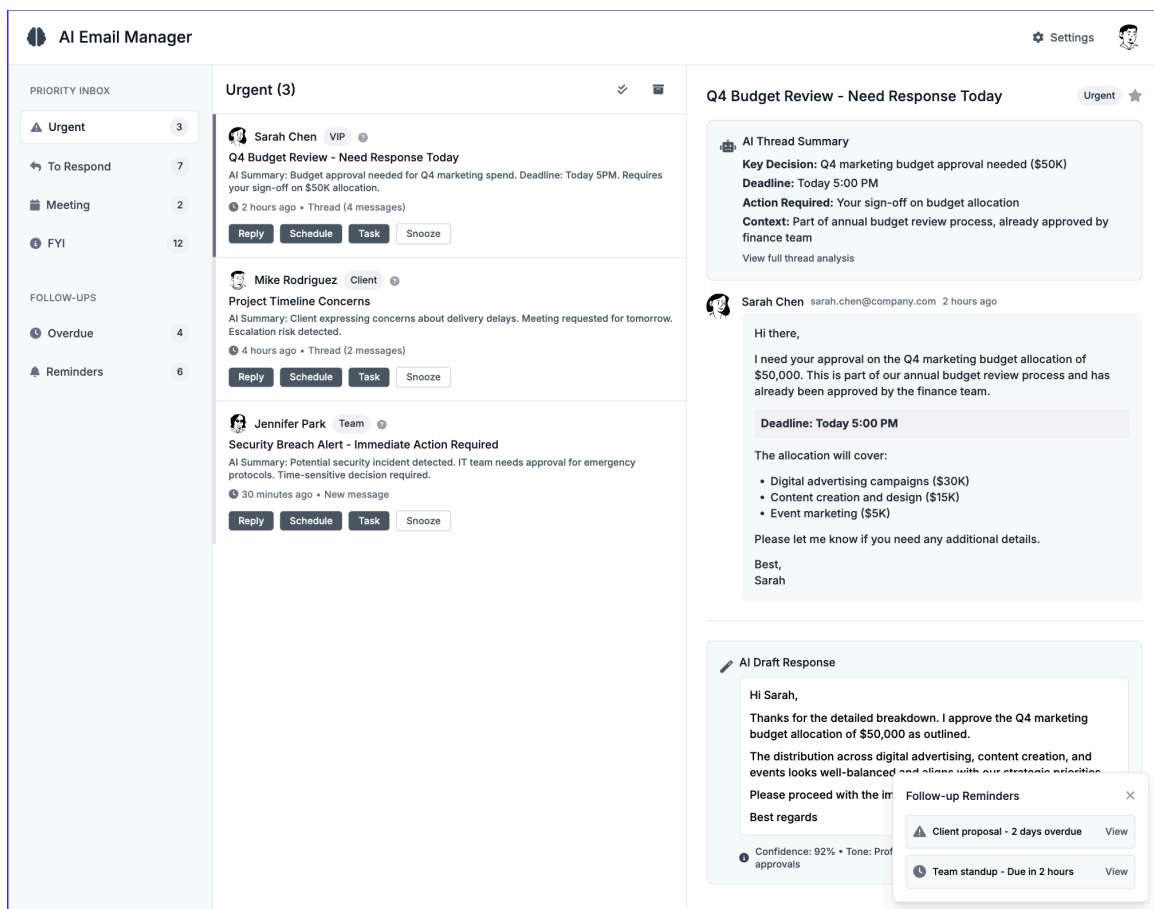


AI-Powered Email & Calendar Management PRD

Sample Wireframe (Created by UXPILOT using the details below as a single prompt)



Sample Prototypes: Built using Lovable and Bolt in one shot by using the details below as prompts

<https://smart-commune-core.lovable.app/>

<https://reliable-frangollo-ec465f.netlify.app/>

Development Assignment & Architecture Guide

Welcome to an exciting challenge in AI-powered productivity automation! This assignment tasks you with architecting and building a functional AI-powered email and calendar management system that transforms how professionals handle their daily communications and scheduling. **Feel free to be as innovative and creative as you'd like** - while we provide a structured framework below, the most exceptional solutions often emerge from fresh perspectives and creative approaches to solving the email overload crisis.

Your Mission

You're building an **intelligent productivity assistant** that understands context, makes reasoned decisions about email prioritization and calendar management, and executes productivity tasks autonomously while maintaining user control and trust. This isn't just another email client - you're creating an AI-powered system that fundamentally changes how knowledge workers interact with their communication workflows.

The beauty of this challenge lies in addressing a real crisis: professionals spend 28% of their workweek managing email, with 70% considering it their biggest productivity drain. Your solution should demonstrate measurable impact on this fundamental workplace problem.

What You Need to Deliver

1. Functional AI Productivity System (Most Important)

Create a **working AI-powered application** that includes:

- **Core AI Engine:** Implements email triage, summarization, and intelligent routing
- **Gmail/Calendar Integration:** Real API integration with Google Workspace or similar
- **Smart Scheduling System:** AI-powered calendar conflict resolution and optimization

- **Human-in-the-Loop Interface:** User approval system for email responses and calendar changes
- **Learning & Adaptation:** System that improves from user feedback and corrections

These components should work together to create a practical productivity assistant that demonstrably reduces email processing time and improves calendar management efficiency.

2. Live Implementation Proof

- **Working Demo:** Complete system demonstration with real email/calendar interaction
- **AI Architecture:** Clear documentation of your intelligent decision-making system
- **Integration Implementation:** Actual API connections to email and calendar services
- **Safety Mechanisms:** Implemented safeguards for email automation and calendar changes
- **Usage Documentation:** How professionals can adopt and customize your system
- **Measurable Results:** Quantified productivity improvements and time savings

Note: Your system must demonstrate real functionality with actual email and calendar data - mockups or theoretical implementations don't count.

Core AI Architecture: The Intelligence Foundation

Every effective productivity AI follows a fundamental pattern that you should implement:

The AI Productivity Loop: Capture → Analyze → Route → Execute → Learn → Repeat

This is your architectural north star - everything else builds around this core cycle:

1. **Capture:** Monitor incoming emails, calendar events, and user interactions

2. **Analyze:** Use AI to understand content, urgency, relationships, and context
3. **Route:** Intelligently categorize and prioritize items for appropriate action
4. **Execute:** Perform approved actions (responses, scheduling, task creation)
5. **Learn:** Update models based on user feedback and correction patterns
6. **Repeat:** Continuously improve decision-making and automation accuracy

Essential System Components

1. AI Decision Engine (The Brain)

What you're building: Intelligent classification and decision-making system that handles the "thinking" part of productivity management.

Key architectural decisions:

- Multi-model AI approach (classification, summarization, generation)
- Context-aware decision making with confidence scoring
- Real-time learning from user corrections and preferences
- Explainable AI for trust and transparency

Success criteria: The brain consistently makes correct triage decisions, generates appropriate responses, and learns from user feedback to improve accuracy over time.

2. Email & Calendar Integration Layer (The Hands)

Your goal: Create secure, reliable connections to productivity platforms with comprehensive functionality.

Core integration categories to implement:

Email Operations: read, classify, respond, search, archive, label

Calendar Operations: schedule, reschedule, check_conflicts, block_time

Task Management: create_task, set_reminder, track_deadline

Contact Intelligence: relationship_analysis, communication_patterns

Critical design principles:

- **Security First:** OAuth2 implementation with minimal permission scope

- **API Efficiency:** Batch operations and smart rate limiting
- **Error Resilience:** Graceful handling of API failures and network issues
- **Data Privacy:** Local processing with encrypted storage

3. Intelligence & Memory System (The Memory)

The pattern: Implement both working intelligence (current context) and learning memory (pattern recognition).

Working Intelligence:

- Current email thread context and conversation history
- Calendar availability and scheduling patterns
- User preference models and communication style
- Real-time classification confidence and reasoning

Learning Memory:

- Historical email patterns and successful automations
- User correction patterns and preference evolution
- Sender relationship models and communication frequency
- Seasonal and temporal productivity patterns

4. User Interface & Control System (The Interface)

Design philosophy: Your interface should enhance natural productivity workflows without adding friction or complexity.

Interface patterns to implement:

- Clean inbox with intelligent categorization and visual priority indicators
- Preview-first approach for all automated actions
- One-click approval/override system for AI suggestions
- Progressive disclosure of AI reasoning and decision factors

Implementation Strategy (Practical Development Steps)

Phase 1: Prove Core Intelligence Works

Start here: Build the simplest possible version that demonstrates AI-powered email triage.

Your minimal viable intelligence:

1. Connect to Gmail API and read recent emails
2. Use AI to classify one email by urgency and category
3. Display classification with confidence score and reasoning
4. Allow user to correct classification
5. Store correction for future learning

Success criteria: Show it an email and get accurate urgency/category classification with explainable reasoning.

Why this matters: Until you prove the basic AI decision-making works reliably, all other features are premature.

Phase 2: Add Automation Sophistication

Recommended progression:

1. Email summarization and key point extraction
2. Draft response generation with context awareness
3. Calendar integration and meeting request detection
4. Smart scheduling with conflict avoidance
5. Follow-up tracking and reminder systems

Key insight: Each automation should solve a real productivity pain point and demonstrate measurable time savings.

Phase 3: Implement Safety and Learning

Essential safety and learning features:

- Preview mode: Show all changes before execution
- Approval workflows: Gate all automated actions
- Learning system: Improve from user corrections
- Rollback capability: Undo automated actions
- Confidence thresholds: Only automate high-confidence decisions

Phase 4: Optimize and Scale

Focus areas:

- Response time optimization and batch processing
- Advanced scheduling algorithms and conflict resolution
- Cross-platform integration and workflow orchestration
- Comprehensive productivity metrics and insights

Technical Architecture Patterns

The Intelligent Triage Pattern

What it is: Multi-stage AI pipeline that progressively understands email content, context, and required actions.

Implementation: Sequential AI models handle classification → summarization → action generation → confidence scoring.

Why it matters: This creates reliable, explainable automation that users can trust and correct.

Human-in-the-Loop Productivity Design

Core principle: Design for augmented intelligence, not replacement intelligence.

Implementation strategy:

- Default to seeking approval for all automated actions
- Learn user preferences to reduce interruption frequency
- Always provide clear escape hatches and manual override options

- Surface AI reasoning to build trust and enable corrections

Contextual Learning Pattern

When to use: For building personalized productivity models that adapt to individual working styles.

How it works: System continuously learns from user interactions, corrections, and productivity patterns to improve future automation.

Code Quality: SOLID Principles Application

Single Responsibility Principle

Each component handles one aspect - AI processing, email integration, user interface, or learning systems.

Open/Closed Principle

Core logic should accommodate new email providers, AI models, and productivity integrations without modification.

Liskov Substitution Principle

Different AI models, email providers, or calendar systems should be interchangeable through consistent interfaces.

Interface Segregation Principle

Create focused interfaces - separate email interfaces from calendar interfaces from AI processing interfaces.

Dependency Inversion Principle

High-level productivity logic should depend on abstractions, not concrete email providers or AI implementations.

Example User Interactions (Target Experience)

Your system should handle interactions like these naturally:

bash

Intelligent email management

"Show me urgent emails from VIP contacts"
"Draft a professional response declining this meeting request"
"Find all emails about the Q4 budget project"

Smart calendar operations

"Schedule a 30-minute meeting with Sarah avoiding her lunch blocks"
"Move my 2pm meeting to the first available slot this week"
"Block 2 hours of focus time for project work tomorrow"

Productivity automation

"Set up follow-up reminders for all pending client emails"
"Create tasks from action items in today's meeting notes"
"Batch process my inbox and show me what needs immediate attention"

Learning and adaptation

"I prefer shorter email responses - adjust your drafting style"
"Always schedule meetings in the afternoon when possible"
"Flag emails from this sender as high priority in the future"

Safety and Trust Framework

Essential Safety Mechanisms

1. Preview Before Execution

- Show exactly what emails will be sent or calendar changes made
- Provide clear summaries of all planned automated actions
- Allow users to approve, modify, or reject AI suggestions

2. Transparent Decision Making

- Display AI confidence scores for all classifications and suggestions
- Provide clear explanations of reasoning ("Urgent because: deadline + VIP sender")
- Maintain audit trail of all AI decisions and user corrections

3. Graduated Automation

- Start with high user involvement, gradually increase autonomy
- Learn user trust patterns and comfort levels with automation
- Provide granular control over AI decision-making authority

4. Data Privacy and Security

- Encrypt all email and calendar data at rest and in transit
- Process sensitive data locally when possible
- Implement minimal data retention policies
- Provide clear data usage and deletion controls

Evaluation Criteria

Primary Assessment Focus:

1. **AI Intelligence Quality** (35%): Accuracy of email triage, summarization, and response generation
2. **Integration Reliability** (25%): Stable, secure connections to email and calendar platforms
3. **User Experience Design** (20%): Intuitive interface that reduces rather than increases cognitive load
4. **Productivity Impact** (20%): Demonstrable time savings and workflow improvements

Excellence Indicators:

- System demonstrates measurable productivity improvements in real usage scenarios
- AI decision-making is accurate, explainable, and continuously improves from user feedback
- Integration handles edge cases gracefully and maintains data security
- Interface feels intuitive and reduces friction in daily productivity workflows
- Code follows clean architecture principles and supports future extensibility
- Implementation shows creative solutions to complex productivity automation challenges

Red Flags:

- AI makes frequent classification errors or generates inappropriate responses
- System requires precise commands rather than understanding natural productivity language
- Integration is fragile or fails to handle common email/calendar scenarios
- Interface adds complexity rather than simplifying productivity workflows
- No evidence of real productivity improvement or time savings
- Implementation lacks proper safety mechanisms or data privacy protections

Core Pain Points Addressed

Email Overload Crisis: 70% of professionals consider email their biggest productivity drain, spending 28% of their workweek managing inbox chaos rather than focusing on high-value work.

Information Processing Burden: Long email threads and context switching create cognitive overload, making it difficult to quickly understand what requires action and what can be archived.

Response Generation Friction: Repetitive email writing and maintaining appropriate tone across different relationships consumes significant time and mental energy.

Calendar & Scheduling Chaos: Meeting requests buried in email, scheduling conflicts, and missed deadlines create workflow disruption and relationship damage.

Dropped Conversations: Critical follow-ups and commitments fall through cracks due to lack of systematic tracking and proactive reminders.

Tool Fragmentation: Manual context switching between email, calendar, tasks, and CRM systems creates inefficiency and increases risk of missing important information.

Core Feature Capabilities

This AI-powered email and calendar management system delivers 9 essential capabilities that directly address the productivity crisis facing modern

professionals:

- **Intelligent Email Triage:** Ability to have incoming emails automatically categorized and labeled by urgency, topic, actionability, and sender importance so that critical messages always surface at the top and low-priority noise is minimized.
- **AI Thread Summarization:** Ability to see a concise, AI-powered summary of any email thread or conversation, instantly highlighting key points, decisions, unresolved questions, and next steps, removing the need to read every message in full.
- **Smart Draft Generation:** Ability to have smart, context-aware draft replies auto-generated for each email—aligned to prior conversation history, the sender's relationship, and typical response templates—while retaining full review and final approval before anything is sent.
- **Email-to-Calendar Conversion:** Ability to convert actionable emails (meeting requests, deadlines, follow-ups) directly into calendar events or tasks, with all relevant context (participants, agenda, links) attached, and with automated suggestions for optimal time slots and conflict avoidance.
- **Inbox Zero Workflow:** Ability to manage the inbox through a unified "inbox zero" workflow, where each email is triaged, routed (respond, schedule, create task, snooze, or delegate), and regular batch digests of outstanding actions are provided, reducing clutter and improving task tracking.
- **Proactive Follow-up Tracking:** Ability to have proactive follow-up reminders and deadline tracking, where the system monitors email threads, flags conversations needing action, auto-sets reminders for overdue responses, and escalates high-priority threads or deadlines before they are missed.
- **Transparent AI Decisions:** Ability to see clear explanations and reasons for every automated action taken (e.g. "Labeled as Urgent because: sender is VIP + message contains deadline"), with a simple one-click way to override or correct any AI-driven choice.
- **Adaptive Learning:** Ability to provide feedback or corrections to the system, so that email triage, summaries, and draft suggestions continuously adapt to personal workflow, tone, and organizational policies.

- **Workflow Customization:** Ability to customize workflow rules, snoozing, batching intervals, and notification settings to match each user's preferred work style, focus time, and responsiveness needs.
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Core Features & User Stories

1. Intelligent Email Triage & Auto-Categorization

Pain Point Solved: Email overload and difficulty prioritizing critical messages

User Story: As a busy professional, I need incoming emails automatically categorized and labeled by urgency, topic, actionability, and sender importance so that critical messages always surface at the top and low-priority noise is minimized.

Core Functionality:

- AI-powered classification using content analysis, sender patterns, and business context
- Automatic Gmail label application ("To Respond," "FYI," "Urgent," "Meeting," custom categories)
- Priority detection based on sender importance, urgency keywords, and relationship history
- Visual priority indicators with color-coding for immediate recognition

2. AI-Powered Thread Summarization & Context Extraction

Pain Point Solved: Information processing burden and cognitive overload from long conversations

User Story: As someone managing multiple ongoing conversations, I need to see a concise, AI-powered summary of any email thread or conversation, instantly highlighting key points, decisions, unresolved questions, and next steps, removing the need to read every message in full.

Core Functionality:

- Intelligent thread analysis extracting key decisions, action items, and open questions

- Intent classification (meeting request, information request, deadline, etc.)
- Context preservation across conversation history
- Visual highlighting of actionable items and deadlines within summaries

3. Context-Aware Draft Generation with Human Approval

Pain Point Solved: Response generation friction and time consumption

User Story: As someone who receives many similar types of emails, I need smart, context-aware draft replies auto-generated for each email—aligned to prior conversation history, the sender's relationship, and typical response templates—while retaining full review and final approval before anything is sent.

Core Functionality:

- Personalized response generation based on conversation history and sender relationship
- Template selection and customization for common scenarios
- Tone matching to sender's communication style and organizational context
- Mandatory human review with easy editing capabilities before sending

4. Email-to-Calendar Conversion with Smart Scheduling

Pain Point Solved: Calendar chaos and scheduling conflicts

User Story: As someone who receives many meeting requests via email, I need to convert actionable emails (meeting requests, deadlines, follow-ups) directly into calendar events or tasks, with all relevant context (participants, agenda, links) attached, and with automated suggestions for optimal time slots and conflict avoidance.

Core Functionality:

- Automatic meeting request detection and calendar event creation
- Smart scheduling suggestions with real-time availability checking
- Conflict detection and alternative time proposals
- Context preservation linking emails, attendees, and agenda items to events

5. Unified Inbox Zero Workflow Management

Pain Point Solved: Inbox overwhelm and lack of systematic email processing

User Story: As someone committed to maintaining inbox zero, I need to manage my inbox through a unified workflow where each email is triaged, routed (respond, schedule, create task, snooze, or delegate), and regular batch digests of outstanding actions are provided, reducing clutter and improving task tracking.

Core Functionality:

- Automated triage with clear routing options for every email
- One-click actions for common email processing decisions
- Batch processing capabilities with weekly digest of accumulated actions
- Progress tracking with visual dashboard showing inbox zero maintenance

6. Proactive Follow-up & Deadline Tracking

Pain Point Solved: Dropped conversations and missed commitments

User Story: As someone managing multiple ongoing conversations, I need proactive follow-up reminders and deadline tracking, where the system monitors email threads, flags conversations needing action, auto-sets reminders for overdue responses, and escalates high-priority threads or deadlines before they are missed.

Core Functionality:

- Thread monitoring for conversations expecting responses
- Automatic follow-up reminders for overdue communications
- Deadline extraction and tracking from email content
- Smart escalation for high-priority contacts and time-sensitive items

7. Transparent AI Decision Making with Easy Override

Pain Point Solved: Lack of trust and control in automated systems

User Story: As someone who needs to maintain control over my communications, I need to see clear explanations and reasons for every automated action taken

(e.g. "Labeled as Urgent because: sender is VIP + message contains deadline"), with a simple one-click way to override or correct any AI-driven choice.

Core Functionality:

- Detailed reasoning display for all AI-driven classifications and suggestions
- Confidence scoring for automated decisions
- One-click override and correction capabilities
- Audit trail of all automated actions and user corrections

8. Adaptive Learning & Personalization

Pain Point Solved: Generic solutions that don't match individual workflow preferences

User Story: As someone with specific communication patterns and preferences, I need to provide feedback or corrections to the system, so that email triage, summaries, and draft suggestions continuously adapt to my personal workflow, tone, and organizational policies.

Core Functionality:

- Learning system that improves from user corrections and feedback
- Personalization based on communication patterns and preferences
- Adaptation to organizational tone, policies, and business context
- Custom rule creation for specific scenarios and exceptions

9. Customizable Workflow & Notification Controls

Pain Point Solved: Rigid systems that don't adapt to individual work styles

User Story: As someone with specific focus time and responsiveness preferences, I need to customize workflow rules, snoozing, batching intervals, and notification settings to match my preferred work style, focus time, and responsiveness needs.

Core Functionality:

- Configurable workflow rules and automation triggers
- Customizable batching intervals and notification timing

- Focus time protection with smart message filtering
 - Personalized responsiveness settings based on sender and urgency
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Essential Screen Designs & Workflows

Screen 1: Intelligent Inbox Dashboard

Serves: Intelligent Triage (1), Inbox Zero Workflow (5), Transparent Decisions (7), Workflow Customization (9)

Core Elements

- **Priority Tabs:** "Urgent," "To Respond," "FYI," "Meeting" with visual urgency indicators
- **Smart Email Cards:** Sender + VIP status, subject, AI summary snippet, urgency labels
- **Action Buttons:** "Respond," "Schedule," "Create Task," "Snooze," "Archive" for each email
- **"Why?" Icons:** Click to reveal AI reasoning for categorization and priority
- **Batch Controls:** Select multiple emails for bulk actions, weekly digest toggle

Essential Workflow

1. Incoming emails automatically categorized by AI into priority tabs
2. User scans prioritized emails with clear visual urgency indicators
3. One-click actions route emails (respond/schedule/task/snooze/archive)
4. "Why?" reveals AI reasoning; drag-drop overrides incorrect categorization
5. Batch processing handles multiple similar emails efficiently

Screen 2: AI Thread Summary & Follow-up View

Serves: Thread Summarization (2), Follow-up Tracking (6), Transparent Decisions (7)

Core Elements

- **AI Summary Panel:** Collapsible overview with key points, decisions, action items, deadlines
- **Smart Highlighting:** Important sentences, commitments, and deadlines visually emphasized
- **Follow-up Alerts:** Red indicators for overdue responses, orange for approaching deadlines
- **Quick Actions:** "Set Reminder," "Mark Complete," "Escalate," "Reply" buttons
- **Context Display:** Shows why AI flagged items as important with confidence scores

Essential Workflow

1. Thread opens with AI-generated summary highlighting key information
2. Important content automatically emphasized throughout conversation
3. System tracks response timing and flags overdue communications
4. User can set follow-up reminders or mark conversations complete
5. AI explains reasoning for flagging conversations as needing attention

Screen 3: Smart Draft Composer

Serves: Draft Generation (3), Transparent Decisions (7), Adaptive Learning (8)

Core Elements

- **Draft Preview:** AI-generated response with editing capability and confidence score
- **Context Panel:** Shows conversation history and relationship factors used by AI
- **Tone Controls:** Formal/Casual slider, "Brief/Detailed" options, template selector
- **AI Reasoning:** "Why this tone/content?" with explanation of draft logic
- **Feedback Buttons:** Thumbs up/down to improve future draft suggestions

Essential Workflow

1. User clicks reply, AI analyzes conversation context and relationship history

2. AI generates contextually appropriate draft with visible confidence level
3. User reviews draft with explanation of AI reasoning displayed
4. User edits tone, content, or selects alternative templates as needed
5. Feedback improves AI's future draft suggestions for similar situations

Screen 4: Email-to-Calendar Conversion

Serves: Calendar Conversion (4)

Core Elements

- **Meeting Detection:** "Meeting request detected" banner with parsed details
- **Smart Scheduling:** Suggested time slots based on availability and conflict checking
- **Event Context:** Auto-extracted participants, agenda, location from email
- **Conflict Warnings:** Red alerts for scheduling conflicts with alternative suggestions
- **One-Click Creation:** "Schedule Meeting" creates event with full email context

Essential Workflow

1. AI detects meeting requests or deadlines in email content
2. System parses participants, timing, location, agenda details automatically
3. Calendar availability checked with conflict detection and alternatives offered
4. User confirms details and creates calendar event with full email context linked
5. Meeting prep and follow-up tasks suggested based on email content

Screen 5: Proactive Reminders Dashboard

Serves: Follow-up Tracking (6), Transparent Decisions (7)

Core Elements

- **Reminder Cards:** Overdue conversations with email snippet and context
- **Urgency Indicators:** Color-coded priority based on sender importance and timing

- **Quick Actions:** "Respond," "Snooze," "Mark Complete," "Escalate" buttons
- **AI Reasoning:** Why this conversation was flagged for follow-up
- **Escalation Rules:** Custom triggers for high-priority contacts or time-sensitive items

Essential Workflow

1. AI monitors all email threads for response patterns and commitments
2. System flags conversations approaching or past expected response times
3. Reminders display with full context and explanation of why flagged
4. User can respond directly, snooze, mark complete, or escalate
5. System learns from user actions to improve future reminder timing

Screen 6: Settings & Learning Hub

Serves: Transparent Decisions (7), Adaptive Learning (8), Workflow Customization (9)

Core Elements

- **AI Decision Log:** History of all automated actions with explanations
- **Feedback Center:** Rate AI suggestions and provide improvement input
- **Custom Rules:** Create personal rules for email processing and prioritization
- **Workflow Settings:** Customize batching, notification timing, focus hours
- **Learning Progress:** Shows how AI is adapting to user preferences over time

Essential Workflow

1. User reviews history of AI decisions and provides feedback on accuracy
2. Custom rules created for specific senders, keywords, or situations
3. Notification and batching preferences configured for personal work style
4. AI learning tracked with visibility into how user feedback improves performance
5. Privacy and data usage controls managed with transparency

Core Integration Workflow

Essential User Journey

1. **Email Arrival** → Auto-categorization into priority tabs (Screen 1)
2. **User Triage** → Quick scan and routing decisions with AI explanations (Screen 1)
3. **Deep Review** → Thread summaries and follow-up tracking (Screen 2)
4. **Response Creation** → AI-assisted drafting with context awareness (Screen 3)
5. **Calendar Integration** → Meeting conversion with smart scheduling (Screen 4)
6. **Proactive Management** → Follow-up reminders and deadline tracking (Screen 5)
7. **Continuous Improvement** → Feedback and customization for optimization (Screen 6)

Feature Integration

- **Email → Calendar**: Direct conversion with conflict avoidance
- **Email → Tasks**: Inbox zero routing with context preservation
- **AI → User**: Transparent reasoning with easy override capability
- **User → AI**: Feedback loop for continuous personalization and improvement