



CON EDISON INTERNSHIP

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SUPERVISOR: TRAVIS FONSECA – FONSECAT@CONED.COM

TEAM: AMI (ADVANCED METERING INFRASTRUCTURE) TEAM

COMPANY: CON EDISON

05/12/2025 | CISC 4900

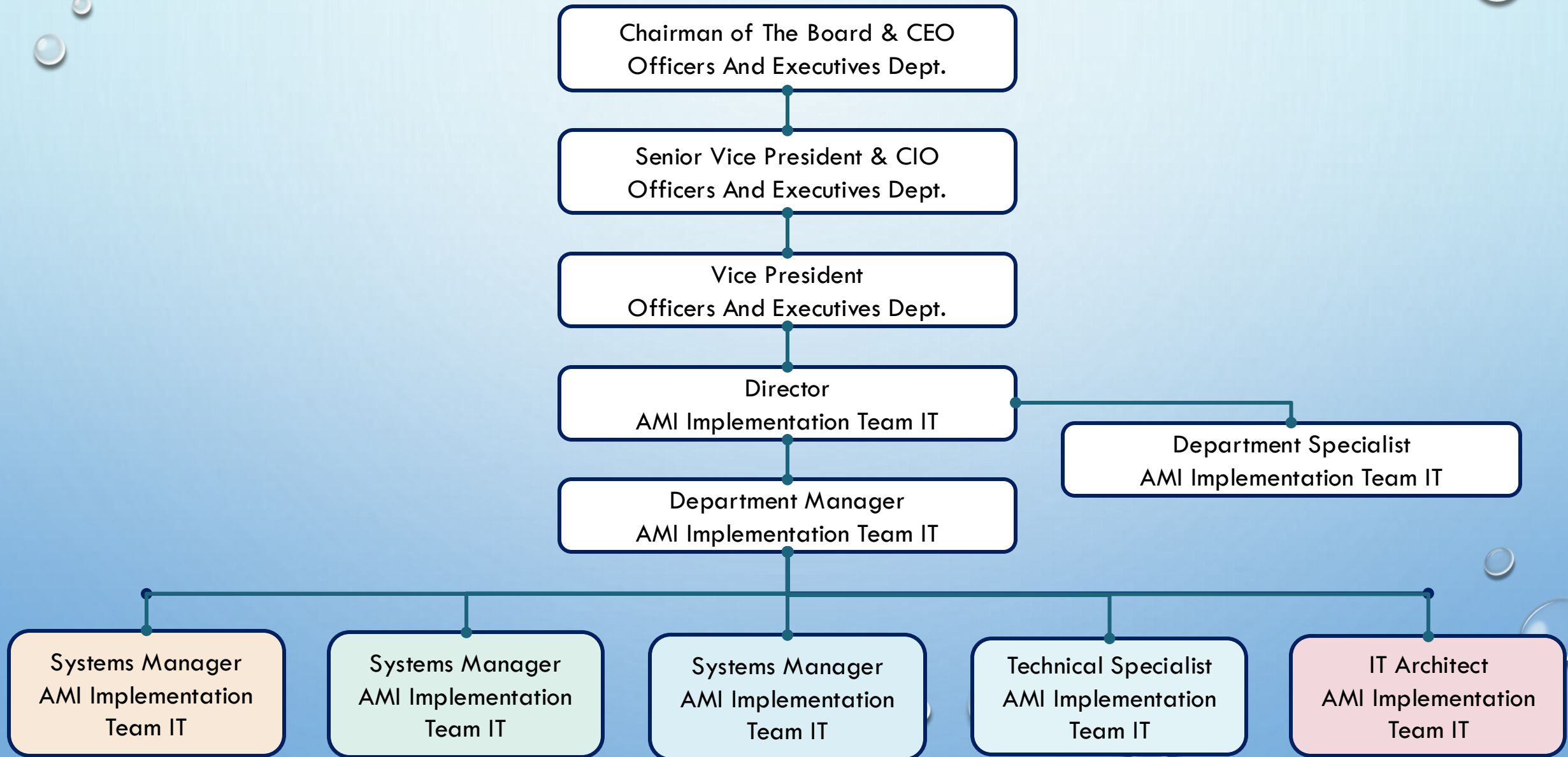
ABSTRACT

AS A COMPUTER AIDE INTERN AT CON EDISON, MY PROJECT FOCUSES ON IMPROVING THE AMI TEAM'S DOCUMENTATION AND SYSTEM MONITORING. I AM RESPONSIBLE FOR ORGANIZING AND MAINTAINING THE TEAM'S WIKI, ENSURING THAT ESSENTIAL DOCUMENTATION IS STRUCTURED AND EASILY ACCESSIBLE.

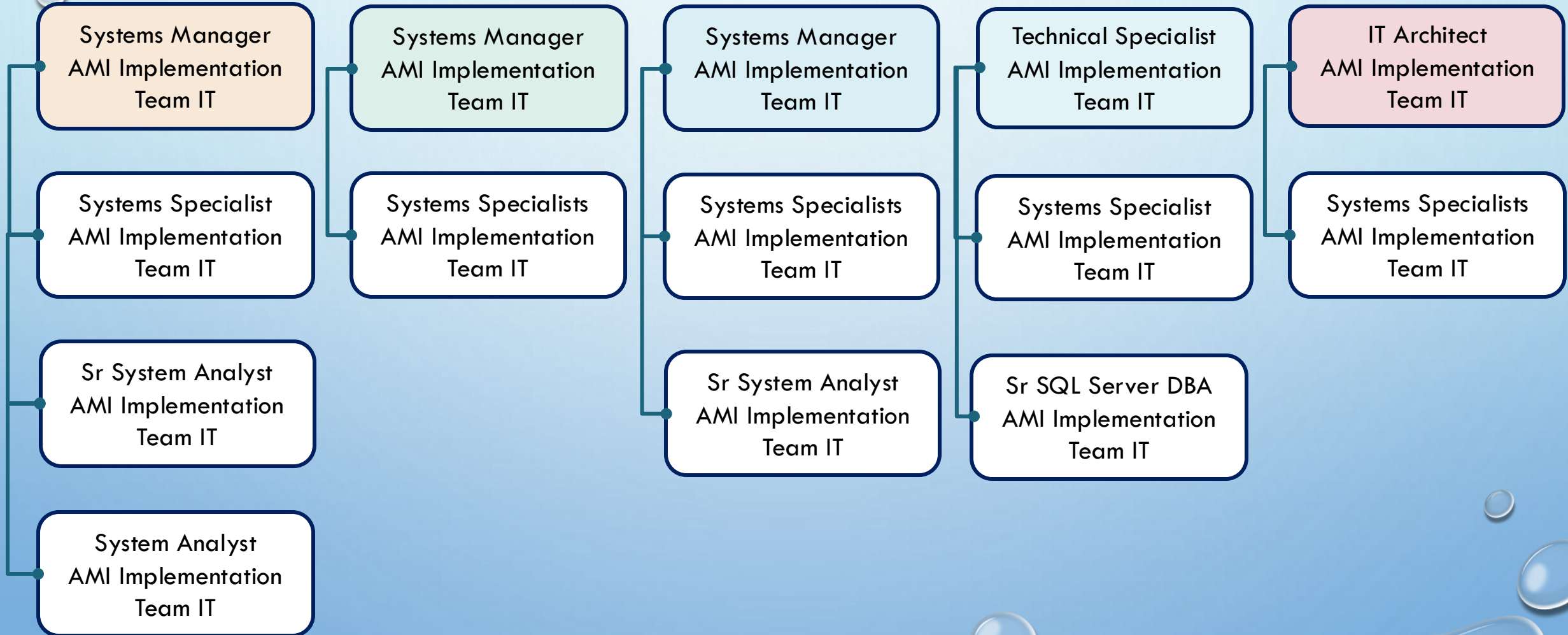
ADDITIONALLY, I WILL BE VERIFYING SQL QUERIES TO HELP WITH THE MDMS MONITORING REPORT, ENSURING ACCURATE DATA OUTPUT.

ANOTHER KEY TASK INVOLVES WORKING WITH GRAFANA DASHBOARDS TO MONITOR SYSTEM PERFORMANCE, HELPING THE TEAM QUICKLY IDENTIFY AND RESOLVE ISSUES. I ALSO CONTRIBUTED TO AUTOMATING THE KPI REPORT, STREAMLINING THE PROCESS AND ENHANCING EFFICIENCY. THROUGH THIS PROJECT, I AIM TO ENHANCE DOCUMENTATION EFFICIENCY, SUPPORT DATA VALIDATION, AND IMPROVE SYSTEM RELIABILITY.

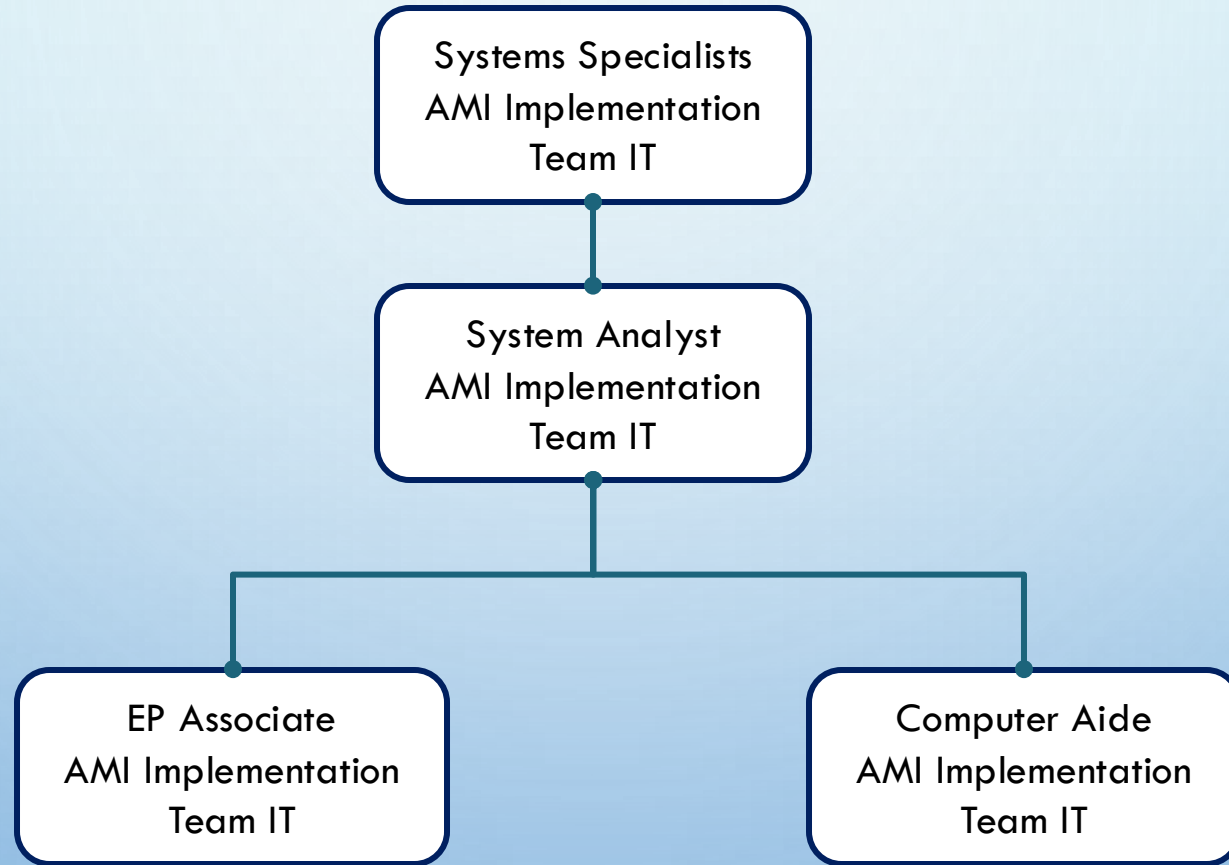
AMI TEAM ORGANIZATION CHART



AMI TEAM ORGANIZATION CHART

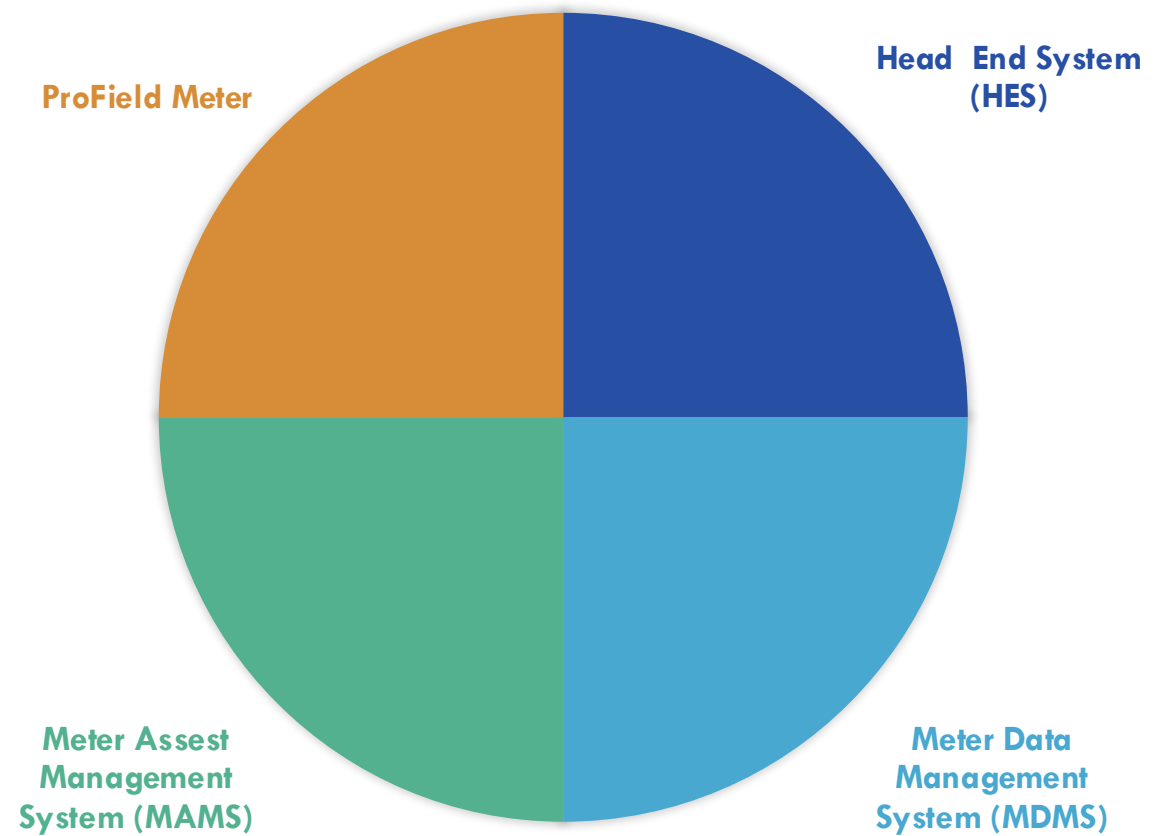


AMI TEAM ORGANIZATION CHART



AMI BUSINESS APPLICATIONS

AMI BREAKDOWN



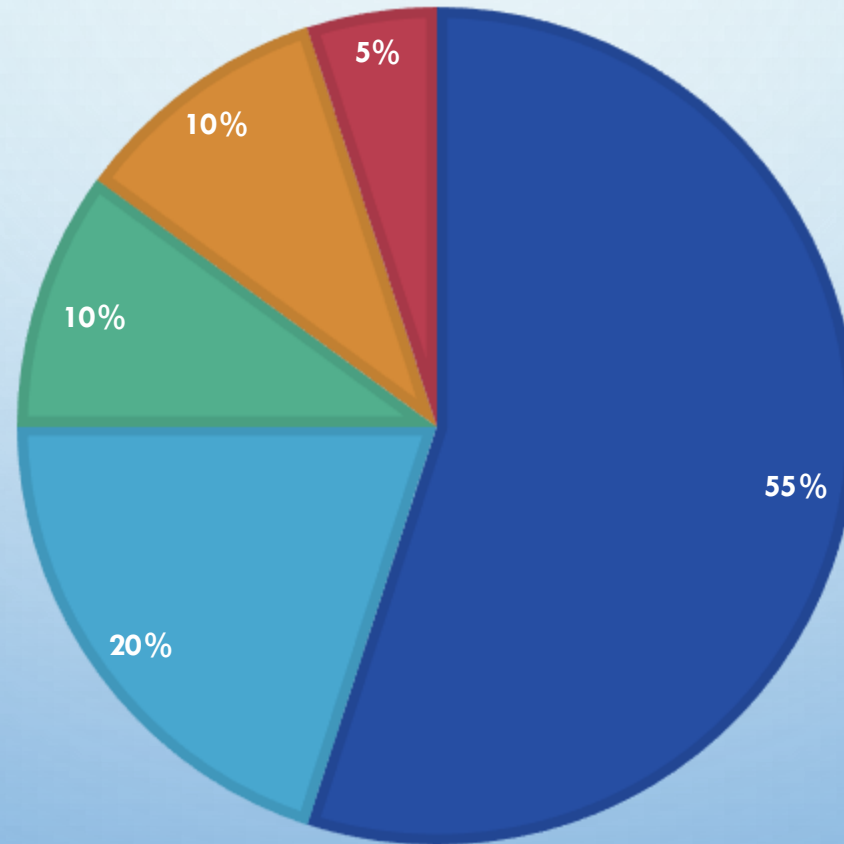
TECH STACK



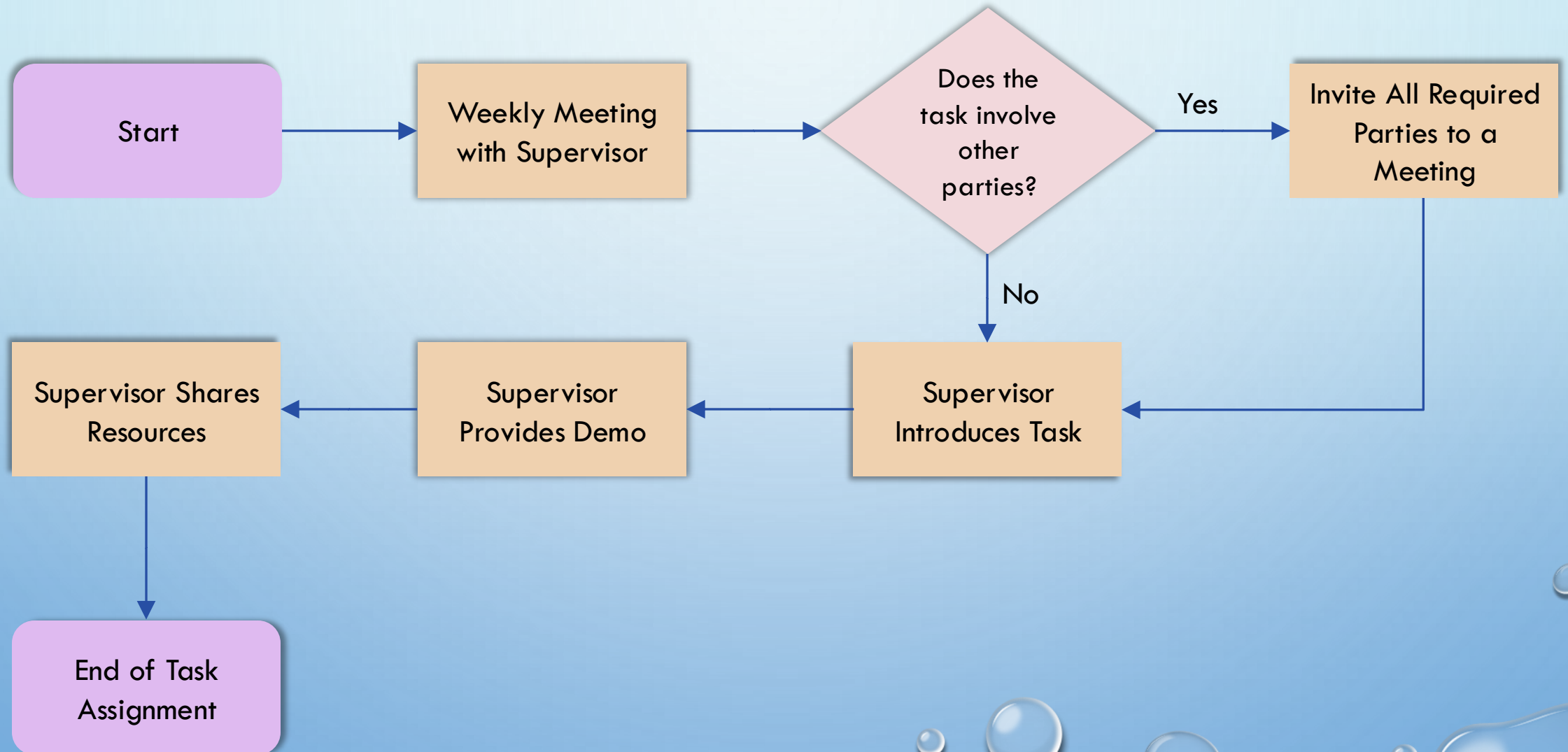
HOW MY TIME IS DISTRIBUTED

TIME BREAKDOWN

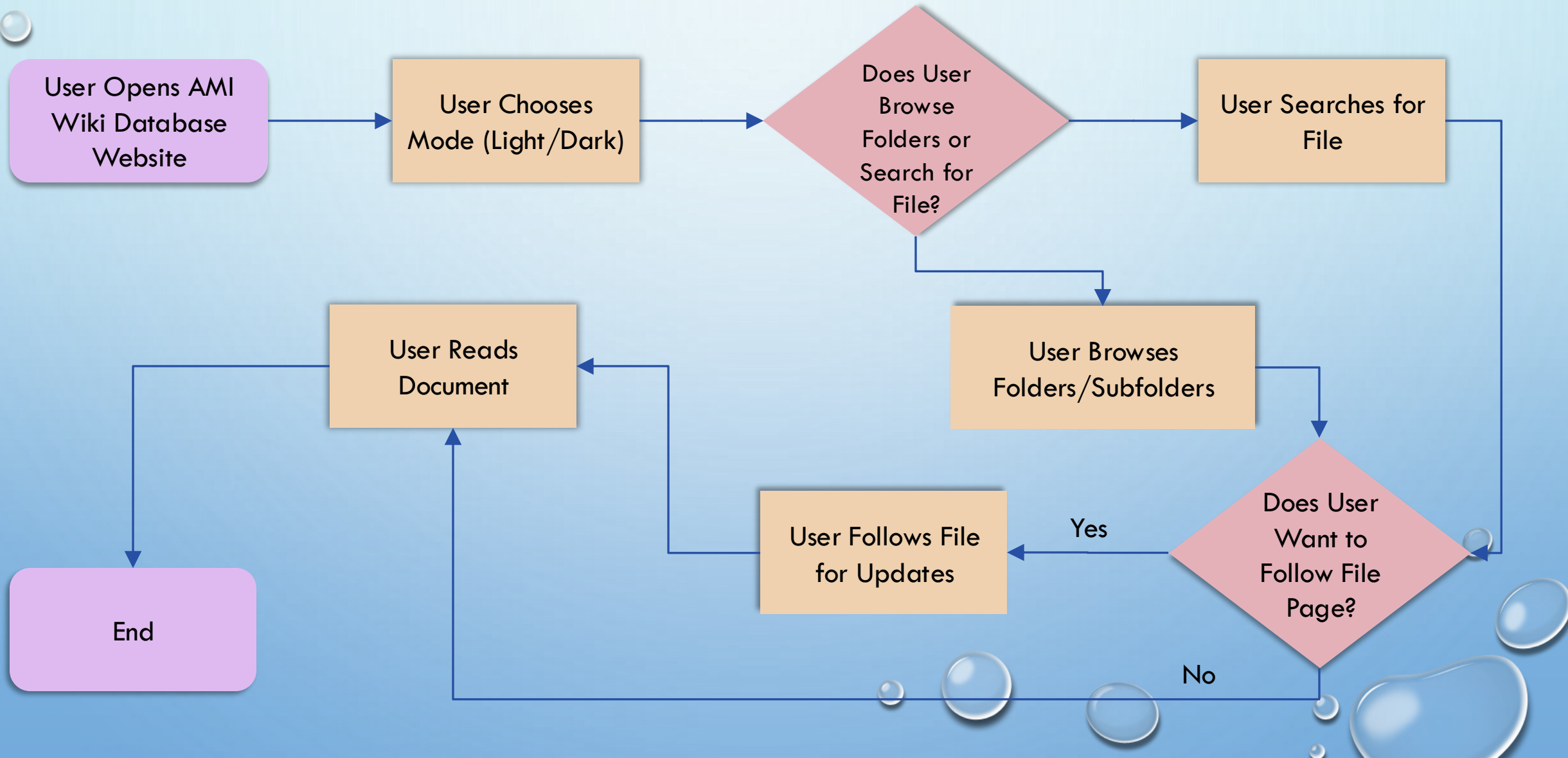
■ Wiki Database Work ■ Teams Meetings ■ Required Trainings ■ Learning New Things Required for Job ■ Pluralsight Courses



TASK DISTRIBUTION PROCESS



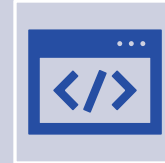
USER EXPERIENCE ON THE AMI WIKI DATABASE WEBSITE



DIGITIZING DOCUMENTATION FOR BETTER ACCESS AND USABILITY



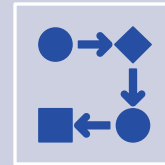
I am transferring and formatting technical documentation into Azure DevOps Wiki for easy online access.



Using HTML and CSS, I ensure the wiki pages mirror the original Word documents, maintaining formatting and readability.



The goal is to create a user-friendly, well-organized database that simplifies access for engineers and analysts.



This transition improves searchability, reduces time spent looking for information, and makes updates easier.

WHY TECHNICAL DOCUMENTATION MATTERS

- **KNOWLEDGE PRESERVATION:** PREVENTS LOSS OF CRITICAL INFORMATION WHEN EMPLOYEES LEAVE AND CONSISTENCY IN BUSINESS PROCESSES.
- **EFFICIENCY:** QUICK ACCESS TO STRUCTURED INFORMATION SAVES TIME AND REDUCES ERRORS, ENSURING ALL TEAMS WORK WITH ACCURATE AND UP-TO-DATE INFORMATION.
- **COLLABORATION:** STANDARDIZED DOCUMENTATION ENSURES TEAMS ACROSS DIFFERENT DEPARTMENTS STAY ALIGNED.
- **COMPLIANCE:** HELPS COMPANIES MEET REGULATORY AND OPERATIONAL REQUIREMENTS.
- **HELPS NEW AND EXISTING EMPLOYEES UNDERSTAND SYSTEMS,** REDUCING TRAINING TIME AND DEPENDENCY ON SPECIFIC INDIVIDUALS.

DRIVING EFFICIENCY AND ACCESSIBILITY IN TECHNICAL DOCUMENTATION



My role supports the AML team at Con Edison by digitizing and centralizing technical documentation on Azure DevOps Wiki.



Previously, important documents were scattered in Word files, making it hard to access and update information.



By transferring 60+ technical documents (some over 100+ pages long) into an online wiki, I am improving accessibility, reducing redundancy, and ensuring consistency across the department.



This saves time for engineers, analysts, and business team members who rely on these documents daily, enhancing overall efficiency and collaboration.

OPTIMIZING KPI REPORTING THROUGH AUTOMATION

- **TASK ASSIGNED:** MY SUPERVISOR TASKED ME WITH FINDING A WAY TO AUTOMATE AMI'S KPI REPORT TO IMPROVE EFFICIENCY AND ACCURACY.
- **WHY IT MATTERS:** THE KPI REPORT IS ESSENTIAL FOR TRACKING THE PERFORMANCE OF THE AMI TEAMS, SPECIFICALLY MONITORING PLANNED VS. UNPLANNED OUTAGES.
- **CHALLENGES:**
 - THE PREVIOUS PROCESS RELIED ON MANUAL DATA ENTRY, WHICH WAS TIME-CONSUMING AND PRONE TO HUMAN ERRORS.
 - THE **YEARLY REPORT** REQUIRED MANUAL UPDATES FROM MULTIPLE **MONTHLY REPORTS**, INCREASING THE RISK OF INCONSISTENCIES.
- MY GOAL WAS TO DEVELOP A SOLUTION THAT WOULD STREAMLINE THE PROCESS, REDUCE ERRORS, AND SAVE TIME FOR THE TEAM.

FINDING THE BEST APPROACH FOR AUTOMATING THE KPI REPORT

- TO DEVELOP AN EFFECTIVE SOLUTION, I CONDUCTED RESEARCH ON EXCEL FEATURES THAT COULD AUTOMATE REPORTING.
- I EXPLORED GOOGLE SEARCHES AND YOUTUBE TUTORIALS TO UNDERSTAND BEST PRACTICES FOR USING FORMULAS, TABLES, AND AUTOMATION TECHNIQUES IN EXCEL.
- MY FOCUS WAS ON FINDING A WAY TO AUTOMATICALLY TRANSFER MONTHLY REPORT DATA INTO THE YEARLY REPORT WITHOUT MANUAL INPUT.
- KEY EXCEL FEATURES I LEARNED ABOUT:
 - **FORMULAS & FUNCTIONS** (SUM, AVERAGE, IF STATEMENTS, ETC.)
 - **LINKED SHEETS & CELL REFERENCES** FOR DYNAMIC UPDATES
 - **DATA VALIDATION & FORMATTING** FOR CONSISTENCY
- THIS RESEARCH PHASE WAS CRUCIAL IN SHAPING MY FINAL APPROACH TO STREAMLINING THE KPI REPORT PROCESS.

STREAMLINING KPI TRACKING WITH SMART EXCEL AUTOMATION



I created a centralized Excel file that consolidates all KPI reports from four teams into one structured workbook with:



Separate sheets for each team's **monthly data**



A **yearly summary sheet** that auto-populates data from the monthly reports



Using formulas, the yearly report now updates automatically, reducing manual work and eliminating errors.



Employees only need to enter monthly data, and all calculations—including total planned/unplanned outages and KPI performance—are handled instantly.



This solution saves time, improves accuracy, and ensures the AMI team can efficiently track and meet performance targets.



INTRODUCTION TO GRAFANA

WHAT IS GRAFANA?

- GRAFANA IS A POWERFUL OPEN-SOURCE PLATFORM USED FOR MONITORING AND OBSERVABILITY.
- IT ALLOWS USERS TO CREATE AND SHARE DYNAMIC DASHBOARDS THAT VISUALIZE DATA FROM VARIOUS SOURCES IN REAL-TIME.
- GRAFANA CONSOLIDATES INFORMATION INTO A SINGLE, CENTRALIZED DASHBOARD, MAKING IT EASIER TO MONITOR SYSTEM PERFORMANCE AND IDENTIFY ISSUES QUICKLY.

HOW WE USE GRAFANA

Our Use of Grafana

- In our organization, we use Grafana to monitor the health and performance of various internal applications, including the MDMS (Meter Data Management System).).
- Grafana dashboards provide a visual representation of key metrics and data points, allowing us to track the status of different processes and systems efficiently.

Examples of Dashboards:

- MDMS Overview: Displays critical information about the overall performance and health of the MDMS.
- MDMS Health Status: Shows detailed metrics and status indicators for various components of the MDMS.
- DRP and FEP Queues: Monitors the lag and backlog of processing reads in the Device Reads Processor (DRP) and Front End Processor (FEP).
- VEE (Validation, Estimation, and Editing): Tracks the validation, estimation, and editing processes for meter data to ensure accuracy and reliability.
- Billing: Monitors the billing processes, including rejected billing requests and billing queue buildup.

MDMS MONITORING REPORT

Health Status	
Normal	Good
Abnormal	Monitoring



MDMS Monitoring Report:



Establishes standards and criteria for determining the health status of our MDMS internal application.



Documents the development of the MDMS Health Status Dashboard and outlines next steps and enhancements.



Key Components:



Health Status Determination: determined by checking a graph of its data displayed in the "MDMS Overview" dashboard on Grafana or the output of a query run in Oracle SQL Developer.



Graphical Checks: Performed using the "MDMS Overview" panel.



Alert Rules: The report includes various alert rules for monitoring different aspects of the MDMS, such as DRP Peak, Kafka Uptick, and VEE Threshold.



By using Grafana and the MDMS Monitoring Report, we ensure the reliability and efficiency of our systems, ultimately providing better service to our customers.

BILLING PERCENTAGE CHECKS



Billing Percentage:



Monitors the billing processes, including rejected billing requests and billing queue buildup.



Good Criteria:



Didn't exceed 25k threshold, but even if it does, that's fine, as long as it finished processing.



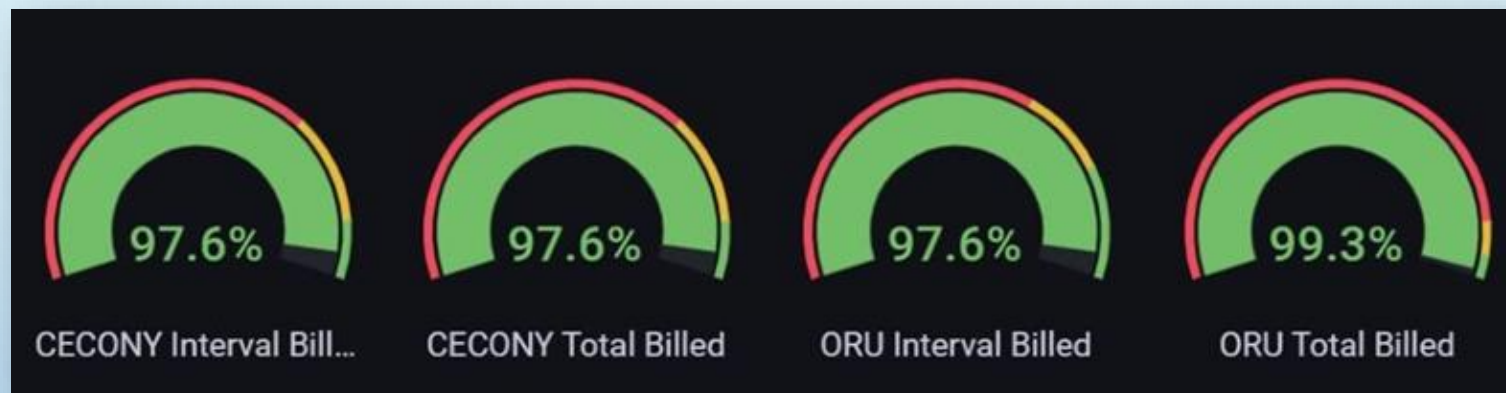
Monitoring Criteria:



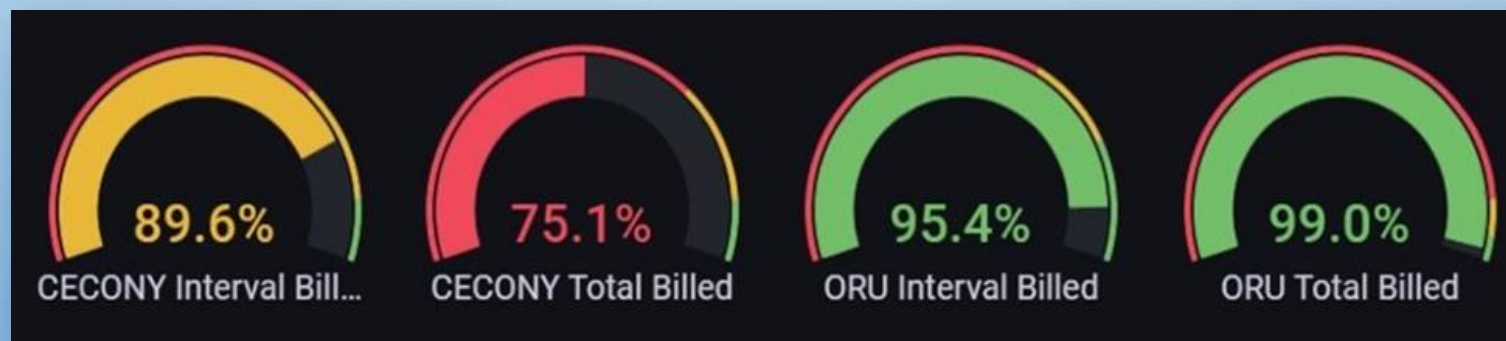
Keeps increasing, or going on a flat line, or doesn't decrease at all.

BILLING PERCENTAGE CRITERIA DASHBOARD

GOOD:



MONITORING:



KAFKA LAG

PURPOSE:

KAFKA IS A PLATFORM DESIGNED TO HANDLE REAL-TIME DATA FEEDS EFFICIENTLY. IT ENSURES THAT DATA IS PROCESSED AND TRANSFERRED QUICKLY BETWEEN DIFFERENT SYSTEMS.

MONITORING:

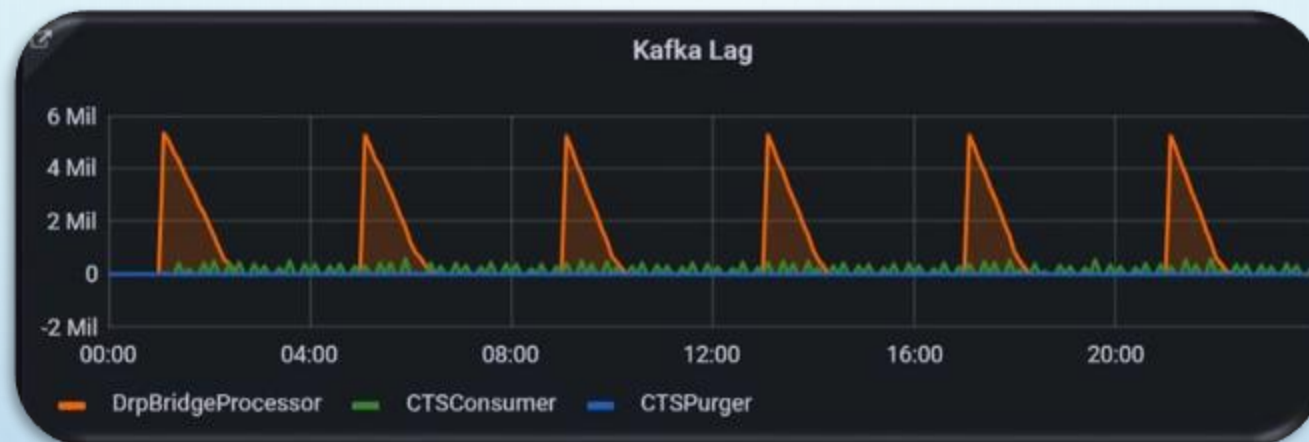
WE USE GRAFANA TO MONITOR KAFKA LAG, WHICH HELPS US TRACK THE DELAY BETWEEN THE PRODUCTION AND CONSUMPTION OF DATA. THIS IS CRUCIAL FOR MAINTAINING THE PERFORMANCE AND RELIABILITY OF OUR SYSTEMS. THE KAFKA LAG APPLICATION PROCESSES BATCHES OF 15-MINUTE INTERVAL READS SENT FROM THE HEAD END SYSTEM EVERY FOUR HOURS.

GOOD CRITERIA:

- THE MAXIMUM HEIGHT OF ANY SPIKE IN DATA PROCESSING SHOULD BE BETWEEN 4 AND 6 MILLION.
- UPTICK TIMES OCCUR EVERY FOUR HOURS: 1AM, 5AM, 9AM, 1PM, 5PM, AND 9PM.
- EACH BATCH OF DATA SHOULD TAKE LESS THAN TWO HOURS TO PROCESS, MEANING THE DRPBRIDGEPROCESSOR SHOULD RETURN TO ZERO WITHIN THAT TIMEFRAME.

KAFKA LAG DASHBOARD

GOOD:



MONITORING:



USING ORACLE SQL DEVELOPER FOR MDMS MONITORING REPORT

HOW WE USE ORACLE SQL DEVELOPER:

- ORACLE SQL DEVELOPER IS A POWERFUL TOOL USED FOR RUNNING SQL QUERIES AND MANAGING DATABASE TASKS.
- IT HELPS US EXTRACT AND ANALYZE DATA FROM THE MDMS (METER DATA MANAGEMENT SYSTEM) DATABASE TO DETERMINE THE HEALTH STATUS OF OUR INTERNAL APPLICATIONS.

INTEGRATION WITH MDMS MONITORING REPORT:

- WE USE ORACLE SQL DEVELOPER TO RUN SPECIFIC QUERIES THAT PROVIDE INSIGHTS INTO VARIOUS ASPECTS OF THE MDMS, SUCH AS DRP AND FEP QUEUES, VEE PROCESSES, AND BILLING PERCENTAGES.



EXAMPLES OF SQL QUERIES IN MDMS MONITORING

HEALTH STATUS DETERMINATION

- DRP AND FEP QUEUES: QUERIES TO CHECK THE LAG AND BACKLOG OF PROCESSING READS.
 - EXAMPLE: `SELECT * FROM DRP_QUEUE WHERE STATUS = 'PENDING'`
- VEE PROCESSES: QUERIES TO VALIDATE, ESTIMATE, AND EDIT METER DATA.
 - EXAMPLE: `SELECT * FROM VEE_LOG WHERE STATUS = 'ERROR'`
- BILLING PERCENTAGES: QUERIES TO MONITOR BILLING PROCESSES AND REJECTED REQUESTS.
 - EXAMPLE: `SELECT COUNT(*) FROM BILLING_QUEUE WHERE STATUS = 'REJECTED'`

GRAPHICAL CHECKS

- THE OUTPUT OF THESE QUERIES IS USED TO CREATE VISUAL REPRESENTATIONS IN GRAFANA DASHBOARDS, SUCH AS THE "MDMS OVERVIEW" AND "MDMS HEALTH STATUS" PANELS.
- THESE VISUALIZATIONS HELP US QUICKLY IDENTIFY AND ADDRESS ANY ISSUES IN THE MDMS.

BY USING ORACLE SQL DEVELOPER IN CONJUNCTION WITH GRAFANA, WE ENSURE THE RELIABILITY AND EFFICIENCY OF OUR MDMS, ULTIMATELY PROVIDING BETTER SERVICE TO OUR CUSTOMERS.

USING PROVISIONING QUERY IN MDMS MONITORING REPORT

PURPOSE:

PROVISIONING QUERIES ARE USED TO ENSURE THAT NEW METERS ARE CORRECTLY SET UP AND INTEGRATED INTO THE MDMS (METER DATA MANAGEMENT SYSTEM).

THESE QUERIES HELP VERIFY THAT ALL NECESSARY DATA SERVICES ARE ACTIVE AND THAT THE METER IS PROPERLY COMMISSIONED.

EXAMPLE OF PROVISIONING QUERY:

QUERY: `SELECT * FROM PROVISIONING WHERE STATUS = 'PENDING'`

THIS QUERY CHECKS FOR ANY METERS THAT ARE PENDING PROVISIONING AND ENSURES THEY ARE PROCESSED CORRECTLY.

INTEGRATION WITH MDMS MONITORING REPORT:

THE OUTPUT OF THE PROVISIONING QUERY IS USED TO UPDATE THE MDMS MONITORING REPORT.

THIS HELPS US TRACK THE STATUS OF NEW METER INSTALLATIONS AND ENSURE THEY ARE CORRECTLY INTEGRATED INTO THE SYSTEM.

BY USING ORACLE SQL DEVELOPER TO RUN THESE QUERIES, WE CAN QUICKLY IDENTIFY AND RESOLVE ANY ISSUES WITH METER PROVISIONING.

SQL PROVISIONING QUERY

OBJECTIVE: COUNT AND CATEGORIZE SERVICE PROVISIONING ACTIVITIES.

DATA SOURCES: SVC_PT, SERVICE_REQUEST, ACTIVITY.

FILTERS:

- LAST 10 DAYS
- SUB-TYPE 'METER - RELIABILITY VALIDATION'
- STATUS 'DONE'
- OUTCOME 'SUCCESS'
- EXCLUDES 'AMR READY' SERVICE POINTS

GROUPING: BY ORG_ID

OUTPUT:

- TOTAL_COUNT: NUMBER OF RECORDS
- CONED_ORG: 'CECONY' (ORG_ID 52) OR 'ORU' (ORG_ID 102)
- PROVISIONING_RESULT:
 - 'GOOD' (< 100)
 - 'MONITOR' (100-999)
 - 'HIGH MONITORING' (≥ 1000)

KEY INSIGHTS:

- PROVIDES A CLEAR COUNT AND CATEGORIZATION OF ACTIVITIES.
- HELPS IDENTIFY ORGANIZATIONS NEEDING ATTENTION BASED ON ACTIVITY VOLUME.

SQL PROVISIONING QUERY

```
--- Query 1 - Provisioning Query
-----
--
SELECT
    COUNT(*) AS Total_Count,
    CASE
        WHEN sdp.org_id = 52 THEN 'CECONY'
        WHEN sdp.org_id = 102 THEN 'ORU'
        ELSE null
    END as CONED_ORG,
    CASE
        WHEN COUNT(*) < 100 THEN 'Good'
        WHEN COUNT(*) >= 100 AND COUNT(*) < 1000 THEN 'Still c
but need monitoring - between 100 and 999'
        ELSE 'Higher than 1000 - Monitoring needed'
    END as provisioning_result
--*
FROM
    svc_pt          sdp,
    service_request sr,
    activity         act
```


SQL PROVISIONING QUERY

```
WHERE
    1 = 1
    AND act.service_request_id = sr.id
    AND sr.insert_time > sysdate - 10
    --AND SR.insert_time > TO_DATE('2019-06-01 00:00:00', 'YYYY-
MM-DD HH24:MI:SS')
    AND act.sub_type = 'Meter - Reliability Validation'
    AND act.status_cd = 'Done'
    AND act.outcome_cd = 'Success'
    AND sr.svc_pt_id = sdp.id
    --AND sdp.org_id = 52
    AND NOT EXISTS (
        SELECT
            *
        FROM
            svc_pt_param spp -- SVC_PT_PARAM NO Partitioning
        WHERE
            spp.svc_pt_id = sdp.id
            AND spp.name = 'AMR Ready'
    )

GROUP BY
    sdp.org_id;
```

COLLABORATION WITH DIFFERENT TEAMS AND ORGANIZATIONS

COLLABORATION WITH SIEMENS AND OTHER ORGANIZATIONS

- SIEMENS: WE WORK CLOSELY WITH SIEMENS ON VARIOUS PROJECTS, INCLUDING THE DEVELOPMENT AND MAINTENANCE OF THE MDMS (METER DATA MANAGEMENT SYSTEM). SIEMENS PROVIDES TECHNICAL EXPERTISE AND SUPPORT FOR OUR SYSTEMS.
- INTERNAL TEAMS: COLLABORATION WITH INTERNAL TEAMS SUCH AS THE AMI (ADVANCED METERING INFRASTRUCTURE) TEAM, IT, AND OTHER DEPARTMENTS IS CRUCIAL FOR THE SUCCESS OF OUR PROJECTS.
- EXTERNAL PARTNERS: WE ALSO COLLABORATE WITH OTHER EXTERNAL PARTNERS AND VENDORS TO ENSURE THE SMOOTH OPERATION AND INTEGRATION OF OUR SYSTEMS.

HOW WE WORK TOGETHER

- REGULAR MEETINGS: WE HOLD REGULAR MEETINGS TO DISCUSS PROJECT UPDATES, ADDRESS ISSUES, AND PLAN FUTURE WORK. THESE MEETINGS INCLUDE BACKLOG REFINEMENT, SPRINT PLANNING, AND DAILY STAND-UPS.
- COMMUNICATION TOOLS: WE USE VARIOUS COMMUNICATION TOOLS SUCH AS EMAIL, TEAMS, AND PROJECT MANAGEMENT SOFTWARE TO STAY CONNECTED AND COORDINATE OUR EFFORTS.

LEARNING EXPERIENCE DURING INTERNSHIP



4 hours per week dedicated to learning new technologies, methodologies, and best practices.



Agile Methodologies: Explored different frameworks (Scrum, Kanban), their benefits, and how Agile contrasts with Waterfall in project management.



Software Development Life Cycle (SDLC): Gained a deeper understanding of how IT projects move from planning to deployment.



Collaboration between IT and Business Teams: Learned how technical teams align with business goals, how requirements are gathered, and the role of effective communication.



Advanced HTML & CSS Formatting: Improved my ability to structure and style data from working on the technical documentation within Azure DevOps Wiki.



Excel for Automation: Learned how to optimize Excel features like formulas, tables, and automation techniques to enhance reporting processes.



Grafana & System Monitoring: Gained hands-on experience with Grafana, understanding how AML uses it to create dashboards for monitoring system performance, identifying trends, and visualizing key operational metrics.

KEY SKILLS FOR FUTURE INTERNS



Advice for future interns:



Agile vs. Waterfall: Be prepared to discuss the differences, advantages, and when to use each methodology.



SQL & Database Concepts: Basic understanding of databases, querying data, and how SQL integrates with business operations.



Strong Programming Fundamentals: Confidence in your primary coding language, as it may come up in technical discussions.



Problem-Solving & Adaptability: Be ready to showcase how you approach learning new tools and solving challenges on the job.



Networking Opportunity: Attend the **Spring Career Fair**, visit the **Con Edison booth**, and leave your **resume** with recruiters to increase your chances of securing an internship.

GITHUB REPOSITORY

[HTTPS://GITHUB.COM/ASHREYAH/CONED-INTERNSHIP](https://github.com/ashreyah/coned-internship)

ashreyah / Coned-Internship

🔍 Type / to search

<> Code

🕒 Issues 10

🔗 Pull requests

💬 Discussions

🔄 Actions

📁 Projects 1

📖 Wiki

🛡 Security

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About ⚙

ashreyah

Update README.md

60d5942 · 11 minutes ago

🕒 11 Commits

📁 Deliverables

Add files via upload

39 minutes ago

📁 TimeLog

Add files via upload

54 minutes ago

📄 README.md

Update README.md

11 minutes ago

📖 README

✎ ⋮

Con Edison Internship

Overview

This repository contains all the project deliverables and time logs for my **Con Edison internship**, which is part of my **CISC 4900** course. My project focuses on organizing and improving documentation for the **AMI team** using a wiki system hosted on Azure DevOps, as well as verifying SQL documents in the **SQL Server SIT environment**.

Releases


No releases published
[Create a new release](#)

Packages







No packages published
[Publish your first package](#)


PROJECT MANAGEMENT

[HTTPS://GITHUB.COM/USERS/ASHREYAH/PROJECTS/1](https://github.com/users/ashreyah/projects/1)







 ashreyah / Projects / @CISC-4900 Task Tracker

Q Type to search


 @CISC-4900 Task Tracker

Add status update


 Backlog  Priority board  Team items  Roadmap  In review  My items + New view

Q Filter by keyword or by field


Discard Save

 To-Do 1 / 5 Estimate: 0


This item hasn't been started


 Coned-Internship #14
5/19 - Supervisor Eval#2 Due

+ Add item


 In progress 2 / 3 Estimate: 0

This is actively being worked on

 Coned-Internship #12
5/12 - Deliverable: Slides (Final Draft), Project Video + Exit Survey


 Coned-Internship #13
5/16 - Last day to submit deliverables


+ Add item

 In review 0 / 5 Estimate: 0


This item is in review


+ Add item


 Done 10 Estimate: 0


+ 

This has been completed

 Coned-Internship #8
3/31 - Deliverable: Slides (1st Draft)

 Coned-Internship #9
4/7 - Deliverable: Demo 2

 Coned-Internship #10
4/11 - Supervisor Eval#1 Due

 Coned-Internship #11
4/28 - Survey: Self-Assessment

+ Add item

LEADERSHIP DEVELOPMENT PROGRAM (LDP)

Leadership Development Program (LDP)

- Con Edison's LDP introduces recent graduates to the energy industry, focusing on safety, operational excellence, and customer experience.
- Mission: To develop technical and business knowledge while cultivating leadership skills.

My Announcement:

- Exciting News: I am happy to share that I have been accepted into Con Edison's Leadership Development Program (LDP) after six interview rounds!
- Future Prospects: This opportunity secures my job post-graduation and sets me on a path to develop my leadership skills and contribute to Con Edison's mission.