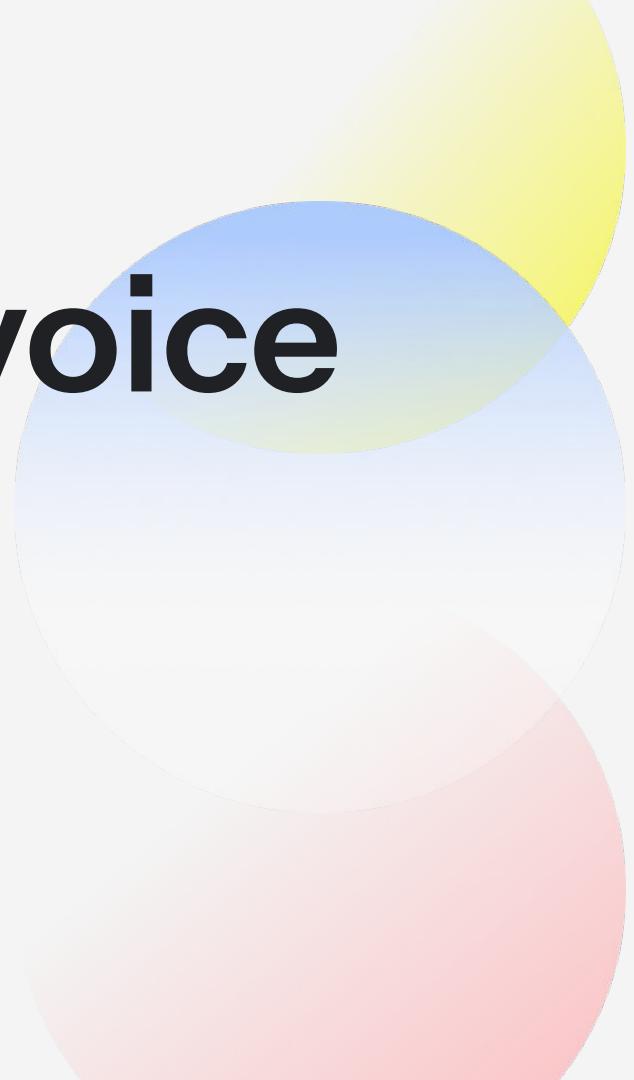
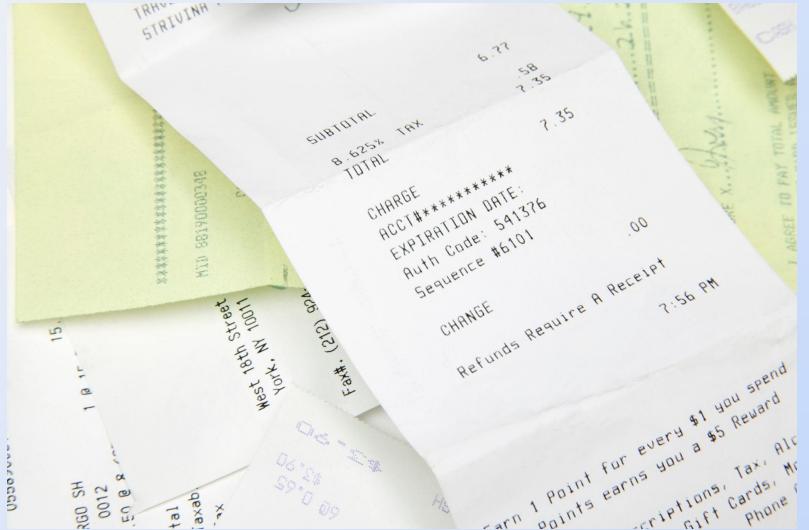


# **BillBuddy:** **Receipt and Invoice** **Digitizer**



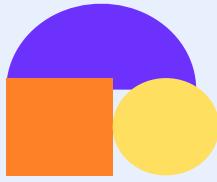
# Problem Statement

- System should automatically scans, extracts, and digitizes information from receipts and invoices using:
    - OCR (Optical Character Recognition)
    - NLP-based field extraction.
  - Digitized data is stored in a structured format,
    - easy to search, analyze
    - Integratable with accounting or ERP systems.



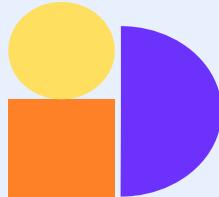
# Existing Solutions and Limitations

- **Veryfi** leads in speed (2.8s average) and accuracy (98.7%),
- **Google Cloud Vision** prioritizes cost efficiency (\$320/1000 docs).
- **Rossum and Nanonets** excel in AI/ML-based extraction for unstructured data.
- **Koncile** claiming near-100% field accuracy via computer vision and LLMs.



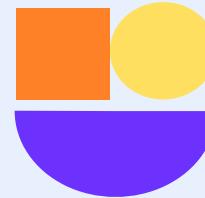
## Accuracy Challenges

Existing systems misread 1 in 10 characters



## Handling Variability

Layouts vary wildly by vendor, country, and format.



## Manual Intervention and Costs

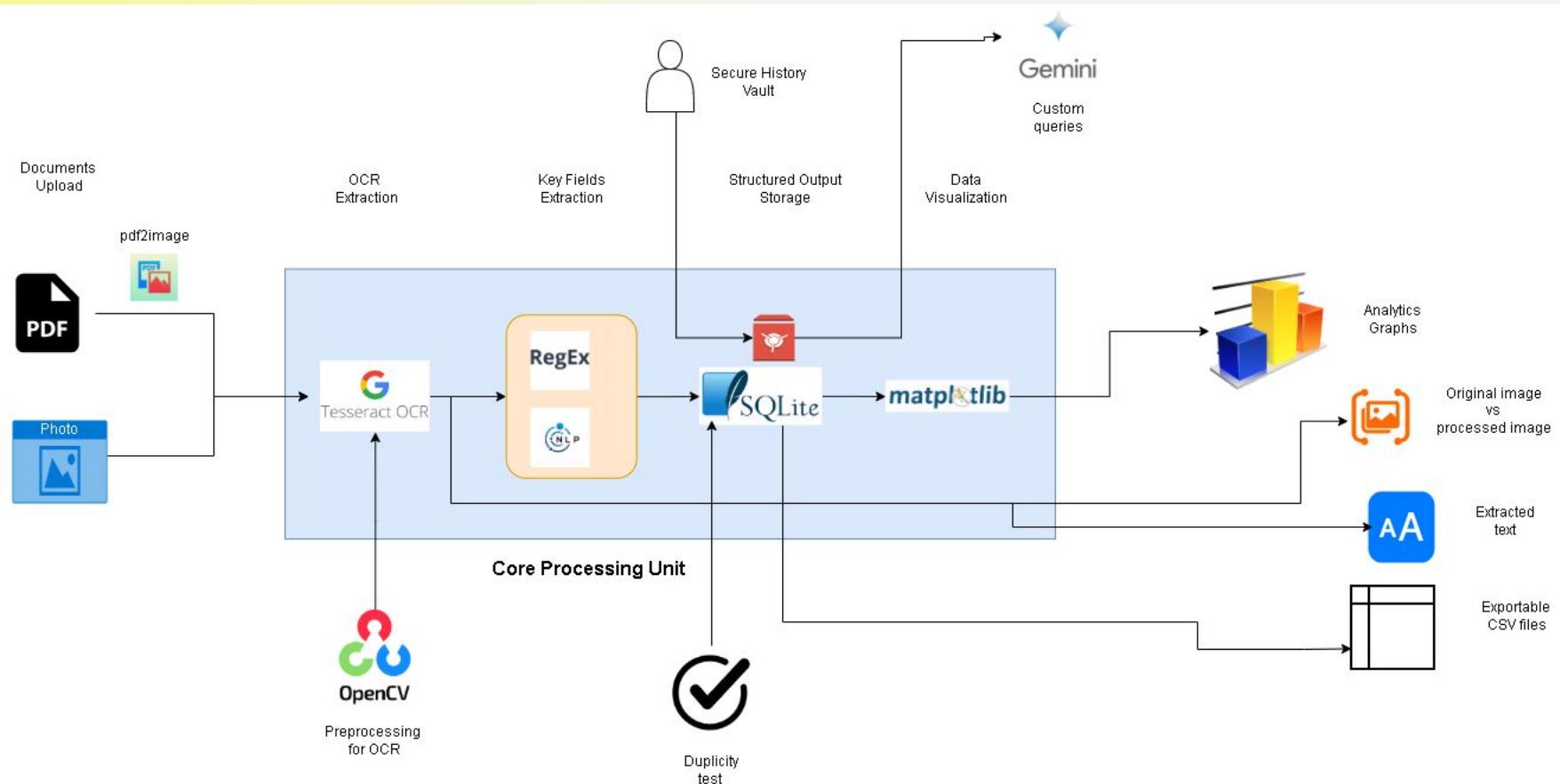
Even top tools like standalone OCR demand regular manual corrections for 10-15% of documents.

# Proposed Solution

- AI-driven system that automates the digitization and processing of physical and digital receipts and invoices using:
  - Optical Character Recognition (OCR)
  - Natural Language Processing (NLP),
- System combines computer vision (OpenCV), OCR (Tesseract), and lightweight NLP
- Transform unstructured documents into structured, actionable insights user-friendly web interface.



# Architecture Diagram



# Input & Processing: OCR Engine

- Robust multi-stage OCR pipeline
- Supports both images and PDFs
  - Uploaded files converted to grayscale images,
  - Reduces noise using **Gaussian blur**
  - Uses **Adaptive thresholding** for clean black-and-white images.
  - PDFs processed using **pdf2image (200 DPI)**
  - Text extracted using **Tesseract OCR (PSM mode 1)**
  - Regex-based parsing for structured fields.

# Receipt Analyzer

Analyzes your Receipt!

Choose files(single/multiples) ...



Drag and drop files here

Limit 200MB per file • PNG, JPG, JPEG, PDF

Browse files

## Extracted Text

Invoice no: 22529030

Date of issue: 02/02/2018

-- Seller: Client:

Hogan, Adkins and Rogers Johnson LLC

2917 Young Cape 3913 Frank Inlet

South James, PA 13959 Port Kathy, GA 28821

Tax Id: 960-87-3385 Tax Id: 938-83-8149

IBAN: GB480ZWQ30024053292452

---- ITEMS

No. Description Qty UM. Net price Networth VAT [%]

Invoice saved to History Vault!



invoice-2-1.pdf 173.0KB

X



invoice-1-3.pdf 84.9KB

X



batch1-0498.jpg 214.7KB

X

Showing page 1 of 2

< >

**Seller:**

Hogan, Adkins and Rogers  
2917 Young Cape  
South James, PA 13959

Tax Id: 960-87-3385  
IBAN: GB48OZWQ30024053292452

**Client:**

johnson LLC  
3913 Frank Inlet  
Port Kathy, GA 28821

Tax Id: 938-83-8149

**ITEMS**

No.	Description	Qty	UN	Net price	Net worth	VAT (%)	Gross worth
1.	PS2 Slim Console System SCPH-77000 PMK PlayStation 2 Tested	4,00	each	252,00	1 008,00	10%	1 108,80
2.	Nintendo Wii Console With Cables And Accessories And New Super Mario-Bros Disc!	5,00	each	29,99	149,99	10%	168,94
3.	Nintendo Switch Gaming Console Wi-Fi Neon Blue & Red Controller,Carry Case,Cable	1,00	each	300,00	300,00	10%	330,00
4.	Sony PlayStation Gray PS3 Console CONSOLE-00417 Tested Working!	2,00	each	21,99	43,99	10%	48,38
5.	8408 Nintendo Gameboy Color console Ice Blue/Turquoise Limited Japan GBC REAR x	4,00	each	74,99	299,96	10%	329,96
6.	Nintendo DS Lite Onyx Black System Console & 6 games Mario Charger Stylo	1,00	each	69,99	69,99	10%	76,99
7.	Nintendo 64 N64 Game-Console System + Controller Conts WORKING	3,00	each	100,00	300,00	10%	330,00

**SUMMARY**

VAT (%)	Net worth	VAT	Gross worth
10%	2 371,88	217,18	2 389,07
Total	\$ 2 371,88	\$ 217,18	\$ 2 389,07

Original

**Seller:**

Hogan, Adkins and Rogers  
2917 Young Cape  
South James, PA 13959

Tax Id: 960-87-3385  
IBAN: GB48OZWQ30024053292452

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**SUMMARY**

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Preprocessed

Activate W

# Data Storage & Persistence

- All results stored in a **user-scoped SQLite database**
- Ensures data privacy and session persistence
- Structured extracted fields
- Validation status and metadata
- Invoices saved automatically after upload
- Vault management at Ease.



## User's History

↑ id	filename	vendor	invoice_id	date	total_amount	upload_time
1	batch1-0001.jpg	Invoice		04/13/2013		2026-01-14 11:31
2	batch1-0002.jpg	Invoice		03/03/2012		2026-01-14 11:32
3	batch1-0003.jpg	Invoice		04/09/2014		2026-01-14 11:32
4	batch1-0001.jpg	Invoice		04/13/2013		2026-01-14 11:36
5	batch1-0002.jpg	Invoice		03/03/2012		2026-01-14 11:36
6	batch1-0003.jpg	Invoice		04/09/2014		2026-01-14 11:36
7	invoice-1-3.pdf					2026-01-14 11:38
8	batch1-0497.jpg	Invoice		07/25/2017		2026-01-14 11:42

[View details](#)

Select an invoice...



Select invoices to delete:

Choose options



Delete

Selected

# User Interface & Data Visualisation

- Built using **Streamlit**.
- Converts processed invoices into insights
- Fully automated analysis pipeline.
- Charts used:
  - **Bar Graph, Line Graph, Pie Charts**
- Integrated **Gemini-powered chat interface** for conversational support



<<



Login

Username

demo\_user

demo\_user

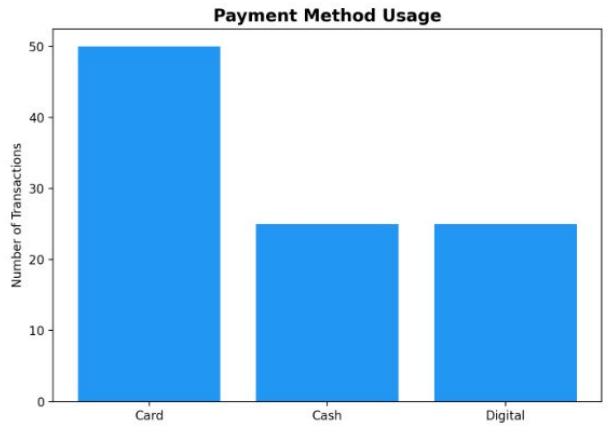
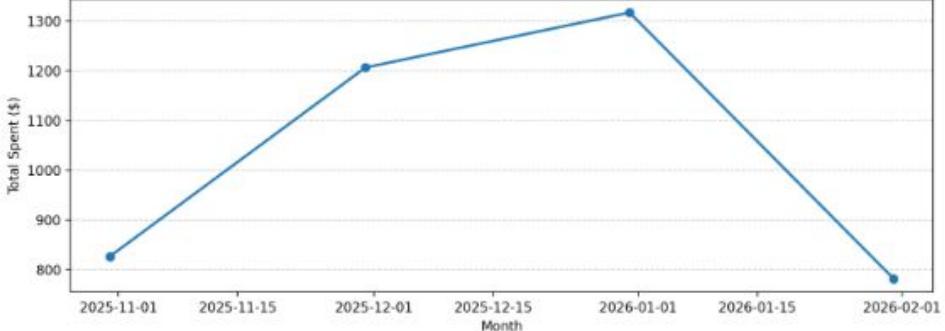
Go to

- Home
- Analyzer
- Dashboard
- History
- Support
- Settings

# Receipt Invoice and Digitizer

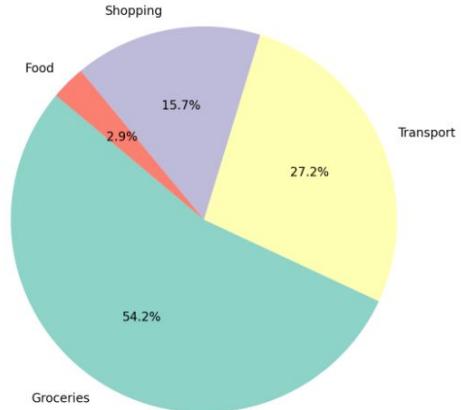
## About the Project

The Receipt and Invoice Digitizer is an AI-driven system that automates the digitization and processing of physical and digital receipts and invoices using Optical Character Recognition (OCR) and Natural Language Processing (NLP), reducing manual effort and improving accuracy in financial operations.



## User's Dashboard

### Spending by Category



# Tools and resources

## Frontend

Streamlit

## Core Libraries and Frameworks

- OpenCV
- Tesseract  
OCR +  
pytesseract
- Pdf2image
- Pillow (PIL)
- Matplotlib,  
Seaborn
- Regex

## Database and data management

- SQLite
- Python  
Standard  
Library  
(json, io,  
datetime)

## External APIs

Google Gemini  
API

# Thank you



*Any questions? Ask away!*

