



# RxRadar

Tracking your meds. Keeping you safe.

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# OUR TEAM



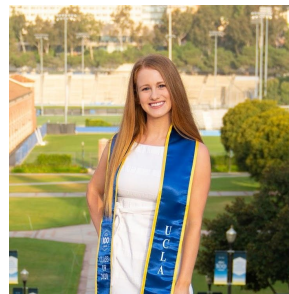
Kevin Chow

- Project Manager
- End-to-End App Implementation
- AWS Design
- Data Engineering
- Model Evaluation



Pauline Ranjan

- AI Engineer
- Model Evaluation
- EDA
- Data Engineer
- Product Manager



Kelsey Ryan

- Product Manager
- EDA
- AI Engineer
- Model Evaluation
- Technical SME



Bikram Khaira

- AWS Design
- Data Engineering
- Technical SME
- End-to-End App Implementation

# THE PROBLEM

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A light blue cloud-like shape containing a red curved line that starts at the top left and ends at the bottom right, framing the percentage.

34%

of Older Adults take 5  
or more medications

A light blue cloud-like shape containing a red curved line that starts at the top left and ends at the bottom right, framing the percentage.

25%

of Older Adults see at  
least 5 different  
doctors each year

Older Adults are

**4 to 7x**

more likely to be  
hospitalized due to  
medication issues

**Older adults** and **caregivers** struggle to track **multiple medications** across **fragmented healthcare systems** — leading to missed drug interactions, duplicate prescriptions, and preventable harm.

# INITIAL EXPERT & USER RESEARCH



## PCP & PHARMACIST

- Fragmented care and medication management (duplicates, interactions) are real concerns
- Their advice: Provide info that's simple, clear, and free of medical jargon



## OLDER ADULTS AND THEIR CAREGIVERS

- Medication management is key
- One shared past experience with overlapping side effects
- Digital comfort varies — simplicity is essential

# MVP DEMO

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**USER INPUT:**  
Drug/Brand  
names, Dosage,  
Frequency

**BRAND TO  
DRUG  
MAPPING**



**PLAIN  
TEXT  
ALERTS**

RxRadar reduces worry by catching **drug duplicates** and **interactions**.

Kelsey Ryan

# IMPACTS



## PUBLIC HEALTH

Up to 50% of adverse drug events are preventable

Annually:  
3.5M doctor visits  
1M ER visits  
125K hospital admissions



## GERIATRIC PATIENTS

87% found with duplicate medications

5% of hospitalizations due to drug-drug interactions



## FINANCIAL & OPERATIONAL

Over \$8B in medical expenses annually

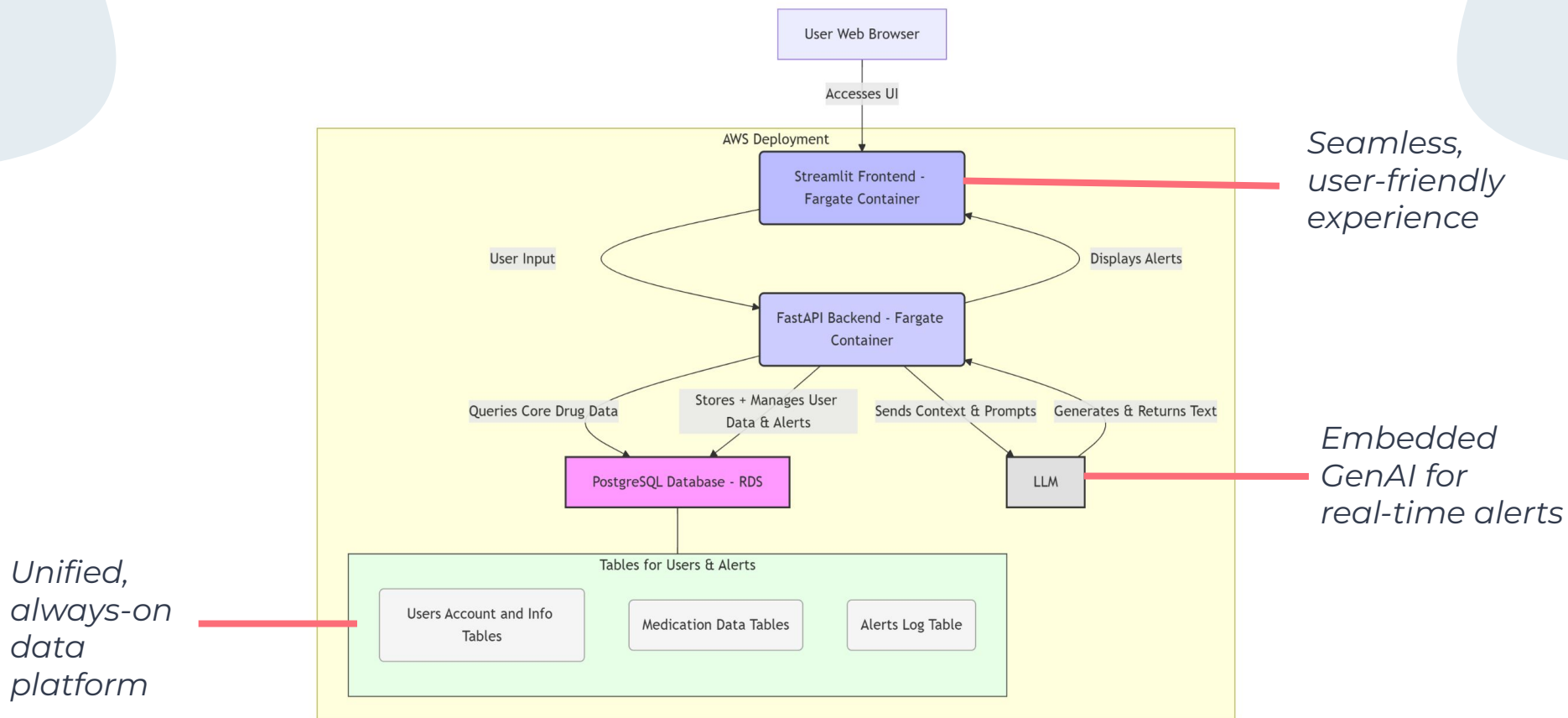
Less Strain via Prevented Doctor Visits, Hospitalizations, and Lab Work

# MARKET LANDSCAPE

	Drug Interactions	Drug Duplicates	Patient Facing	Cross Provider	Plain Text Alerts
First Databank	✓	✓	✗	✗	✗
MedAware	✓	✗	✗	✗	✗
Epic CDS	✓	✓	✗	✗	✗
Medisafe	✓	✗	✓	✓	✗
DrFirst	✓	✗	✗	✗	✗
RxRadar	✓	✓	✓	✓	✓



# UNDER THE HOOD: OUR ARCHITECTURE



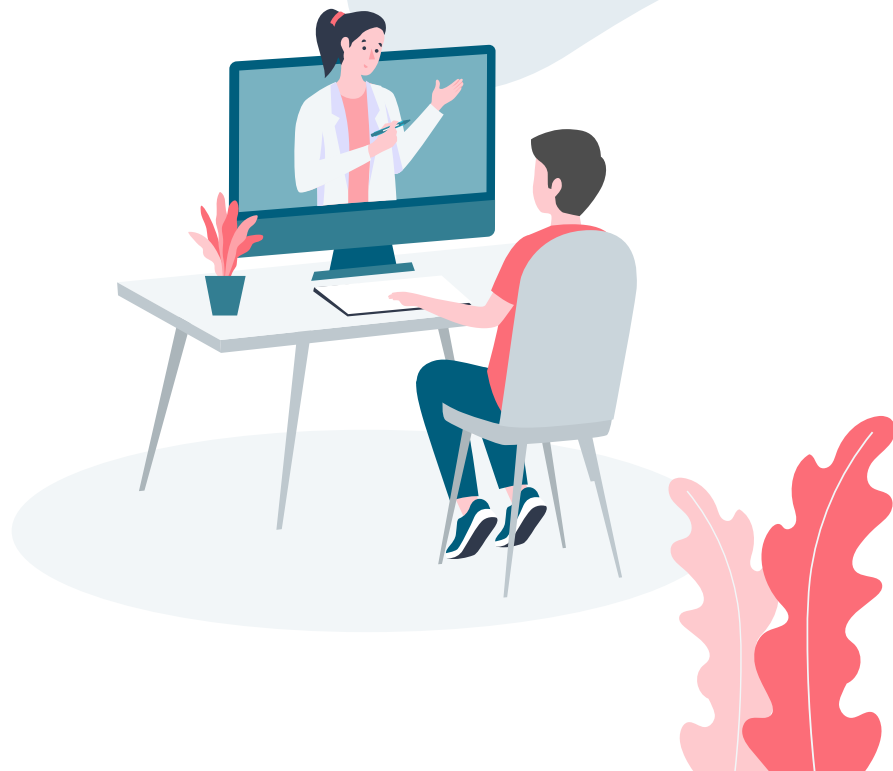
# OUR DATA SOURCES

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The Right Data for the Right Problem

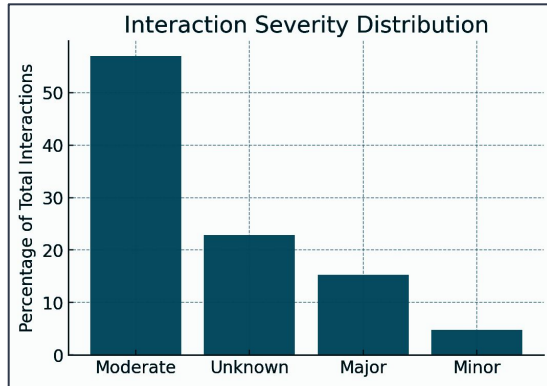
Our Primary Data Sources:

1. DrugBank — drug features and curated drug interactions & details
2. TWOSIDES — real-world side effect signals
3. DDInter — clinical severity of drug interactions ranked by experts
4. RxNorm API — product and brand names



# EXPLORING OUR DATA

1. Dataset covers common high-risk medications taken by older adults



2. Severity distribution confirms focus on high-risk alerts is appropriate

**Data supports geriatric patient use cases**

**Clean data supports reliable, clinically-relevant alerts**

**EDA + Market Research: Plain text alerts are not only possible but in demand**

# OUR FINAL DATA TABLES

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Clean, Purpose-Built Tables for the App

## **brand\_to\_drug\_mapping**

Brand names  
mapped to their  
active ingredients

## **spellcheck**

Full list of brand and  
drug names

## **Model\_data (100K Drug Pairs)**

Drug features,  
interaction data,  
severity, side effects

# OUR BASELINE

## Initial Baseline Outputs

- Started with raw outputs from a generic prompt and limited context.

Interaction Alert for Lepirudin and Bivalirudin:

- Severity: Major
- ATC Group Context: Blood and blood forming organs
- Lepirudin belongs to: Carboxylic Acids and Derivatives
- Bivalirudin belongs to: Polypeptides

What this means: The risk or severity of bleeding can be increased when Lepirudin is combined with Bivalirudin.

Reported Side Effects: Anaemia (PRR: 5.0, Freq: 0.0625); Atrial fibrillation (PRR: 30.0, Freq: 0.1875); Dizziness (PRR: 2.5, Freq: 0.0625);

Please consult your doctor or pharmacist before combining these medications.

- Used multiple prompting techniques (e.g., CoT).
- Shared all versions with users for feedback.

Baseline

Eval Design

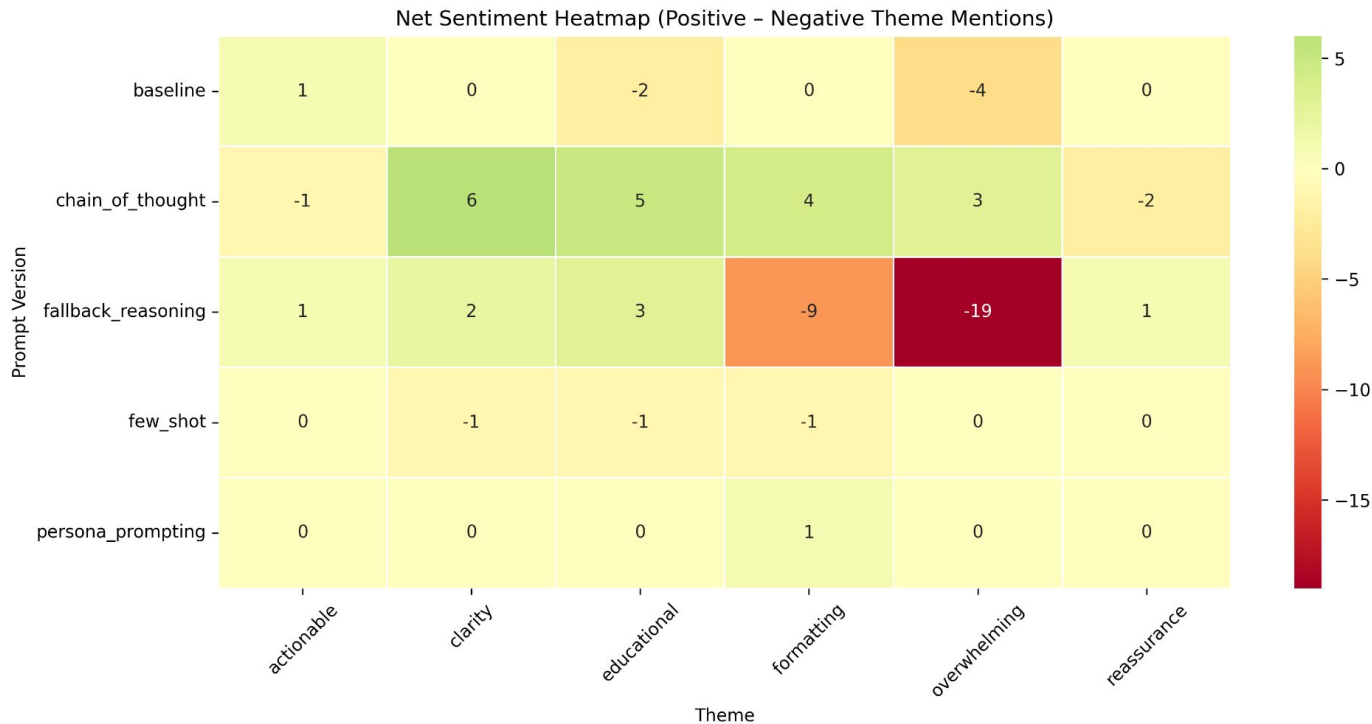
Metrics

Baseline Eval

Refinement

Final Eval

# DESIGNING OUR EVALUATION CRITERIA



Baseline

Eval Design

Metrics

Baseline Eval

Refinement

Final Eval

# OUR EVALUATION METRICS

We selected these to reflect what older adults & caregivers said they care about:

- **Severity Match** – Is the risk level clear?
- **Mechanism Match** – Do we explain why the interaction matters?
- **Drugs Mentioned** – Are both meds clearly named?
- **Concise** – Is the alert short and easy to read?
- **Avoids Jargon** – No confusing medical terms
- **Risk Language** – Do we clearly state potential harms?
- **Has Explanation** – Do we explain what could happen?

Baseline

Eval Design

Metrics

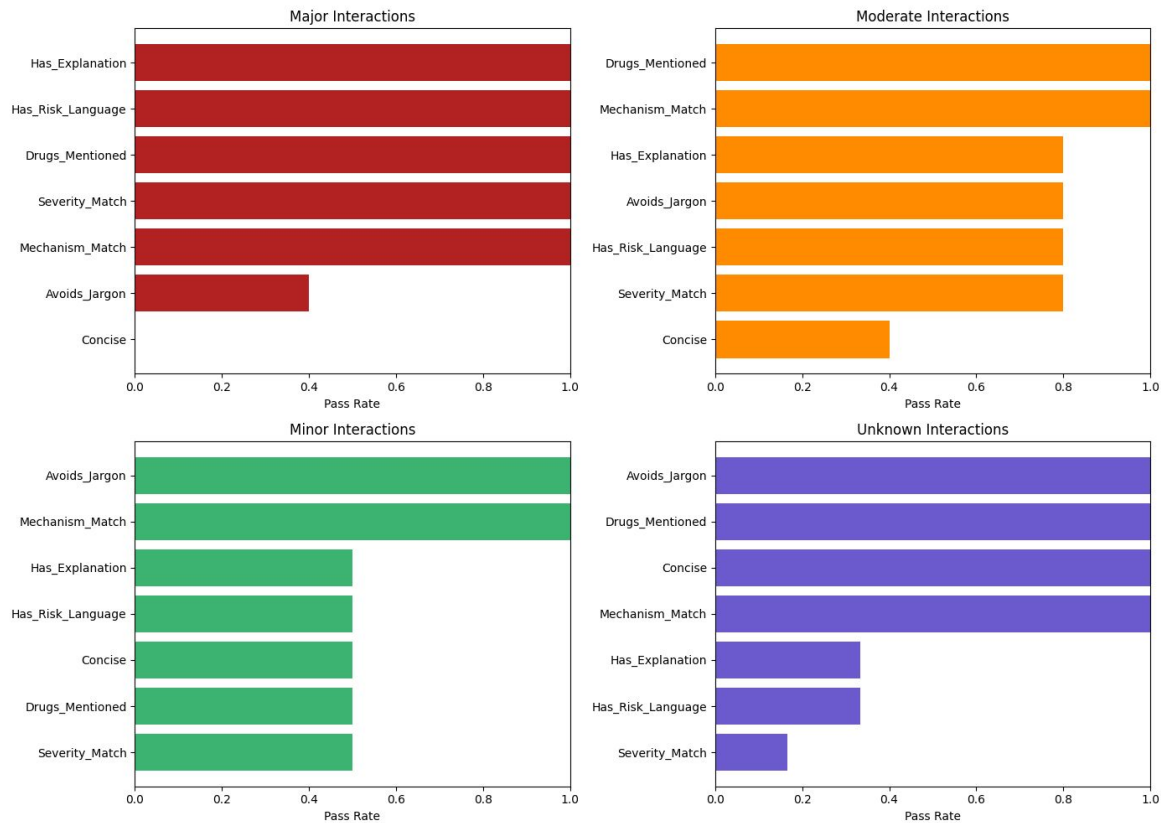
Baseline Eval

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# EVALUATING OUR BASELINE ALERTS

Pass Rate by Metric for Each Severity Level



Baseline

Eval Design

Metrics

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Final Eval



# IMPROVING OUR ALERTS

- **Switched to Chain-of-Thought prompting** for structured reasoning.
- **Expanded context:** Prompt now includes drug roles, risks, mechanisms, and explanation requests.
- **Explicit style guidance:** Set tone, format, and reading level (for older adults and caregivers).
- **Reworded risk framing:** Now uses clear language to explain "what could go wrong" and why.
- **Iterative testing:** Each version was evaluated against rubric and improved accordingly.

Baseline

Eval Design

Metrics

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Final Eval

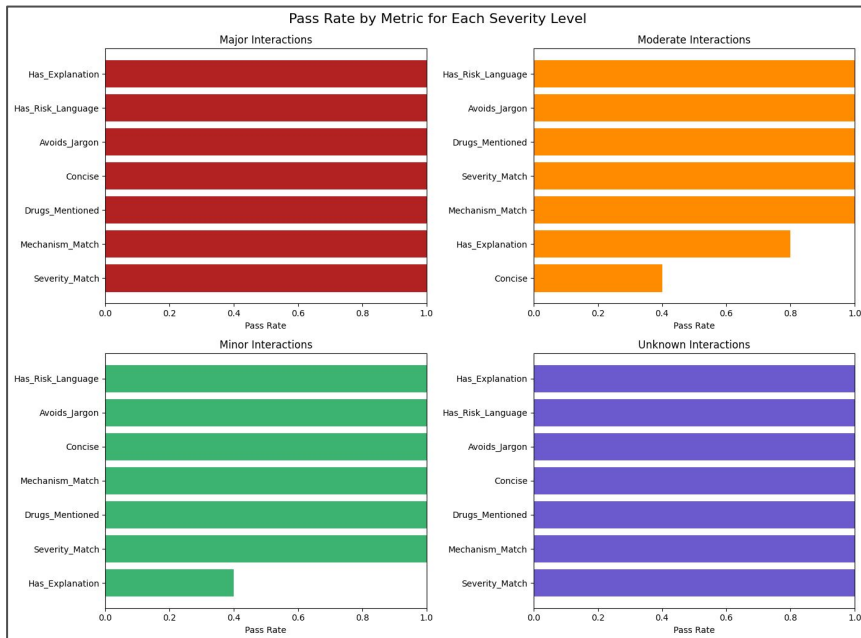
# FINAL ALERT PERFORMANCE

Warfarin and amiodarone have a major interaction. Taking these medications together increases your risk of bleeding.

Warfarin is a blood thinner. It prevents blood clots by blocking vitamin K. Amiodarone is used for irregular heartbeats. It can affect your heart rate and rhythm.

Amiodarone can increase the effect of warfarin in your body. This can lead to a higher risk of bleeding.

Please talk to your doctor or pharmacist before taking these medications together.



100%

Severity Match

100%

Has Risk language

85%

Concise

80%

Has explanation

# CHALLENGES & TRADE-OFFS

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**01.**

## **DRUG NAME HANDLING**

Develop a system to clarify  
ambiguous drug brand names.

**02.**

## **3+ DRUGS**

Focus on alerts for pairs of drugs.  
ABC → AB, BC, AC

**03.**

## **GOOGLE ADK vs. LLM**

Switch to LLM to simplify infrastructure,  
while preserving core functionality.

# FUTURE WORK

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1. **OCR** for Medication Input
2. **Dosages And Frequency** Incorporation for Alerts
3. **NER** for Information Extraction From Clinical Notes
4. **Integration** into EHR Systems

# OUR MISSION

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Help Geriatric Patients + Caregivers  
Manage Fragmented Care &  
Polypharmacy Risks

Does this resonate with you?  
Try our MVP: <https://tinyurl.com/Mids-RxRadar>  
Learn more: [kchowp.github.io/rxradar](https://kchowp.github.io/rxradar)

# ACKNOWLEDGEMENTS

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1. **Target Users Interviewed:** Senior Patients and Caregivers
2. **SMEs:** Primary Care Physician & Pharmacist
3. **Instructors:** Korin and Joyce
4. **TAs:** Billy Fong
5. **Classmates:** Mohamed Bakr and Those Who Gave Feedback