynh
Brandon Linville
Palmer McGuire
Conner Sheridan
Ajay Suresh

Department of Computer Science and Engineering
Michigan State University

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

Project Sponsor Overview

- RPM is one of the fastest growing freight brokerage that specializes in vehicle transportation
- Headquartered in Royal Oak, MI while operating in 30 different countries handling upwards of 60k transportation orders monthly
- RPM receives client orders in various formats around the globe to be processed for delivery and eventual deployment.
- RPM is looking to develop a software solution for automating the process seeking to improve efficiency of order classification and database integration..
- This new software will reduce manual labor by sorting and transforming order files automatically, including manual override functionality.
- This automation will enhance RPM's operational efficiency, flexibility, and innovation capabilities, supporting its growth as a leading logistics provider.



RPM



Project Functional Specifications

- Approximately 20% of customer orders are manually sent via email, creating a complex, manual data processing workflow
- The project aims to automate this process, integrating with RPM's shipment management software and reducing manual intervention
- Software will classify, parse, and convert emails into usable data, posting orders directly to RPM's shipment software
- RPM brokers will manage unautomated VIN orders through a dashboard, addressing issues and viewing process statistics like error rates and order types
- The project's goal is to increase order input automation while offering data-driven metrics to improve future order input processes

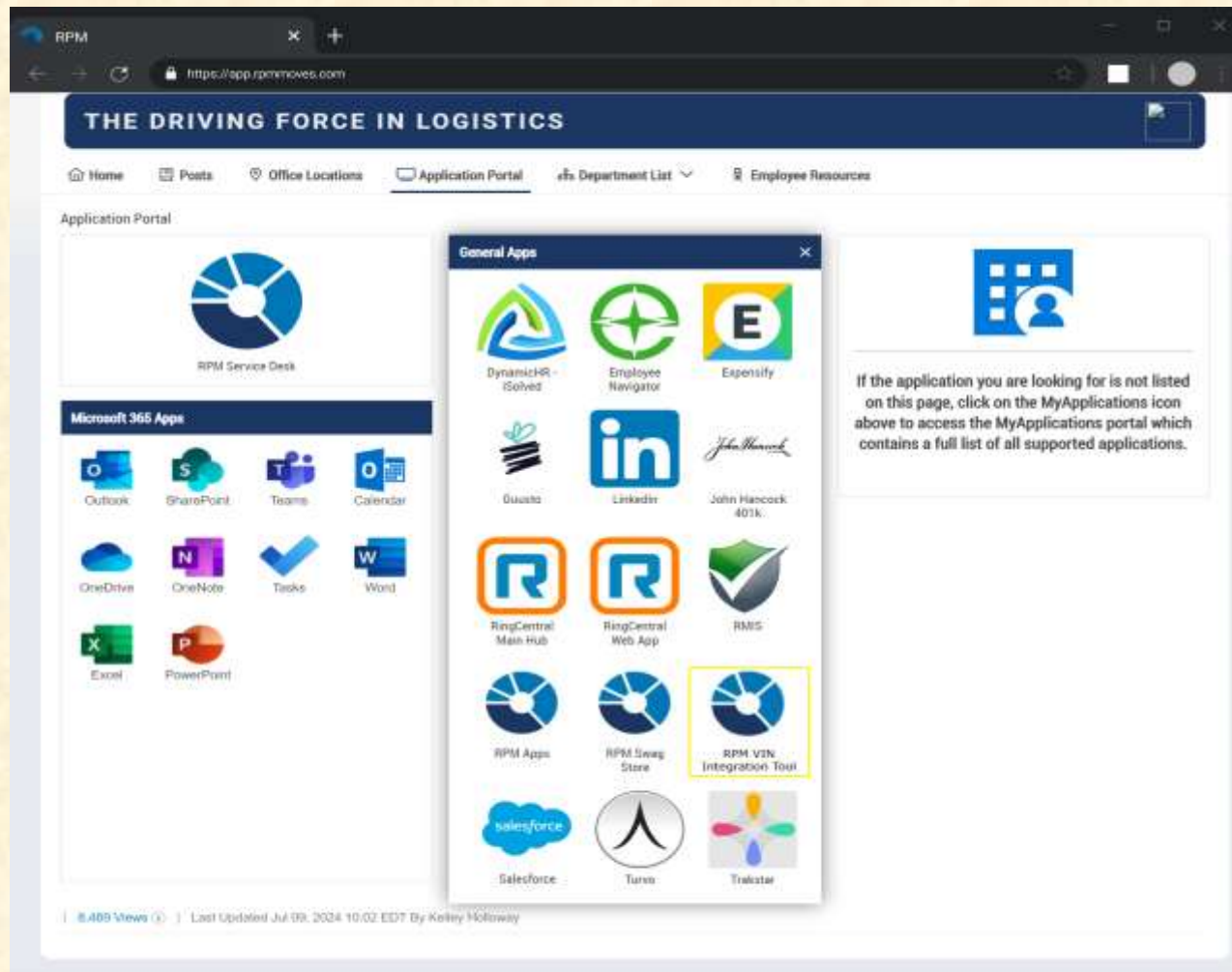


Project Design Specifications

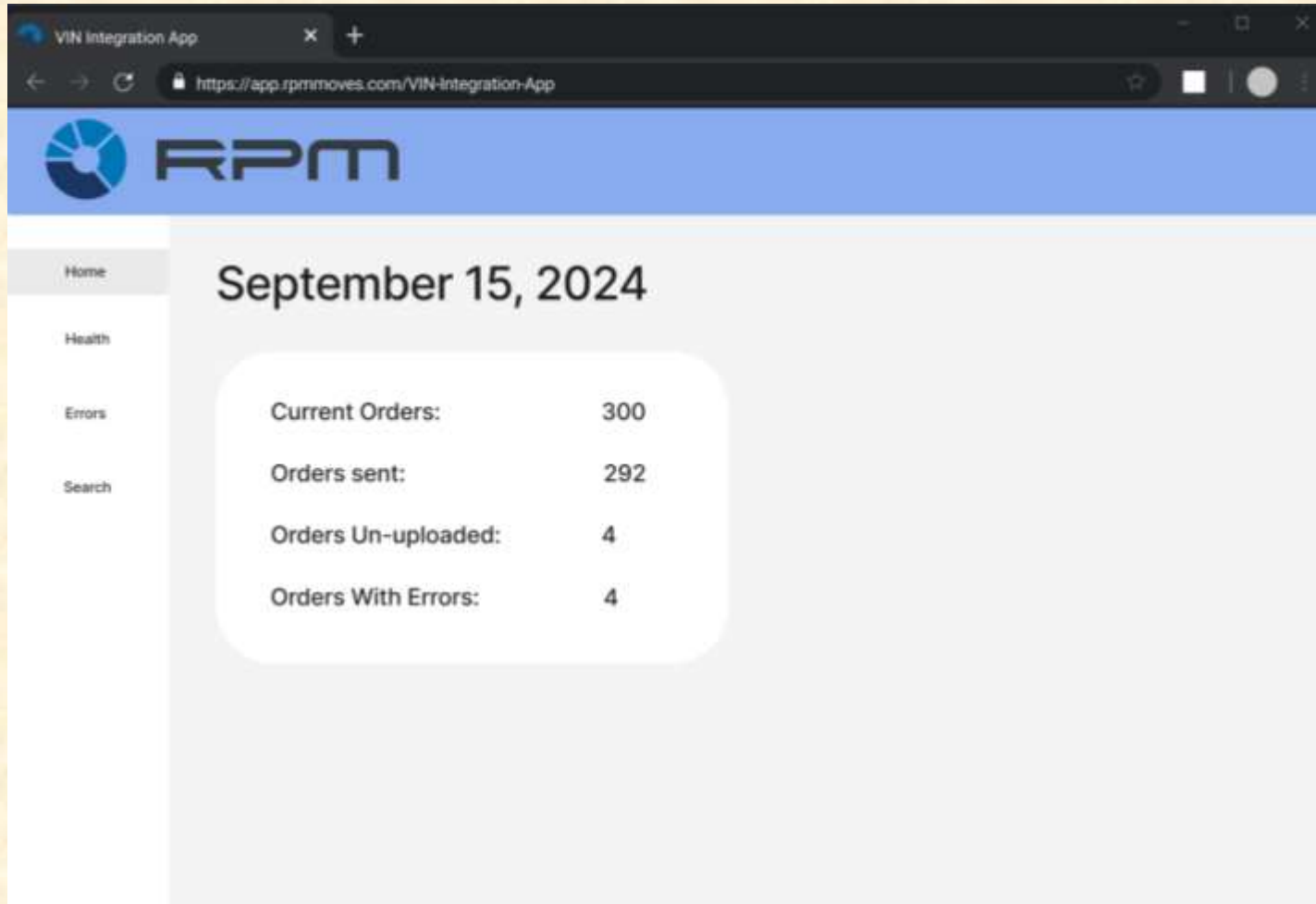
- Automates file classification, data extraction, and normalization for seamless integration into RPM's database
- Provides an error management menu for manual data correction or escalation
- Boosts efficiency by reducing manual input and speeding up order processing
- Ensures data accuracy and consistency across all orders by data pattern verification
- Ex: VIN 17-character alphanumeric code, datetime, etc.
- Scalable to handle growing customer demand and workload



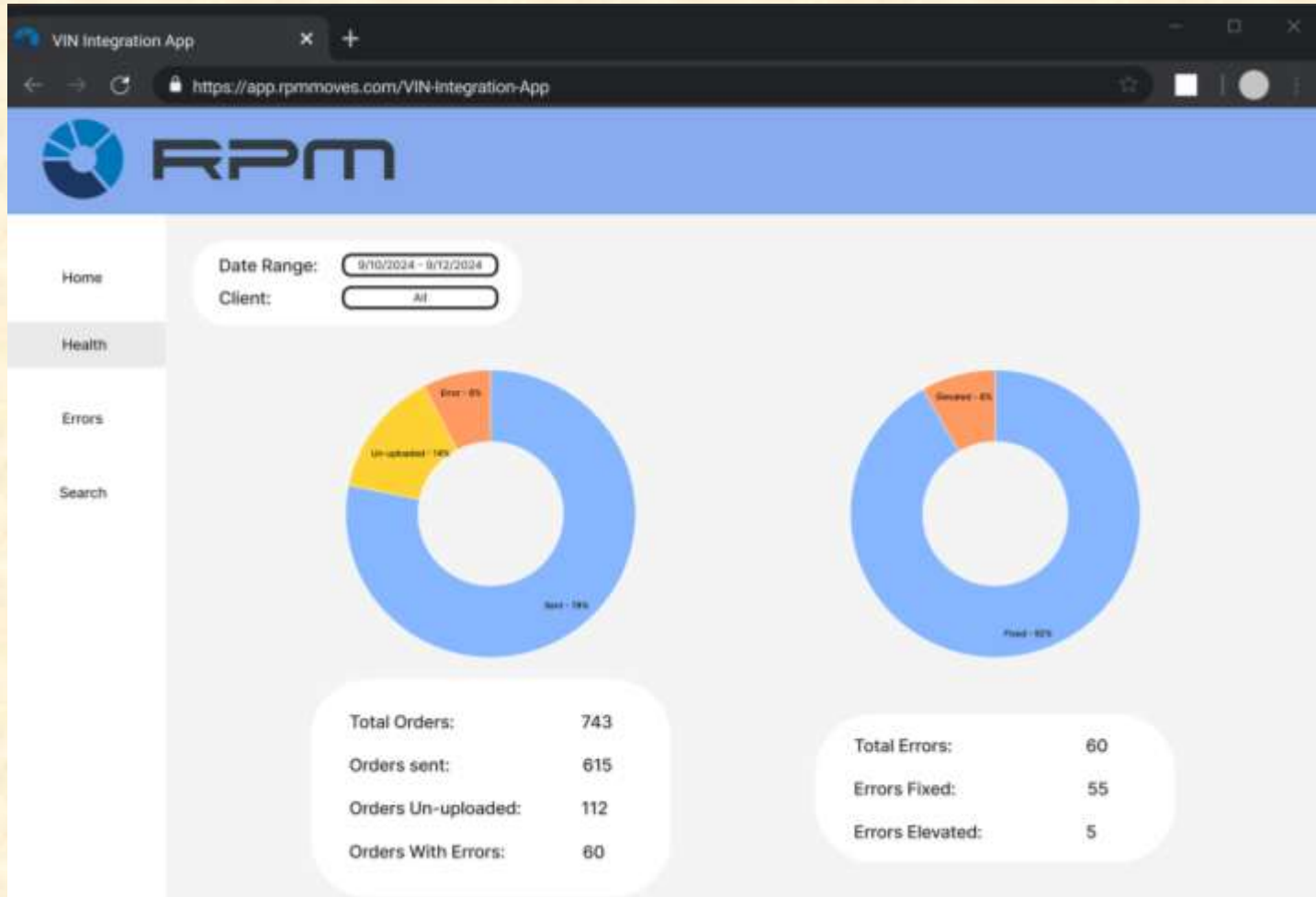
Screen Mockup: User Authentication and Access



Screen Mockup: Home Page



Screen Mockup: Health Dashboard



Screen Mockup: Error Dashboard

The screenshot displays the VIN Integration App interface. The browser address bar shows the URL <https://app.rpmmoves.com/VIN-Integration-App>. The RPM logo is visible in the top left. A sidebar on the left contains navigation options: Home, Health, Errors (selected), and Search. The main content area features a header with the instruction "Double Tap An Order to Open and Edit" and a red badge indicating "10 Orders Stuck". Below this is a table listing 10 stuck orders.

Client	Date Received	VIN number
MSJ	9/18/2024	5Y1SL65848Z411435
MSJ	9/18/2024	3Y1SL65848Z411489
MSJ	9/4/2024	2Y1SL65848Z411454
MSJ	9/7/2024	5Y1SL65848Z411410
MSJ	9/7/2024	6Y1SL65848Z411439
MSJ	9/18/2024	5Y1SL65848Z411435
MSJ	9/18/2024	3Y1SL65848Z411489
MSJ	9/4/2024	2Y1SL65848Z411454
MSJ	9/7/2024	5Y1SL65848Z411410
MSJ	9/7/2024	6Y1SL65848Z411439



Screen Mockup: Edit Order

Home

Health

Errors

Search

Vehicle

VIN number: [Redacted] Year: 2021 Model: Toyota Make: Highlander

Pick up

Location Name: Boardwalk Auto Center Street Address: 1 Blair Island Rd. City: Redwood City State: CA Postal Code: 94063 Country: USA

Start Date: 07/18/2024 End Date: - Notes: -

Delivery

Location Name: Adesa Golden Gate Street Address: 18501 West Stanford Rd. City: Tracy State: CA Postal Code: 95377 Country: USA

Start Date: - End Date: - Notes: -

Elevate Order **Submit Order**

Delivery Company: RPM

Please Pickup the Following vehicle:

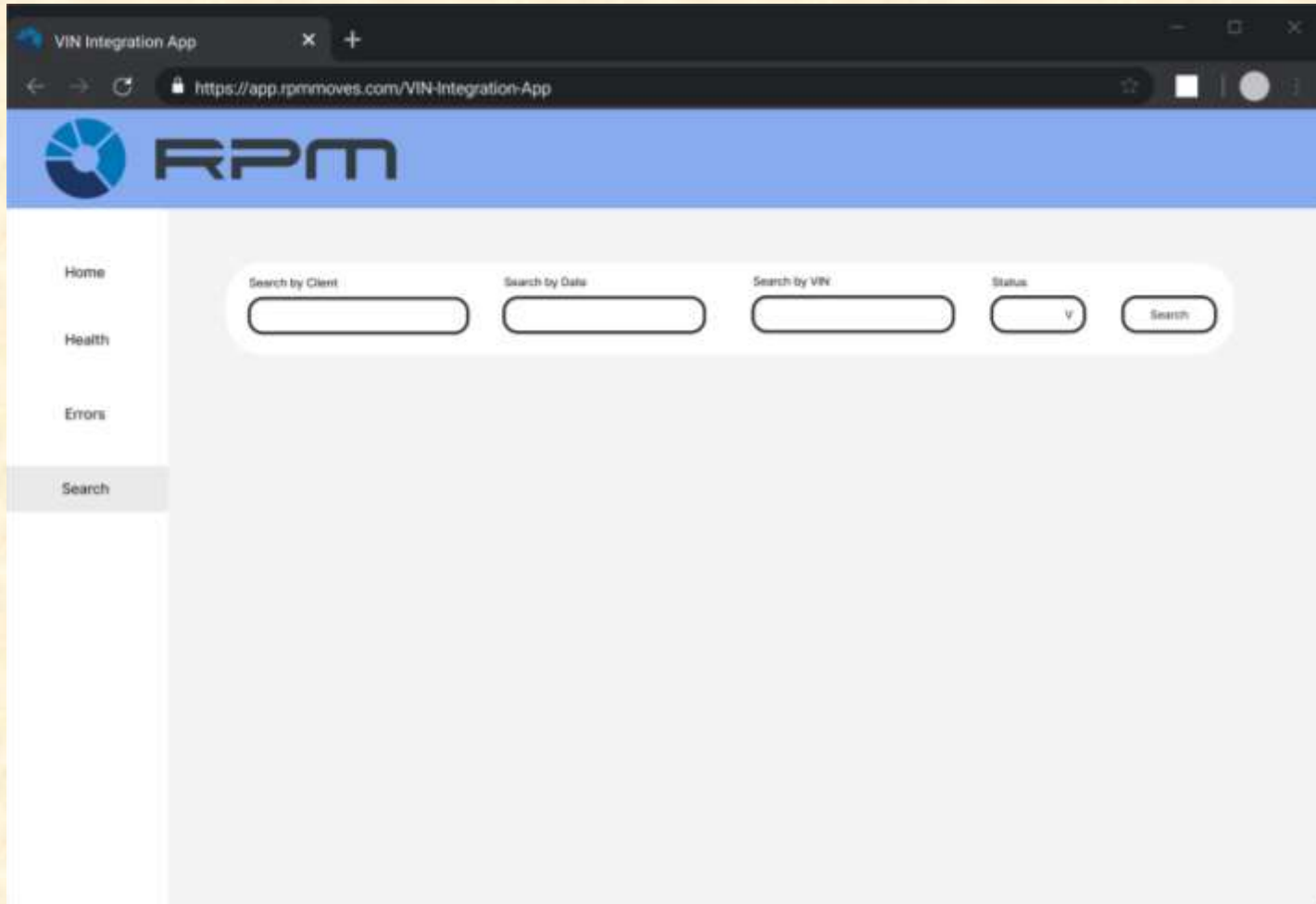
Stock Number : 8067/28792/MS144699
Pickup Request Date : 07/15/2024

Pickup Location:

Type : Dealership
Name : BOARDWALK AUTO CENTER
Line 1 : 1 BLAIR ISLAND RD.
City : REDWOOD CITY
State/Zip : CA 94063



Screen Mockup: Search



Screen Mockup: Search Results

The screenshot displays the VIN Integration App interface. The browser address bar shows the URL <https://app.rpmmoves.com/VIN-Integration-App>. The app header features the RPM logo. A left sidebar contains navigation options: Home, Health, Errors, and Search. The main content area includes search filters: Search by Client (MSU), Search by Date (8/1/2024 - 8/31/2024), Search by VIN (-), and Status (v). A Search button is located to the right of the filters. Below the filters, the Results section contains a table with the following data:

Client	Date Received	VIN number	Status
MSU	8/8/2024	5Y1SL85B4RZ411435	Sent (8/20/2024)
MSU	8/8/2024	3Y1SL85B4RZ411489	Error
MSU	8/4/2024	2Y1SL85B4RZ411454	Pending
MSU	8/1/2024	5Y1SL85B4RZ411410	Sent (8/2/2024)
MSU	8/1/2024	6Y1SL85B4RZ411439	Sent (8/2/2024)

Below the table, there is a note: Double Tap an order to view email.



Screen Mockup: Search Results- Open Order

The screenshot displays the VIN Integration App interface. The browser address bar shows the URL <https://app.rpmmoves.com/VIN-Integration-App>. The app header features the RPM logo. A left sidebar contains navigation options: Home, Health, Errors, and Search (which is highlighted). The main content area includes search filters: Search by Client (MSU), Search by Date (8/1/2024 - 8/31/2024), Search by VIN (-), and Status (V). A Search button is located to the right of these filters. Below the filters is a table with the following data:

Client	Date Received	VIN number	Status
MSU	8/18/2024	5Y1DL5B482411435	Sent (8/20/2024)

Below the table, the details for the selected order are displayed:

Delivery Company: RPM

Please Pickup the Following Vehicle:

Stock Number : 9CG7/28792/9S144699
Pickup Request Date : 07/13/2024

Pickup Location:

Type : Dealership
Name : BOARDWALK AUTO CENTER
Line 1 : 1 BAIR ISLAND RD.
City : REDWOOD CITY
State/Zip : CA 94063

Contact 1/2 : ATTN: BRENDAN DOLAN, JASON LAU/
Phone 1/2 : 877-526-9868, 415-265-9814
Fax 1/2 : 650-568-5125
Email 1/2 : BRENDAN.DOLAN@BWLKCAUTO.COM

Deliver to:

Name : ADESA GOLDEN GATE
Line 1 : 18501 WEST STANFORD RD.
City : TRACY
95247/CA - 95247

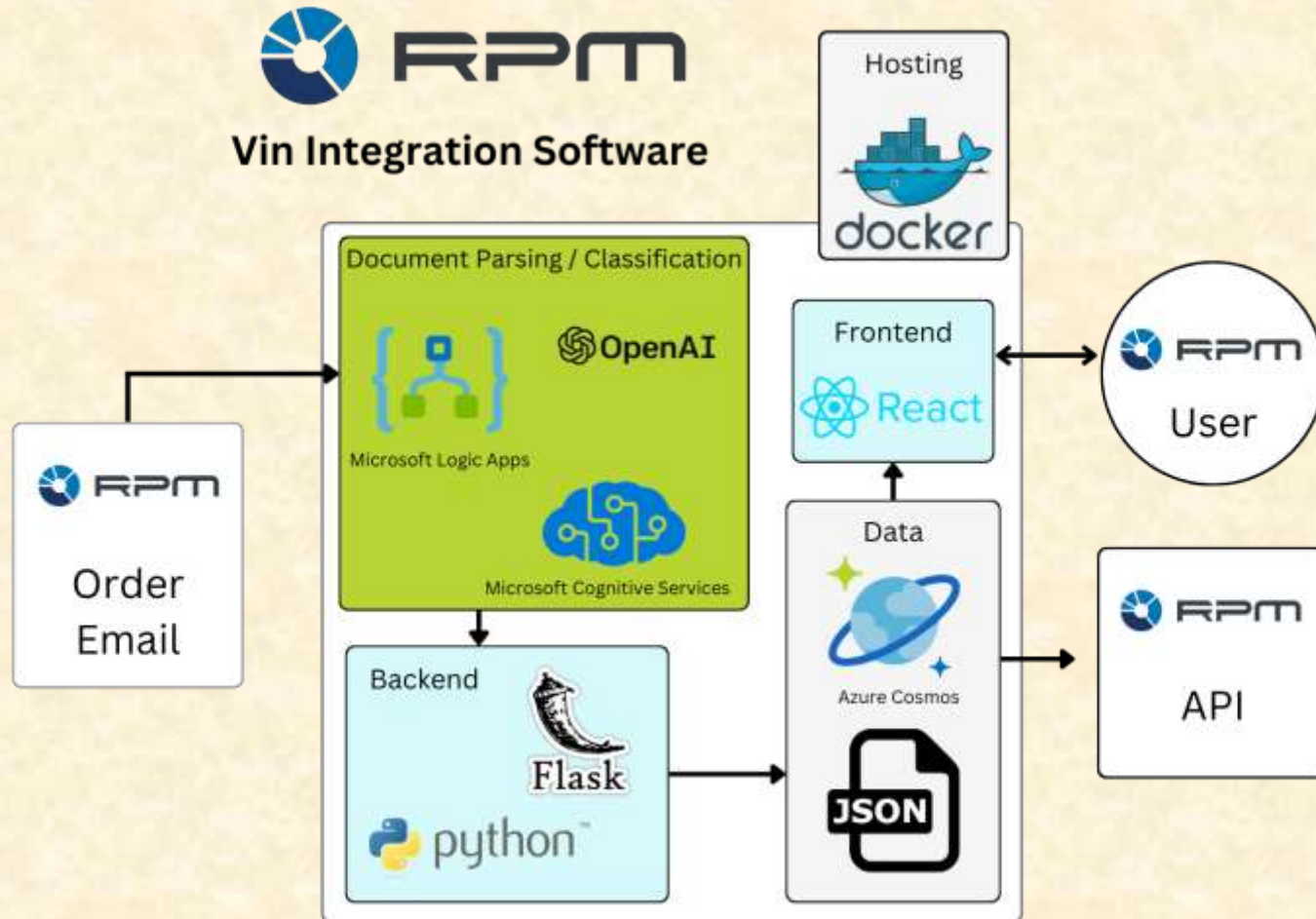


Project Technical Specifications

- VIN Integration Tool is a React web application utilizing Azure features
- Flask back-end supporting the React based front-end
 - TypeScript, HTML, and CSS
- Front-end will be containerized using Docker and run on Azure Container Instances (ACI)
 - RPM General apps dashboard
- Azure logic email triggers automatically classify and sort ambiguous email data file types
 - Azure functions wrap python code to parse separate file and normalize
- Open AI model cleans and structures data efficiently
- Azure Cosmos DB stores structured JSON client data
 - Flexible and scalable across multiple regions



Project System Architecture



Project System Components

- **Hosting Platforms and Databases**

- Azure Cosmos SQL (Azure non-relational NoSQL database)
- Azure Hosting Services (host the app on RPM application portal)
- Docker (used for containerization, ensuring consistency across different environments)

- **Software Platforms / Technologies**

- OpenAI (text extraction resulting in JSON structured outputs)
- Microsoft Azure (including, but not limited to, azure cognitive and azure logic apps)
- Python (pushing and pulling data from database and handle file classification cases)
- React (front-end of the app using Typescript)
- Flask (API calls and additional back-end functionality)
- JSON (structured data output from text extraction, consistent format for automation)



Project Risks

- **Final integration with RPM'S system and client mapping between software – Difficulty: Easy**
 - RPM has a relatively complex API that is part of their legacy code and has pointed out the connection may take substantial time. Similarly, RPM maintains multiple client identifiers that will need to be maintained or created through our system
 - Team RPM will create mock orders to test external API connection and ensure complete correctness. Developing a plan with RPM to handle clients not in RPM's system and client identifier creation if necessary.
- **Email classification correctness and file to text conversion – Difficulty: Medium**
 - RPM receives VIN data in various file types. Each file type must be categorized and handled differently. This poses a serious risk if every file type is not accounted for
 - Received expansive RPM email order data examples. Categorize and maintain list of all current options and research niche or future file types and formats. Also, explore and test technologies that currently handle ambiguous file types
- **AI Drift and output variability – Difficulty: Hard**
 - AI models are known to exhibit drift over time, which leads to changes in output for the same input cases. The inability to trust the output, especially over periods of time, poses a significant risk as we must ensure all orders are always processed 100% correctly, or this could cost the client serious revenue loss over time
 - Use drift mitigation techniques such as incorporating human oversight and AI-assisted evaluation. This is the process of running AI output through a second AI input to ensure it aligns with formatting, length, and text requirements. Develop strategy to verify orders with RPM based on the results of AI output testing



Questions?

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