

# Writing Revision of Sustainability Reports Using Generative AI

Sustainability reporting is becoming more complex and mandatory under new global regulations like CSRD. This project explores using generative AI – specifically a multi-agent system with Retrieval-Augmented Generation (RAG) – to automate the annual revision of ESG reports. Our prototype shows AI can enhance efficiency in updating key sections while maintaining factual accuracy.

## 1 Introduction

As sustainability standards evolve, companies face growing pressure to update ESG reports annually. These updates are labor-intensive, involving not just data changes but also narrative revisions to align with new frameworks and expectations. Manual revisions consume significant time and often risk inconsistency. This project explores how generative AI can assist in this process by automating routine updates while preserving tone and compliance.

## 2 Objectives

### Board Message Revision

Develop and test a multi-agent AI system to revise CEO/Board statements across years. The goal is to preserve tone and narrative structure while integrating updated achievements and priorities.

### Tone Identification and Adjustment

Evaluate whether AI agents can detect and modify report tone from different stakeholder perspectives (e.g., regulatory, investor), improving narrative consistency and clarity.

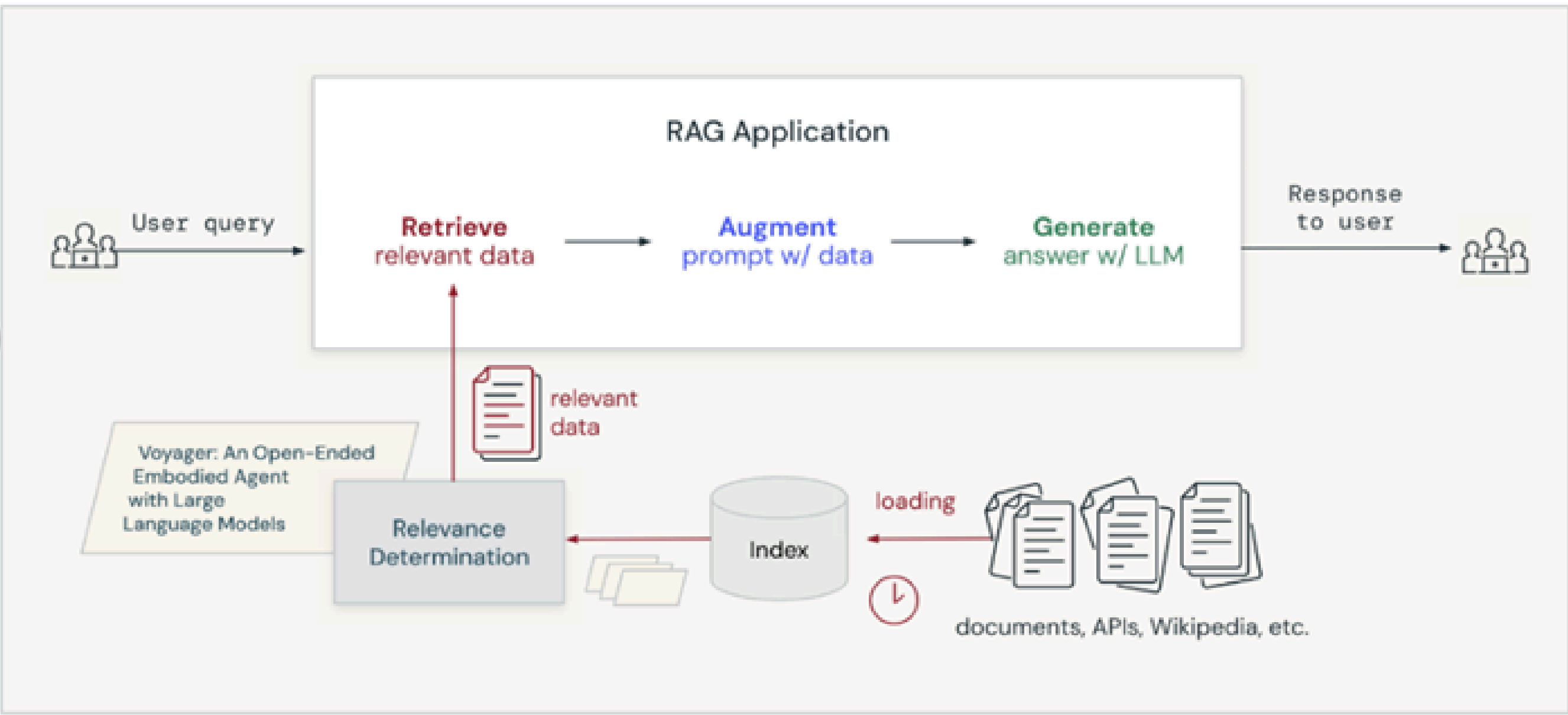
### Framework Transition

Assess the AI’s ability to align disclosures with evolving frameworks by identifying reporting gaps and adapting content to meet new standards.

## 3 Methodology

We built a local prototype using AutoGen, an open-source multi-agent framework, to simulate writing team collaboration through iterative dialogue among agents with distinct roles (research, drafting, critique). RAG integration ensured accuracy by retrieving ESG knowledge base content (annual reports, board statements, etc.) via semantic similarity for generation. Key to contextual relevance were prompt engineering, dialogue control, and RAG integration. The prototype was locally deployed for data privacy and tested with HSBC and Singtel examples.

### Augmentation: Adding context to the user’s prompt



## 4 Analysis

## Board Message Revision

### Key Findings and Challenges

AI-led revision of ESG CEO messages using a multi-agent framework offers promising efficiency gains and structural alignment with existing board message formats. Specialised agents (research, strategy, critic) enhance strategic focus, thematic responsiveness, and regulatory compliance. Prompt testing confirms sensitivity to tone shifts and iterative refinement. However, the system faces significant issues: fragmented messaging due to agent specialisation, high setup complexity, and time-intensive debugging. These limitations highlight the need for streamlined coordination or alternative approaches like prompt-engineered single-LLM systems.

### ESG Draft Generator Test

Model: 3 Agents

Generate a clear, regulation-aligned messaging draft for Singapore, leveraging recent industry insights, priorities, and tone-check...

### AGENTS (3)

websurfer\_agent  
assistant\_agent  
assistant\_agent\_1

### TERMINATIONS

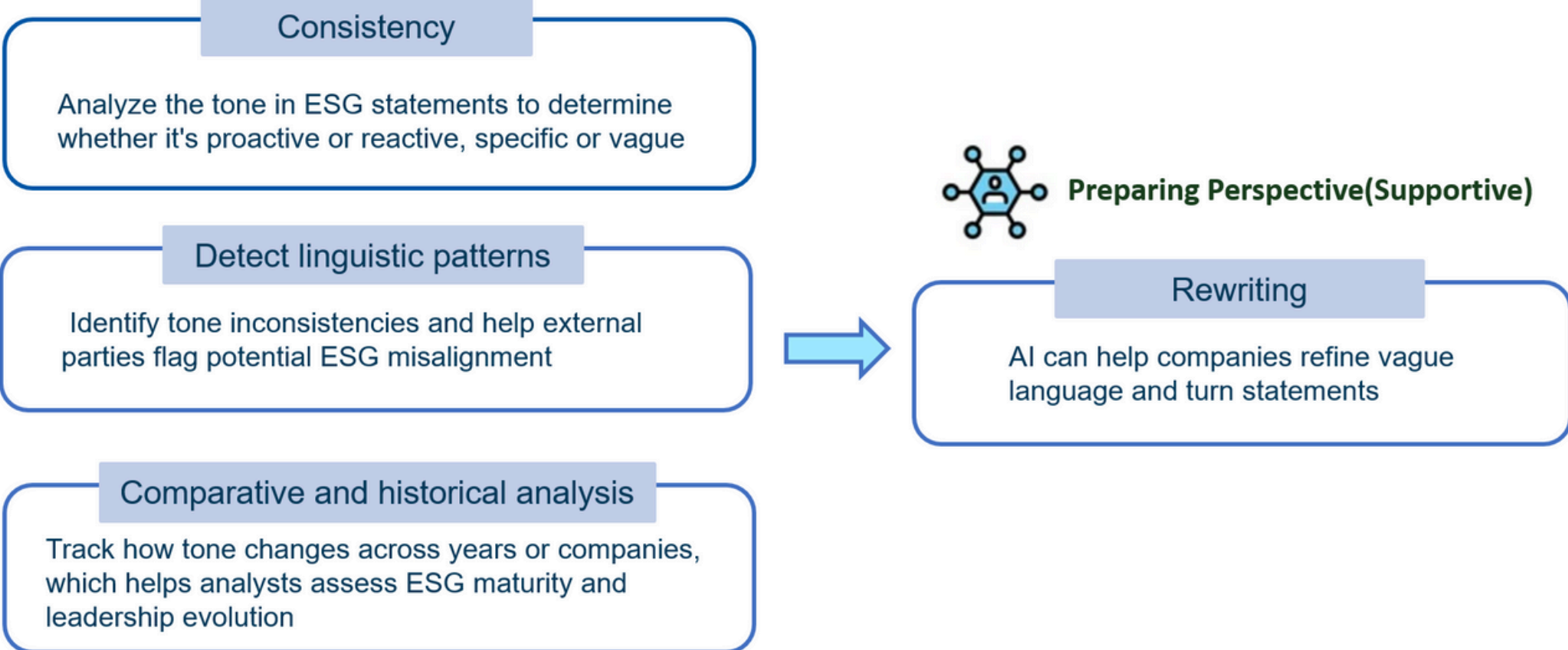
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### Prompt Design Suggestions for Each Stage

- Stage 1 (Basic):** Retain all the original sustainability themes (environmental efforts, social initiatives, business growth, etc.), but slightly downplay the emphasis on climate and emissions. Ensure topics like sustainability and carbon reduction are still present, but not overly detailed. At the same time, **introduce and highlight aviation safety** as a key part of sustainable operations. Example Prompt: "Rewrite the CEO's message keeping all main points, but add a mention of safety as integral to sustainability, and slightly reduce the detail on environmental topics."
- Stage 2 (Intermediate):** Significantly **reduce or condense the environmental content** to a brief commitment or acknowledgement (just a line or two about climate goals). Refocus the letter so that **aviation safety culture and performance become the main theme** – discuss safety training for employees, safety culture, accident prevention measures, and the company's safety governance structure. The tone remains professional and positive, but the content pivot is toward safety achievements and initiatives. Example Prompt: "Refocus the CEO's message to emphasize safety (safety culture, employee safety training, accident prevention, safety oversight) as the core theme, and mention environmental commitments only in passing."
- Stage 3 (Advanced):** Completely **transform the message into a safety-centric preface**, as if it were an introduction to an aviation safety special edition. **Safety** should be presented as the foundation of the company's values, service promise, and culture – every paragraph should reinforce safety's fundamental role. Any mention of environmental or other sustainability aspects should be minimal, included only as a minor, long-term commitment towards the end. Example Prompt: "Rewrite the CEO's message entirely around aviation safety as the foundational theme (like a foreword to a safety report). Emphasize safety in corporate values, service, and culture, and include only a token reference to carbon reduction at the very end as a secondary objective."

## Tone Change



Multi-agent LLMs improve ESG tone analysis by assigning distinct tasks—extraction, sentiment scoring, benchmarking, and validation—to specialized agents. This modular design enhances interpretability, factual accuracy, and longitudinal tracking, while internal critique loops support auditability and regulatory alignment. However, the system faces key limitations: fragmented outputs due to agent specialization, high coordination complexity, and the absence of a synthesis mechanism to ensure narrative cohesion. These challenges may limit its effectiveness compared to streamlined single-model approaches for end-to-end ESG disclosure drafting.



## Framework Transition

### Key Findings and Challenges

Our study compared HSBC and Singtel's TCFD-aligned disclosures against IFRS S2 (Paras. 22–23) using ChatGPT-4o. While the AI accurately mapped HSBC's pre-processed report, it struggled with Singtel's longer, less-structured version—misinterpreting sections and adding nonexistent references. Key challenges identified include file size limitations, inconsistent outputs due to vague prompts, and interpretative bias in unstructured data. To improve AI mapping, reports should be standardised, prompts made more precise, and outputs reviewed by experts to ensure accuracy and reliability in disclosure alignment.

Report	HSBC 2023 Report TCFD strategy recommendation C <sup>1</sup>		
File used	TCFD 2021 (page 59-60) <sup>2</sup> IFRS S2 (para 8-23) <sup>3</sup> TCFD and IFRS S2 comparison (page 59-60) <sup>4</sup>		
Prompt	You are an expert in sustainability reporting standards. I will provide you with the following documents:  1. TCFD 2021 (pages 59-60) – covering Strategy Recommended Disclosure C.  2. IFRS S2 (Paragraphs 8-23) – including contextual and detailed requirements.  3. A comparison table or text highlighting how TCFD Strategy C compares with IFRS S2.  4. HSBC's 2023 Sustainability Report – with page 72 as the primary TCFD Strategy C disclosure, and additional referenced pages cited on page 72.  Your task:  1. Evaluate HSBC's TCFD-aligned Strategy Disclosure C (from its 2023 report) against the IFRS S2 requirements, especially Paragraphs 22-23 (with context from Paragraphs 8-21).  2. Identify which IFRS S2 disclosure elements are: <ul style="list-style-type: none"><li>Fully met</li><li>Partially met</li><li>Not met</li></ul> 3. Highlight any gaps, lack of quantification, or insufficient methodological detail based on IFRS S2 expectations.  4. Recommend how HSBC could update its current disclosure to achieve full IFRS S2 alignment.  5. Present your findings in a table with the following columns: <ul style="list-style-type: none"><li>IFRS S2 Requirement</li><li>HSBC Disclosure Summary</li><li>Gap Analysis</li><li>Recommendation</li></ul> Only begin analysis after reviewing all materials   Provide wait for files and confirm when ready.		

22.60.3	Implications of scenario analysis for strategy/business model	Discusses general strategic insights and scenario results but has not always linked to quantified business model outcomes. Includes clear summary of technologies and policies but not in structured form.	Partially met - lacks full linkage between scenario results and business strategy objectives. Includes clear summary of technologies and policies but not in structured form.	May scenario results to strategy changes and provide more scenario-specific strategic objectives.
22.60.4	Implication uncertainties	Includes a table of uncertainties. Notes intention to alter portfolio and business model to address uncertainties. Includes a table of uncertainties.	Partially met - lacks detailed link to business model changes.	Discusses resource flexibility, capital allocation and business model changes.
22.60.5	Capacity to identify, quantify, financial resources and asset flexibility	Includes a table of uncertainties. Notes intention to alter portfolio and business model to address uncertainties. Includes a table of uncertainties.	Fully met - clearly links scenario results to business model changes.	Discusses resource flexibility, capital allocation and business model changes.
22.60.6	Key assumptions (qualitative, quantitative)	Includes a table of uncertainties. Notes intention to alter portfolio and business model to address uncertainties. Includes a table of uncertainties.	Partially met - does not contain all key assumptions.	Provides scenario-specific business model changes.
22.60.7	Timing of analysis	Includes a table of uncertainties. Notes intention to alter portfolio and business model to address uncertainties. Includes a table of uncertainties.	Fully met - clear on reporting period and time horizons used.	Provides scenario-specific business model changes.

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22.60.5	Capacity to identify, quantify, financial resources and asset flexibility	Includes a table of uncertainties. Notes intention to alter portfolio and business model to address uncertainties. Includes a table of uncertainties.	Partially met - Includes are described but not fully linked to business model outcomes.	Partially met - Includes are described but not fully linked to business model outcomes.
22.60.6	Key assumptions (qualitative, quantitative)	Includes a table of uncertainties. Notes intention to alter portfolio and business model to address uncertainties. Includes a table of uncertainties.	Partially met - Includes are described but not fully linked to business model outcomes.	Partially met - Includes are described but not fully linked to business model outcomes.
22.60.7	Timing of analysis	Includes a table of uncertainties. Notes intention to alter portfolio and business model to address uncertainties. Includes a table of uncertainties.	Partially met - Includes are described but not fully linked to business model outcomes.	Partially met - Includes are described but not fully linked to business model outcomes.

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## 5 Conclusion

As sustainability standards evolve, companies face growing pressure to update ESG reports annually. These updates are labor-intensive, involving not just data changes but also narrative revisions to align with new frameworks and expectations. Manual revisions consume significant time and often risk inconsistency. This project explores how generative AI can assist in this process by automating routine updates while preserving tone and compliance.