



# 2022 CAPSTONE FINAL PRESENTATION

UNIVERSITY OF TEXAS AT AUSTIN - MCCOMBS SCHOOL OF BUSINESS  
MASTERS OF SCIENCE INFORMATION TECHNOLOGY AND MANAGEMENT

**WELLS  
FARGO**

# MEET THE TEAM



**Garrett Wadley**  
Business Analyst



**Preety Pinghal**  
Business Analyst



**Adriana Van Tho**  
Business Analyst



**Matt Luce**  
Project Manager



**Iris Wang**  
Business Analyst

# AGENDA

1. Background information
2. Business Problem
3. Original Objectives
4. New Objectives
5. Objective Accomplishments
6. Important Decisions
7. Things that went well
8. Challenges
9. Future Capstone Advice
10. Demonstration of Work





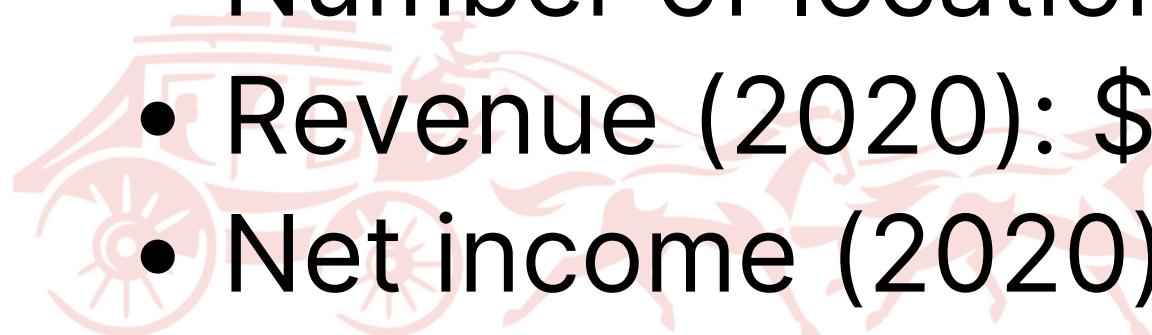
# BACKGROUND INFORMATION

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# BACKGROUND INFORMATION

Wells Fargo serves customers globally as a financial services company providing banking, investing and mortgage products and services, and consumer and commercial financing.

- Headquarters: San Francisco, CA
- Founded: 1929
- Number of customers (2020): >70 Million
- Number of employees (2020): 268,531
- Number of locations: 5,200 branches; 13,000 ATMs
- Revenue (2020): \$72.34 Billion
- Net income (2020): \$3.30 Billion



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drybar®



MOTIVATION

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# BUSINESS PROBLEM

The motivation behind APMF:

- Scattered data across various platforms-Teradata, EDL
- No unified control
- Delays and manual effort in collecting information
- No visuals regarding data usage and trends for decision making
- Inefficient Capacity planning
- Optimal Resource utilization for Node Clusters
- Impactful decision making





# IMPORTANCE

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# IMPORTANCE OF THE PROJECT

- Unified, 360 views of all the existing data management platforms
- Better Decision Making based on the Trends and Analytics
- Savings in terms of cost, effort, and time.
- Forecasting will lead to resource optimization.
- Lower Storage Costs.





# ORIGINAL OBJECTIVES

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# ORIGINAL OBJECTIVES

## Capacity and Cost Lens

- Research and Development - Addressing Pain Points and Challenges
- Personas, User Journey, and Empathy Maps for feeding into Epics and User Stories
- Creative Design Thinking - Current and Future States Vision
- Product Feature Testing for Q1 and subsequent release.





NEW OBJECTIVES

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# NEW OBJECTIVES

Cost Lens was removed from the scope of the project due to constraints on Wells Fargo's end, and an extension to the capacity lens was assigned.

## Capacity Forecasting - Time Series and Deep Learning

- Forecasting should be done on Individual Clusters.
- Development of ARIMA model, using the data from EDL.
- Advanced Models like LSTM (Long Short Term Memory) and Bi-directional LSTM, for improving RMSE values.





# ACCOMPLISHMENTS

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# ACCOMPLISHMENTS

## DESIGN THINKING

- Applied **design thinking methods** on capacity lens.
- Participated in 9 group **interviews** with over 20 high level managers.
- Generated data aligned with **business strategy**.
- Developed **4 sets of data user personas** (Persona, Empathy map, User journey map - current state, User journey map - Future state)



# ACCOMPLISHMENTS

## UI/UX

- Evaluated the product and our design thinking project( backlog, comparison report)
- **Product feature:** Contributed on the platform UI design, and feature recommendations.



# ACCOMPLISHMENTS

## MACHINE LEARNING

- Developed **machine learning models** for time series forecasting.
- Applied **3 different models** on the dataset, and we recommended Wells Fargo use the 2 better performance models (SARIMA, LSTM) that we trained for future forecasting.
- Provided **insights and recommendations** for product and data science team.





IMPORTANT DECISIONS

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# IMPORTANT DECISIONS

- What Persona groups to create
  - How to group individuals based on their job description
- How to shift project scope following delays
- What models to select to test with
  - What recommendation to give based on modeling





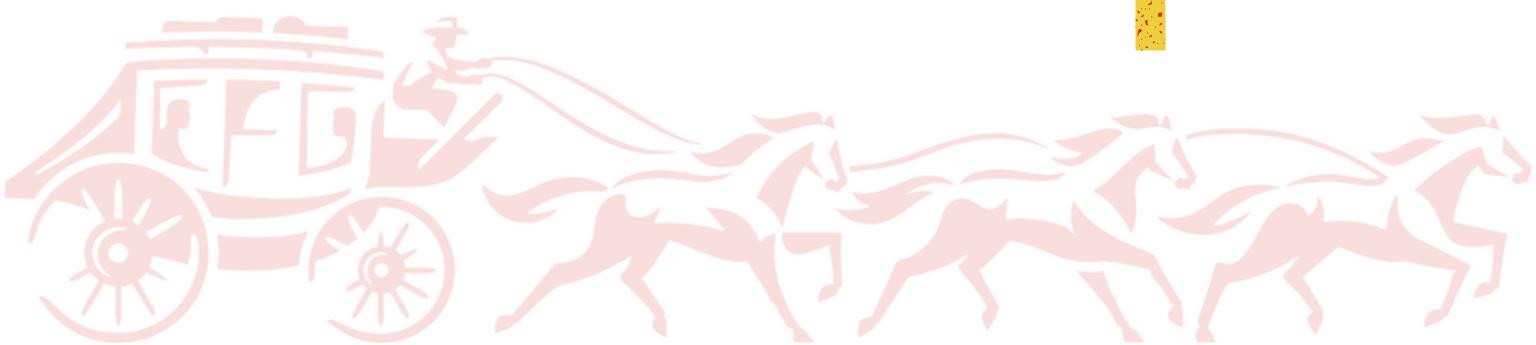
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THINGS THAT WENT WELL

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# THINGS THAT WENT WELL

Persona generation,  
empathy mapping,  
user journey creation  
all followed what we  
learned in Design  
Thinking with Dr.  
Walls



Our SARIMA and LSTM  
models worked  
exceptionally, with  
accuracies over 95% in  
forecasting storage  
usage



Our team was able to  
agree on and adhere  
to schedules set  
according to project  
managers via Notion;  
any disagreements  
were swiftly and  
professionally handled



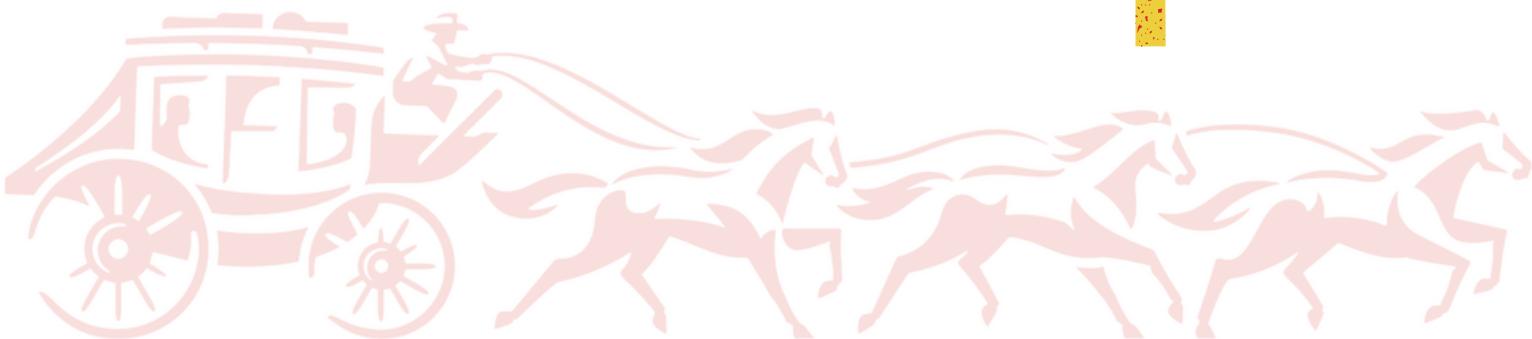


# CHALLENGES

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# CHALLENGES

Due to early delays and accessibility challenges, our design thinking task took longer than expected to begin, and ended before we could fully appreciate the end result and conduct follow-up feedback sessions with stakeholders



A short window of time limited our scope concerning ML forecasting; we were only able to complete a few models for one set of data.

Our project was not an isolated environment; therefore, we occasionally dealt with disjointed schedules, uncertain timelines, and reliance on personnel outside our project team





REFLECTION

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# REFLECTION

## Working with Client

- Get to know the company
- Understand every person's role
- Establish communication avenues early on and backup means

## Team Management

- Trello to Notion
- Prep for meetings with clients beforehand
- Play to each person's strengths



## Communication

- Constant updates
- Transparency about capabilities

## Planning

- WhenIsGood

## Impacts of Organizational Constraints

- Little control of project and timeline
- Remaining adaptable





# DEMONSTRATION

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# Persona – AI/ML Users



**Name:** Max  
**Area:** AI/ML  
**Job Title:** AI/ML senior Project Manager  
**Reports to:** AI/ML Supervisor

## About

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## Goals & Aspirations

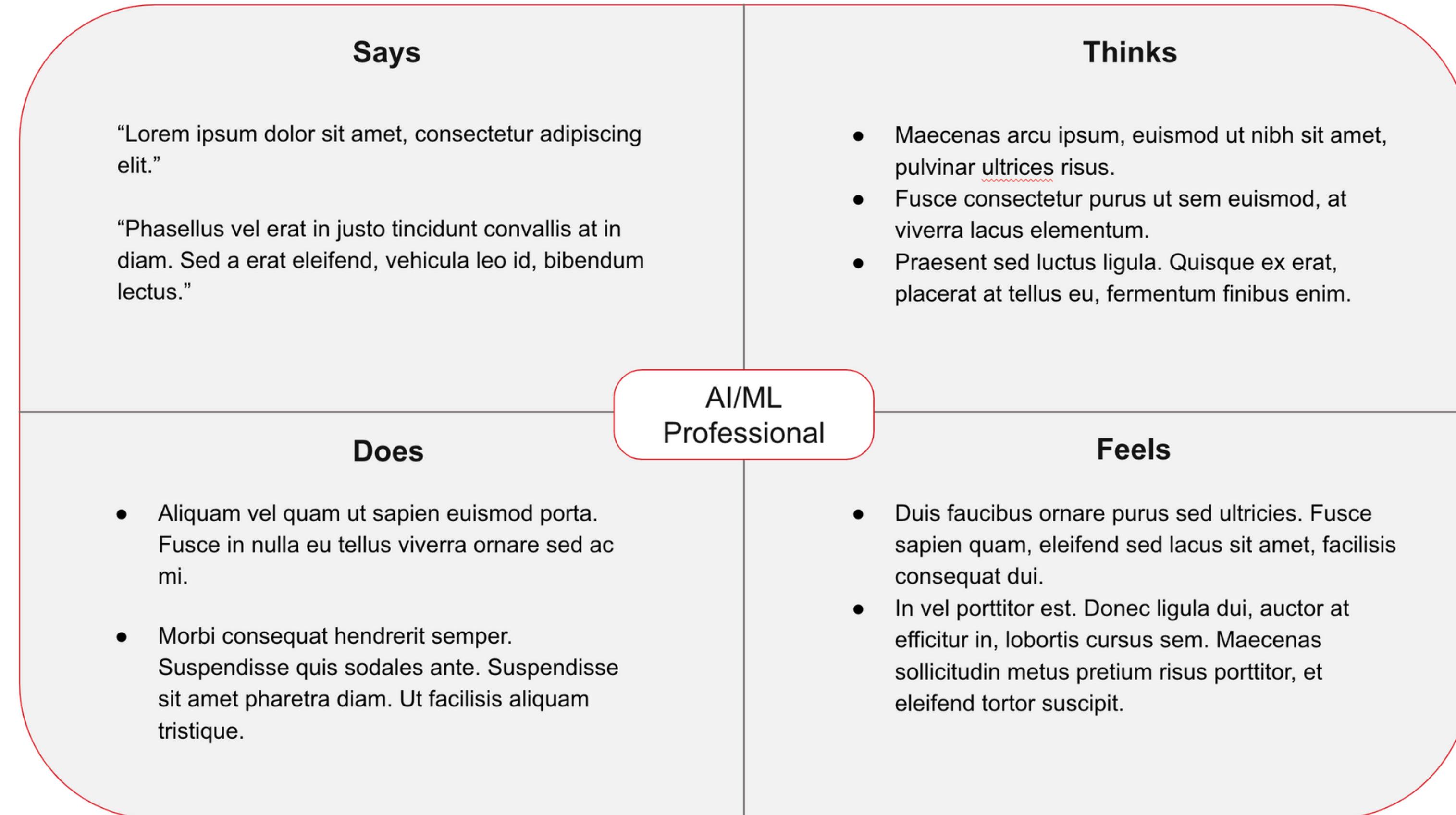
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- Sed a erat eleifend, vehicula leo id, bibendum lectus. Aliquam vel quam ut sapien euismod porta.
- Fusce in nulla eu tellus viverra ornare sed ac mi. Proin semper diam at sem accumsan mattis.

## Needs

- Lorem ipsum dolor sit amet, consectetur adipiscing elit. Phasellus vel erat in justo tincidunt convallis at in diam. Sed a erat eleifend, vehicula leo id, bibendum lectus. Aliquam vel quam ut sapien euismod porta.
- Fusce in nulla eu tellus viverra ornare sed ac mi. Proin semper diam at sem accumsan mattis. Aenean porta ligula magna, sit amet euismod nisi vestibulum fermentum. Ut et risus nisl.
- Aliquam quis aliquam mi, sit amet porttitor tellus.

## Frustrations

- Lorem ipsum dolor sit amet, consectetur adipiscing elit. Phasellus vel erat in justo tincidunt convallis at in diam. Sed a erat eleifend, vehicula leo id, bibendum lectus.
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- Duis magna diam, faucibus sed condimentum non, fringilla sed ante.



# User Journey Current State

## Scenario

In vel porttitor est. Donec ligula dui, auctor at efficitur in, lobortis cursus sem. Maecenas sollicitudin metus pretium risus porttitor, et eleifend tortor suscipit.

## User Expectations / Goals

Duis magna neque, suscipit et faucibus in, posuere nec massa. Nam condimentum magna gravida dignissim vehicula.

Max, AI/ML  
Project Manager



	Requirements Gathering	Accessing the Data Metrics	Optimal WorkLoad and Capacity Planning
Activities	<ol style="list-style-type: none"> <li>Fusce sed metus viverra, bibendum nisl ac, molestie leo. Morbi elit augue, rhoncus vel ipsum sed, interdum vulputate nisl.</li> <li>Nullam laoreet facilisis massa ac sodales.</li> </ol>	<ol style="list-style-type: none"> <li>Fusce sed metus viverra, bibendum nisl ac, molestie leo. Morbi elit augue, rhoncus vel ipsum sed, interdum vulputate nisl.</li> <li>Nullam laoreet facilisis massa ac sodales.</li> </ol>	<ol style="list-style-type: none"> <li>Fusce sed metus viverra, bibendum nisl ac, molestie leo. Morbi elit augue, rhoncus vel ipsum sed, interdum vulputate nisl.</li> <li>Nullam laoreet facilisis massa ac sodales.</li> </ol>
Satisfaction	<div style="background-color: orange; border-radius: 10px; padding: 10px; display: inline-block;"> <span style="color: white;">gravida dignissim vehicula</span> </div> <div style="margin-top: 20px;"> </div> <div style="background-color: orange; border-radius: 10px; padding: 10px; display: inline-block;"> <span style="color: white;">Duis magna neque</span> </div> <div style="margin-top: 20px;"> </div> <div style="background-color: orange; border-radius: 10px; padding: 10px; display: inline-block;"> <span style="color: white;">Nam condimentum magna</span> </div>		
Experiences & Thoughts	<ol style="list-style-type: none"> <li>Fusce sed metus viverra, bibendum nisl ac, molestie leo. Morbi elit augue, rhoncus vel ipsum sed, interdum vulputate nisl.</li> <li>Nullam laoreet facilisis massa ac sodales.</li> </ol>	<ol style="list-style-type: none"> <li>Fusce sed metus viverra, bibendum nisl ac, molestie leo. Morbi elit augue, rhoncus vel ipsum sed, interdum vulputate nisl.</li> <li>Nullam laoreet facilisis massa ac sodales.</li> </ol>	<ol style="list-style-type: none"> <li>Fusce sed metus viverra, bibendum nisl ac, molestie leo. Morbi elit augue, rhoncus vel ipsum sed, interdum vulputate nisl.</li> <li>Nullam laoreet facilisis massa ac sodales.</li> </ol>

# User Journey Future State

## Scenario

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## User Expectations / Goals

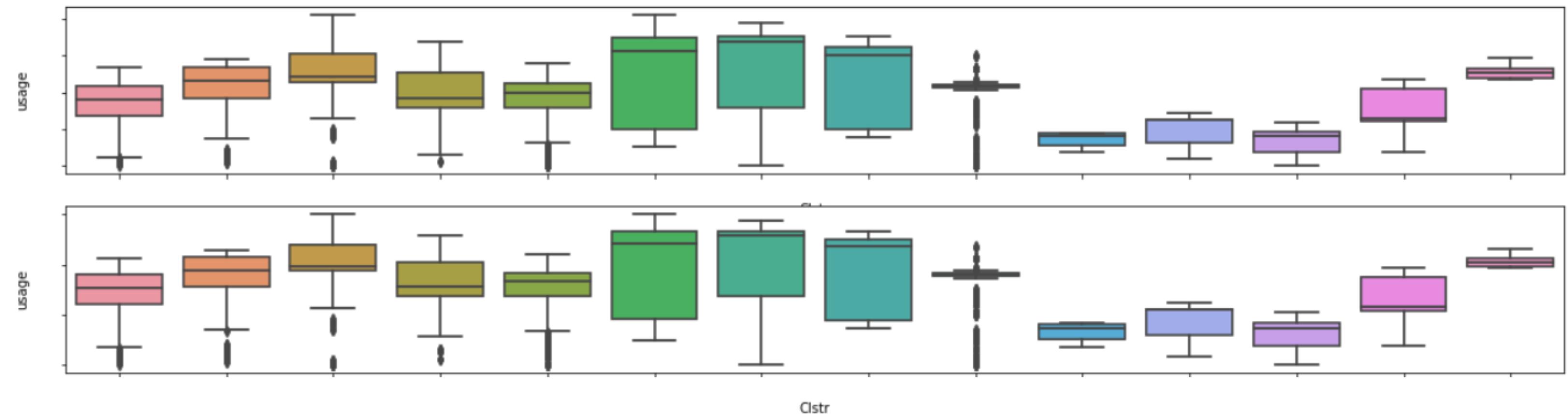
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Max, AI/ML  
Project Manager

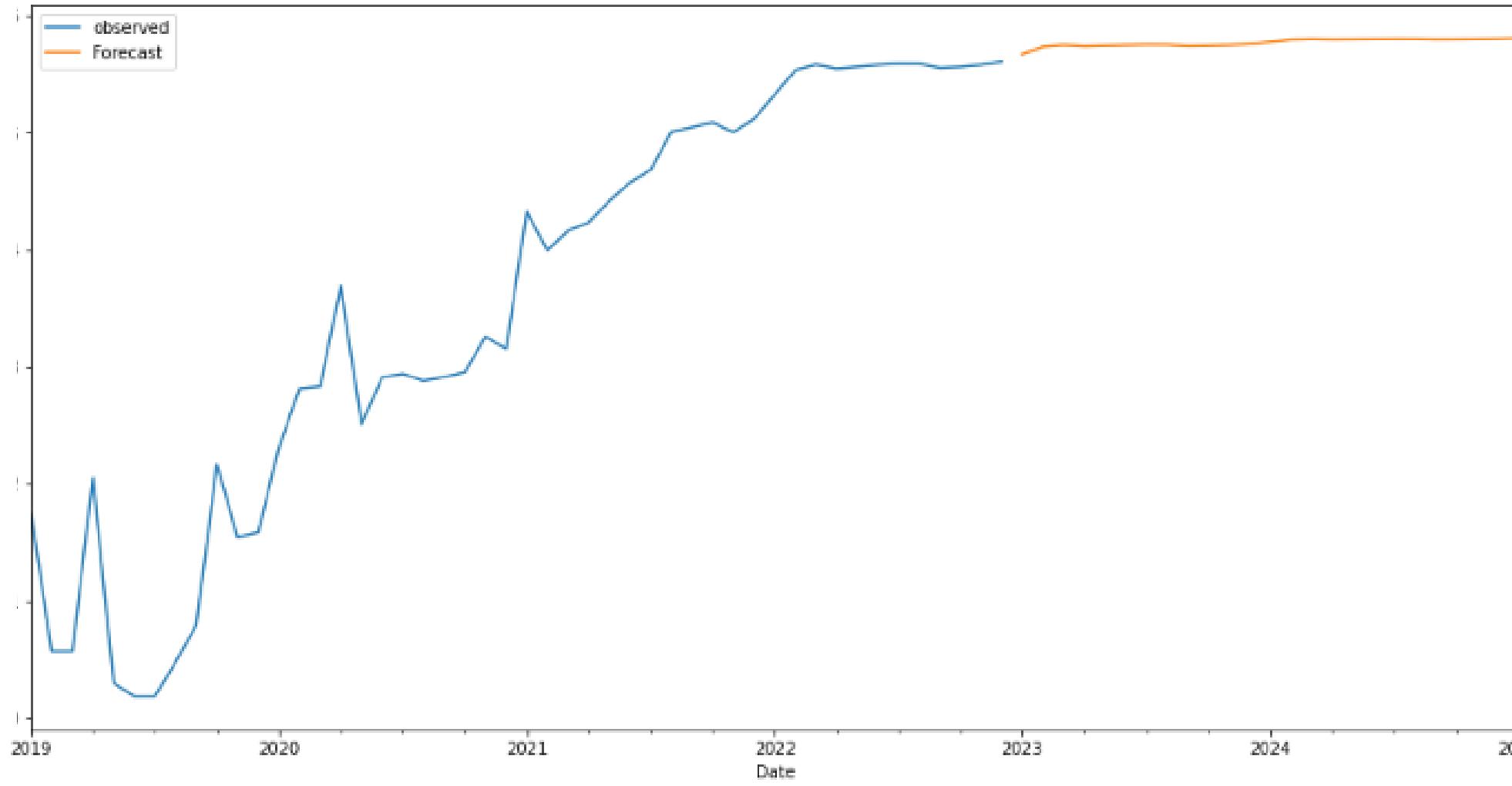
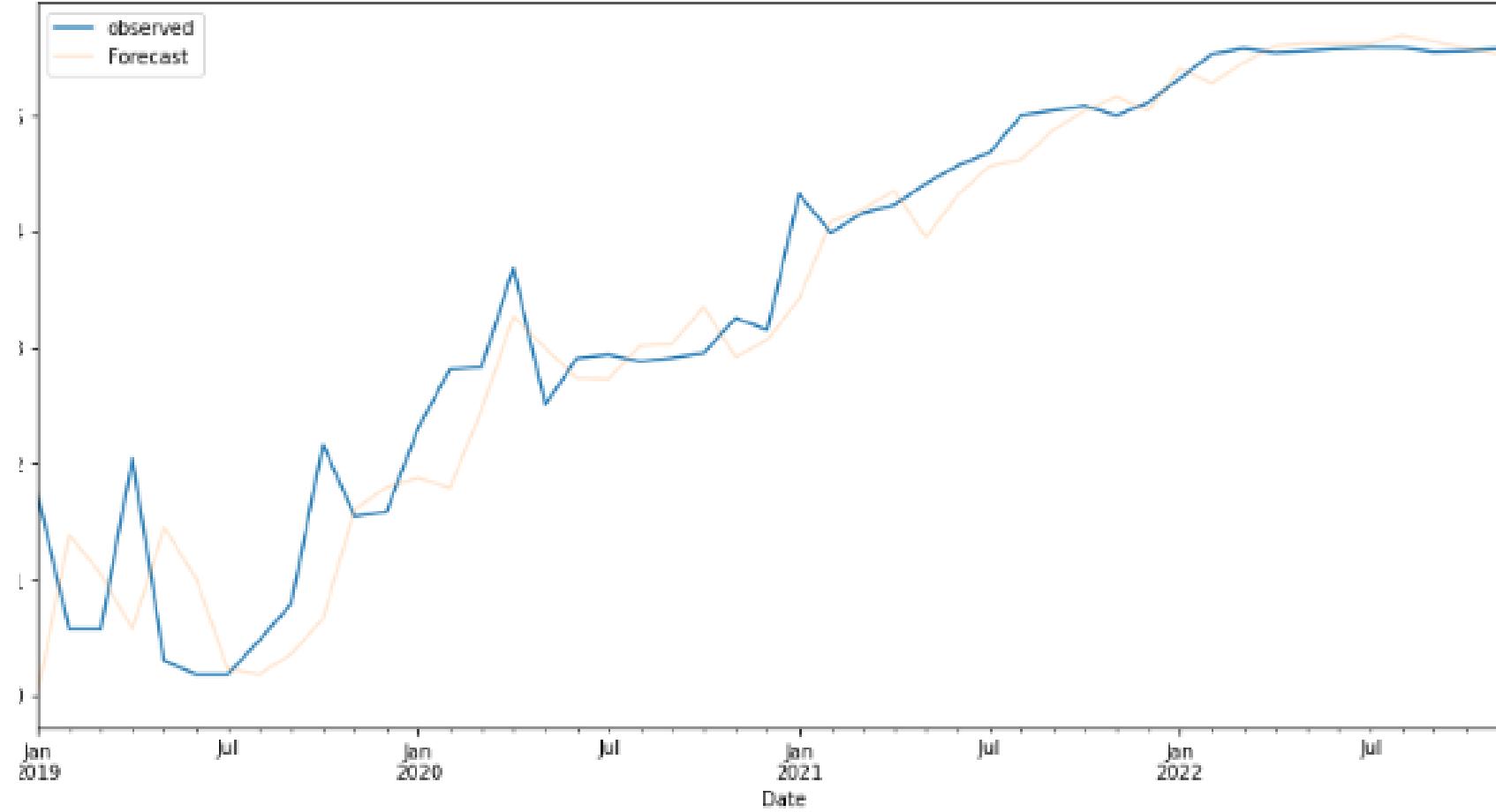


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Activities	<ul style="list-style-type: none"> <li>1. Fusce sed metus viverra, bibendum nisl ac, molestie leo. Morbi elit augue, rhoncus vel ipsum sed, interdum vulputate nisl.</li> <li>2. Nullam laoreet facilisis massa ac sodales.</li> </ul>	<ul style="list-style-type: none"> <li>1. Fusce sed metus viverra, bibendum nisl ac, molestie leo. Morbi elit augue, rhoncus vel ipsum sed, interdum vulputate nisl.</li> <li>2. Nullam laoreet facilisis massa ac sodales.</li> </ul>	<ul style="list-style-type: none"> <li>1. Fusce sed metus viverra, bibendum nisl ac, molestie leo. Morbi elit augue, rhoncus vel ipsum sed, interdum vulputate nisl.</li> <li>2. Nullam laoreet facilisis massa ac sodales.</li> </ul>
Satisfaction	<div style="background-color: #f4a460; border-radius: 15px; padding: 10px; text-align: center;"> <span style="color: white;">gravida dignissim vehicula</span> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 10px;"> <span style="font-size: 2em;">😊</span> <span style="background-color: #f4a460; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;"> <span style="color: white;">Duis magna neque</span> </span> <span style="font-size: 2em;">😊</span> </div> <div style="background-color: #f4a460; border-radius: 15px; padding: 10px; text-align: center;"> <span style="color: white;">Nam condimentum magna</span> </div>		
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# NODE CLUSTERS - LOAD ANALYSIS



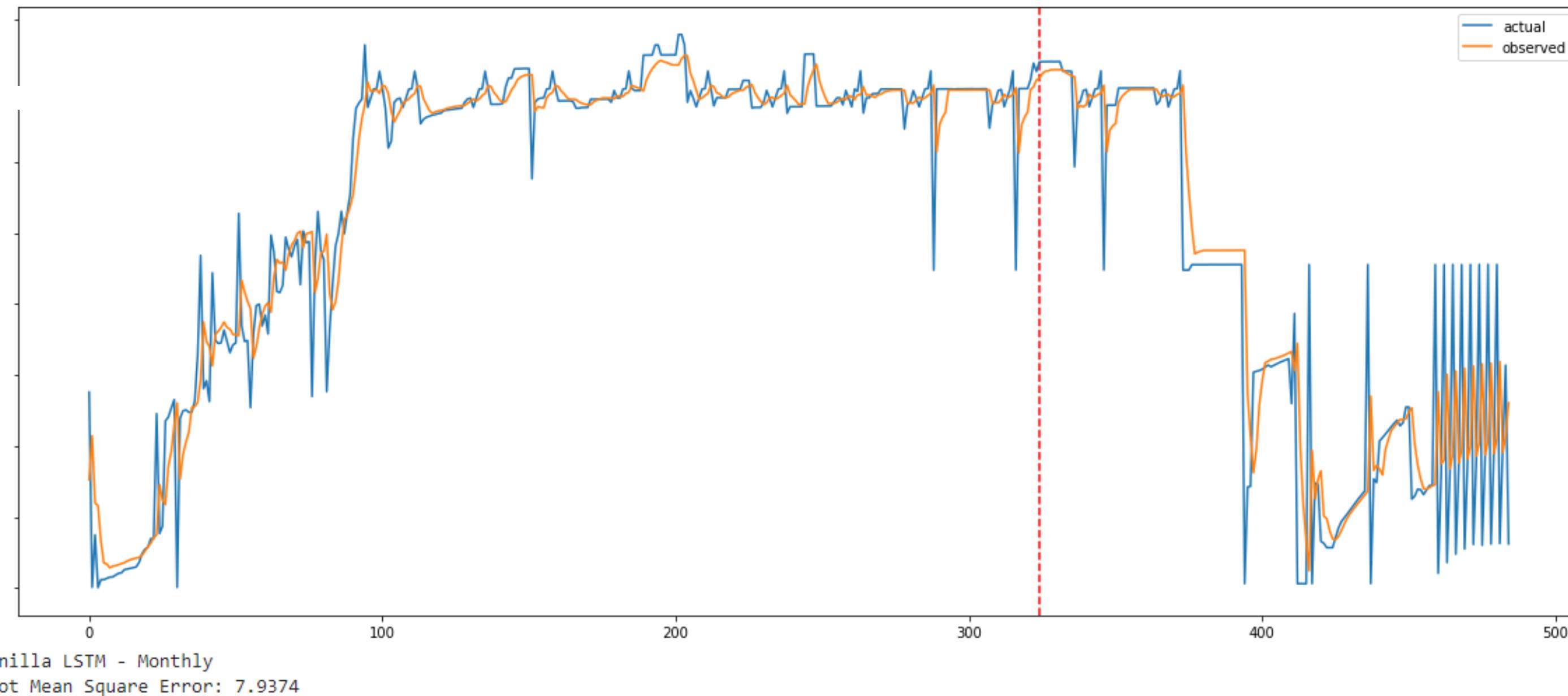
# SARIMA DEMONSTRATION



RMSE : 3.18

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# VANILLA LSTM DEMONSTRATION



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THANK YOU!

Questions?

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WHERE OUR HEART IS.

UnionBank

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