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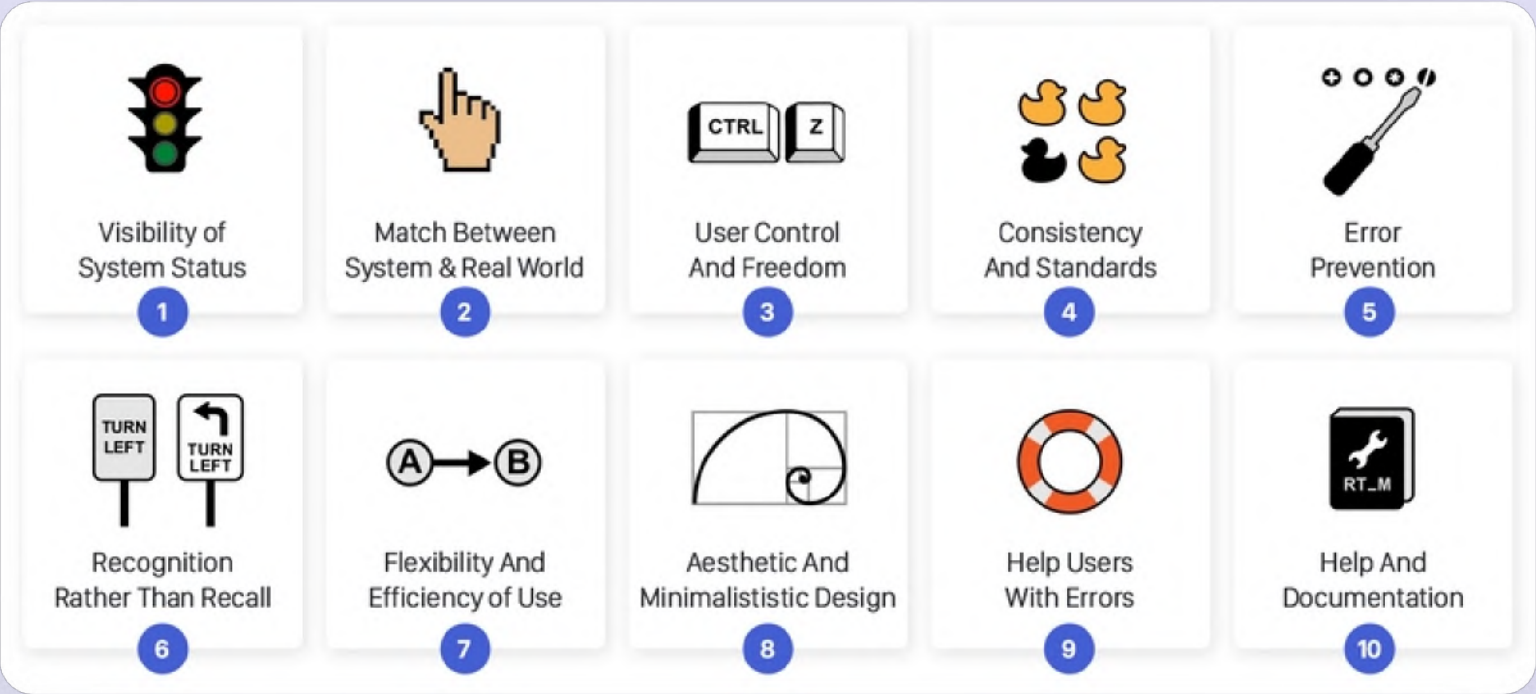
# Challenge 1



ReX will be your AI  
design mentor

# Introduction

Objective: To harnesses the power of artificial intelligence to enhance document analysis. By extracting and understanding content from PDFs, our evaluator will provide intuitive recommendations to improve the user's UI/UX design.



## Agenda/Overview

01

Market opportunity  
and competition

02

Goals

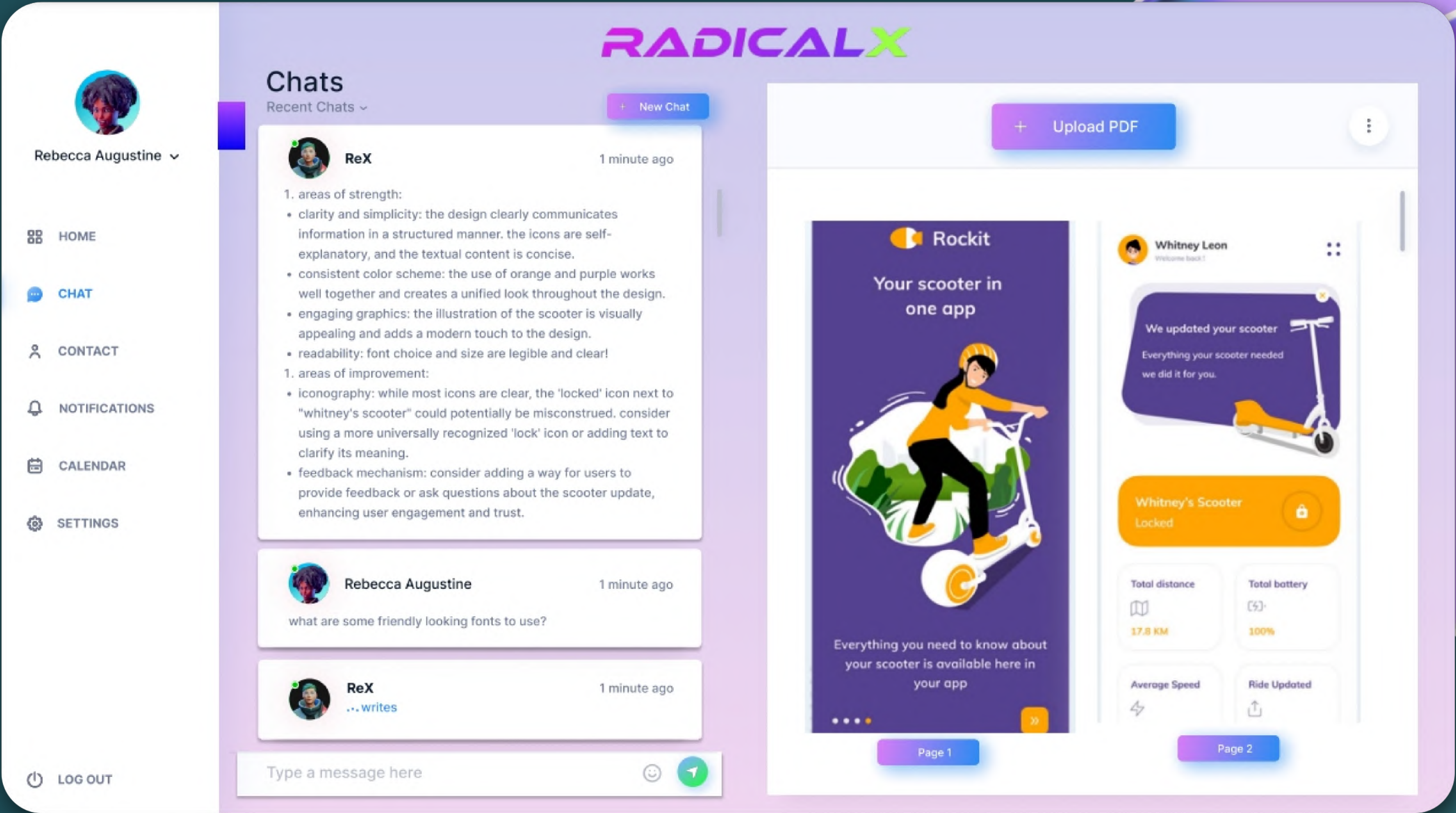
03

Action plan



# Chapter 1

## Market opportunity and Rendition: Web App Mock-Up



Tap into our users'  
learning drive

# Educational AI

Lesson driven

## Why?

Instead of just pointing out mistakes, you're equipping users with the knowledge to avoid them in the future.

## How?

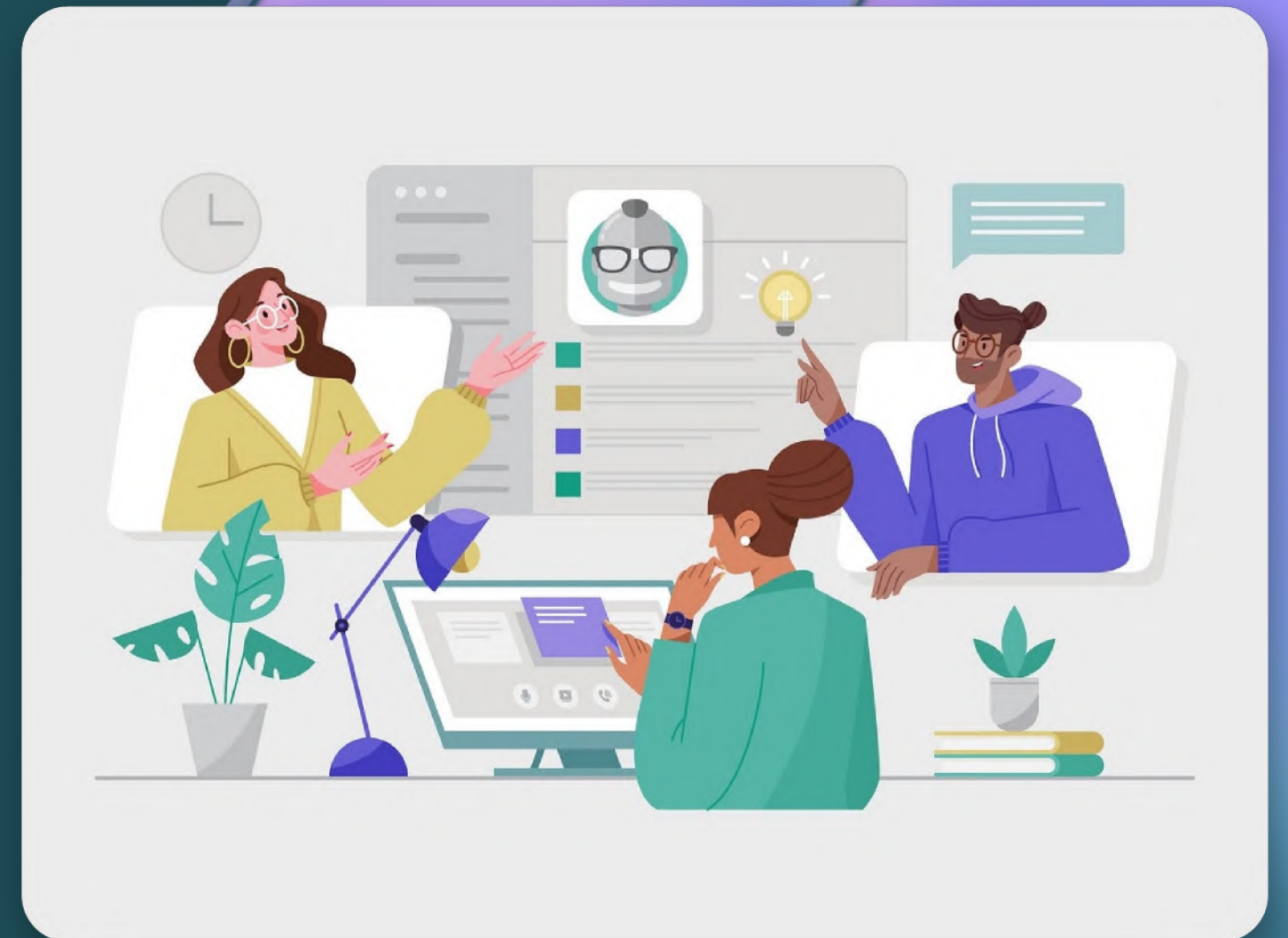
- Guided Learning
- Educate the users on design principles
- Optimize existing content and consistency
- Illustrate how design choices can impact user engagement or brand perception



## Why make it Educational/Lesson Driver?

*Many of us favor mentorship and the convenience in learning all in one application..*

- Users can receive knowledge and skills, not just feedback
- Increased engagement will make users return
- Broader audience appeal to professionals, students and enthusiasts to learn and improve their designs.



- ❑ **Web and Mobile App Designers and Students:** Ensure designs to be both aesthetically pleasing and user-friendly.
- ❑ **Startups:** Businesses launching their web and mobile platforms can refine their designs before going live.
- ❑ **E-commerce Platform:** Businesses with online stores can receive feedback on their product pages, checkouts, and overall navigation.

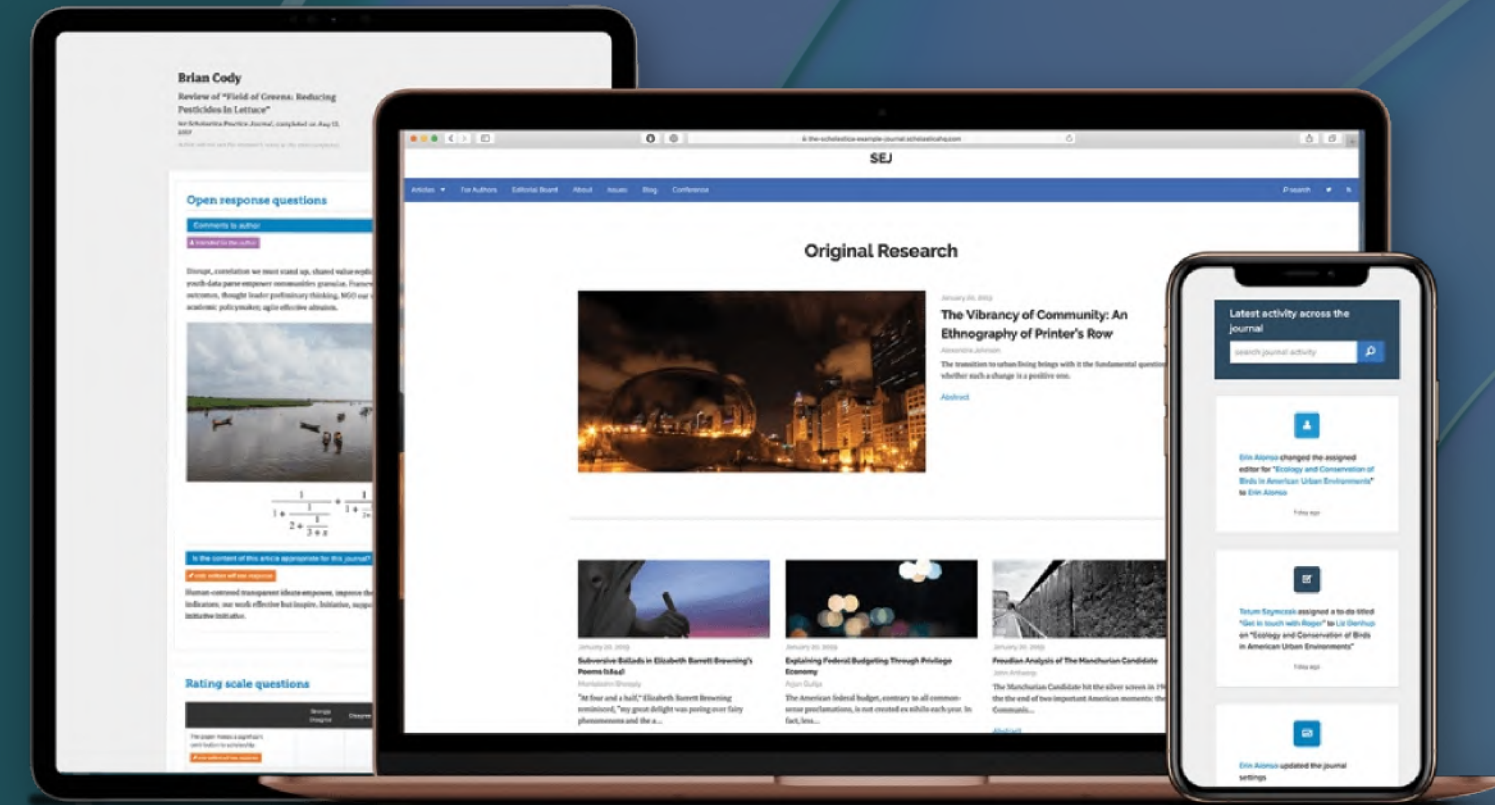




## Chapter 2

## Target Audience Part 2

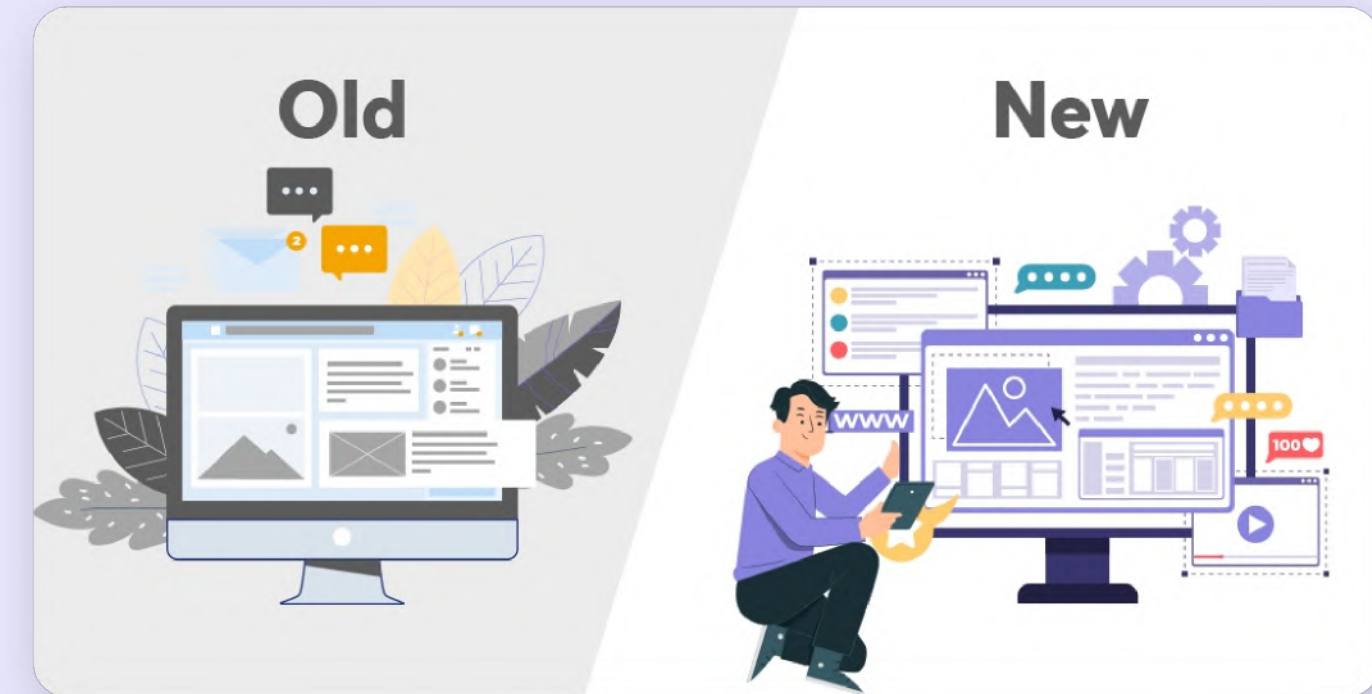
- ❑ **Businesses and Marketers:** That make brochures, annual reports, product catalogs, etc.
- ❑ **Document-based Startups:** New startups like e-magazines, e-newspapers, and online journals.



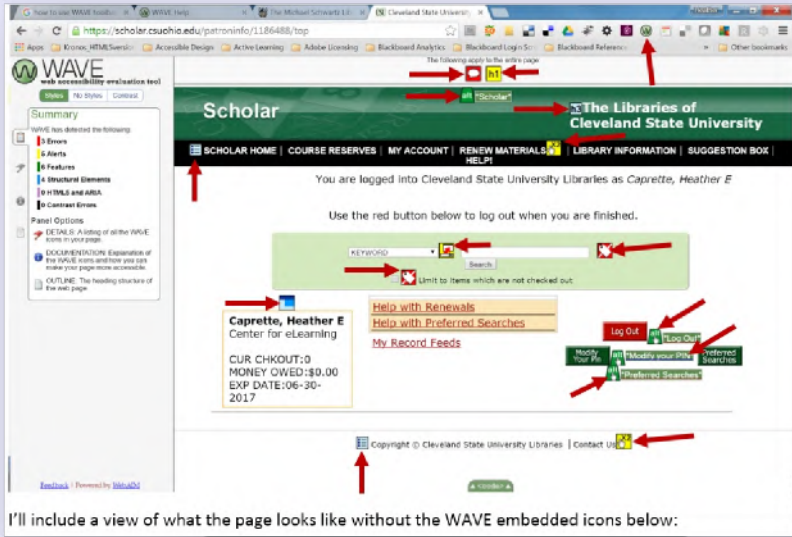


## Use/Test Case

- **Website Redesign And Mobile App Prototyping:** Before rolling out a revamped applications, designers can receive feedback on new layouts, graphics, and user flows.
- **Usability Testing:** Designers can get a feel for how user-friendly their designs are, identifying potential pain points or confusing elements.
- **E-commerce Experience:** Online retailers can refine product listings, checkout processes, etc.

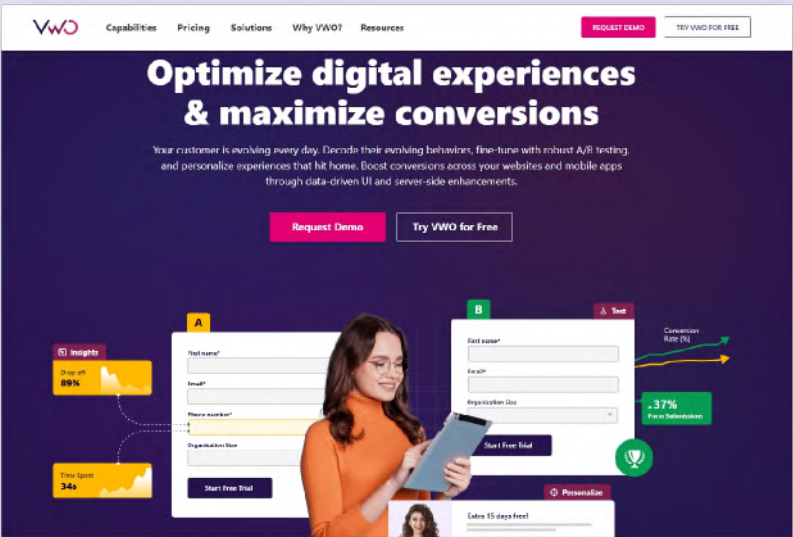


# Competitor analysis: AI-Powered Design Feedback Tools



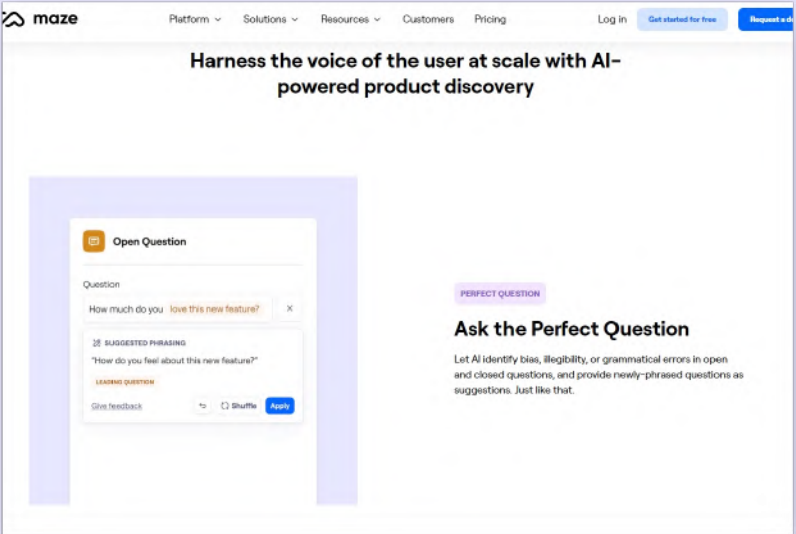
## Wave

A web accessibility evaluation tool.



## VWO

Provides A/B testing and multivariate testing tools for design and content changes.

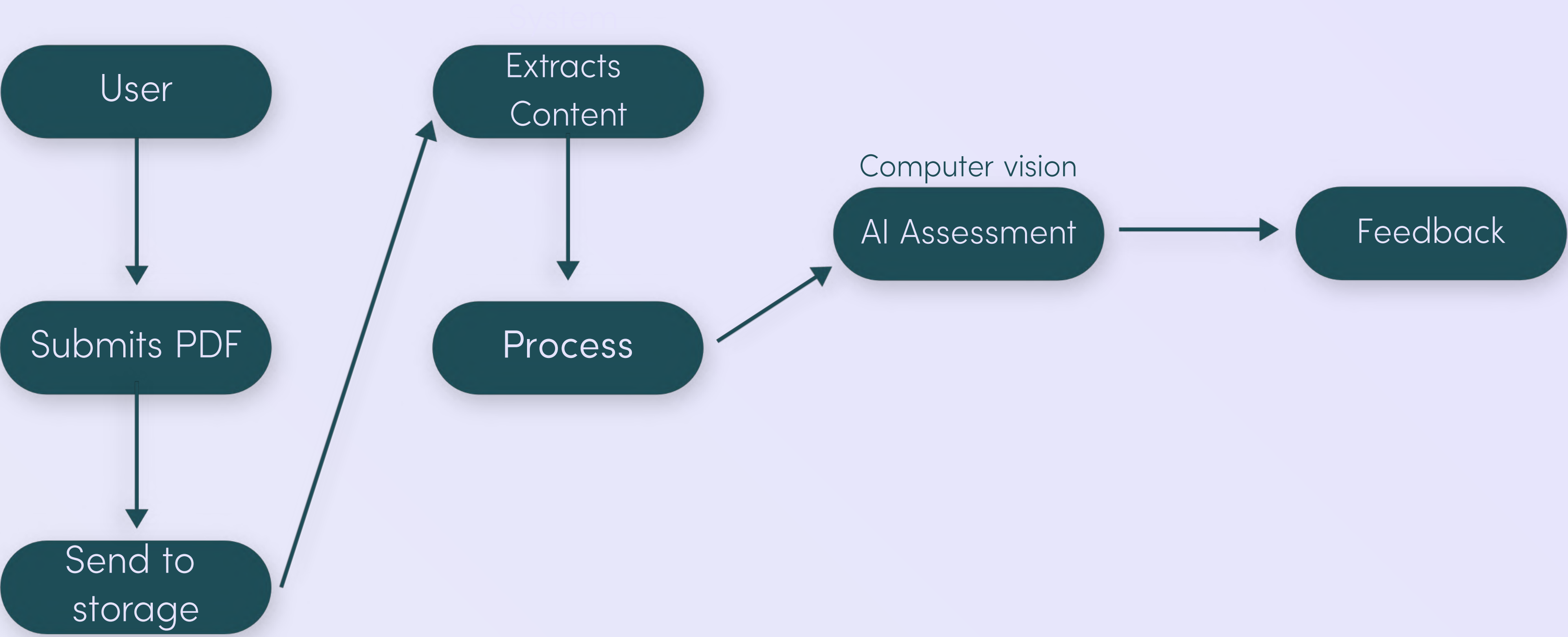


## Maze.Design

Allows designers to test prototypes and get actionable insights from real users.



Integration: Prototype



## Functionality

### 1. **User Uploads PDF:**

- a. User provides the document for analysis first being sent temporarily to a bucket in Google Cloud Storage

### 2. **System Extracts Content:**

- a. Text Extraction: Extracting written content from the PDF.
- b. Image Extraction: Pulling all visual elements or images.

### 3. **Image Captioning:**

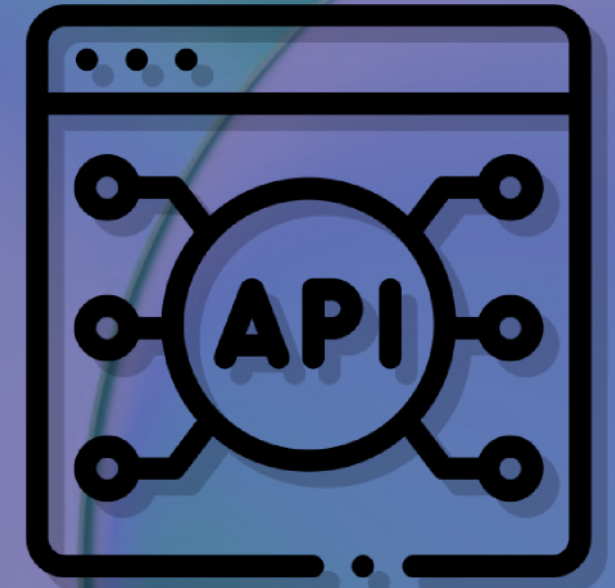
- a. Process the extracted images.
- b. Use AI models to generate context-based captions for each image.

### 4. **AI Assessment:**

- a. Input both the extracted text and image captions into the AI model.
- b. The model analyzes and offers comprehensive feedback on the document's design and content.

### 5. **End:**

- a. Conclude with the feedback being presented to the user.





Rough Demo(Prototype)



## Integration: Prototype

### ☐ **Flask Web Application:**

- Serves as the backend and front end for the web service.

### ☐ **Environment Variables and Configurations:**

- `load_dotenv()`: Loads environment variables from a `.env` file, which could contain sensitive information like API keys.
- `configparser`: Reads a configuration file to load settings such as Google Cloud Storage bucket name, service account path, and a secret key.

### ☐ **Google Cloud Storage:**

- Used for storing uploaded PDF files.
- The application uses a service account for authentication.

### ☐ **Vertex AI and Language Model**

### ☐ **PyPDFLoader:**

- Part of langchain library, it is used to load PDFs and extract content.



## Integration: Prototype

- ☐ **Image Captioning with BLIP:**
  - This helps the system understand the content of the images.
- ☐ **Temporary Files and PDF Reading**
- ☐ **Image Processing with PIL**
- ☐ **Flask Routes:**
  - The index route handles the PDF upload, saving to GCS, extracting images, getting captions, and generating initial design feedback.
  - The ask route allows-users to ask specific questions about the design, and it uses the context of the previously generated captions to provide relevant answers.
- ☐ **Error Handling and User Feedback:**
  - The application provides user feedback through flash messages in case of empty uploads or errors.



Humanized conversation  
solutions for all  
messaging channels on  
a single platform.



Connect text and images

# BLIP

Bootstrapped Language Image Pretraining model provided by Salesforce. BLIP is designed for tasks that involve both visual and textual data. It is a multimodal AI model, aiding our project so it can understand and generate content that combines language and imagery.



Image captioning:

Image-Text Retrieval:  
"The man sitting on a couch is smiling."  
...

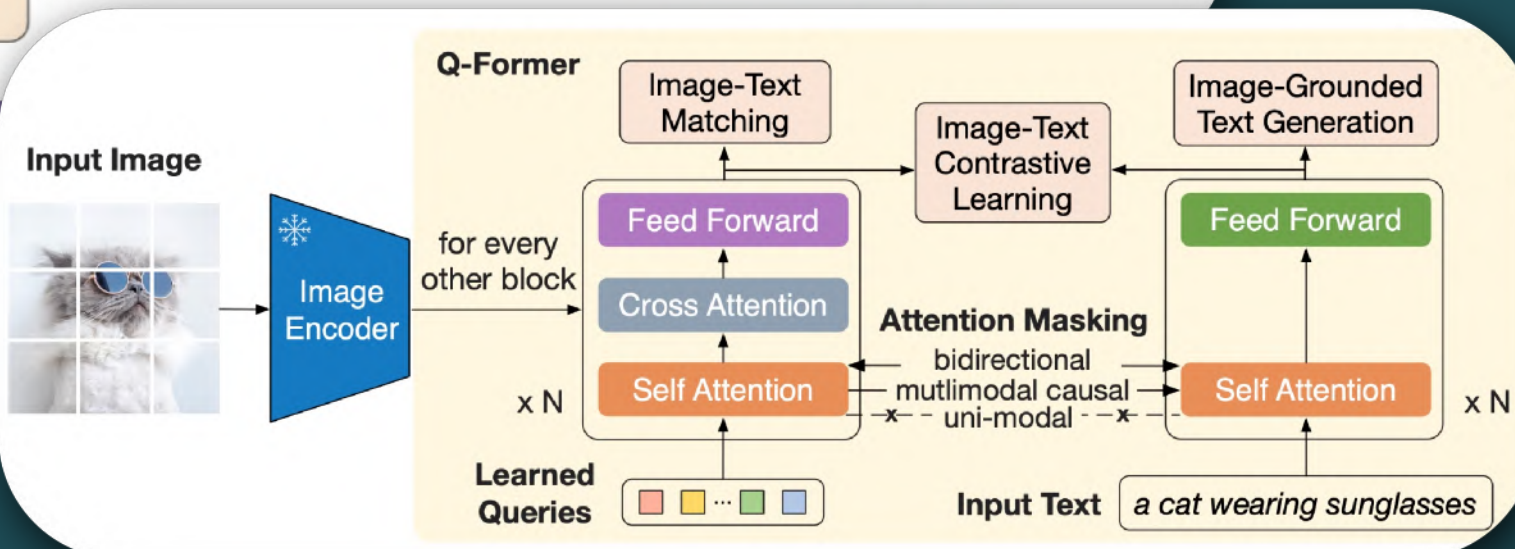
VQA: "What is the dog wearing?"

BLIP

"A man and a dog are reading a book together."

Matching score: 0.75  
...

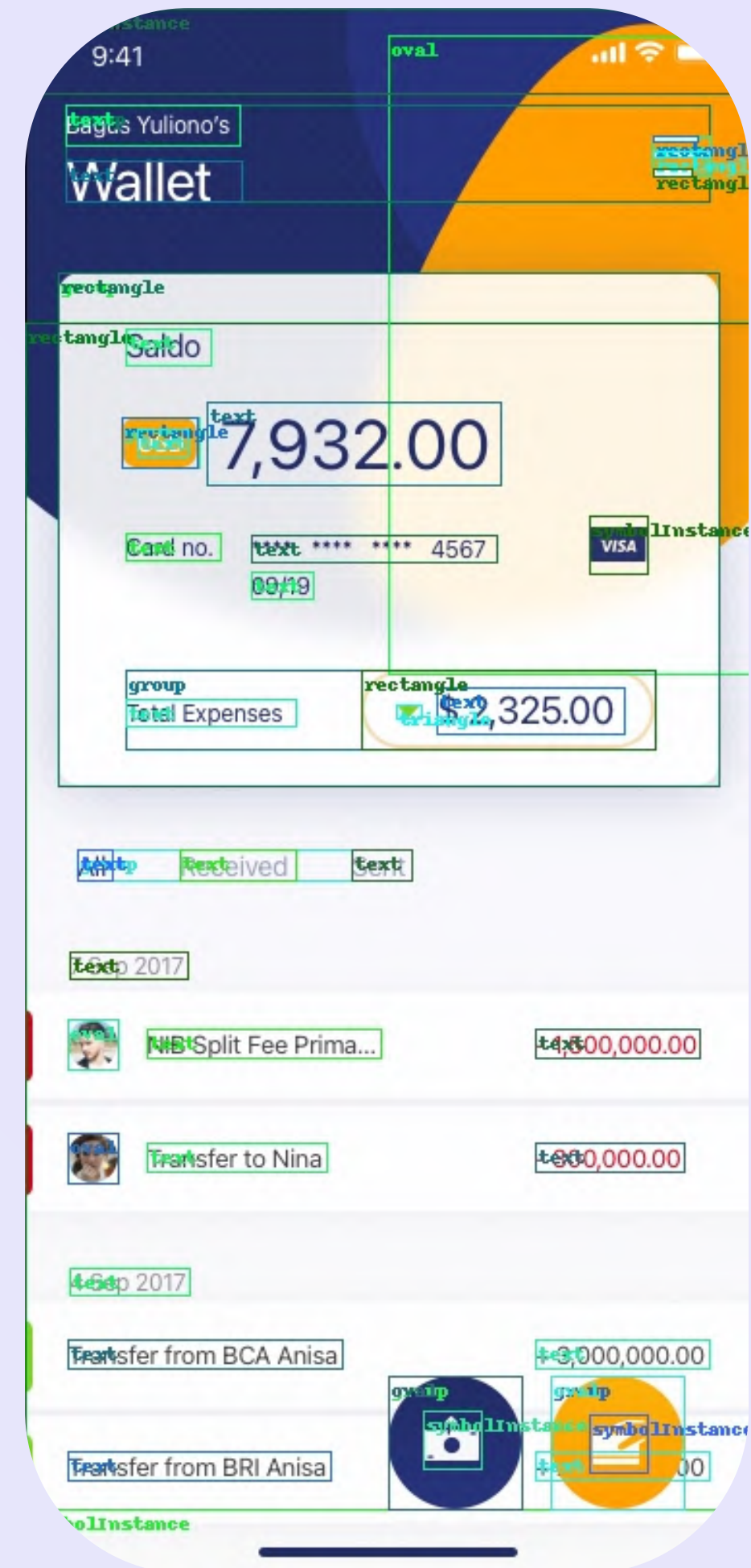
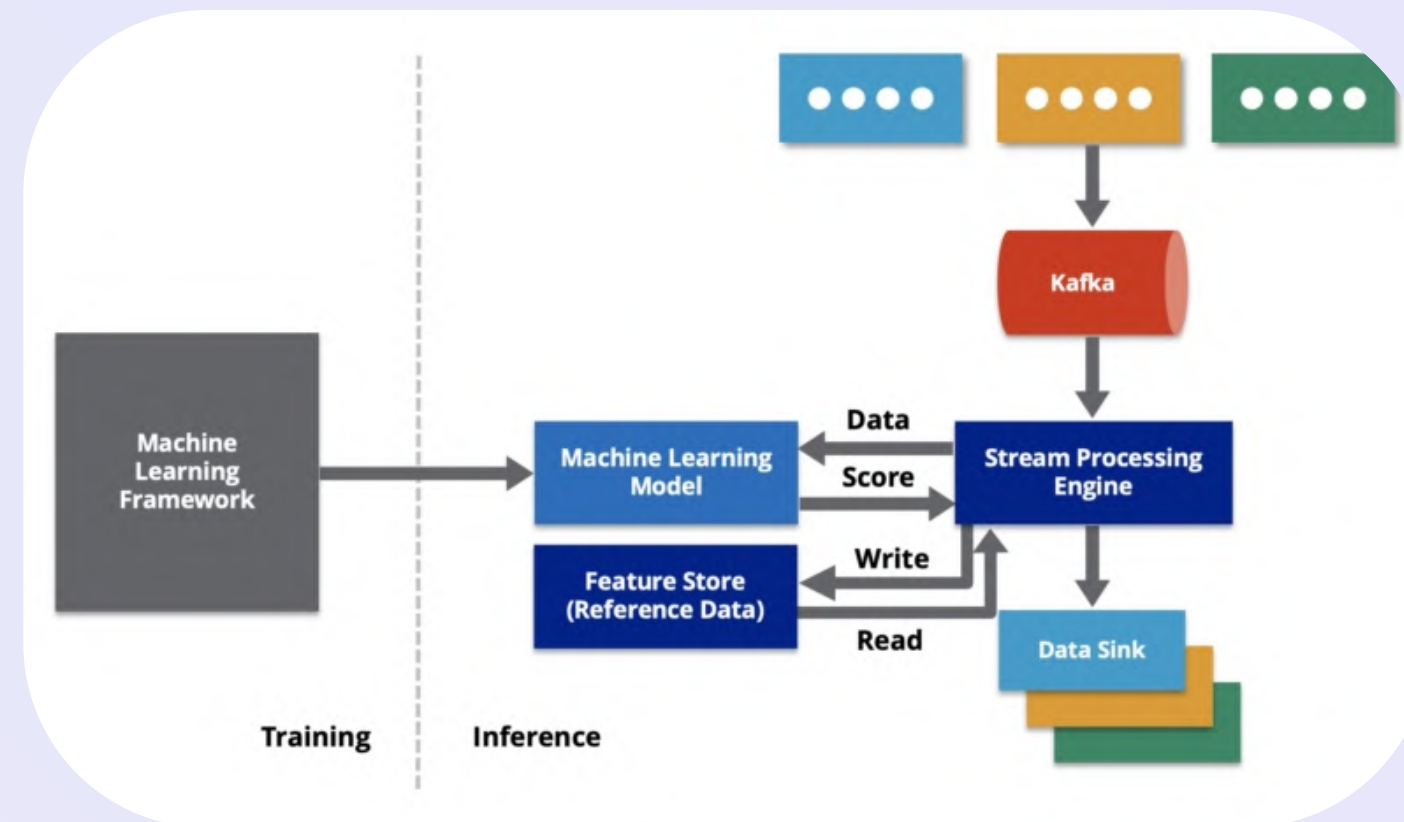
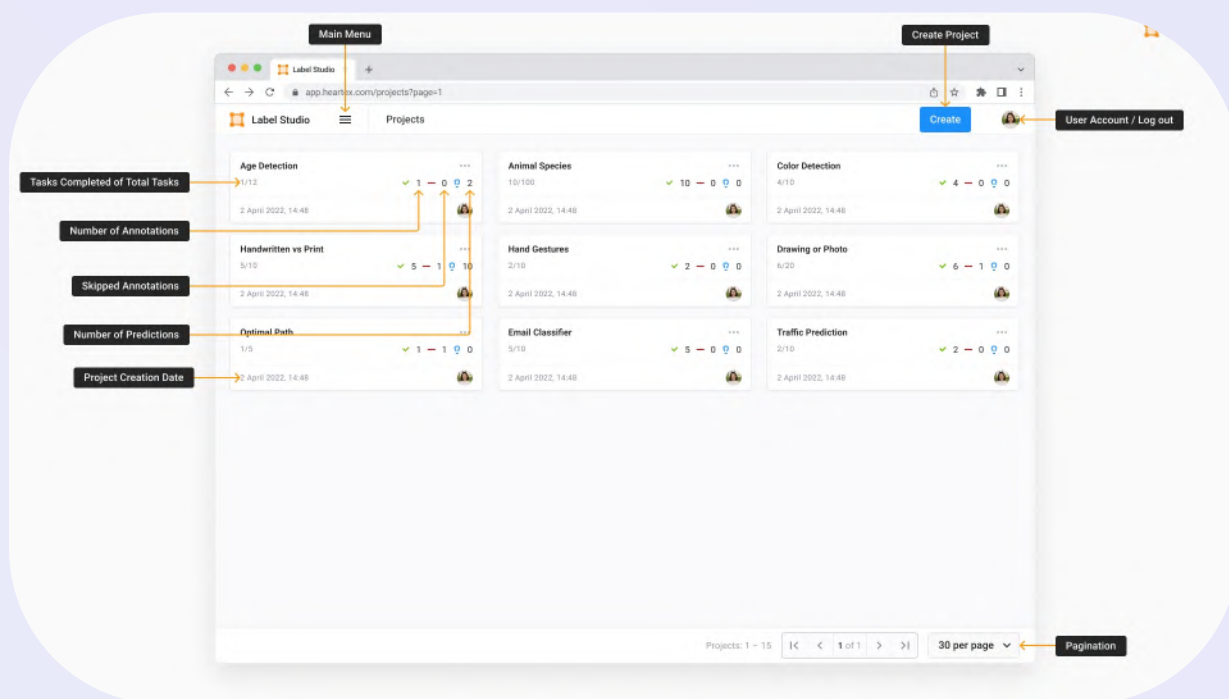
"A pair of glasses"





## AI Model Enhancement:

- Extracting images with descriptive visualization and context.
- Extensive samples of both Mobile and Website UI/UX Designs from Hugging Face
- Labeling important UI/UX elements such as buttons, context, headers, paragraphs, font/typography, sizes, shapes, color, sections, etc
- Result: Ability to evaluate layout, usability, and interactivity with relativity of elements



## Improvements/Future Modifications

- ❑ **User Experience:** Implement asynchronous processing, progress indicators, faster evaluation time.
- ❑ **Security:** Harden the security by scanning uploads for malware and disabling debug mode in production.
- ❑ **Error Handling:** Enhance error logging with more granular details and user-friendly error messages to aid in troubleshooting and improve user feedback.

### Future Implementations:

- ❑ **AI Model Enhancement:** Train the AI models on a specialized UI/UX dataset to improve the relevance and accuracy of feedback.
- ❑ **Scalability:** Containerize with Docker and use cloud functions for better scalability and performance during intensive operations.
- ❑ **Frontend Enhancement:** Upgrade the frontend with a modern JavaScript framework to make the interface more responsive and intuitive.
- ❑ **Feedback Loop:** Integrate a mechanism for the AI to learn from user interactions.



# Thank You.

That's it, folks.