

DIGITAL HUMANISM SUMMER SCHOOL REPORT

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PROJECT:

EVALUATING THE USEFULNESS OF GENERATIVE AI IN PUBLIC CONSULTATION ANALYSIS

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Introduction

- *Background and Motivation*

Public consultations are a cornerstone of democratic governance, providing a mechanism for citizens, businesses, and organizations to voice their opinions on proposed legislation. However, the increasing volume of participation in these digital processes has created a significant bottleneck. Public authorities often struggle to process the vast amounts of unstructured data generated during these consultations efficiently.

This report reviews a case study conducted by "Team: Project D" titled Evaluating the Usefulness of Generative AI in Public Consultation Analysis. The study focuses on a specific legislative revision: the European Union's End-of-Life Vehicles (ELV) Law [1]. The motivation behind this initiative is to determine if Artificial Intelligence, specifically Large Language Models (LLMs), can address the resource constraints associated with traditional analysis methods while maintaining democratic principles of fairness and representation.

The primary goal of the EU ELV Law revision is to transition the automotive sector toward a circular economy. This involves addressing the environmental footprint of vehicles throughout their lifecycle, from design to recycling, and solving critical issues such as "missing vehicles" and illegal exports. Given the technical complexity and wide-ranging impact of this law, the consultation attracted diverse feedback from stakeholders including automotive manufacturers, recyclers, and public authorities.

We come in at this stage to examine the performance of LLMs in analysing this vast amount of unstructured data, by detailly explaining our approach in using LLMs, analysing the insights produced in this process and finally, commenting on the whole process.



Figure 1 End-of-Life Vehicles, Basie B, Getty Images

Problem Statement

The central challenge identified in the analysed document is the difficulty of synthesizing citizen feedback manually. While public consultations generate rich and diverse input, distilling this information into actionable insights is fraught with obstacles. The report identifies four specific pain points associated with current manual workflows:

- **Time Constraints:** Reviewing lengthy, free-form comments is an excessively time-consuming process that delays policy development.
- **Inconsistency:** Manual summaries often suffer from a lack of consistency when different reviewers are involved, leading to potential discrepancies in how feedback is interpreted.
- **Cognitive Overload:** Analysts face cognitive overload when attempting to process diverse or conflicting viewpoints simultaneously.
- **Scalability:** Existing manual mechanisms fail to scale effectively. As public participation grows, the ability of authorities to analyse every comment diminishes.

Furthermore, there is a risk that "subtle sentiments like sarcasm, emotion, or minority views may be flattened or ignored" in traditional summarization processes, leading to a loss of nuance.

All these pose a significant challenge in effectively, quickly, and properly analysing vast feedback from citizens, making the overall good intent laborious. This highlights a need for right and appropriate methods to ease this process.

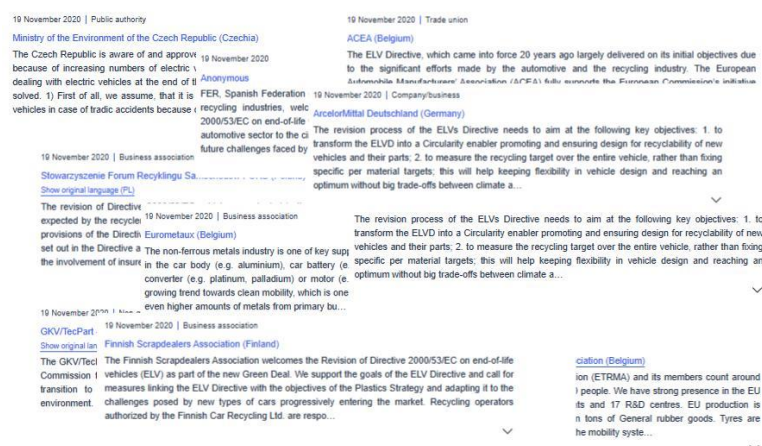


Figure 2 Feedback Extract from the Platform.

Methodology

To address these challenges, the project employed a methodology leveraging Generative AI to automate and enhance the analysis of stakeholder comments. Given LLMs ability to handle unstructured data, fast analysis, thematic clustering, and scalability, we sought to answer the question: “*Can AI help us efficiently generate fair, representative summaries of citizen feedback?*”

1. Tools:

The primary LLM used was Open AI’s Chat GPT, with assist from Google’s Gemini. This study argues that AI is uniquely working for this task because it can handle unstructured data, free-form text of varying length and style, and perform thematic clustering to identify recurring ideas. The data source consisted of feedback collected during the EU ELV Law consultation. Specific stakeholder inputs included:

- *Public Authorities*: Like The Ministry of the Environment of the Czech Republic, which commented on electric vehicles and accident handling.
- *Trade Unions and Associations*: Like ACEA (European Automobile Manufacturers Association) and Eurometaux (Non-Ferrous Metals Association).
- *Corporate Entities*: Like ArcelorMittal Deutschland.

2. Approach:

The analytical approach was divided into distinct phases:

- *Data Formatting (Preprocessing)*: The raw data often arrives as unstructured comments. The methodology involves transforming this into "Structured Comments" suitable for machine processing. While we performed this manually, it should be noted that this process could be automated using web scraping and scripting tools such as Python (utilizing libraries like BeautifulSoup, Pandas, or Regex filters).

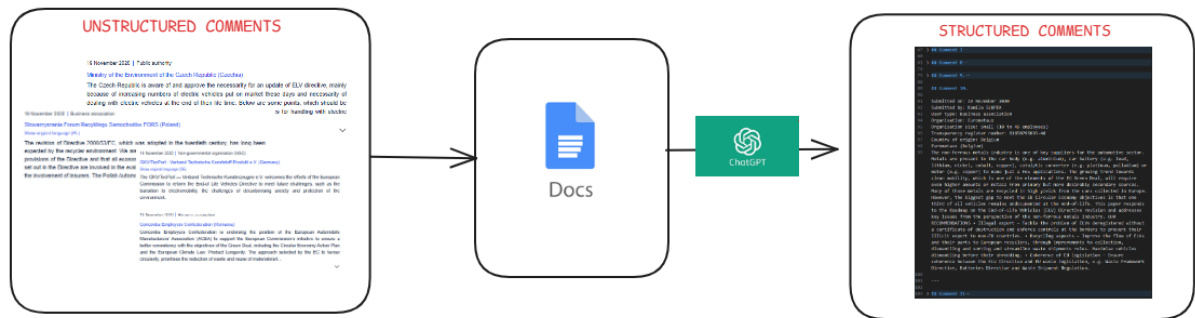


Figure 3 Data Formatting Pipeline.

- **Prompt Engineering:** The project designed specific prompts to guide the AI in different analytical tasks. The AI was instructed to adopt specific personas to enhance the quality of the output:
 - a. **The Policy Analyst Persona:** For the "Summary" and "Analysis" tasks, the prompt instructed the AI: *"You are a policy analyst reviewing stakeholder feedback on a proposed law... generate a 1-3 paragraph summary capturing the key discussion points"*.
 - b. **The Data Visualization Expert Persona:** For visual outputs, the prompt was: *"You are a data visualization expert... Your task is to create a graphical representation of the sentiment expressed"*.

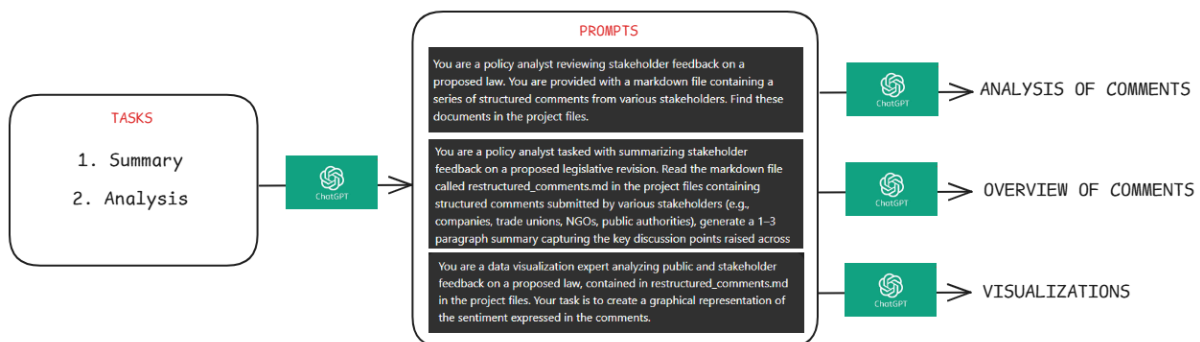


Figure 4 Prompt Generation Pipeline

- **Model Evaluation:** The methodology included a comparative evaluation of four leading AI models: Gemini, DeepSeek, Grok, and Perplexity. These models were scored based on five metrics: Coverage, Accuracy, Balance, Clarity/Conciseness, and Actionability

Results and Discussion

1. Analysis of Stakeholder Feedback

The AI-generated summaries successfully extracted complex themes from the consultation data. Key findings regarding the ELV Directive revision included:

- *Modernization and EVs*: There was broad support for modernizing legislation to align with the transition to electric vehicles (EVs). Stakeholders emphasized the need for safe dismantling procedures for high-voltage batteries and harmonized requirements for Authorised Treatment Facilities (ATFs).
- *Traceability*: A strong consensus emerged regarding the need for EU-wide digital registration to combat "missing vehicles." The systems used in the Czech Republic and the Netherlands were highlighted as effective models.
- *Extended Producer Responsibility (EPR)*: While the principle of EPR was widely endorsed, implementation views diverged. Industry actors debated between centralized schemes versus manufacturer-led systems.
- *Recycled Content*: The proposal for mandatory recycled content targets, particularly for plastics, elicited mixed reactions. Recyclers and NGOs supported them to stimulate innovation, while automakers raised concerns regarding safety and supply chains.
- *Legal Inconsistencies*: Stakeholders flagged conflicts with other EU laws like REACH and the Batteries Regulation.

The exact AI-generated summary produced by the LLM was:

Stakeholder feedback on the proposed revision of the End-of-Life Vehicles (ELV) Directive reveals broad support for modernizing the legislation to align with current technological trends, particularly the transition to electric vehicles (EVs), and to address persistent challenges in enforcement and circularity. A recurring theme across sectors—including automotive manufacturers, recyclers, public authorities, and NGOs—is the need to adapt the Directive to manage the growing volume of EVs and high-voltage batteries, with specific emphasis on safe dismantling, battery traceability, and harmonized requirements for Authorised Treatment Facilities (ATFs). There is strong consensus on improving the traceability of ELVs through EU-wide digital registration and deregistration systems, seen as essential for combating the widespread problem of unaccounted or illegally exported vehicles. Many stakeholders highlight the Czech Republic's insurance-linked system and the Netherlands' integrated vehicle registry as effective models to reduce "missing vehicles" and improve end-of-life compliance.

While most contributors endorse the principle of extended producer responsibility (EPR), views diverge on its implementation. Some industry actors support centralized schemes funded by modest owner contributions, while others emphasize manufacturer-led systems to offset costs borne by dismantlers. The proposal for mandatory recycled content in vehicles—especially plastics—elicits mixed reactions. Recyclers and NGOs support progressive targets to stimulate demand and innovation, whereas automakers and component suppliers caution against such mandates, citing safety, material degradation, and supply chain limitations. Stakeholders also flag inconsistencies between the ELV Directive and other EU laws, such as the Batteries Regulation and REACH, advocating better legal alignment to avoid overlapping or contradictory requirements.

Innovative and sector-specific suggestions include promoting eco-design to ease disassembly and increase reuse; requiring vehicle information systems (like IDIS) to provide comprehensive dismantling data; and recognizing parts removed for reuse as non-waste to reduce legal uncertainty. Several submissions call for stricter regulation of online spare parts sales and stronger controls at borders to stem illegal flows of vehicles and components. Concerns were also raised about the treatment of specific materials—such as glass, rubber, and polymer composites—and the lack of obligations for their proper recycling. Overall, stakeholders urge a more coherent, enforceable, and adaptable Directive that fosters environmental performance, market fairness, and safety, while remaining technically and economically viable for all actors in the ELV value chain.

2. Statistical Analysis by LLM:

Bellow are statistical insights generated by the LLM and presented in charts.

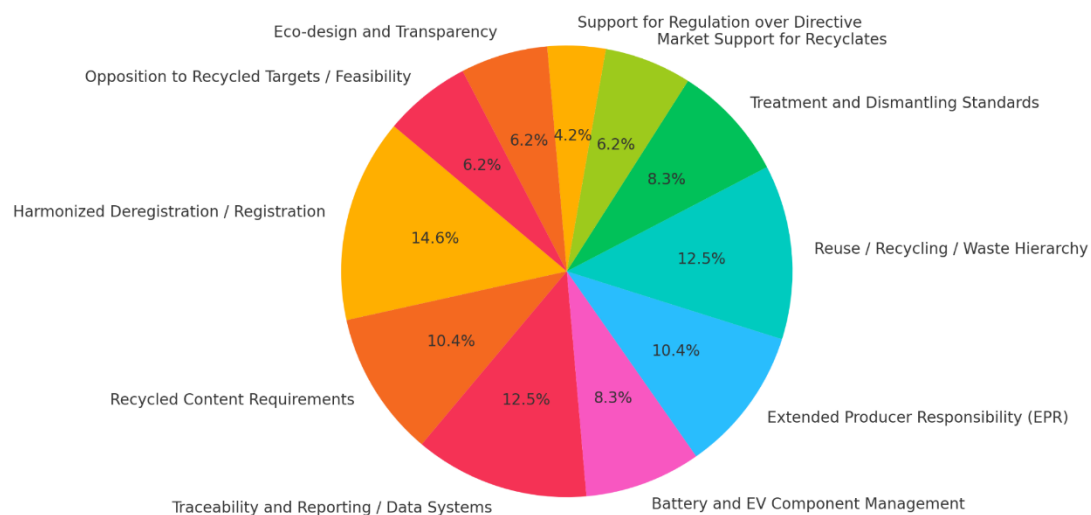


Figure 5 AI-Generated Analysis (Major themes)

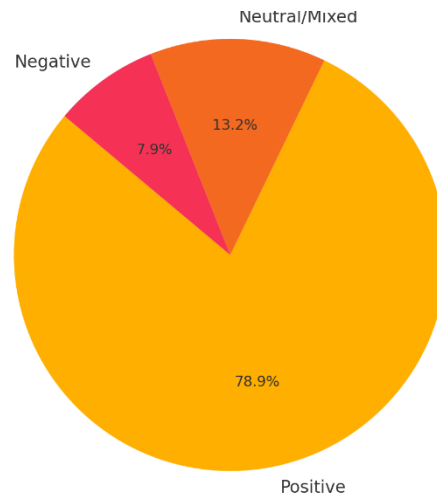
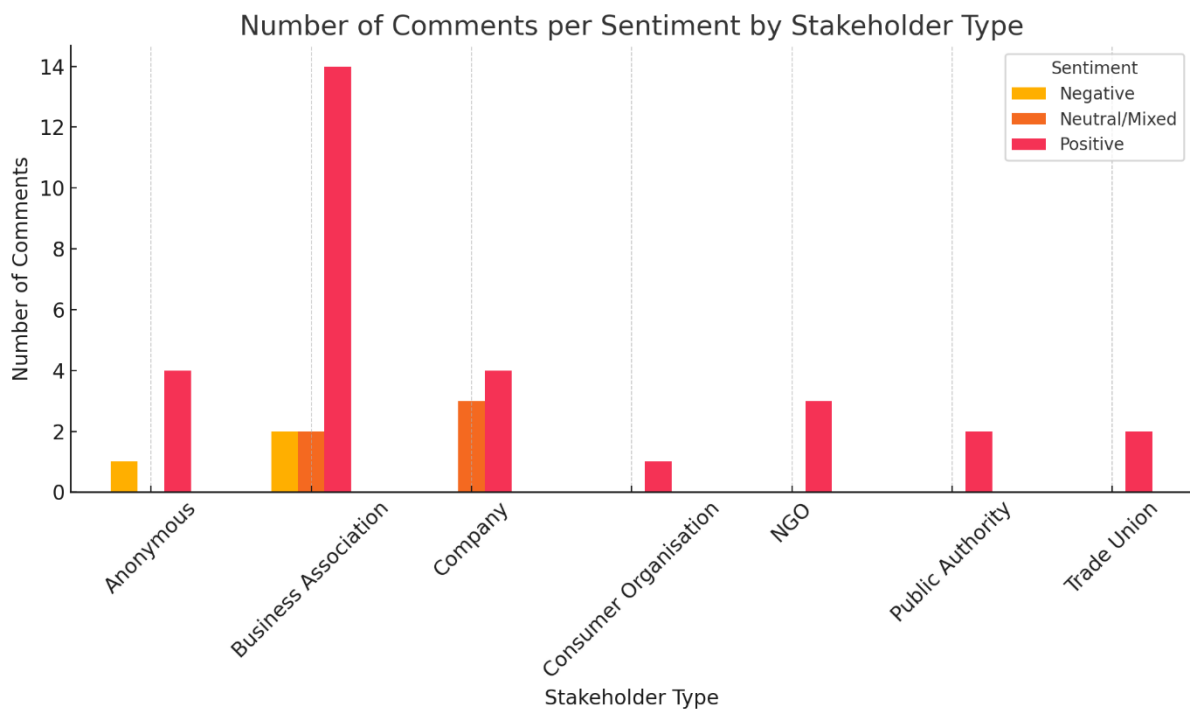


Figure 6 Sentiment Distribution of Responders



3. Model Performance Evaluation:

The performance of the AI model (Chat GPT) on a 5-point scale was quantified by feeding the annalysis back into different LLMs to judge. Five comparison matrices were choosen: coverage, accuravy, balance, clarity/conciseness, Actionability. Perplexity achieved the highest overall score, followed closely by Gemini. The detailed scores were summerised in the table bellow.

Metric	Coverage	Accuracy	Balance	Clarity/ Conciseness	Actionability	Average
Gemini	4	5	5	5	5	4.8
DeepSeek	4	5	4	5	5	4.6
Grok	4	4	5	5	4	4.4
Perplexity	5	5	5	5	5	5.0
						4.7

Figure 7 Performance Matrix as Judged by Other LLMs

4. Potential Analysis Risks:

We identified potential risks that comes with AI assisted analysis of data including:

- *Hallucination Risk:* The possibility of AI generating plausible but inaccurate statements.
- *Bias Propagation:* AI models may reflect or amplify existing societal biases present in the training data.
- *Over-Summarization:* The risk that important but less frequent viewpoints are omitted in the pursuit of brevity.

Based on this, we propose the following ethical considerations:

- *Transparency:* Users must know how summaries are generated.
- *Responsibility:* Final decisions must always be human-led.
- *Privacy:* Data protection standards (e.g., GDPR) must be respected.

Conclusion

1. Learning:

This case study demonstrates that Generative AI can transform public consultation from a bottleneck into a dynamic asset. By efficiently summarizing vast amounts of text, LLMs allow policymakers to gain real-time insights into public sentiment. This project showed that with the right prompt engineering, specifically "humanizing" the comments, technology can create a partnership for growth.

2. Next Steps

We envisage a "participatory AI ecosystem." In this future state, citizens are not only consulted but are also informed about how their input is analysed and used. The ultimate goal is not for AI to replace public discourse, but to amplify it. With responsible use, AI can make democratic consultation "smarter, fairer, and more inclusive"

Reference.

- [1] "End-of-Life Vehicles - Environment - European Commission." Accessed: Nov. 26, 2025. [Online]. Available: https://environment.ec.europa.eu/topics/waste-and-recycling/end-life-vehicles_en