TECH AVINYA CARBON FOOTPRINT APP

Role: [carbon footprint calculator using user input and Data Processing Lead]

Tech Stack Handling

TO DO	Role	status
IBM Watson Visual Recognition (OCR)	☐ Implement and fine-tune OCR using IBM Watson Visual Recognition to extract text from uploaded receipts. IBM Watson Visual Recognition offers powerful OCR capabilities and integrates well with other IBM services, ensuring a consistent and reliable tech stack.	In progress
Language Translation (IBM Watson Language Translator)	☐ After text extraction, translate the text to English if it is in another language. Ensuring that all text data is in English will standardize the input for subsequent processing, making the app more versatile and user-friendly.	In progress
External APIs (Plaid)	☐ Integrate these APIs to fetch and process transaction data from users' bank accounts. Plaid provide secure and reliable access to banking data, essential for accurate carbon footprint tracking.	In progress
Data Processing (Random Forest, SVM, Neural Networks)	☐ Develop and train models for categorizing transactions and calculating emissions using the Emission Factors DB.	In progress
Aggregation, Report Generation, AI Personalized Recommendations	☐ Aggregate categorized data, generate user-friendly reports, and develop AI-driven personalized recommendations for reducing carbon footprint.	In progress

Apply the Contour Detection Model	☐ As the camera view is active, apply the contour detection model (using OpenCV or TensorFlow Lite) in real-time to detect and highlight the receipt. This process will run continuously while the camera is on ☐ Once captured, the image is immediately cropped based on the detected contours and sent for further processing, such as OCR and translation.	In progress
Chatbot Integration	☐ Integrate the OCR and data processing models with a chatbot that will assist users by answering questions, guiding them through receipt uploads, and providing real-time feedback on their carbon footprint.	In progress
Map Integration	☐ Implement a map using Power BI to visualize every user's calculated carbon footprint as dots, varying in size based on the emissions.	In progress

Skills to Learn

TO LEARN	Learning plan	Status
Advanced OCR Techniques with IBM Watson	☐ Study IBM Watson Visual Recognition documentation, and practice with sample projects.	Done
Language Translation Techniques	☐ To accurately translate text from various languages into English. Explore IBM Watson Language Translator documentation and experiment with sample texts.	Done
API Integration and Data Security	☐ To securely handle and process sensitive financial data from users. Take online courses on API integration, with a focus on security best practices.	In progress
Machine Learning for Categorization, Emission Calculation, and Personalization:	☐ Explore machine learning tutorials, particularly those focused on recommendation systems, and implement models using Python libraries like scikit-learn and TensorFlow.	Done

Chatbot Integration	☐ Focus on learning how to integrate the chatbot using IBM Watson Assistant or other chatbot frameworks, ensuring it works smoothly with the existing backend components.	In progress
Power BI for Data Visualization	☐ Study Power BI mapping and data visualization techniques, with a focus on integrating it into the web application.	In progress

Tasks to Manage

	Task	description	timeline
1	Implement OCR for Receipts using IBM Watson	☐ Set up and fine-tune OCR models using IBM Watson Visual Recognition for text extraction.	
2	Integrate Language Translation	☐ Implement a translation feature to convert non-English text to English using IBM Watson Language Translator.	
3	Integrate Banking APIs	☐ Implement Plaid and Yodlee APIs for fetching transaction data.	
4	Develop and Train Categorization and Personalization Models	☐ Train and test machine learning models for transaction categorization, emission calculation, and personalized recommendation generation.	
5	Aggregation and Personalized Report Generation	☐ Develop the aggregation logic, generate personalized reports, and implement AI-driven personalized recommendations.	
	Apply the Contour Detection Model	☐ Once captured, the image is immediately cropped based on the detected contours and sent for further processing, such as OCR and translation.	

6	Chatbot Integration	☐ Integrate the OCR, translation, and data processing models with a chatbot and provide real-time feedback.
7	Power BI Map Integration	☐ Develop and integrate a Power BI map that displays user carbon footprints as dots of varying sizes based on their emissions.

Challenges and Mitigation

challenge	Plan to Overcome
Variability in receipt formats	Use IBM Watson Visual Recognition's customizable features and preprocessing techniques to handle different formats.
Ensuring API integration security	Follow best practices in API security, including encryption and secure storage of credentials
Personalization accuracy	Continuously refine and test recommendation models using diverse user data to improve personalization accuracy.

dependencies

☑Access to Sample Receipts:

- **Related to** OCR model training and testing.

☑Bank API Access:

- **Related to** Integration and testing of transaction fetching features.

☑Emission Factors Database:

- **Related to** Emission calculation accuracy.

☑Power BI Integration Access:

- **Related to** Map visualization development.