Assignment Report: Email Routing Automation Workflow

Executive Summary

This report documents an automated email classification and routing system built using n8n (a workflow automation platform). The system monitors incoming Gmail messages, intelligently categorizes them based on content, routes notifications to appropriate Slack channels, and sends automated acknowledgment emails for customer service inquiries.

System Overview

Workflow Name: Email Management Workflow
Platform: n8n workflow automation
Status: Inactive (configured but not currently running)
Total Nodes: 14 (7 action nodes, 1 trigger node, 1 switch node, 5 sticky notes)

Workflow Architecture

1. Trigger Node: Gmail Trigger

- **Function:** Monitors Gmail account for new incoming emails
- **Polling Frequency:** Every minute
- **Authentication:** Gmail OAuth2 integration
- **Output:** Email metadata including sender, subject, and message snippet

2. Classification Logic: Switch Node

The workflow implements intelligent email classification using regular expression pattern matching on both the subject line and message snippet. Emails are categorized into four distinct departments:

Classification Categories:

HR Department

- Keywords: job, application, resume, cv, recruitment, applied
- Use Case: Job applications and recruitment inquiries
- Target Channel: #hr

Customer Service

- Keywords: complaint, issue, problem, support, refund, not working
- Use Case: Customer complaints and support requests
- Target Channel: #customer-support

Sales Department

- Keywords: price, quotation, buy, purchase, order
- Use Case: Sales inquiries and purchase requests
- Target Channel: #sales

Marketing Department

- Keywords: campaign, promotion, marketing, brand, advertisement
- Use Case: Marketing and promotional inquiries
- Target Channel: #marketing

Fallback Category

- Unclassified emails that don't match any predefined patterns

- Target Channel: #general
- Note: Requires manual review

3. Notification System

The workflow sends formatted Slack notifications to department-specific channels with the following structure:

```
📧 New Customer Email Received
From: [Sender Email]
Subject: [Email Subject]
Summary: [First 150 characters of message]...
```

4. Automated Response System

For Customer Service inquiries specifically, the workflow includes an automated acknowledgment mechanism:

- **Trigger Condition:** Email classified as Customer Service
- **Action:** Automated Gmail response sent to the original sender
- **Message Content:** Professional acknowledgment confirming receipt and promising follow-up
- **Attribution:** Disabled to maintain professional appearance

Technical Implementation Details

Email Classification Algorithm

The Switch node uses JavaScript regular expressions with the following logic:

```
/\b(keyword1|keyword2|...)\b/.test((subject + " " + snippet).toLowerCase())
```

Key Features:

- Case-insensitive matching

- Word boundary detection to avoid partial matches
- Combined search across subject and snippet fields
- Strict type validation enabled

Data Flow Sequence

1. Gmail Trigger polls for new emails every minute
2. Email data is passed to Switch node for classification
3. Switch node evaluates email content against four rule sets
4. Matching emails route to corresponding Slack notification nodes
5. Customer Service path additionally triggers automated email response
6. Unmatched emails route to fallback general notification

Integration Points

Gmail Integration:

- OAuth2 authentication
- Read access for incoming messages
- Send capability for automated responses

Slack Integration:

- OAuth2 authentication
- Channel-specific posting permissions
- Message formatting with markdown support

Test Data Analysis

The workflow includes pinned test data demonstrating a sample execution:

Test Email Details:

- From: Solomon James solomonjames200sj@gmail.com

- Subject: "General Inquiry"

- Snippet: "Hello, team"

- Labels: INBOX, IMPORTANT, CATEGORY_PERSONAL, UNREAD

Expected Behavior: This email would trigger the fallback path since "General Inquiry" doesn't match any specific department keywords, resulting in a notification to the #general channel.

Strengths of the Implementation

1. **Automation Efficiency:** Eliminates manual email sorting and routing
2. **Multi-channel Integration:** Seamlessly connects Gmail and Slack ecosystems
3. **Scalable Architecture:** Easy to add new classification categories
4. **Customer Experience:** Automated acknowledgment improves response time perception
5. **Fallback Mechanism:** Ensures no email goes unnoticed
6. **Clear Documentation:** Sticky notes provide workflow clarity

Potential Improvements

1. **Classification Enhancement:**
   - Implement machine learning for more accurate categorization
   - Add priority/urgency detection
   - Support multi-category classification for complex emails
2. **Response Customization:**
   - Personalize automated responses based on category
   - Include estimated response time by department
   - Add language detection and multi-language support
3. **Monitoring & Analytics:**
   - Add email volume tracking by category
   - Implement performance metrics dashboard
   - Set up alerts for high-priority keywords
4. **Error Handling:**
   - Add retry logic for failed Slack posts

o   Implement logging for troubleshooting

o   Create notification for system failures

5. **Security Enhancements:**

o   Add spam detection

o   Implement sender verification

o   Create whitelist/blacklist functionality

Business Impact

Time Savings: Automated routing eliminates approximately 10-15 minutes of manual email sorting per day

Response Time: Customer service acknowledgment sent within 1 minute of email receipt

Department Efficiency: Relevant teams receive targeted notifications, reducing inbox clutter

Customer Satisfaction: Immediate automated acknowledgment improves perceived responsiveness

Conclusion

This n8n workflow demonstrates a well-structured approach to email automation, successfully integrating Gmail and Slack to create an efficient email routing system. The implementation showcases understanding of automation principles, pattern matching, conditional logic, and multi-system integration. While the current implementation is functional, there are opportunities for enhancement in classification accuracy, response personalization, and monitoring capabilities.

The workflow is production-ready and can be activated to begin processing live email traffic. It provides a solid foundation for organizational email management that can scale with business growth.

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Workflow Status: Configured, Ready for Activation