



# JOB RECOMMENDATION SYSTEM

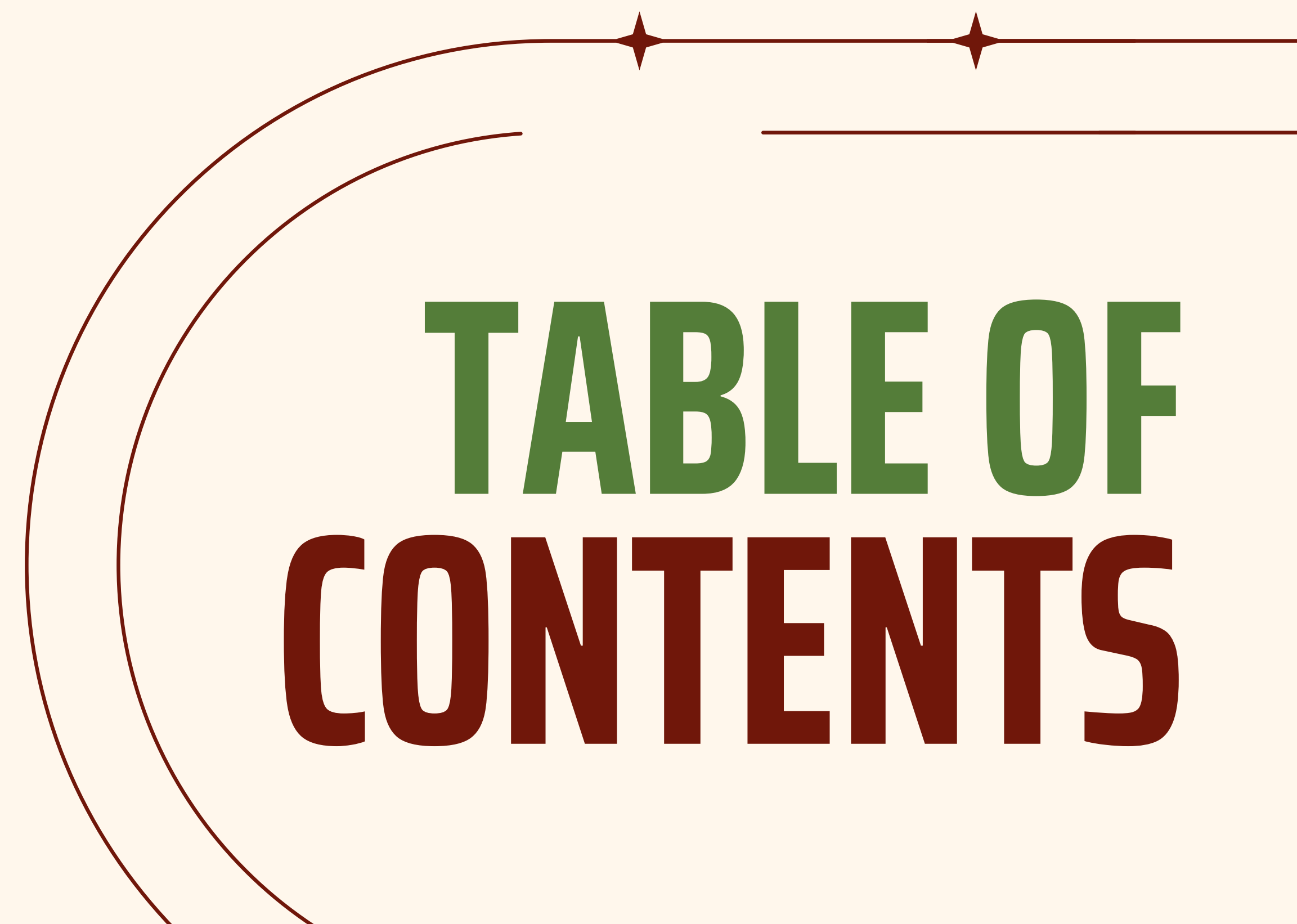
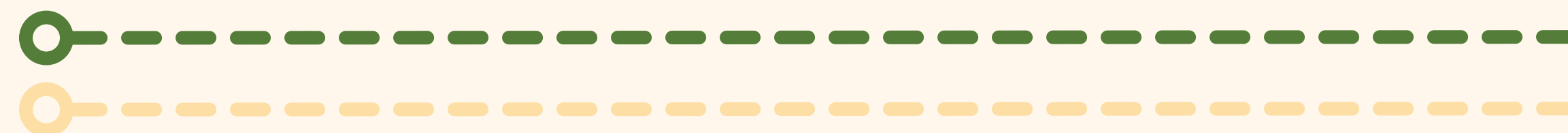
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Subject: Fundamental of Data Science

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# INTRODUCTION

## What is Job Recommendation System (JRS)?

To help job seekers by matching their skills and experience to relevant job opportunities.

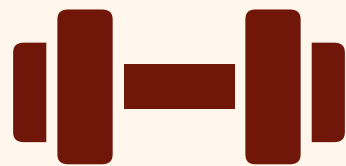
## Objective of the Project

Develop a JRS that supports Khmer language input and applies advanced algorithms to generate accurate job recommendations.

## How it Works

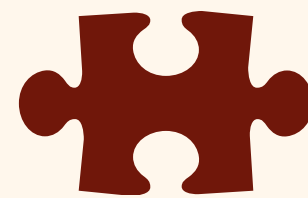
- Users input their skills and experience
- Data Processing
- Train data with Hybrid model
- Output: Generates a ranked list of job opportunities with relevance scores

# PROBLEMATIC



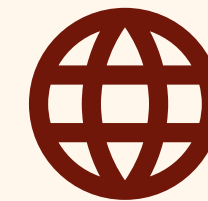
## CHALLENGES FOR JOB SEEKERS

Lack of tailored job recommendations in  
local languages



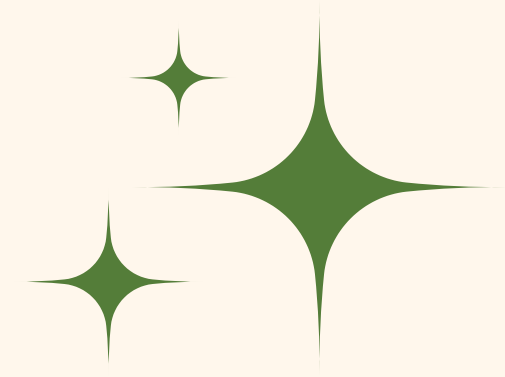
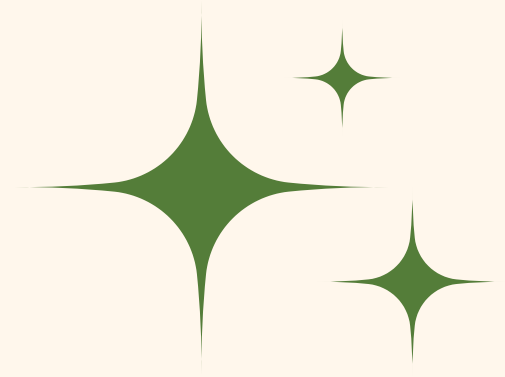
## ALGORITHMIC LIMITATIONS

Dependency on high-quality data and  
preprocessing to ensure meaningful  
matches



## KHMER LANGUAGE PROCESSING

there is limited evidence of existing JRS  
specifically trained for Khmer, recent  
advancements in Khmer Natural Language  
Processing (NLP) provide a solid foundation  
for such development



# DATA PROCESSING

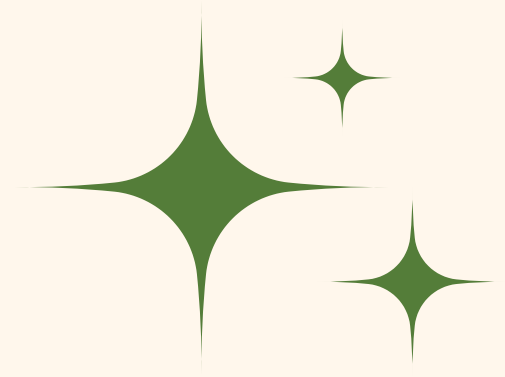


# DATA COLLECTION

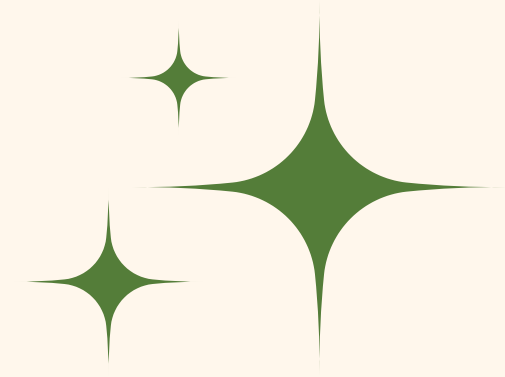


**Our dataset was scraped from multiple job-finding websites in Cambodia, ensuring a diverse and representative collection of job and user data for our recommendation system.**

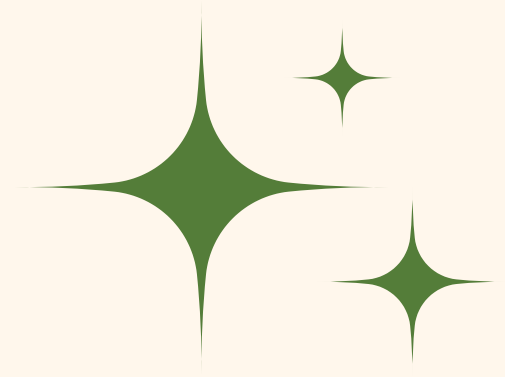
- **Size: 3,600 entries**
- **Columns: 16 features**
- **Content: Includes title, salary, job descriptions, required skills, user preferences, and additional relevant data.**



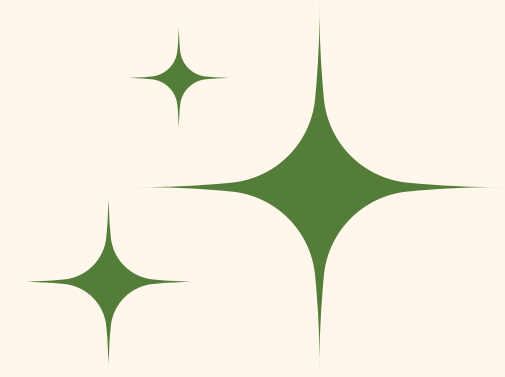
# TEXT PREPROCESSING



- **Objective: Clean and standardize text data for better analysis.**
- **Actions Performed:**
  - **Lowercasing.**
  - **Stopword Removal**
  - **Lemmatization**
  - **Tokenization**

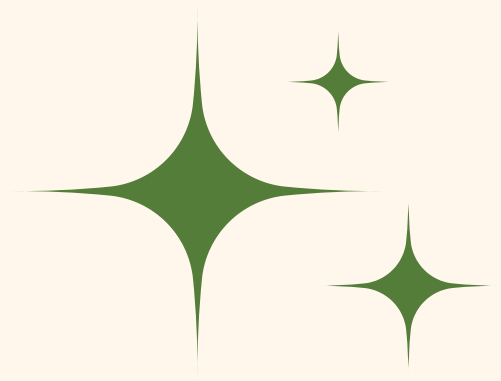


# FEATURE ENGINEERING

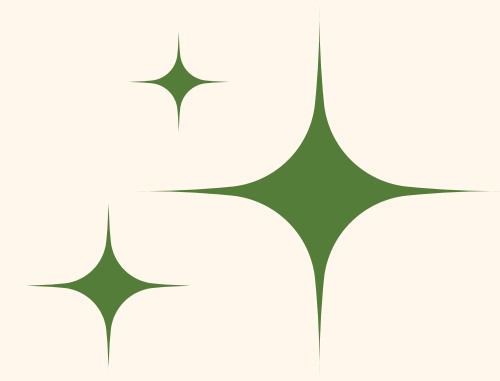


- **Processed\_Requirements:** Cleaned job qualification text.
- **Processed\_Experience:** Cleaned job experience text.
- **Combined\_Text:** Merged Processed\_Requirements and Processed\_Experience into a single searchable field.





# VECTORIZATION




- **Convert text data (job descriptions and user skills) into numerical format for analysis.**
- **We used the model that contain TF-IDF (Term Frequency-Inverse Document Frequency) to transform the text into numerical vectors.**

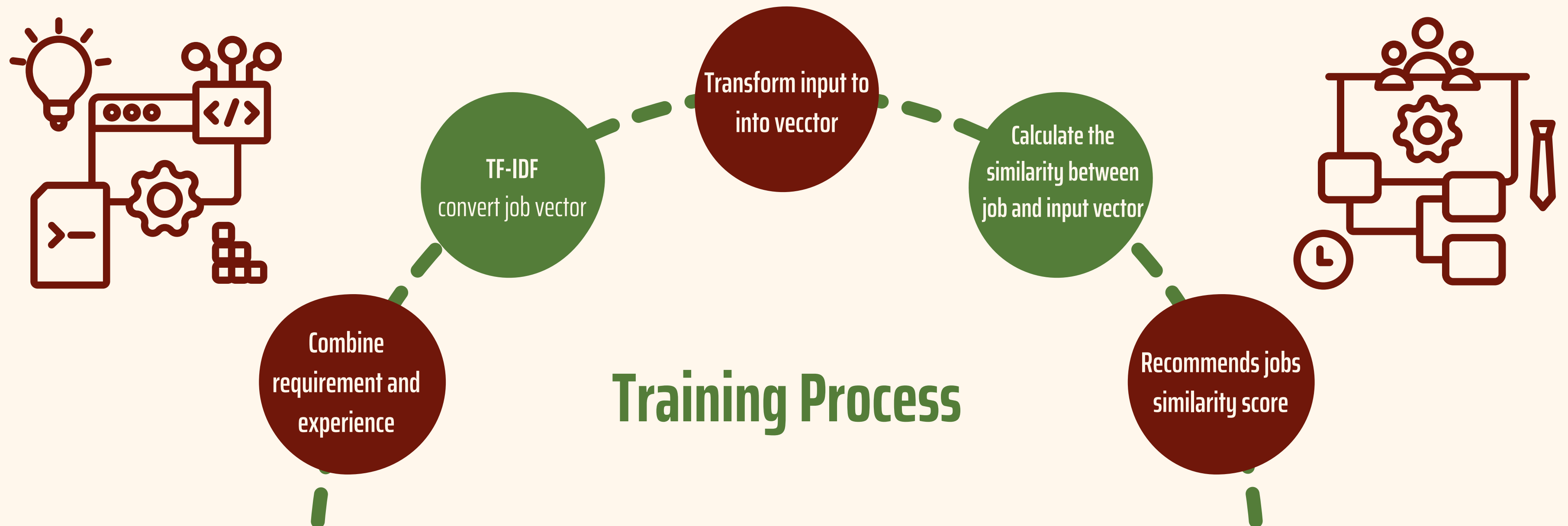


# SIMILARITY



- Calculate the cosine similarity between the user's skill vector and each job description vector.
  - Rank the jobs by their similarity score.
  - Recommend the top 5 jobs with the highest scores.
- 

# TRAINING MODELS





# MODELS

## Content-based

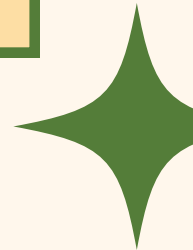
recommends jobs based on a user's skills by comparing them to job requirements and experience using text similarity.

## Collaborative Filtering

model leverages a user-job interaction approach, recommending jobs based on similar users' preferences

## Random Recommendations

model provides random recommendations, ensuring variety and exploration



## Precision

Measures the proportion  
Higher => Accurate Identified

## Recall

Assesses the proportion  
Higher => capture a larger proportion

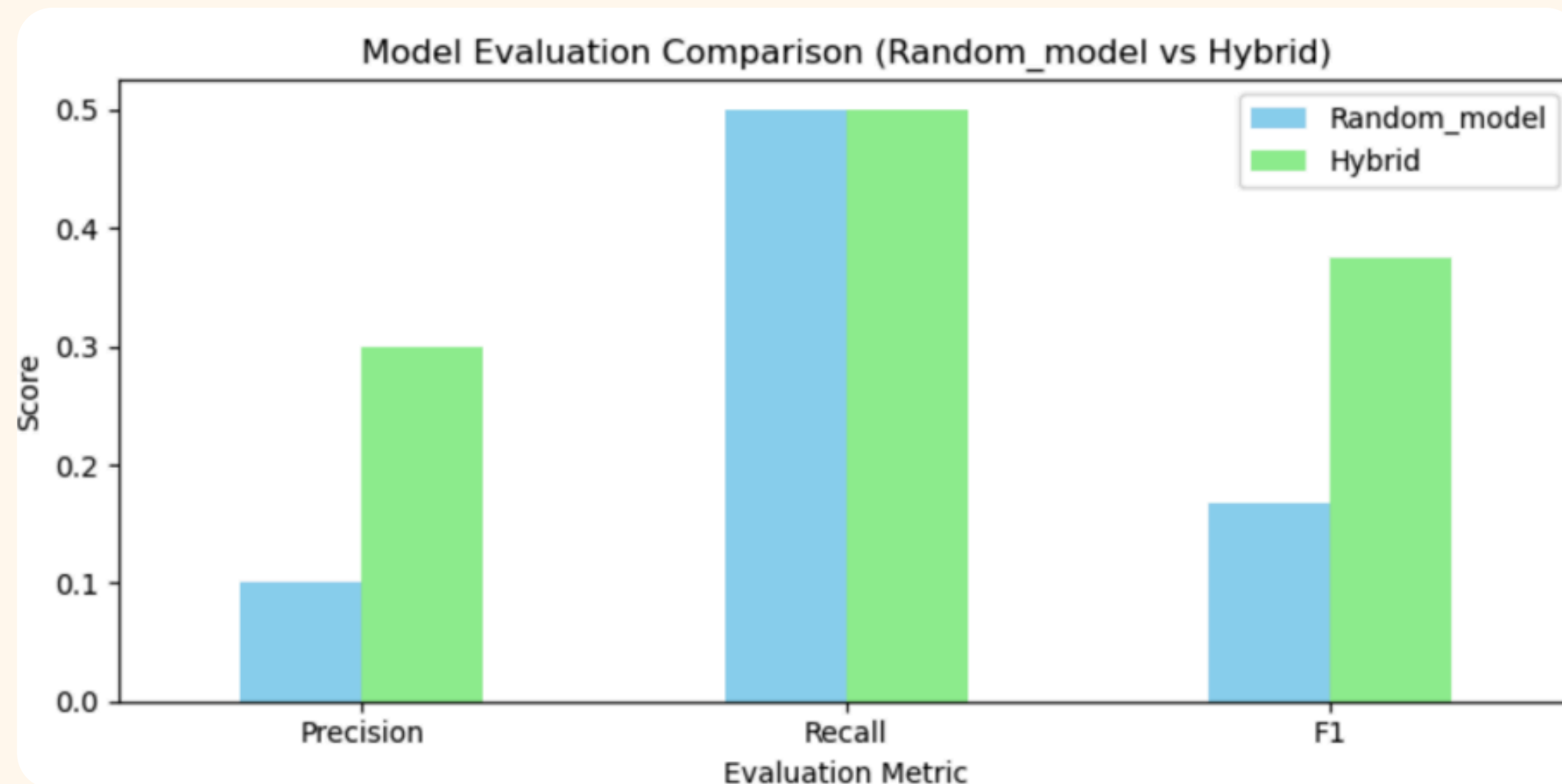
## F1-Score

to balance evaluation of model  
performance

# EVALUATION

evaluation

# EVALUATION



# RESULT



## Hybrid model

Input: “I am student of Computer Science major, I have experience with PHP as web application and react as web frontend.” - Year of experience: “1 - 2”

	ID	Title \
3409	3410	IT Officer
107	108	Officer, Web Developer
511	512	Web Development Manager
19	20	Frontend Developer
59	60	Full Stack Web Developer

	Descriptions \
3409	Are you a tech-savvy individual with a passion...
107	Employee experience is our priority in Phillip...
511	Not specified
19	Not specified
59	We are looking for a talented and experienced ...

	Requirements \
3409	Bachelor Degree in IT, Programmer, Web Design,...
107	Male/female, Cambodian nationality\nBachelor d...
511	- Bachelor's Degree in computer science, or in...
19	Bachelor's Degree in Computer Science\nAt leas...
59	• Bachelor's degree in Computer Science or a ...



## Random model

Input: “I am student of Computer Science major, I have experience with PHP as web application and react as web frontend.” - Year of experience: “1 - 2”

	ID	Title \
391	392	Business support and Training Intern
334	335	Website Monitoring & Reporting Officer
35	36	Sale Coordinator
309	310	Mobile Developer
500	501	Sales

	Descriptions \
391	As a Business Support and Training Advisor, s/...
334	Special Opportunity to gain experience and sal...
35	Our company would like to invite the qualified...
309	Not specified
500	Not specified

	Requirements \
391	A third or final year student major in IT\nExc...
334	Simple Key Requirements:\n•Want to work with I...
35	No have work experience / experience with sale...
309	Bachelor's degree in computer science or equiv...
500	- Undergraduate or Finished high school.\n- no...



# CONCLUSION

Our JRS serves as a step forward in addressing the challenges of matching job seekers with relevant opportunities

## FUTURE WORK



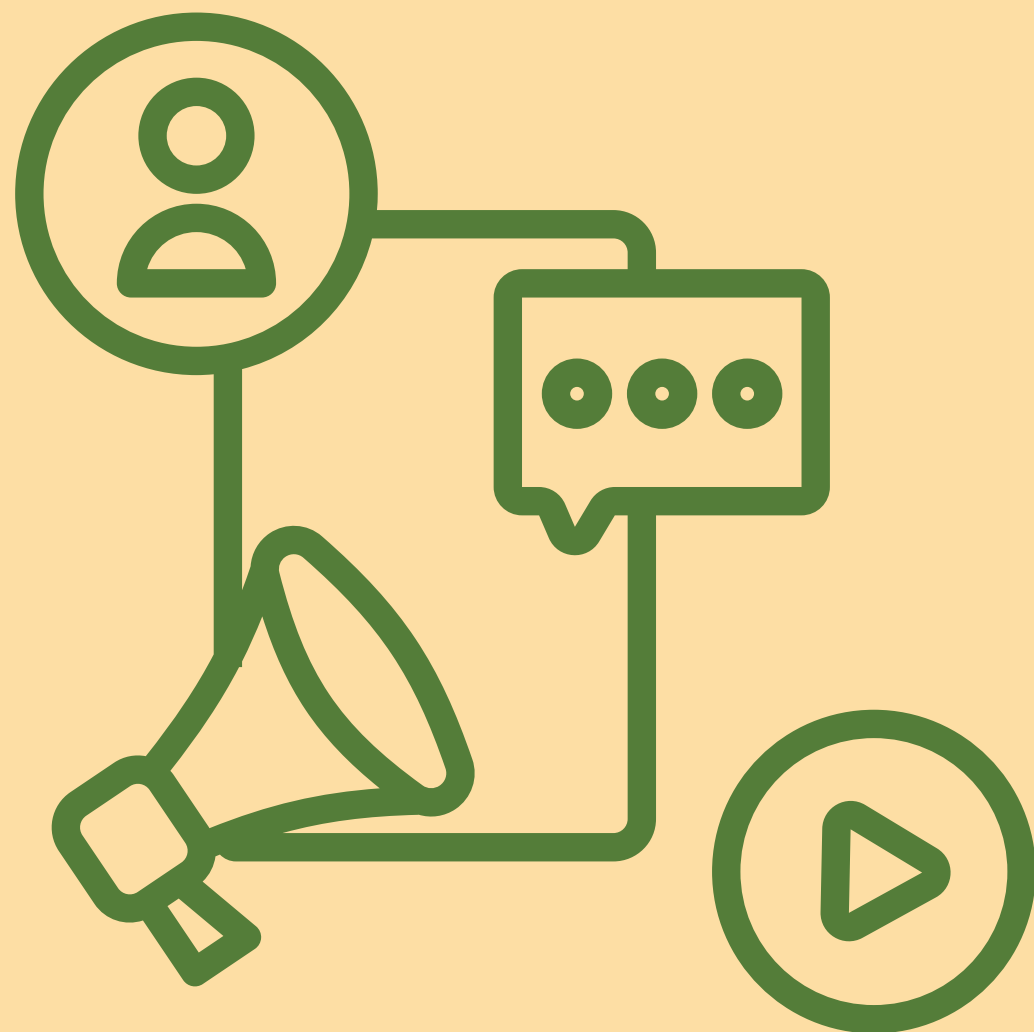
Improving Accuracy



Supporting Khmer Input







ITSUKI TAKAHASHI

**THANK YOU**