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📰 News Popularity Intelligence System

Transformer-Based AI for Editorial Ranking & Media Intelligence

🧠 How the Model Infers Popularity

1 Latent Popularity Concept

Popularity is treated as a latent variable rather than a supervised label. Since real engagement metrics (clicks, shares) are unavailable, the system infers attention potential using semantic intelligence.

2 Transformer Representation Learning

• Title and description are concatenated
• DistilBERT extracts contextual embeddings
• Articles are mapped into high-dimensional semantic space
• Clustering identifies attention-driven groups

3 Popularity Scoring Logic

The final popularity score is computed using a fusion of:

• Embedding-based cluster strength
• Emotional intensity
• Urgency-related keywords
• Lexical diversity

```
Base Score = 1 - (Cluster_ID / Total_Cluster

Signal Boost =
    (Sentiment * 0.2)
  + (Urgency_Terms * 0.1)
  + (Lexical_Diversity * 0.2)

Final Popularity Score =
    min(Base Score + Signal Boost, 1.0)
```

• The base score reflects semantic cluster positioning
• Signal boost enhances articles with emotional and urgent tone
• Score is normalized between 0 and 1

4 Why This Works Without Labels

Even without real engagement labels, articles with:

• Urgency • Emotional intensity • Clear narrative structure

tend to cluster together in embedding space.

These clusters are interpreted as high-attention groups, allowing the system to rank articles meaningfully.

> If real engagement data becomes available, the Transformer can be fine-tuned with a regression head for direct supervised popularity prediction.