Gen AI-Based Email Classification for Commercial Bank Service Requests

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1. Overview

This document outlines a Pega application designed for a Commercial Bank to manage service requests received via email. The application automatically reads emails, identifies their purpose, analyzes sentiment, and creates service requests. It also routes requests to appropriate teams, handles multiple requests within a single email, and detects duplicates.

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2. Technology Used

- **Pega Platform**:
    - **App Studio**: Simplifies application development.
    - **Dev Studio**: Enables advanced customization.
    - **Prediction Studio**: Powers AI-driven email analysis and data extraction.
- **Pega GenAI**: Summarizes emails and extracts key details.
- **NLP & Decisioning**: Provides smart automation and routing capabilities.

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3. Workflow Management

Assumption

Each request type has a unique process, requiring a separate **case type** in Pega.

Case Types

- Adjustment
- AU Transfer
- Closing Notice
- Commitment Change
- Fee Payment
- Money Movement - Inbound
- Money Movement - Outbound

Case Design

- Each case is a top-level case.

- Multiple cases are created if an email contains multiple request types.
- **Stages**: Intake → Evaluation → Resolve (expandable as needed).

Application Name

- **Loan Servicing Platform (LSP)**: Houses all case types.

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4. Data Design

Data Types

1. **CB-LSP-Data-Account** (Abstract)
    - **Purpose**: Stores loan account details.
    - **Key Fields**: Borrower, DealName, ABA, AccountName, AccountNumber, BankName, ReferenceID.
    - **Inherits from**: CB-LSP-Data.
2. **CB-LSP-Data-Attachment** (Concrete)
    - **Purpose**: Stores attachment details.
    - **Key Fields**: FileName, FileSize, FileType, UploadDate, UploadedBy.
    - **Inherits from**: CB-LSP-Data.

Class Structure

- CB-LSP-Work-Adjustment
- CB-LSP-Work-AUTransfer
- CB-LSP-Work-ClosingNotice
- CB-LSP-Work-CommitmentChange
- CB-LSP-Work-FeePayment
- CB-LSP-Work-MMInbound
- CB-LSP-Work-MMOutbound

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5. Components

- **Email Channel**: Reads emails and attachments.
- **Prediction Studio**: Analyzes email intent and extracts data using AI.
- **Pega GenAI**: Interprets and summarizes email content.
- **Case Management**: Manages service request workflows.
- **Data Flows**: Processes emails in real-time and detects duplicates.
- **Rules Engine**: Routes requests based on predefined rules.

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6. How It Works

6.1 Email Ingestion

- **Input**: Emails.
- **Process**:
    - The Email Channel reads incoming emails using a **ServiceAccount email listener**.
    - A sample Gmail account is monitored, and the inbox is checked regularly.
    - When a customer emails the account, the listener processes the content and sends a confirmation reply.

6.2 Intent Detection and Classification

- **Goal**: Identify the email's main purpose and any additional requests.
- **How**:
    - Prediction Studio's **Topic Detection Model** classifies requests (e.g., "Adjustment").
- **Output**: Request types with confidence scores (e.g., Adjustment: 0.95).

6.3 Data Extraction

- **Goal**: Extract key details like the sender's email.
- **How**:
    - In the Email Channel's **Behavior** tab under **Suggested Cases**, map the inbound email ID to the **Customer Email** field in Pega.
- **Output**: The email ID is automatically added to the case.

6.5 Duplicate Detection

- **Goal**: Identify repeat emails (e.g., from reply chains).
- **How**:
    - The **Case Match rule** checks details like sender email ID and account number.
    - If a duplicate is found, users can:
        - **Ignore and Proceed**: Continue with the current case.
        - **Cancel**: Stop the current case to avoid duplication.
- **Output**: User decides how to handle duplicates.

6.6 Workflow and Routing

- **Goal**: Assign requests to the right team.
- **How**:
    - Cases follow stages: Intake → Classification → Assignment → Resolution.
    - **Skill-Based Routing**: Matches request types to team skills (e.g., "Adjustments" → AdjustmentWB).
    - Routing considers priority and team availability.

- **Output**: Case assigned to a team queue (e.g., AdjustmentWB).

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7. Technical Details

7.1 AI Models in Prediction Studio

1. **Topic Detection**:
    - Identifies request types using email data.
    - **Output**: Request types with confidence scores.
2. **Entity Extraction**:
    - Extracts the sender's email ID.
    - **Output**: Maps to case fields.

7.2 Validation

- **Data**: Email content.
- **Process**: Train models in Prediction Studio with an 80% train/20% test split to ensure accuracy.

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8. Steps to Build

1. **Set Up Email Channel**: Configure in App Studio to read emails.
2. **Set Up Prediction Studio**: Build and train AI models with email data.
3. **Add Pega GenAI**: Integrate for email summaries and extraction.
4. **Create Case Types**: Define each request type with stages.
5. **Build Data Flow**: Connect email processing to case creation.
6. **Set Routing Rules**: Assign skills to teams in Pega.
7. **Test**: Validate with sample emails.

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9. Assumptions and Limits

- **Assumptions**: Provided email data is sufficient for AI training.
- **Limits**: AI accuracy relies on data quality; Pega Infinity '23 or later is required for GenAI.

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10. Performance and Growth

- **Speed**: Data Flows ensure fast email processing.
- **Growth**: Pega's cloud platform scales with email volume.

- **Monitoring**: Prediction Studio tracks AI performance.