

# The Evolution of Topic Modeling

Exploring how topic modeling has transformed from statistical methods to Al-powered intelligence.

Uncovering how these technologies help businesses extract meaning from mountains of unstructured text data.

### Neha Singh



## The Problem with Feedback

Modern businesses face an overwhelming flood of customer feedback across multiple channels. The structured part is easy. But what about the open comments? What are people really saying?"

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# What Is Topic Modeling?

### Definition

Topic modeling uncovers hidden themes in large volumes of text data at scale.

### **Business Challenge**

Companies collect massive amounts of unstructured feedback daily.

### Applications

Voice of Customer analysis, survey processing, and NPS verbatim insights.



### **Before LLMs: Rules, Probabilities & Limitations**



### Why Traditional Methods Started Falling Short



85% of business data is unstructured." – Gartner



## After LLMs: Context-Rich, **Embedding-Based Models**



## **Topic Modeling on Customer Feedback**



### **Pre-trained Models**

BERT and RoBERTa provide rich language understanding.

### **Nuanced Insights**

Systems identify specific topics like "AI ethics" accurately.

## Contextual embeddings capture subtle

BERTopic leads state-of-the-art topic

## Traditional vs LLM-Powered Topic Modeling

### **Before (LDA-based)**

- Topic 1: "delay, parts, service"
- Topic 2: "cost, warranty, repair" ٠
- Topic 3: "staff, rude, experience"

**Insight:** Vague, overlapping topics requiring manual labeling.

### After (LLM-based)

- Topic A: "Delayed delivery of spare parts for premium SUVs"
- Topic B: "Repeated battery failure in hybrid models" •
- Topic C: "Service advisors pushing unnecessary paid services"

**Insight:** Specific, actionable insights for immediate business decisions.

### **Success Story: Topic Modeling in E-commerce**

An e-commerce retailer faced mounting customer service challenges:



## Future Direction: LLMs + Agents for Dynamic Insights



Start with BERTopic or Top2Vec for quick wins in customer experience text analytics.

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