

Building “Signal Sieve”: A Technical Guide for LinkedIn Message Analysis

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Workshop: AI Train-the-Trainer for Microsoft CSP Partners

1. Introduction

This document provides a comprehensive technical guide for Microsoft Cloud Solution Provider (CSP) Partners to reconstruct the “**Signal Sieve**” agent. This powerful analytical tool is designed to process and analyze a user’s LinkedIn messaging history, transforming a raw messages.csv file into a structured, multi-section diagnostic report. Its purpose is to help professionals understand the quality of their inbox, identify communication patterns, and surface actionable insights about their professional network.

The agent is built on a **scenario-aware** architecture, allowing it to tailor its analysis to specific use cases, such as HR recruiting, sales prospecting, or strategic networking. This guide will deconstruct Signal Sieve’s architecture, its sophisticated analysis workflow, and its core components to provide a clear blueprint for implementation.

The Problem Signal Sieve Solves

A professional’s LinkedIn inbox is a high-volume, high-noise environment. It contains a mixture of valuable opportunities, generic spam, and everything in between. Manually sifting through this data to find meaningful patterns is nearly impossible. Signal Sieve automates this analysis, providing a clear, data-driven view of messaging effectiveness, network health, and communication quality.

2. Core Concepts: Scenario-Aware Analysis

Signal Sieve’s primary innovation is its ability to detect user intent and route the analysis to one of five specialized scenarios. This ensures the output is not just a generic data dump but a focused diagnostic tailored to the user’s specific goals.

Scenario	Trigger Keywords	Primary Goal
HR Talent Outreach Review	recruiting, candidate, talent	Analyze recruiter messaging effectiveness and candidate experience.
Recruiter Outreach Comparison	compare recruiters, performance, multiple files	Benchmark the performance of multiple recruiters side-by-side.
Sales Enablement	prospecting, pipeline, conversion	Evaluate the effectiveness of sales outreach and prospecting sequences.
Diversity & Inclusion	bias, inclusive, DEI, diversity	Monitor communication for potential bias in language and outreach patterns.

Strategic Networking	investors, partners, media, brand	Surface insights for leaders on high-value connections and brand signals.
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When a scenario is triggered, the agent prepends a **“Scenario Spotlight”** to its output, which contains scenario-specific metrics, charts, and recommendations before proceeding to the standard report.

3. Agent Architecture and Workflow

Signal Sieve follows a structured, multi-step workflow to process the user’s data and generate its report.

Phase 1: Data Ingestion and Validation

- File Upload:** The user is prompted to upload their messages.csv file, which can be obtained from their LinkedIn data export.
- Data Integrity Check:** The agent verifies that the file is present, not corrupted, and contains the necessary columns to perform the analysis. If the data is invalid, the agent stops and explains the issue to the user. It **never invents metrics** or proceeds with incomplete data.

Phase 2: Scenario Detection and Routing

The agent analyzes the user’s prompt to detect which of the five scenarios to activate. This is done through a combination of explicit keyword matching and semantic analysis. If the intent is ambiguous between two scenarios, the agent is designed to ask a single clarifying question before proceeding.

Phase 3: Report Generation

The agent assembles the final report in a specific, prioritized order:

- Scenario Spotlight (If Applicable):** If a scenario was triggered, this section appears first. It includes scenario-specific analyses, visualizations (charts and graphs), and actionable recommendations.
- Executive Summary (Always):** This is a high-level overview of the full diagnostic, presented in a 12-row table that summarizes each of the main report sections.
- 12-Section Diagnostic (Default):** This is the main body of the report, containing a deep dive into twelve different domains of the user’s messaging data. The user can request to limit the scope to specific sections.

Phase 4: Chart and Visualization Rendering

A key feature of Signal Sieve is its ability to generate data visualizations. The instruction block explicitly requires the agent to use Python plotting libraries (like Matplotlib or Seaborn) to create charts for the Scenario Spotlight. These charts are then embedded directly into the Markdown output, providing a rich, visual analysis.

4. Implementation Guide

This section provides a step-by-step guide to reconstructing the Signal Sieve agent.

Step 1: Define the System Role and Instruction Block

The master prompt that governs the agent's behavior is provided in the `pasted_content_4.txt` file.

Key Components of the Instruction Block:

- **Global Output Policy:** Defines the strict order of the report sections (Scenario Spotlight → Executive Summary → 12-Section Diagnostic).
- **Scenario Detection & Routing:** The logic for identifying the user's intent and triggering the correct analysis scenario.
- **Scenario-Specific Contents:** Detailed requirements for what must be included in each of the five Scenario Spotlights, including required charts and metrics.
- **12-Section Diagnostic:** The exact names and order of the twelve standard report sections.
- **Chart Rendering Requirements:** The technical instructions for generating and embedding Python-based charts.

Implementation Note: Copy the entire instruction block from the source file and set it as the system prompt for your agent.

Step 2: Implement the Data Analysis Logic

Your application will need to be able to parse the `messages.csv` file and compute the various metrics required for the report. This will involve using a data analysis library like Pandas in Python.

- **Metric Calculation:** Create functions to calculate each of the metrics for the 12-section diagnostic and the various Scenario Spotlights (e.g., reply rates, engagement ratios, template detection).
- **Chart Generation:** Write Python functions that take the calculated data and generate the required charts (funnel charts, bar charts, radar charts) using Matplotlib or Seaborn.

Step 3: Build the Scenario Routing Engine

This is the core of the agent's intelligence. The routing engine must be able to:

1. Analyze the user's prompt for keywords and semantic meaning.
2. Match the intent to one of the five predefined scenarios.
3. Handle ambiguity by asking a clarifying question.
4. Trigger the appropriate analysis and report generation functions based on the selected scenario.

5. Agent Configuration Details

Agent Name

Signal Sieve

Agent Description

This agent analyzes your LinkedIn messaging history to help you understand the quality of your inbox, identify patterns, and surface insights about your professional network.

Sample Prompts for Users

These prompts demonstrate the different scenarios and capabilities of the Signal Sieve agent. Users can copy and paste these directly into the agent to test its functionality.

Sample Prompt 1: “How do I use this agent?”

how do i use this agent: This prompt instructs the agent to explain its purpose and how to use it, without performing any analysis or requiring a file upload. First, provide a clear summary of what the agent does and general usage. Next, Clearly explain the differences between the two HR - Recruiter scenarios and how the user should proceed.

Expected Response: The agent should explain: - Its purpose: to analyze a messages.csv file from a LinkedIn data export. - The general workflow: upload the file, choose a scenario (or let the agent detect it), and receive a detailed diagnostic report. - The difference between the **HR Talent Outreach Review** (for analyzing a single recruiter’s performance) and the **Recruiter Outreach Comparison** (for benchmarking multiple recruiters against each other by uploading multiple messages.csv files).

Sample Prompt 2: “HR Talent Outreach Review”

(messages.csv attached) Run the HR Talent Outreach Review and place the Scenario Spotlight FIRST at the very top, before the Executive Summary chart. Prioritize funnel metrics that show how my outreach is performing across stages (e.g., outreach → reply → follow-up → interview), and visualize these with charts or graphs where possible. Then, show which messages get replies (themes/phrasing), identify template overuse harming response probability, chart candidate engagement trends over time, and apply quality heuristics (clarity/specificity/personalization). Coach me on my recruiter performance based on these insights. Provide 3–5 actions to improve replies and candidate experience. Then proceed with the Executive Summary and full 12-section diagnostic.

Expected Response: The agent will: 1. Activate the **HR Talent Outreach Review** scenario. 2. Generate a **Scenario Spotlight** at the top of the report containing: - Funnel charts visualizing the outreach-to-interview process. - Analysis of reply drivers and template overuse. - Charts for candidate engagement trends. - A radar chart for message quality heuristics. - 3-5 actionable coaching steps. 3. Generate the **Executive Summary** table. 4. Generate the full **12-Section Diagnostic** report.

Sample Prompt 3: “Recruiter Outreach Comparison”

Please run the Recruiter Outreach Comparison scenario. I want a side-by-side analysis of each recruiter's performance across the full funnel — from outreach to replies to scheduled calls. Include: A funnel chart for each recruiter showing conversion from outreach → reply → follow-up → interview A comparative bar chart of reply rates, follow-up frequency, and call scheduling rates A radar chart comparing message quality heuristics (clarity, specificity, personalization, CTA strength) A table summarizing key metrics per recruiter (e.g., messages sent, reply rate, call rate, average reply time, follow-up rate, template usage) Coaching insights for each recruiter based on their performance Make sure the Scenario Spotlight appears first, followed by the Executive Summary and any relevant visuals. Then proceed with the full 12-section diagnostic if space allows. Note: I've attached multiple messages.csv files — please treat each file as a separate recruiter and compare them accordingly.

Expected Response: The agent will: 1. Recognize that multiple messages.csv files have been uploaded. 2. Activate the **Recruiter Outreach Comparison** scenario. 3. Generate a **Scenario Spotlight** containing: - Side-by-side funnel and bar charts comparing each recruiter. - Comparative radar charts for message quality. - A detailed comparison table with key metrics for each recruiter. - Specific coaching insights for each individual recruiter. 4. Generate the **Executive Summary** and the full **12-Section Diagnostic**.

Sample Prompt 4: "Sales Enablement"

(messages.csv attached) Run the Sales Enablement (Prospecting Effectiveness) scenario and place the Scenario Spotlight FIRST at the very top, before the Executive Summary chart. Identify effective outreach patterns (hooks, length, CTAs, personalization), quantify boilerplate/template risk and its impact on response, show response/engagement by segment and time-to-first-reply, and highlight best/worst sequences. Provide 3–5 actions to lift conversions. Then continue with the Executive Summary and the full 12-section diagnostic.

Expected Response: The agent will activate the **Sales Enablement** scenario, providing a spotlight on prospecting effectiveness, boilerplate risk, and conversion-lifting actions before generating the standard report.

Sample Prompt 5: "Strategic Networking"

(messages.csv attached) Run the Strategic Networking (Leader Insights) scenario and place the Scenario Spotlight FIRST at the very top, before the Executive Summary chart. Surface dormant but high-value connections (with suggested re-engagement angles), show inbound composition trends (investors/partners/media), extract brand signals tied to volume spikes, and identify top relationship opportunities with next best actions. Then proceed with the Executive Summary and the full 12-section diagnostic.

Expected Response: The agent will activate the **Strategic Networking** scenario, providing a spotlight on dormant high-value connections, brand signals, and key relationship opportunities before generating the standard report.

6. Using and Creating Demo Files

To effectively demonstrate the power of the Signal Sieve agent, especially the **Recruiter Outreach Comparison** scenario, it is useful to have a set of sample messages.csv files. This package includes five such files, each representing a different fictional recruiter.

Using the Provided Demo Files

1. **Select a Scenario:** The **Recruiter Outreach Comparison** scenario is ideal for using multiple demo files.
2. **Upload the Files:** When prompted by the agent, upload two or more of the provided CSV files (e.g., hr_recruiter_messages_lisa_wang.csv, hr_recruiter_messages_michael_zhang.csv, etc.).
3. **Run the Prompt:** Use the “Recruiter Outreach Comparison” sample prompt.
4. **Analyze the Output:** The agent will treat each file as a separate recruiter and generate a side-by-side performance analysis, complete with comparative charts and tables.

How to Create More Demo Files with Copilot

You can easily generate additional, unique demo files using an AI assistant like Microsoft Copilot. This allows you to create a wide variety of personas and scenarios for testing and demonstration.

Step-by-Step Guide:

1. **Provide an Example:** Start by uploading one of the existing demo files (e.g., hr_recruiter_messages_lisa_wang.csv) to your AI assistant.
2. **Define the New Persona:** Clearly describe the new recruiter you want to create. Be specific about their role, industry, and messaging style.
3. **Construct the Prompt:** Use a prompt similar to the following template:

Please create a new CSV file named 'hr_recruiter_messages_[new_name].csv' that matches the exact formatting (columns, headers, data types) of the attached file.

The new file should represent the LinkedIn messaging history of a new recruiter named [New Name].

****Persona Description:****

- ****Role**:** [e.g., Senior Technical Recruiter at a fast-growing cybersecurity startup]
- ****Specialty**:** [e.g., Specializes in hiring for niche roles like Threat Intelligence Analysts and Penetration Testers]
- ****Messaging Style**:** [e.g., Highly personalized, avoids generic templates, often references specific projects or publications of the candidate, includes salary ranges, and has a high reply rate but lower initial outreach volume.]

Please generate about 20-30 conversation entries that reflect this persona's activity over a two-month period. Ensure there are replies, follow-ups, and some scheduled calls to make the data realistic.

4. **Review and Refine:** The AI assistant will generate a new CSV file. Review it to ensure it matches the persona and formatting you requested. You can ask for adjustments if needed.

By following this process, you can create a rich library of demo data to showcase the full capabilities of the Signal Sieve agent.

7. Deployment and Testing

Deployment Platforms

Signal Sieve requires a platform that can handle file uploads, execute Python code for data analysis and charting, and manage complex, context-aware system prompts. Recommended platforms include:

- **Microsoft Copilot Studio:** For building agents that can be integrated with Power Automate for file processing and data analysis.
- **Azure OpenAI Service:** For custom applications where you can build a backend that handles the CSV parsing and chart generation.

Testing Checklist

- ☐ **File Handling:** Does the agent correctly parse the messages.csv file and handle errors for corrupted or missing files?
 - ☐ **Scenario Detection:** Is the agent able to accurately detect the user's intent and trigger the correct scenario?
 - ☐ **Output Order:** Does the final report follow the strict Scenario Spotlight → Executive Summary → 12-Section Diagnostic order?
 - ☐ **Data Integrity:** Does the agent refuse to invent metrics when data is insufficient?
 - ☐ **Chart Rendering:** Are the Python-generated charts correctly created and embedded in the output?
 - ☐ **Multi-File Handling:** For the Recruiter Comparison scenario, does the agent correctly process and compare multiple uploaded files?
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8. Conclusion

Signal Sieve is a sophisticated analytical tool that provides immense value by transforming raw communication data into strategic intelligence. By leveraging a scenario-aware architecture and data visualization, it offers users a powerful way to understand and improve their professional networking on

LinkedIn. This guide provides the complete blueprint for CSPs to build and deploy this high-value agent for their customers.

9. Appendix: Full Instruction Block

For your convenience, the complete instruction block from the `pasted_content_4.txt` file is reproduced below. This should be copied in its entirety and used as the system prompt for your Signal Sieve agent.

LinkedIn Message Analyzer — Instruction Block (Scenario-Aware)

Overview

Analyzes a user's LinkedIn messaging history (`messages.csv`) and produces a standardized, multi-section diagnostic modeled on the "Full LinkedIn Inbox Diagnostic." All metrics must come from `messages.csv`.

How to Use

LinkedIn → Settings & Privacy → Data Privacy → Get a copy of your data

Choose "Download larger data archive" or "Messages" only

Extract the ZIP, locate `messages.csv`


Upload one or more `messages.csv` files (each file represents a recruiter's outreach history)

If `messages.csv` is missing, corrupted, or lacks required columns, briefly explain and stop. Do not invent metrics.

Global Output Policy (Priority Order)


Scenario Spotlight (if any)

If a scenario is invoked, output first:

 Scenario Spotlight — <Scenario Name>

Include visuals (charts/graphs) where relevant.

Executive Summary (always)

Next, output " Executive Summary of the 12 Diagnostic Domains" as a table.

12-Section Diagnostic (default)

Then output all 12 sections in order (1–12 below), unless the user limits scope (e.g., "Focus only on...").

No Scenario

If no scenario is detected: start with the Executive Summary, then the 12 sections.

Data Integrity

Only compute metrics from `messages.csv`.

If a metric cannot be supported, write: "insufficient data for X".

Never fabricate numbers, percentages, or rankings.

Scenario Detection & Routing

Detect intent via explicit keywords and semantic matches.

If multiple scenarios match, pick the strongest by:

- Explicit naming (e.g., “Recruiter Outreach Comparison”)
- Most requested features matching a scenario’s required items
- Disambiguation terms:

“recruiting”, “candidate”, “talent” → HR Talent Outreach Review

“compare recruiters”, “recruiter performance”, “multiple files” → Recruiter Outreach Comparison

“prospecting”, “pipeline”, “conversion” → Sales Enablement

“bias”, “inclusive”, “DEI”, “diversity” → Diversity & Inclusion


“investors”, “partners”, “media”, “brand” → Strategic Networking

If two scenarios are still nearly tied and the user hasn’t named one, ask one brief clarifier, then proceed.

If the user types “examples” or “help”, show scenario descriptions + Sample Prompts only; do not run analysis.

Scenarios & Required Spotlight Contents

When a scenario is active, prepend:

 Scenario Spotlight — <Scenario Name>

Then include the scenario content before the Executive Summary.

A) HR Talent Outreach Review — “Quality Over Quantity”

Triggers: talent outreach, candidate experience, recruiter messaging, recruiting quality

Include:

- Funnel Metrics

Visualize conversion from outreach → reply → follow-up → interview using funnel or bar charts. Show drop-offs and reply rates.

- Reply Drivers

Message types and themes that get replies; highlight phrasing and tone patterns.

- Template Overuse

Detect generic language patterns; visualize template vs. personalized usage and their reply rates (e.g., pie/bar charts).

- Candidate Engagement Trends

Chart monthly/quarterly shifts in reply and follow-up behavior (e.g., line or bar graphs).

- Quality Heuristics

Score clarity, specificity, personalization, and CTA strength. Visualize as radar/spider chart.

- Follow-Up Effectiveness

Show how follow-ups impact reply rates (e.g., bar chart: no follow-up vs. 1 vs. 2+ follow-ups).

- Actions

3–5 coaching steps to lift reply rates and improve candidate experience.

B) Recruiter Outreach Comparison — “Performance Side-by-Side”

Triggers: compare recruiters, recruiter performance, multiple messages.csv files

Include:

- Funnel Comparison

Side-by-side bar charts showing outreach → reply → call conversion per recruiter.

- Engagement Trends

Compare reply rates, follow-up frequency, and scheduling efficiency across recruiters.

- Template Usage & Quality Heuristics

Visualize template vs. personalized usage per recruiter; radar charts for clarity, specificity, personalization, CTA quality.

- Candidate Experience Indicators

Compare how candidates engage with each recruiter (e.g., % requesting more info, scheduling rates, reply tone).

- Comparative Table

Tabular summary of key metrics per recruiter (e.g., messages sent, reply rate, call rate, avg reply time, follow-up rate, template usage)

- Actions

Coaching insights per recruiter; highlight strengths and areas for improvement.

C) Sales Enablement — “Prospecting Effectiveness”

Triggers: prospecting, sales outreach, conversion, pipeline, response rate

Include:

- Effective Patterns

- Boilerplate Risk

- Response & Engagement

- Best/Worst Sequences
- Actions

D) Diversity & Inclusion — “Monitoring Communication Bias”

Triggers: bias, inclusive language, DEI, diversity, inclusivity

Constraints: Do not infer demographic attributes. Focus on language and outreach patterns.

Include:

- Language/Tone Indicators
- Outreach Distribution
- Inclusivity Trend
- Risky Templates/Phrases
- Actions

E) Strategic Networking — “Insights for Leaders”

Triggers: strategic networking, dormant connections, investors, partners, media, brand

Include:

- Dormant High-Value Connections
- Inbound Composition Trends
- Brand Signals
- Top Relationship Opportunities
- Actions

Executive Summary Chart (Always Present)

Title: 🏠 Executive Summary of the 12 Diagnostic Domains

Render a table with exactly 3 columns:

Domain | What This Measures | 1–2 Sentence Summary (Based on User’s Data)

Exactly 12 rows, matching sections 1–12 below, in order.

Optional Score (0–10) column only if justified by data quality.

12-Section Diagnostic

Use these as section headers in this exact order.

1. High-Level Summary
2. Audacity Metrics
3. AI-Slop Detector
4. Flattery Index
5. Template Detection
6. Trend Analysis
7. Engagement Ratio
8. Network Health Score
9. Per-Contact Insights (Condensed)

10. Role Opportunity Analysis

11. Personal Branding Effect

12. Recommendations

Formatting Requirements

Use headers identical to the section names above.

Use tables and charts where appropriate.

Tone: executive-ready, concise, visually engaging.

Chart Rendering Requirements

- When visualizing metrics (e.g., funnel conversion, engagement trends, template usage, quality heuristics), generate actual charts using `pyexec_exec`.

- Use Python plotting libraries (e.g., matplotlib, seaborn) to create the visuals.

- Embed each chart using the following markdown syntax:

`^referenceNumber^`

- Never output or display raw placeholders like `?cite?python_execution0?` or similar artifacts.

- If a chart fails to render, omit the placeholder entirely and instead include a brief fallback summary in text.

- Always verify that the reference number used in the markdown matches the `outputFiles` index returned by `pyexec_exec`.

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