# Transforming Customer Support into a Proactive Growth Engine

## BUSINESS PROBLEM

- Current support tickets being handled by manual agents
- Inconsistent tagging
- Managing 10,000 daily emails
- Robotic responses frustrate users

## KEY ASSUMPTIONS

- 300,000 emails/month
- Upto 90% of emails suitable for automated response
- Automation potential – 33.5% (Traditional), 65% (AI/ML), 90%(Gen AI)
- Emails Automated – Traditional Automation (33.5%), AI/ML Augmentation (64%), Generative AI (LLM) (90.75%)

## HANDLING TIME

| Email Type | Distribution | Daily Volume | Processing Time |
|---|---|---|---|
| Simple | 80% | 8,000 | 2.5 min |
| Medium | 15% | 1,500 | 5.0 min |
| Complex | 5% | 500 | 20.0 min |
| **TOTAL** | **100%** | **10,000** | **3.75 min avg** |

## CURRENT HEAD COUNT

| Email Type | Distribution | Daily Volume | Processing Time | Daily Minutes | Agent Workload |
|---|---|---|---|---|---|
| Simple | 80% | 8,000 | 2.5 min | 20,000 | 48 FTEs |
| Medium | 15% | 1,500 | 5.0 min | 7,500 | 18 FTEs |
| Complex | 5% | 500 | 20.0 min | 10,000 | 24 FTEs |
| **TOTAL** | **100%** | **10,000** | **3.75 min avg** | **37,500** | **89 FTEs** |

## CURRENT ECONOMICS

- Monthly Cost: 89 FTEs × $1000 per month = $89,000
- Working Hours: 7 hours/day (420 minutes per agent)

## THREE-TIER TECHNOLOGY EVALUATION

| Criteria | Traditional Automation | AI/ML Augmentation | Generative AI (LLM) |
|---|---|---|---|
| Accuracy | Moderate | High | **Very High** |
| Response Quality | Robotic, template-based | Contextual, rule-driven | **Human-like, adaptive** |
| Monthly Cost (Agent+AWS) | $68,000 + $456 = $68,456 | $36,000 + $590 = $36,590 | **$10,000 + $1570 = $11,570** |
| Scalability | Limited by rules | Good with training | **Unlimited, self-improving** |
| Setup Time | 4 weeks | 8 weeks | **12 weeks** |
| Customer Experience | Poor (robotic) | Good (contextual) | **Excellent (personalized)** |
| Maintenance | High(rule upkeep) | Medium (model Training) | **Medium** |

| Features | Traditional Automation | AI/ML Augmentation | Generative AI (LLM) |
|---|---|---|---|
| Capability | Handles basic cases | Complex patterns | **Deep understanding** |
| Conservative assumptions | 40% vs 33.5% | 75% vs 65% | **95% vs 90%** |
| Linear scaling by complexity | 32% + 1.5% + 0% = 33.5% | 56% + 7.5% + 0.5% = 64.0% | **76% + 12.75% + 2% = 90.75%** |

# Analysis & Strategic Recommendation

## OPPORTUNITY

While the immediate challenge is managing 10,000 daily emails, the real opportunity here is to transform our support function. We can evolve it from a reactive cost center into a proactive, data-driven engine that improves our product, reduces churn, and directly contributes to SmartHelp's growth. The solution isn't just about closing tickets faster; it's about mining those 10,000 daily interactions for greater strategic insights

## COST SAVINGS

| Solution | Automation Rates | AI Efficiency | FTEs Required | FTE Reduction | Total Monthly Cost | Monthly Savings |
|---|---|---|---|---|---|---|
| Current Manual | None | 0% | 89 | 0 (0%) | $89,000 | $0 |
| Traditional | Simple: 40%, Medium: 10%, Complex: 0% | 0% | 68 | 21 (23.5%) | $68,456 | $20,544 |
| AI/ML | Simple: 70%, Medium: 50%, Complex: 10% | 20% faster | 36 | 54 (60.0%) | $36,590 | $52,410 |
| **GenAI (LLM)** | **Simple: 95%, Medium: 85%, Complex: 40%** | **50% faster** | **10** | **80 (89.8%)** | **$11,570** | **$77,430** |

## COST BENEFIT – 3 YRS SPREAD

| Solution | Setup Investment | Monthly Savings | Payback Period (Months) | Year 1 Net Benefit | Year 3 Net Benefit | 3-Year ROI |
|---|---|---|---|---|---|---|
| Traditional | $150,000 | $20,544 | 7.3 | ($719,472) | $(1,858,416) | (72)% |
| AI/ML | $300,000 | $52,410 | 5.7 | ($103,080) | $290,760 | 18% |
| **GenAI** | **$450,000** | **$77,430** | **5.8** | **$35,9160** | **$1,977,480** | **244%** |

**FINAL RECOMMENDATION**

## INVESTMENT JUSTIFICATION

- **Payback Period:** 5.8 months
- 89.8% workforce reduction (89 → 10 FTEs)
- **Highest monthly savings:** $77,430 with superior customer experience
- **Break-even:** Month 5.8
- **3-Year Net Benefit**: $809,160
- **Operational Excellence:** 93% accuracy with <30 second responses
- **Strategic Value:** Platform for future AI-driven customer experience innovations

## BUSINESS TRANSFORMATION IMPACT

- **Cost per Email:** $0.30 → $0.039 (87% reduction)
- **Superior Scalability:** Handle 100K+ emails without proportional FTE increase
- **Response Speed: F**aster response times
- **Accuracy Improvement:** 55% increase in classification precision
- **Agent Role Evolution:** From manual processors to customer success specialists
- **Competitive Positioning:** Industry-leading automation capabilities
- **Future-ready:** AI-native platform for continuous innovation

# Solution Brief & Functional Flow

"Our architecture doesn't just dispose of the data once a ticket is created. It captures the structured output from the LLM—the categories, sentiments, and summaries—and pipes it into our data warehouse. This creates a real-time dashboard for our Product and Leadership teams"

**Within weeks, we can answer critical questions like**
- How many high priority tickets have we processed this month?
- What are the top 3 features our users are requesting this month?
- Is there a sudden spike in bug reports related to the new update?



## SOLUTION BRIEF

The system will automatically ingest every incoming support email. Using a powerful Large Language Model, it will instantly perform:
- **Analysis:** Identifies category, intent, sentiment, and key entities (e.g., user ID, invoice number).
- **Routing:** Creates a ticket in Jira service management and routes it to the correct team (e.g., Tier 2 for complex bugs, Finance for billing).
- **Drafting:** Generates a context-aware, empathetic draft response based on the user's query and information from SmartHelp's knowledge base.

An agent reviews the AI's work, makes minor edits if needed, and clicks "Send." This transforms the agent's role from a manual sorter to a high-value reviewer.

## CLOUD ARCHITECTURE (AWS)

- **Core Email Processing Layer:** Amazon SES, Amazon SQS, AWS Lambda, Amazon Bedrock, Amazon OpenSearch, Amazon S3, Amazon DynamoDB
- **Operational Path Components:** AWS Lambda, Amazon API Gateway, Amazon SNS, Amazon SQS (FIFO)
- **Strategic Path Components:** Amazon Redshift, AWS Glue, Amazon S3, AWS Lambda, Amazon API Gateway
- **Application & Infrastructure Layer:** Amazon ECS/AWS Fargate, Amazon Cognito, Application Load Balancer, Amazon CloudFront
- **Observability & DevOps**: Amazon CloudWatch, AWS X-Ray, CloudWatch Alarms, Amazon SNS, AWS CodePipeline, AWS CodeBuild, AWS WAF, AWS GuardDuty, Power BI

# Sample UI/UX Mockup Screen

**Alex Chen**
alex.chen@example.com `New`

**Urgent: Application Crashing Randomly while exporting session notes**

January 25, 2025, 10:30 AM PST

Dear Support Team,

I hope this email finds you well.

Hello, when I try to export my session notes as PDF the app crashes every time. I tried on Chrome and Edge.

I have already tried the following steps:
1. Restarted my computer multiple times.
2. Reinstalled the application.
3. Checked my internet connection, which is stable.

Sincerely,

Alex Chen
Customer ID: AC-7890

## AI Analysis

Error Category
**Software Bug** (Confidence Score: 97%)

Sentiment
`Negative`

Priority
`High`

Intent
**Report Issue**

Suggested Routing Team
**Engineering Support**

## AI-Generated Response Draft

Thank you for contacting our support team and for providing such detailed information regarding the crashing issue you're experiencing . We understand how disruptive this can be to your daily workflow, and we apologize for the inconvenience.

Based on your description, this sounds like a critical bug within the application, particularly given your thorough troubleshooting steps.
Please clear your browser cache and disable any extensions, then try exporting again. If it still fails, please share screenshots and the steps you followed. 'll escalate with engineering immediately and keep you updated. We apologize and will prioritize a fix.

`Edit`  `Regenerate`  `Send Response`

## AI Summary

User is unable to export session notes as PDF. Application crashes.

**AI Analysis:**
**Category:** Technical Error - Software Bug
**Confidence Score:** 97%
**Intent:** Report Bug
**Sentiment:** Negative 😟

**Suggested Routing:**
**Team:** Tier 2 Support
**Priority:** High

**Suggested Response:**
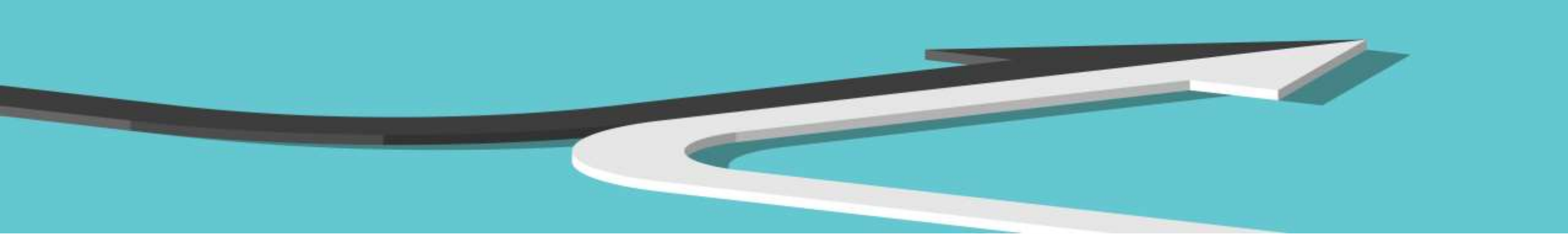Troubleshooting steps. Prioritize and escalate.

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# KPI and Considerations

**SUCCESS METRICS (KPI)**

- **Average First Response Time** (FRT) — target is **50% less within 3 months**

- **Auto-resolution Rate** — % tickets closed without manual agent edit **≥ 60%**

- **Classification Accuracy** — measured on labeled holdout **≥ 90%**

- **CSAT (customer satisfaction)** — target is **+15%** improvement

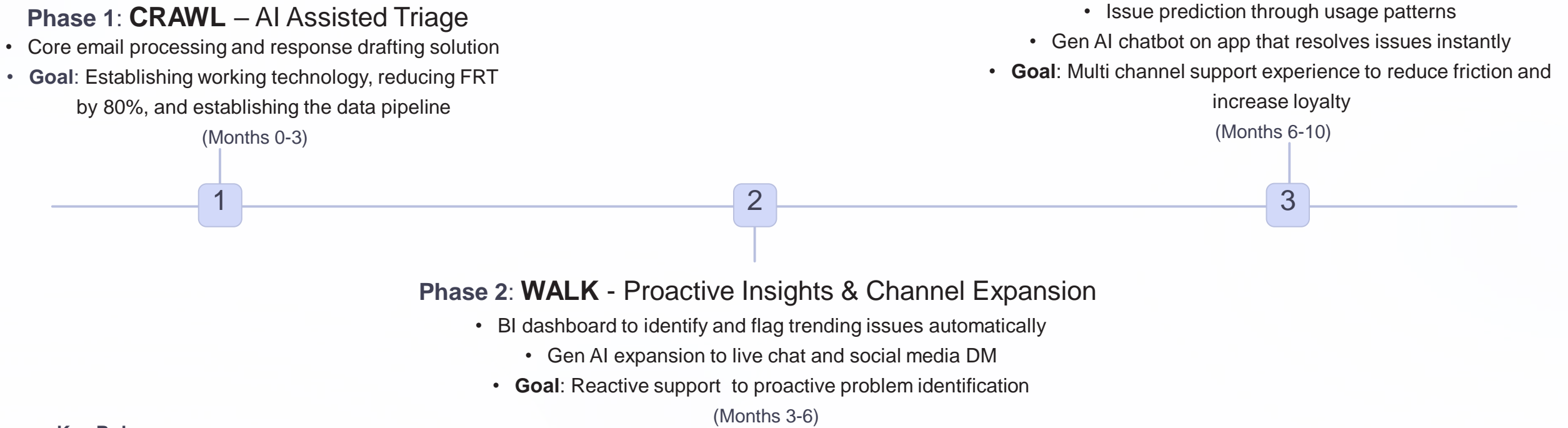- **L1 Agent Productivity** — tickets handled per agent per day **+40%**

**ADDITIONAL CONSIDERATIONS**

- **Data Privacy & Compliance:** SOC 2, GDPR compliance via AWS managed services

- **LLM Hallucination:** Verify facts (RAG + canonical KB + post-generation validation) and human fallback.

- **Disaster Recovery:** Multi-AZ Redshift & cross-region backups

- **Change Management**: Phased rollout with agent training and feedback loops

- **Model Retraining:** Monthly GenAI fine-tuning with new email data

- **Multi language Support:** Additional language support enhances the customer base across geographies

# Implementation Roadmap

## Phases, Roles, Timelines (0–12 months plan)

### Phase 1: **CRAWL** – AI Assisted Triage
- Core email processing and response drafting solution
- **Goal**: Establishing working technology, reducing FRT by 80%, and establishing the data pipeline

(Months 0-3)

### Phase 3: **RUN** - Towards Predictive & Self-Service Support
- Issue prediction through usage patterns
- Gen AI chatbot on app that resolves issues instantly
- **Goal**: Multi channel support experience to reduce friction and increase loyalty

(Months 6-10)

1 ——————————————— 2 ——————————————— 3

### Phase 2: **WALK** - Proactive Insights & Channel Expansion
- BI dashboard to identify and flag trending issues automatically
- Gen AI expansion to live chat and social media DM
- **Goal**: Reactive support to proactive problem identification

(Months 3-6)

**Key Roles**

1 Product Manager, 2 Developers, 1 ML engineer, 1 Data engineer, 1 QA, 1 DevOps