

MICHIGAN STATE

UNIVERSITY

Project Plan Presentation Dashboard for Data Visualization

The Capstone Experience

Team Magna

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

Project Sponsor Overview

- Magna International is a worldwide leader in automobile parts supplying.
- Magna International employs over 170,000 people with 345 manufacturing facilities and 90 R&D centers in over 28 countries.
- Magna USA is headquartered in Troy, Michigan. Magna is a Fortune 500 company with over 30 billion dollars in revenue in 2022.



Project Functional Specifications

- Auto part manufacturers such as Magna International manage massive amounts of data.
- Now that Magna is moving into the autonomous robotics sphere, they will have to deal with all the new data they are creating.
- Our Project is meant to create a streamlined dashboard that allows Magna employees to easily access, filter, and organize large amounts of data.

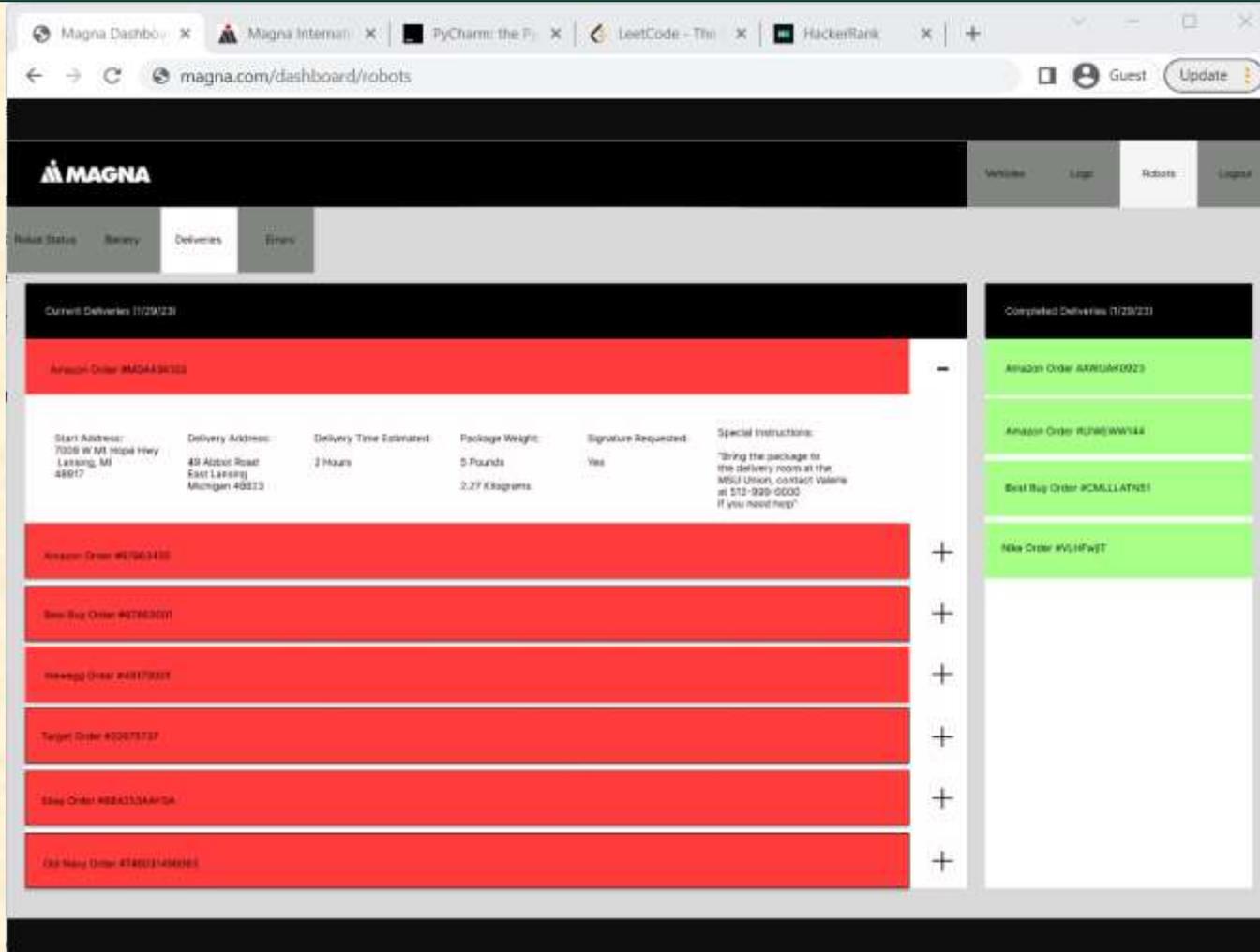


Project Design Specifications

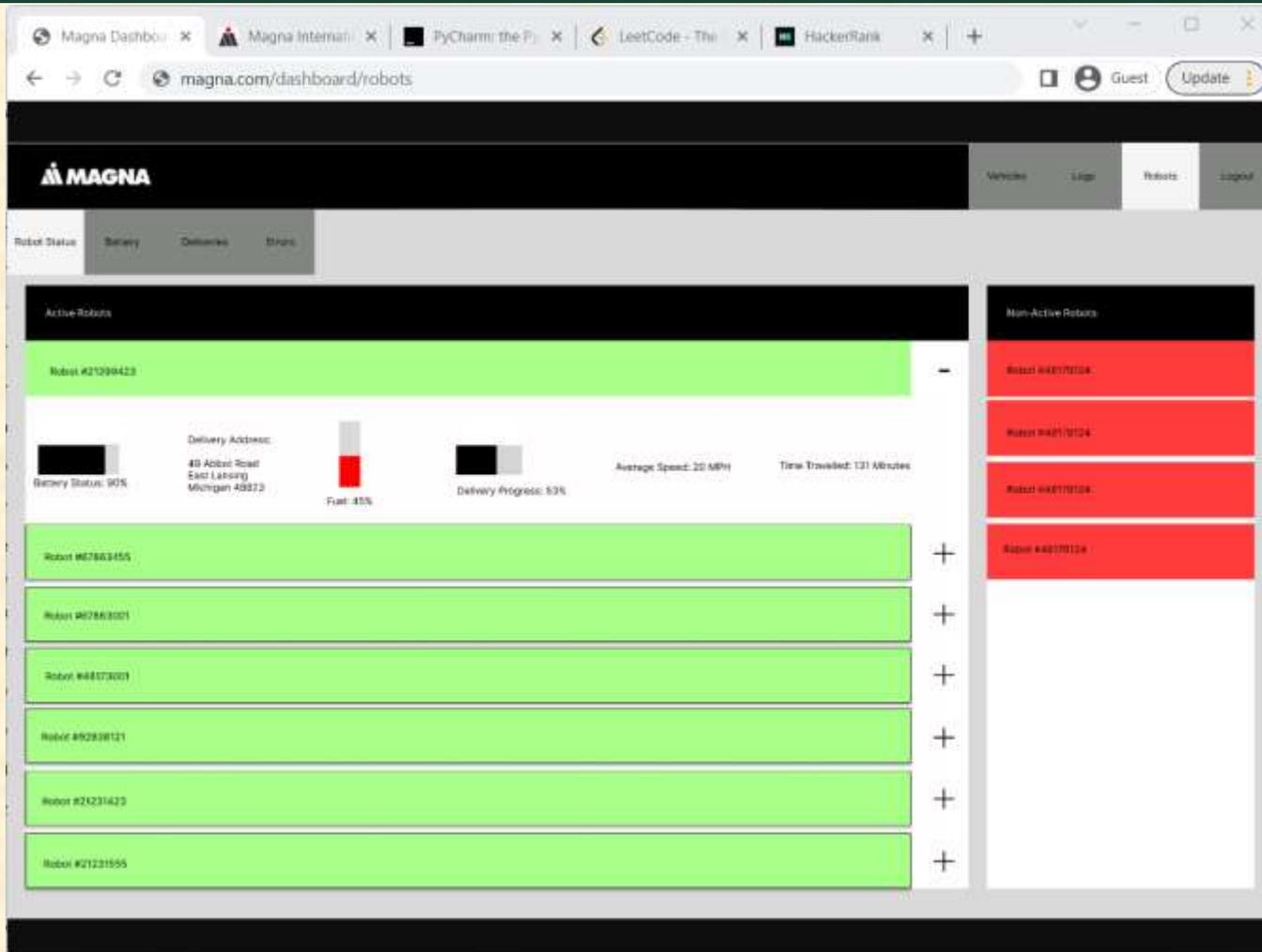
- An interface that displays real time data for the autonomous delivery bots.
- Analyze the fleet status and performance of the delivery bots.
- Display quantitative information for each delivery that happens in a day.
- Ability to select and view each different bot's data.
- End to end testing of Magna's internal LMDD website.



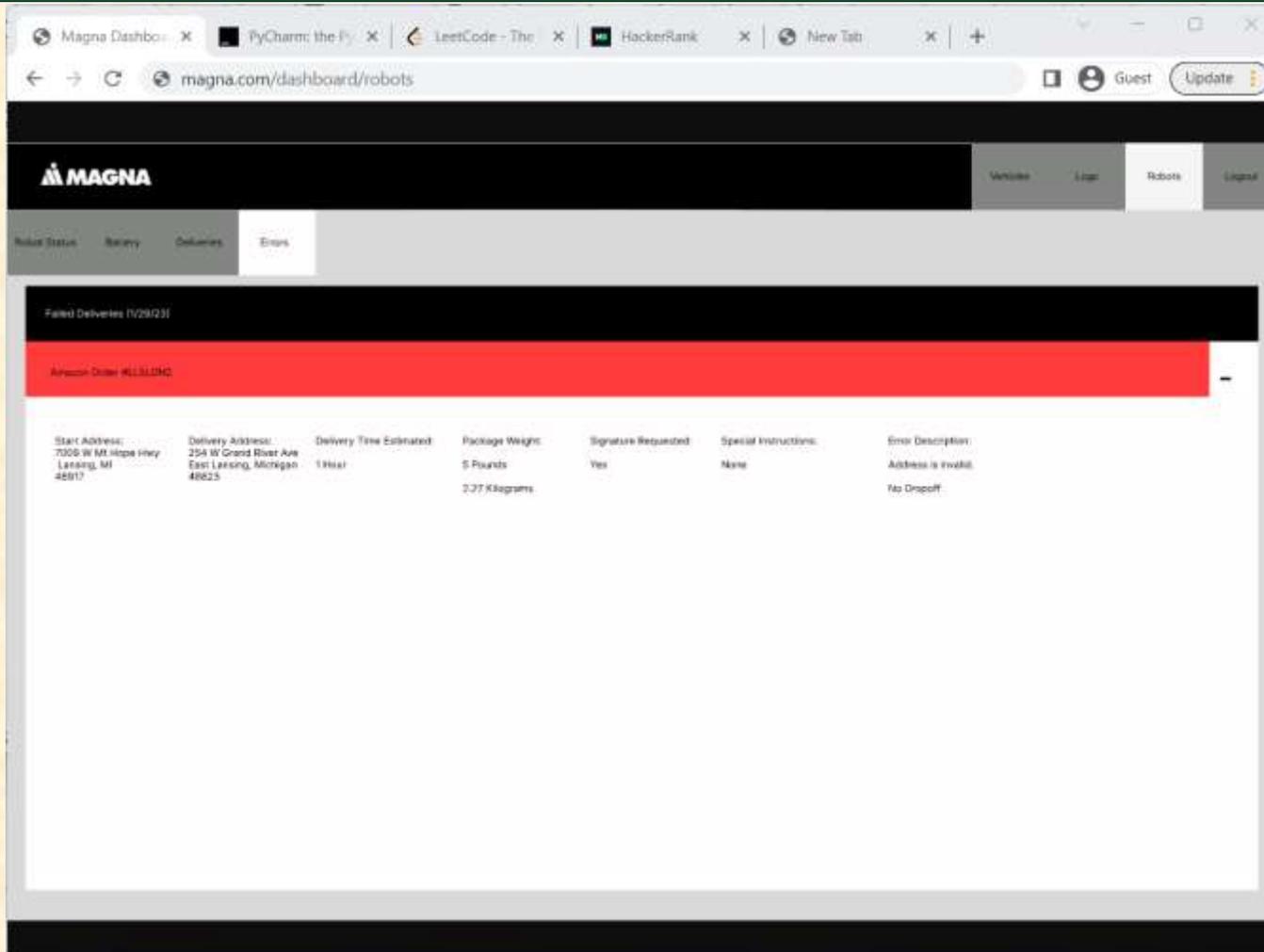
Screen Mockups: Delivery Status



Screen Mockups: Robots Status



Screen Mockups: Errors



Screen Mockup: Testing Suite

```
jannik@quicksilver - N run test
=====
ERRDR: test_update_data (magna.tests.SeleniumTestCase)
-----
Traceback (most recent call last):
  File "/Users/admin/magna/tests.py", line 360, in test_update_data
    self.login()
  File "/Users/admin/magna/tests.py", line 141, in login
    self.selenium.find_element_by_link_text('Login').click()
AttributeError: 'WebDriver' object has no attribute 'find_element_by_link_text'
=====
ERRDR: test_distance_traveled (magna.tests.SeleniumTestCase)
-----
Traceback (most recent call last):
  File "/Users/admin/magna/tests.py", line 242, in test_distance_traveled
    self.login()
  File "/Users/admin/magna/tests.py", line 141, in login
    self.selenium.find_element_by_link_text('Login').click()
AttributeError: 'WebDriver' object has no attribute 'find_element_by_link_text'
=====
ERRDR: test_emergency_scenario (magna.tests.SeleniumTestCase)
-----
Traceback (most recent call last):
  File "/Users/admin/magna/tests.py", line 435, in test_emergency_scenario
    self.login()
  File "/Users/admin/magna/tests.py", line 141, in login
    self.selenium.find_element_by_link_text('Login').click()
AttributeError: 'WebDriver' object has no attribute 'find_element_by_link_text'
=====
ERRDR: test_properties_and_units (magna.tests.SeleniumTestCase)
-----
Traceback (most recent call last):
  File "/Users/admin/magna/tests.py", line 164, in test_properties_and_units
    self.login()
  File "/Users/admin/magna/tests.py", line 141, in login
    self.selenium.find_element_by_link_text('Login').click()
AttributeError: 'WebDriver' object has no attribute 'find_element_by_link_text'
=====
ERRDR: test_bot_selection (magna.tests.SeleniumTestCase)
-----
Traceback (most recent call last):
  File "/Users/admin/magna/tests.py", line 198, in test_bot_selection
    self.login()
  File "/Users/admin/magna/tests.py", line 141, in login
    self.selenium.find_element_by_link_text('Login').click()
AttributeError: 'WebDriver' object has no attribute 'find_element_by_link_text'
=====
Ran 52 tests in 32.864s

FAILED (errors=5)
Preserving test database for alias 'default'...

jannik@quicksilver - N
```

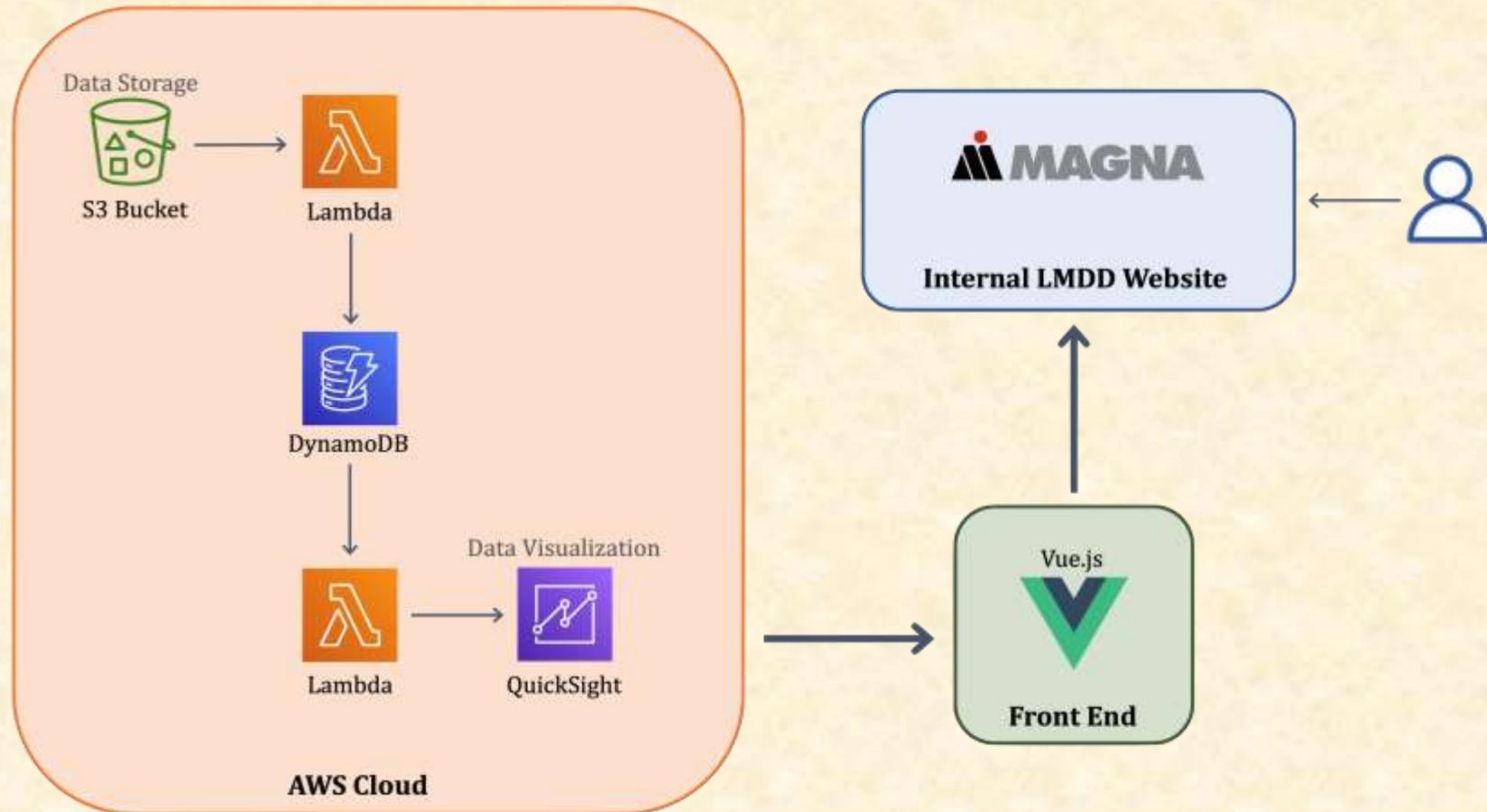


Project Technical Specifications

- Backend
 - Connect existing data stored in AWS S3 to DynamoDB using Lambda, then DynamoDB to Amazon QuickSight
 - End to end LMDD website functionality testing
- Frontend
 - Create visualizations in QuickSight using provided data
 - Integrate QuickSight into internal LMDD website



Project System Architecture



Project System Components

Software Platforms / Technologies

- Amazon S3
- Lambda
- DynamoDB
- QuickSight
- LMDD
- Selenium



Project Risks

- Visualizing a large amount of data effectively
 - Description: Magna has over 9 different variables they want to track.
 - Mitigation: Ongoing communication with Magna.
- Integration of various distinct platforms
 - Description: We need to integrate several different platforms together in this project.
 - Mitigation: We plan to create an efficient backend that links the platforms together.
- Amazon S3 may not connect directly to QuickSight
 - Description: The project requires synchronizing S3 dynamically with QuickSight.
 - Mitigation: DynamoDB can be substituted instead.
- Data Formatting
 - Description: The format that Magna uses to stream data to our backend may be difficult to work with.
 - Mitigation: Receive format of the data from Magna.



Questions?

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