

# Email Redactor AI

Reflex application presentation

# Introduction



**Email Privacy Redactor AI** is a sophisticated web application that automatically detects and redacts sensitive information from both email text and attached images before sending. Built with modern AI technologies, it ensures your emails remain compliant with privacy regulations (GDPR, HIPAA, etc.) while maintaining readability.

# Problem

**Sharing emails often requires redacting sensitive information like**

- Personal identifiable information (PII)
- Financial data (credit cards, account numbers)
- Authentication credentials (passwords, tokens, API keys)
- Healthcare information
- Confidential business data

**Manually finding and redacting this information is**

- ✖ Time-consuming and error-prone
- ✖ Easy to miss hidden sensitive data
- ✖ Impractical for images and screenshots
- ✖ Risk of human error leading to data breaches

# Our Solution

01

## AI-Powered Detection

Uses advanced LLM models to intelligently identify 12+ types of sensitive information

02

## Text Redaction

Automatically replaces sensitive data in email content with customizable placeholders

03

## Image Redaction

OCR + AI analysis to redact sensitive text from images and screenshots

04

## Granular Control

Enable/disable specific redaction types based on your needs

05

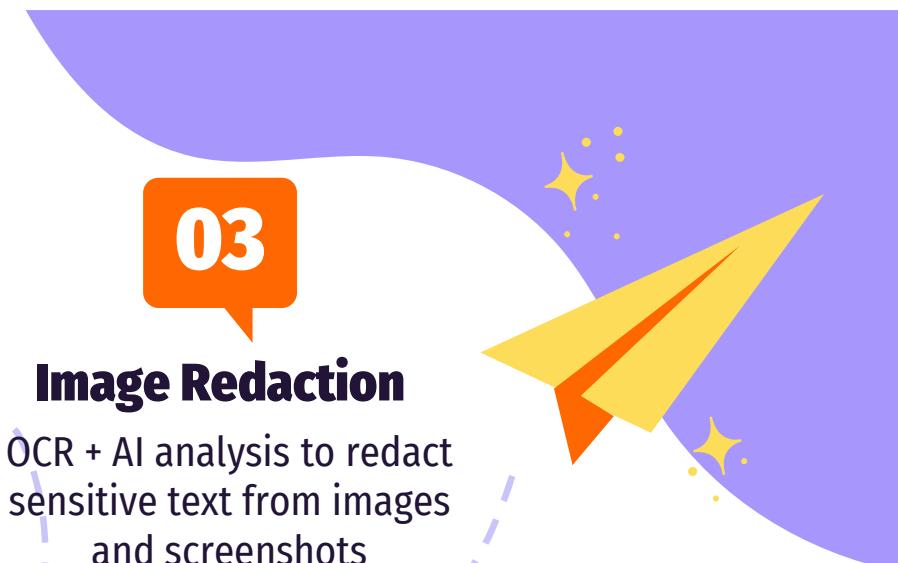
## Direct Integration

Preview, edit, and send redacted emails seamlessly

06

## Privacy-First

All processing happens securely with no data storage



# Workflow

## Preview Email

User verifies that personal data was redacted by AI from email text and images



## Compose Email

User enters email text, attaches images and hits Send Email button



## Send Email

Verified redacted email is sent to the recipients



# Compose Email – How It Works

## 1. Fill Email Details

- Enter recipient(s) in "To" field
- Optionally add CC recipients
- Enter email subject
- Type or paste email content in the Content area

## 3. Optional: Upload Images

- Click "Upload Images" button or drag-and-drop
- Or click the  icon to load sample test images
- Upload up to 4 images (max 5 MB total)
- Images appear as thumbnails; click to view full-size

## 2. Optional: Load Test Content

- Click the  icon next to "Content:" label
- Select from predefined test files
- Content automatically populates the text area

## 4. Configure Redaction Settings

- Each redaction type has a checkbox (enabled by default) and customizable placeholder
- Check/uncheck types you want to redact or skip
- Edit placeholder text (e.g., change [NAME] to [REDACTED NAME])
- Click "Preview Redacted Email" button

# Compose Email Features



Member Enrollment & Claim Form  
Document ID: HC-9920-ALPHA Date: January 6, 2026  
Section A: Member Information

The information below must match the subscriber's legal documentation.

Primary Member Name: Marcus V. Thorne  
Verification ID: PASS-99283-TX  
Residential Address: 1200 Maplewood Drive, Austin, TX 78701  
Member Email: m.thorne.dev@example-corp.net

Section B: Security & Portal Access

Important: Your temporary Password (SecureHealth09) and Token (auth\_987654321) expire within 24 hours of document issuance.  
System API Key: live\_pk\_8822\_myv\_001  
Contact Phone: +1 (512) 555-0102

Section C: Billing & Financial Authorization

Please provide the account details for the reimbursement of the claim.  
The patient has authorized a one-time payment of amount \$500.75 for services rendered. For identity verification and tax reporting, we have recorded the SSN XXX-XX-1192 on file.  
Direct Deposit Account: 8810023918  
Backup Payment Card: Visa \*\*\*\* 9991

**Email Redactor AI**

Compose your email and add images if needed. For a quick test use icon menus below: - to populate sample content, - to load sample images. Click Preview to automatically redact sensitive information.

**To:** john@yahoo.com, martha  
**CC: (optional)** martha  
**Invalid email address(es):** martha

**Subject:** Redacted email sample

**Content:** Member E: Incident Report  
Document: Member Enrollment  
Section A: Service Activation Record  
6, 2026

The information below must match the subscriber's legal documentation.

Primary Member Name: Marcus V. Thorne

**Quick-load sample images from predefined test files**

Section B: Security & Portal Access  
Access to the digital health portal requires the following unique identifiers:  
Important: Your temporary Password (SecureHealth09) and Token (auth\_987654321) expire within 24 hours of document issuance.  
System API Key: live\_pk\_8822\_myv\_001  
Contact Phone: +1 (512) 555-0102

**Multiple images support (max 4 images, 5 MB total)**

**Please, fix input errors above**

**Real-time validation for To and CC fields**

**Quick-load sample emails from predefined test files**

**Redact this information:**

<input checked="" type="checkbox"/> Name: [NAME]	<input checked="" type="checkbox"/> Email: [EMAIL]
<input checked="" type="checkbox"/> Phone: [PHONE]	<input checked="" type="checkbox"/> Address: [ADDRESS]
<input checked="" type="checkbox"/> SSN: [SSN]	<input checked="" type="checkbox"/> Card: [CC CARD]
<input checked="" type="checkbox"/> API Key: [KEY]	<input checked="" type="checkbox"/> Passwd: [PASS]
<input checked="" type="checkbox"/> Token: [TOKEN]	<input checked="" type="checkbox"/> ID: [ID]
<input checked="" type="checkbox"/> Amount: [\$]	<input checked="" type="checkbox"/> Account: [ACCOUNT]

**Custom Placeholders:** edit replacement text for each redaction type

**Enable/Disable Controls:** checkbox-based control for each redaction type

- Names (First names, last names, full names)
- Email Addresses (Any email format)
- Phone Numbers (All international formats)
- Physical Addresses (Street, city, state, zip)
- Social Security Numbers (SSN formats)
- Credit Card Numbers (Including masked formats like Visa \*\*\*\* 9901)
- API Keys (Various key formats)
- Passwords (Password values, not labels)
- Tokens (JWT, API tokens, session tokens)
- ID Numbers (Document IDs, verification IDs like HC-9920-ALPHA)
- Dollar Amounts (Prices, salaries, costs)
- Account Numbers (Bank accounts, customer accounts)

# Compose Email – How It Works (Redaction)

## 1. Text Redaction

- Email content sent to Groq API
- AI analyzes text and identifies sensitive information
- Replaces with specified placeholders
- Returns redacted text

## 2. Optional: Image Redaction

- Each image sent to OCR.space API
- OCR extracts text with coordinates
- Text boxes sent to Groq AI for classification
- PIL draws black boxes over sensitive text areas
- Returns redacted images

## 3. Real-time Feedback

- AI feedback panel shows progress
- Connecting to Groq API
- Sending text to Groq API
- Text redaction complete (X tokens used)
- Processing x image(s)
- All images processed successfully

# Compose Email Features



**Email Redactor AI**

Compose your email and add images if needed. For a quick test use icon menus below: - to populate sample content, - to load sample images. Click Preview to automatically redact sensitive information.

**To:**

**CC: (optional)**

**Subject:**

**Content:** Member Enrollment & Claim Form  
Document ID: HC-9920-ALPHA Date: January 6, 2026  
Section A: Member Information  
  
The information below must match the subscriber's legal documentation.  
  
Primary Member Name: Marcus V. Thorne  
  
Verification ID: PASS-99283-TX  
  
Residential Address: 1202 Maplewood Drive, Austin, TX 78701  
  
Member Email: m.thorne.dev@example-corp.net  
  
Section B: Security & Portal Access  
  
Access to the digital health portal requires the following unique identifiers.  
  
Important: Your temporary Password (SecureHealth99) and Token  
  
**Attach images: Sensitive text detected and redacted automatically**

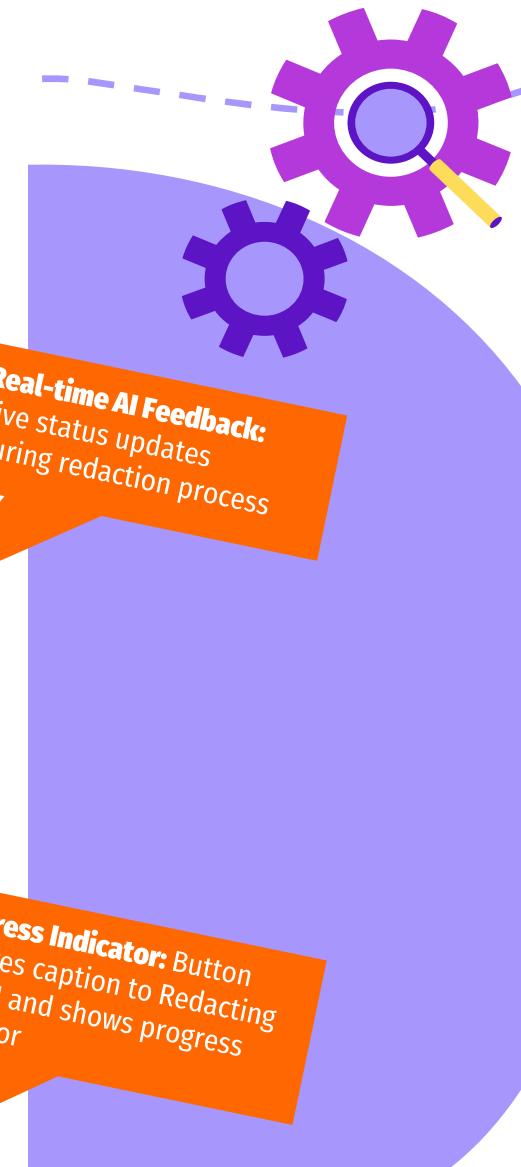
**Redact this information:**

<input checked="" type="checkbox"/> Name: [NAME]	<input checked="" type="checkbox"/> Email: [EMAIL]
<input checked="" type="checkbox"/> Phone: [PHONE]	<input checked="" type="checkbox"/> Address: [ADDRESS]
<input checked="" type="checkbox"/> SSN: [SSN]	<input checked="" type="checkbox"/> Card: [CC CARD]
<input checked="" type="checkbox"/> API Key: [KEY]	<input checked="" type="checkbox"/> Passwd: [PASS]
<input checked="" type="checkbox"/> Token: [TOKEN]	<input checked="" type="checkbox"/> ID: [ID]
<input checked="" type="checkbox"/> Amount: [\$]	<input checked="" type="checkbox"/> Account: [ACCOUNT]

**AI Feedback:**

```
[20:11:32] 📱 Connecting to Groq API for text redaction...
[20:11:32] 🚀 Sending text to Groq API (Llama 3.3 70B)...
[20:11:33] ✅ Groq API: Text redaction complete (997 tokens used)
[20:11:33] 🖼 Processing 4 image(s) with OCR.space...
[20:11:33] 📸 Processing image 1/4...
```

**Progress Indicator:** Redacting with AI...



# Preview Email – How It Works

## 1. Overview

- Page displays redacted email content (editable)
- Check that non-sensitive information remains intact
- "Show Comparison" button for side-by-side text comparison
- Original data preserved for "Back" button functionality

## 2. Review Redacted Content

- Verify all sensitive information is properly redacted
- Check that non-sensitive information remains intact

## 3. Make Manual Edits (if needed)

- Content area is fully editable
- Make any adjustments before sending

## 4. View Images

- Click any image to open full-size modal
- Compare original vs. redacted versions
- Close modal with X button

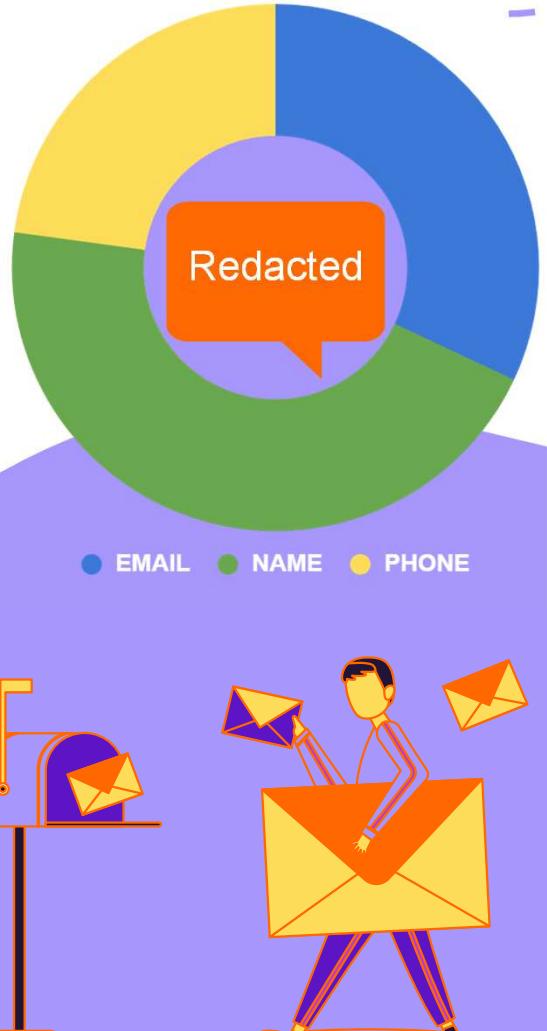
## 5. Send Email

- Email sent via configured service (Mailpit/Resend/SendGrid)
- Images attached if present
- Redirects to success page

## 6. Go Back

- Returns to compose page
- All original data restored (unredacted content, original images)
- Can modify settings and redact again

# Preview Email Features



**Preview Redacted Email**

To:

CC:

Subject:

**AI Feedback:**

```
[22:51:12] 🚀 Connecting to Groq API for text redaction...
[22:51:12] 🚀 Sending text to Groq API (Llama 3.3 70B)...
[22:51:12] ✅ Groq API: Text redaction complete (892 tokens used)
[22:51:12] 🚀 Processing 2 image(s) with OCR.space...
```

**Redacted Content (Editable):**

Date: February 14, 2026  
Reported By: [NAME] (Operations Manager)  
Email: [EMAIL]  
Phone: [PHONE]

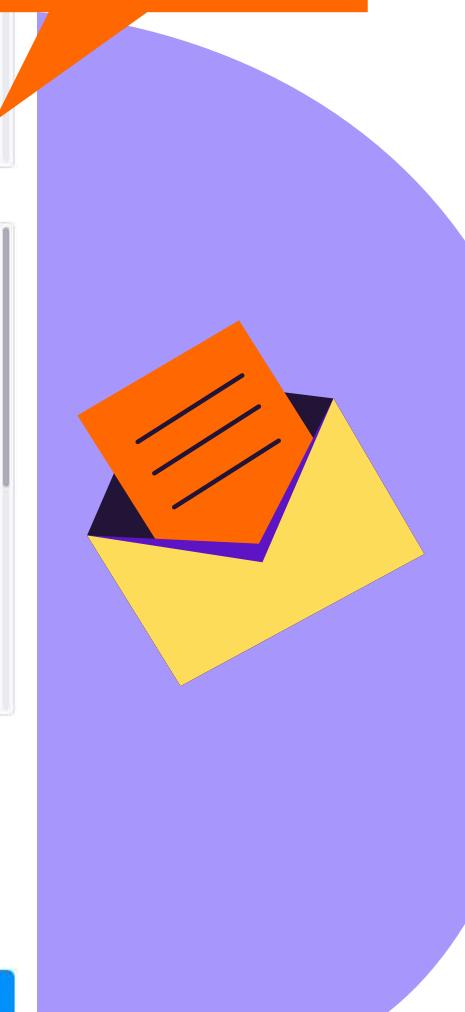
**INCIDENT SUMMARY:**  
On Monday morning, an external contractor named [NAME] visited the site.  
[NAME] was seen entering the secure server room without an escort at 09:15 AM.  
When questioned by [NAME] from the Security Department, the contractor claimed he was sent by 'Vertex Solutions' to check a hardware fault.

**FOLLOW-UP ACTIONS:**

1. Contact Vertex Solutions at [EMAIL] to verify the work order.
2. Confirm [NAME]'s ID number: [ID].
3. Send a summary to the Director's personal assistant, [NAME], at [EMAIL] for internal audit tracking.

**Redacted Images:**

**Real-time AI Feedback:**  
Live status updates during redaction process



# Preview Email Features



**Interactive Preview button:**  
opens side-by-side comparison window with  
original vs redacted email

Original Content: 

CONFIDENTIAL INCIDENT REPORT

Date: February 14, 2026  
Reported By: Sarah Jenkins



● EMAIL ● NAME ● PHONE ● ID

## Compare Content

### Redacted Content

CONFIDENTIAL INCIDENT REPORT

Date: February 14, 2026  
Reported By: [NAME] (Operations Manager)  
Email: [EMAIL]  
Phone: [PHONE]

**INCIDENT SUMMARY:**  
On Monday morning, an external contractor named [NAME] visited the site.  
[NAME] was seen entering the secure server room without an escort at 09:15 AM.  
When questioned by [NAME] from the Security Department, the contractor claimed he was sent by 'Vertex Solutions' to check a hardware fault.

**FOLLOW-UP ACTIONS:**

1. Contact Vertex Solutions at [EMAIL] to verify the work order.
2. Confirm [NAME]'s ID number: [ID].
3. Send a summary to the Director's personal assistant, [NAME], at [EMAIL] for internal audit tracking.

End of Report.

### Original Content

CONFIDENTIAL INCIDENT REPORT

Date: February 14, 2026  
Reported By: Sarah Jenkins (Operations Manager)  
Email: s.jenkins@confidential-edge.com  
Phone: (555) 012-8843

**INCIDENT SUMMARY:**  
On Monday morning, an external contractor named Mark Thompson visited the site.  
Mr. Thompson was seen entering the secure server room without an escort at 09:15 AM.  
When questioned by David Miller from the Security Department, the contractor claimed he was sent by 'Vertex Solutions' to check a hardware fault.

**FOLLOW-UP ACTIONS:**

1. Contact Vertex Solutions at support@vertex-sol.net to verify the work order.
2. Confirm Mark's ID number: TX-99420-B.
3. Send a summary to the Director's personal assistant, Emily Rose, at emily.rose\_temp@gmail.com for internal audit tracking.

End of Report.

# Preview Email Features

**Image Comparison Viewer:** click image to open side-by-side comparison window with original vs redacted image

**Redacted Image**

**Original Image**

**Content:**

CONFIDENTIAL INCIDENT REPORT

Date: February 14, 2026

Reported By: [NAME] (Operations Manager)

Email: [EMAIL]

Phone: [PHONE]

**INCIDENT SUMMARY:**

On Monday morning, an external contractor named [NAME] visited the site. Mr. [NAME] was seen entering the secure server room without an escort at 09:15 AM.

When questioned by [NAME] Miller from the Security Department, the contractor claimed he was sent by 'Vertex Solutions' to check a hardware fault.

**FOLLOW-UP ACTIONS:**

1. Contact Vertex Solutions at [EMAIL] to verify the work order.
2. Confirm [NAME]'s ID number: [ID]
3. Send a summary to the Director's personal [NAME] Rose, at [EMAIL] for internal audit tracking.

**Content:**

CONFIDENTIAL INCIDENT REPORT

Date: February 14, 2026

Reported By: Sarah Jenkins (Operations Manager)

Email: s.jenkins@confidential-edge.com

Phone: (555) 012-8843

**INCIDENT SUMMARY:**

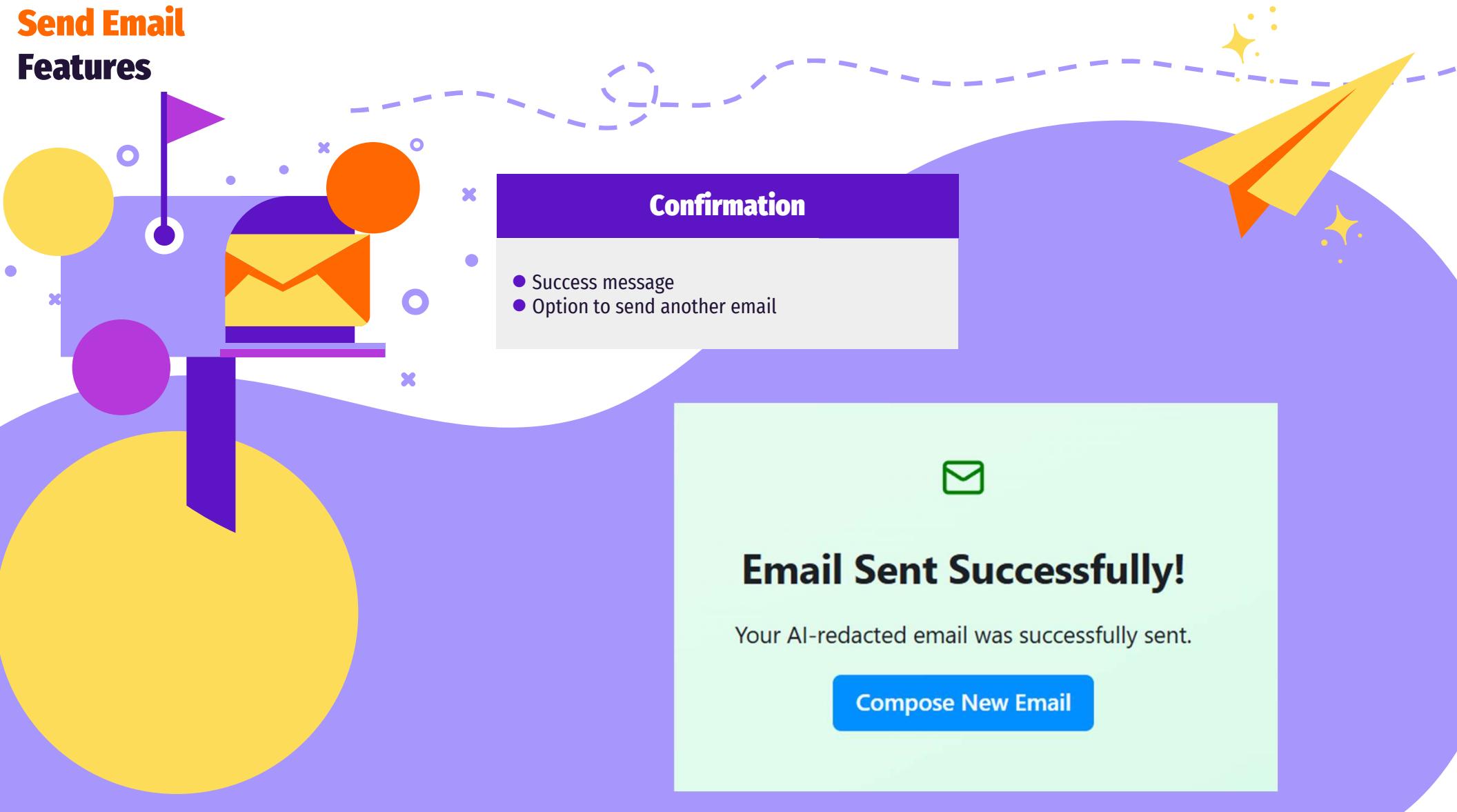
On Monday morning, an external contractor named Mark Thompson visited the site. Mr. Thompson was seen entering the secure server room without an escort at 09:15 AM.

When questioned by David Miller from the Security Department, the contractor claimed he was sent by 'Vertex Solutions' to check a hardware fault.

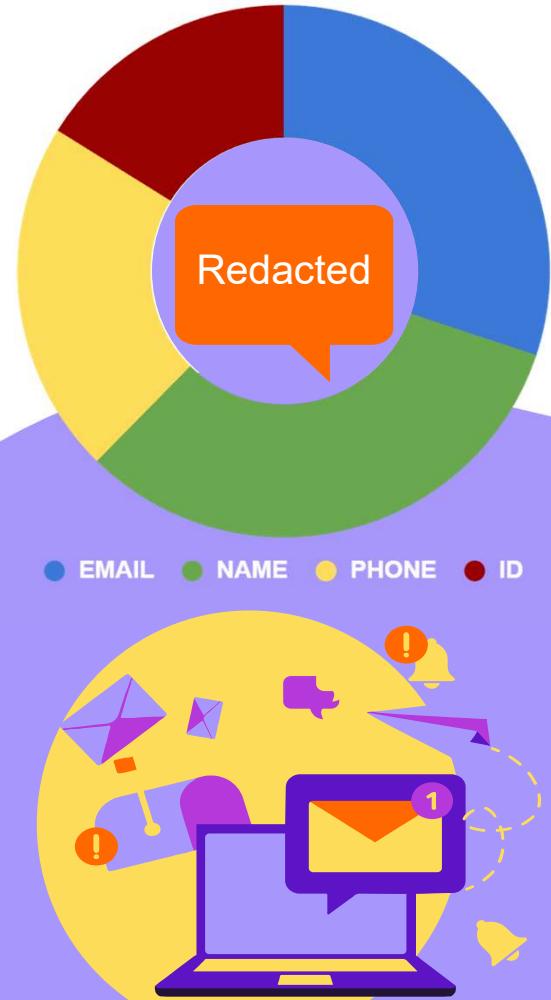
**FOLLOW-UP ACTIONS:**

1. Contact Vertex Solutions at support@vertex-sol.net to verify the work order.
2. Confirm Mark's ID number: TX-99420-B
3. Send a summary to the Director's personal assistant, Emily Rose, at emily.rose\_temp@gmail.com for internal audit tracking.

## Send Email Features



# Send Email Features



**Gmail**

Vlad Koval <vkoval@gmail.com>

**Redacted email sample**

1 message

onboarding@resend.dev <onboarding@resend.dev>  
To: vkoval@gmail.com

Fri, Jan 30, 2026 at 6:30 PM

CONFIDENTIAL INCIDENT REPORT

Date: February 14, 2026  
Reported By: [NAME] (Operations Manager)  
Email: [EMAIL]  
Phone: [PHONE]

INCIDENT SUMMARY:  
On Monday morning, an external contractor named [NAME] visited the site. [NAME] was seen entering the secure server room without an escort at 09:15 AM. When questioned by [NAME] from the Security Department, the contractor claimed he was sent by 'Vertex Solutions' to check a hardware fault.

FOLLOW-UP ACTIONS:

1. Contact Vertex Solutions at [EMAIL] to verify the work order.
2. Confirm [NAME]'s ID number: [ID]
3. Send a summary to the Director's personal assistant, [NAME], at [EMAIL] for internal audit tracking.

End of Report.

2 attachments

image\_1.png 215K

image\_2.png 276K

**Content:**

CONFIDENTIAL INCIDENT REPORT

Date: February 14, 2026  
Reported By: [NAME] (Operations Manager)  
Email: [EMAIL]  
Phone: [PHONE]

INCIDENT SUMMARY:  
On Monday morning, an external contractor named [NAME] visited the site. [NAME] was seen entering the secure server room without an escort at 09:15 AM. When questioned by [NAME] Miller from the Security Department, the contractor claimed he was sent by 'Vertex Solutions' to check a hardware fault.

FOLLOW-UP ACTIONS:

1. Contact Vertex Solutions at [EMAIL] to verify the work order.
2. Confirm [NAME]'s ID number: [ID]
3. Send a summary to the Director's personal assistant, [NAME] Rose, at [EMAIL] for internal audit tracking.

A yellow dashed line connects the "Redacted attachment" callout to a yellow arrow pointing at the "image\_1.png" file in the Gmail screenshot. The background features a purple globe with a yellow paper airplane flying across it, leaving a dashed trail of yellow stars.

# Real-World Use Cases

	Healthcare & HIPAA Compliance	Financial Services	Customer Support	Legal & Compliance	Human Resources	Screenshot Sharing	GDPR Compliance
Scenario	Healthcare provider needs to forward patient inquiry to specialist	Bank representative sharing account inquiry with compliance team	Support agent needs to escalate ticket with customer information	Lawyer forwarding case-related email with client information	HR sharing employee inquiry with management	Developer sharing error screenshot containing API keys	European company sharing customer data inquiry
Solution	Automatically redact patient names, SSNs, medical record IDs, addresses	Redacts account numbers, credit card numbers, SSNs, dollar amounts	Redacts names, emails, phone numbers, account numbers	Redacts client names, addresses, SSNs, case IDs	Redacts employee IDs, SSNs, addresses, salary information	OCR extracts text, AI identifies and redacts API keys, tokens, credentials	Automatically redacts all PII (names, emails, addresses, IDs)
Benefit	Ensures HIPAA compliance while maintaining email context	Protects customer financial data per PCI-DSS requirements	Privacy protection while maintaining ticket context	Attorney-client privilege protection	Employee privacy compliance	Prevents accidental credential exposure	GDPR-compliant data sharing

# Product Technical Features

## State Management

Persistent state across navigation with "Back" button support

## Async Processing

Non-blocking API calls for smooth user experience

## Multiple Email Providers

Supports Mailpit (dev), Resend API, and SendGrid (production)

## Base64 Image Handling

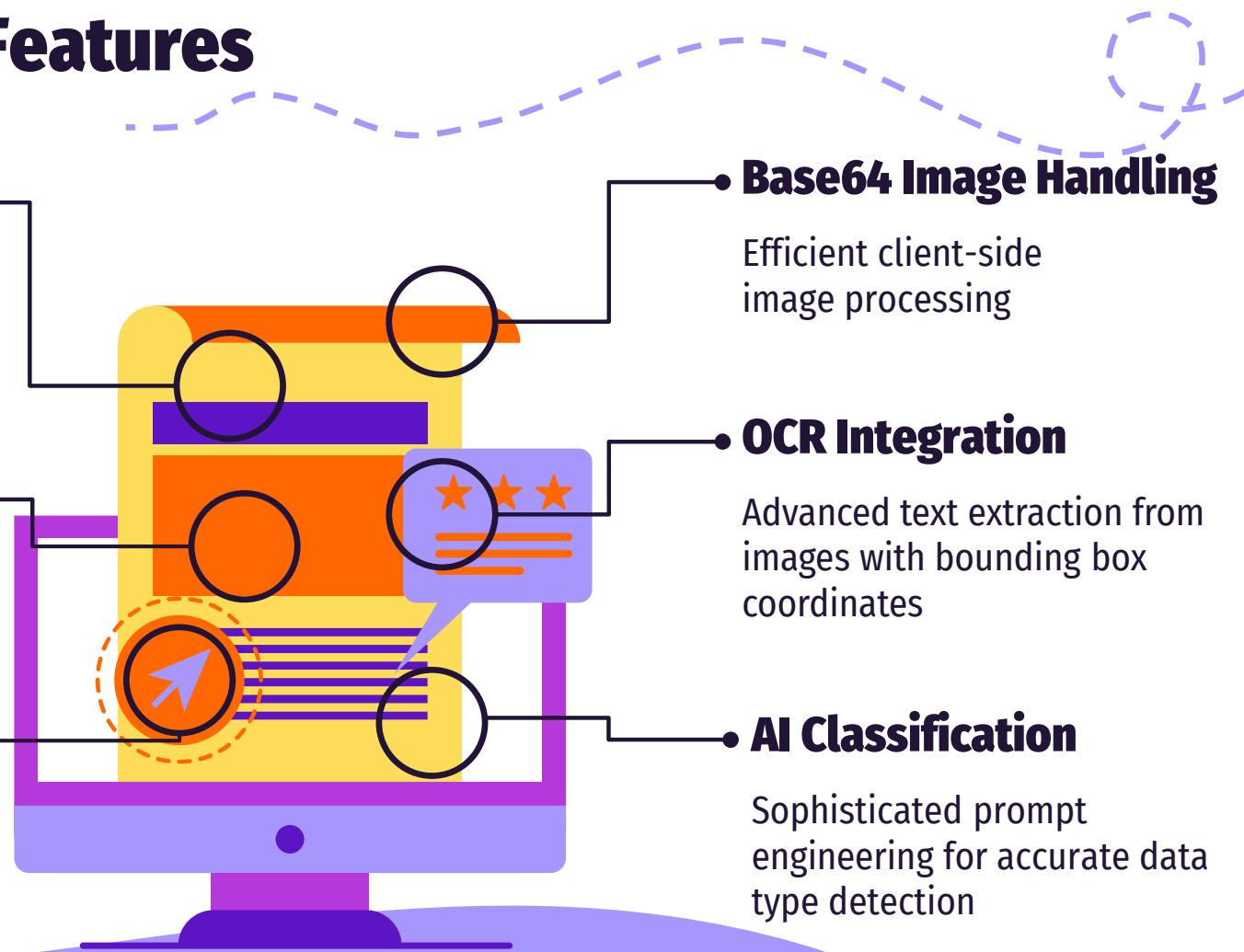
Efficient client-side image processing

## OCR Integration

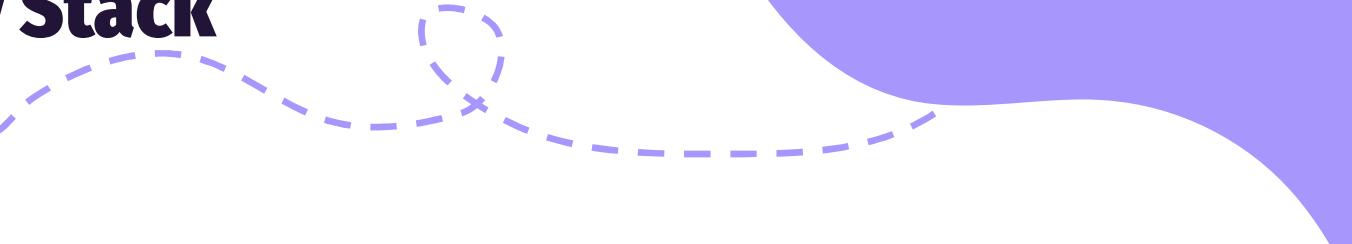
Advanced text extraction from images with bounding box coordinates

## AI Classification

Sophisticated prompt engineering for accurate data type detection



# Technology Stack



## Frontend & Framework

- **Reflex** - Python web framework
- Built on React/Next.js
- Component-based architecture
- Reactive state management
- Server-side rendering (SSR)

## AI & Machine Learning

- **Groq API** - Ultra-fast LLM inference
- Text classification and redaction in both email content and OCR-extracted text
- Lightning-fast inference, cost-effective, privacy-focused

## OCR (Optical Character Recognition)

- **OCR.space API** - Cloud-based OCR service
- Extracts text with precise bounding box coordinates from images
- Outputs text content + pixel coordinates for accurate redaction boxes

## Email Services

- **Mailpit** - local SMTP testing server for development
- **Resend API** (primary production) - Modern email API
- **SendGrid API** (fallback production) - Enterprise email delivery

```

EmailPrivacyRedactorAI/
├── email_privacy_redactor_ai/
│   ├── __init__.py
│   ├── email_privacy_redactor_ai.py      # Main state management
│   ├── app.py                           # Reflex app configuration
│   ├── index_page.py                   # Landing page
│   └── pages/
│       ├── email_compose_page.py      # Compose email UI
│       ├── email_preview_page.py     # Preview redacted email UI
│       └── email_sent_page.py        # Success confirmation page
│
│   └── components/
│       ├── text_redactor.py          # Groq API text redaction logic
│       ├── ocrspace_image_redactor.py # OCR + AI image redaction
│       ├── email_sender.py           # Email sending orchestrator
│       ├── image_file_handler.py    # Image upload handling
│       ├── mailpit_email_sender.py  # Mailpit email sender
│       ├── resend_api_email_sender.py # Resend API integration
│       ├── sendgrid_api_email_sender.py # SendGrid API integration
│       └── ui/
│           ├── checkbox_input.py      # Custom checkbox + input component
│           └── auto_clear_page_button.py # Auto-clear on refresh component
│
└── assets/
    ├── Incident_Report_Test.txt      # Sample test content
    ├── Incident_Report_Test.jpg      # Sample test images
    ├── Member_Enrollment_Test.txt
    ├── Member_Enrollment_Test.jpg
    ├── Service_Activation_Record_Test.txt
    └── Service_Activation_Record_Test.jpg

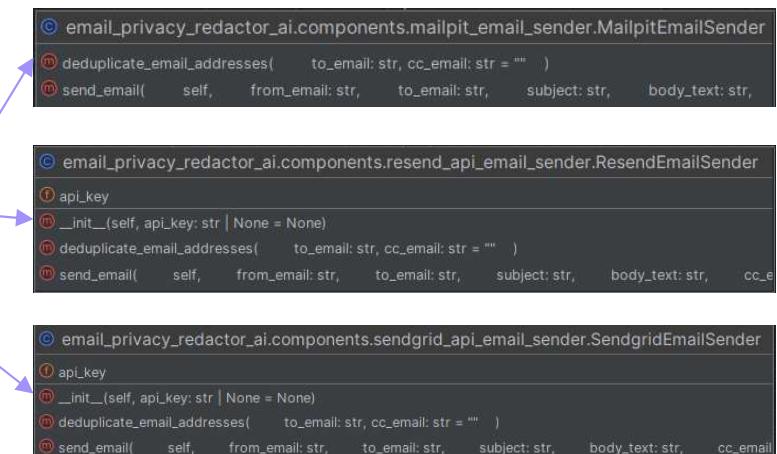
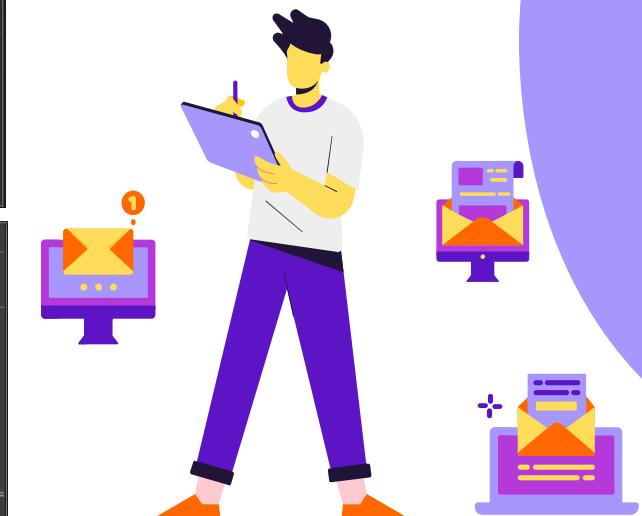
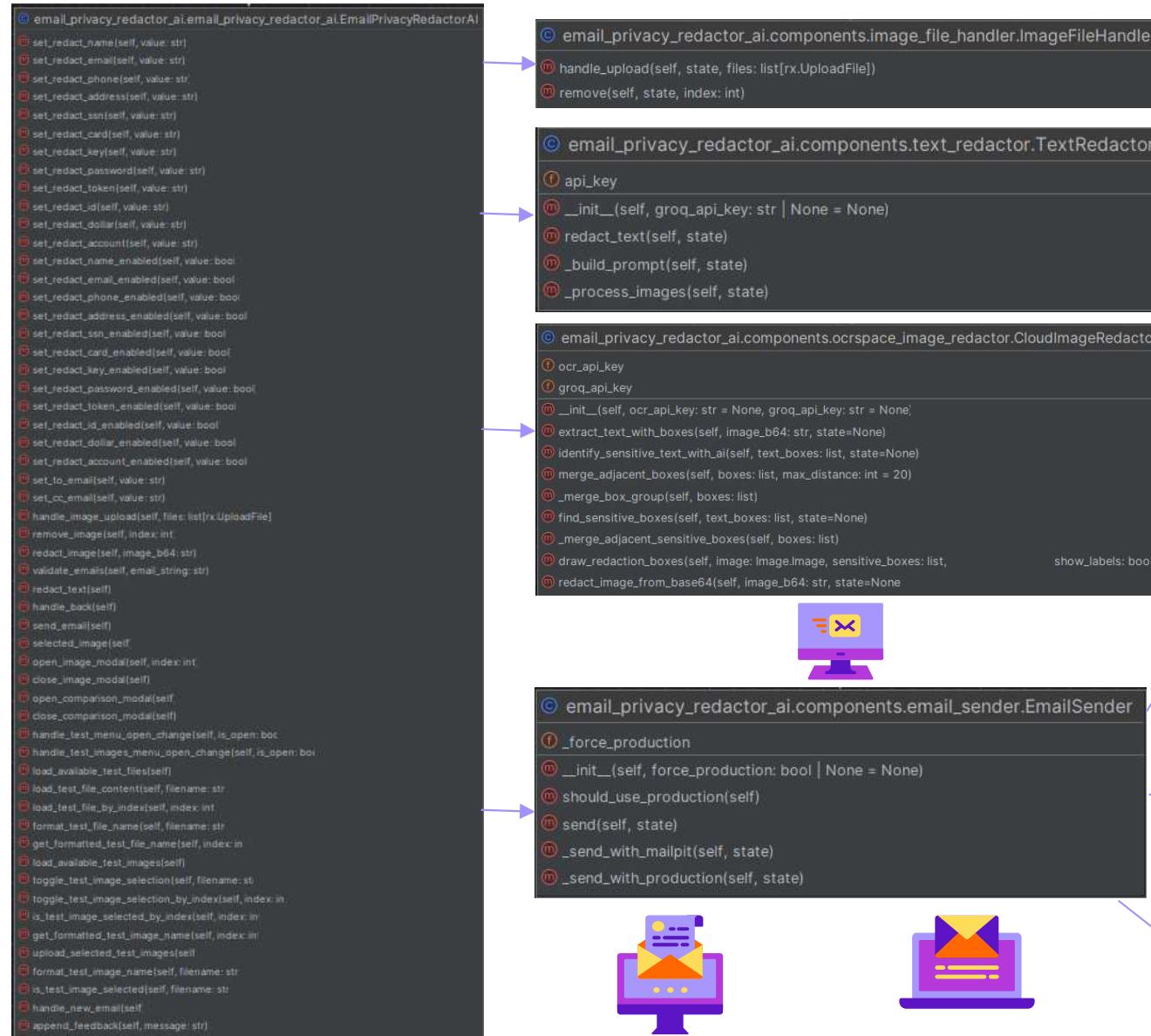
```

rxconfig.py # Reflex configuration  
 requirements.txt # Python dependencies  
 README.md # This file

# Project Structure



# Class Diagram



# Thank You!

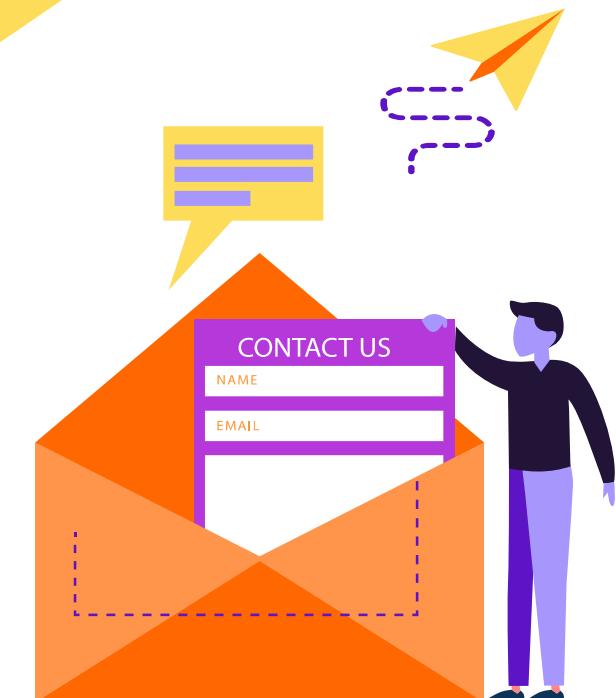
## Vlad Koval

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