

# Generating Multiple Questions from Presentation Transcripts: A Pilot Study on Earnings Conference Calls

Yining Juan,<sup>1</sup> Chung-Chi Chen,<sup>2</sup> Hen-Hsen Huang,<sup>3</sup> Hsin-Hsi Chen<sup>1</sup>  
<sup>1</sup>Department of Computer Science and Information Engineering, National Taiwan University, Taiwan  
<sup>2</sup>National Institute of Advanced Industrial Science and Technology, Japan  
<sup>3</sup>Institute of Information Science, Academia Sinica, Taiwan

### Scenario



### Earnings Conference Calls



**Outline:**

- Prepared Remarks**
  - Operator
  - Director, Investor Relations and Corporate Finance
  - Chief Executive Officer
  - Chief Financial Officer
- Questions and Answers**
  - Operator
  - Q: UBS – Analyst  
A: CEO
  - Q: Credit Suisse – Analyst  
A: CFO
  - Q: Credit Suisse – Analyst  
A: CEO
  - ...

### Multi-Question Generation (MQG)

**Presentation**  
 Good day, and welcome to the Apple Q4 fiscal year 2022 earnings conference call. . .

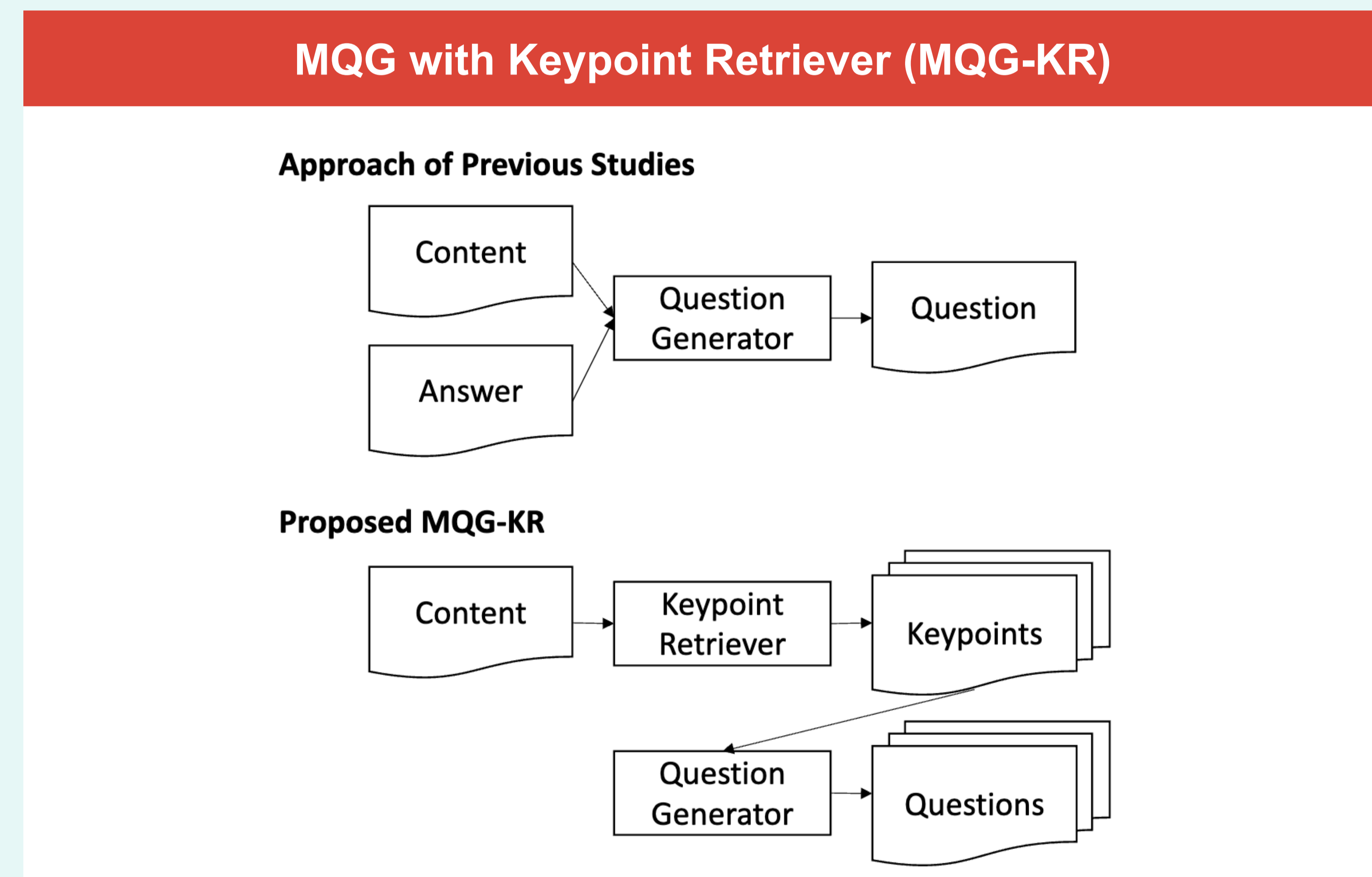
**One-to-One Question Generation**  
*Condition: gross margin*  
 Can you talk a bit about gross margin puts and takes?

**Proposed MQG**

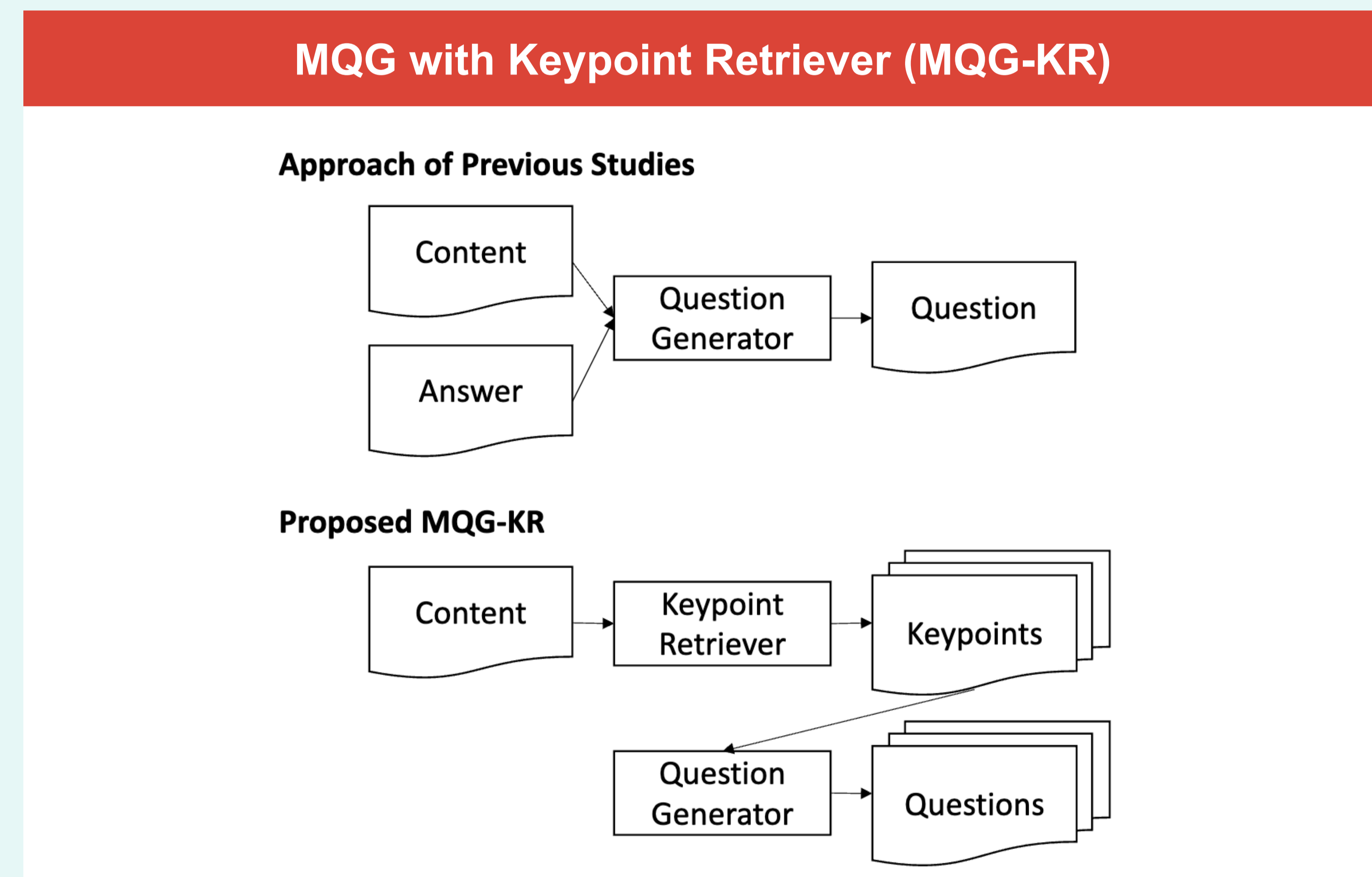
- Can you talk a bit about gross margin puts and takes?
- How you think about balancing the consumer price versus your own costs and kind of the associated follow-through?
- Any preliminary thoughts around capital intensity into fiscal 2023?

### MQG with Keypoint Retriever (MQG-KR)

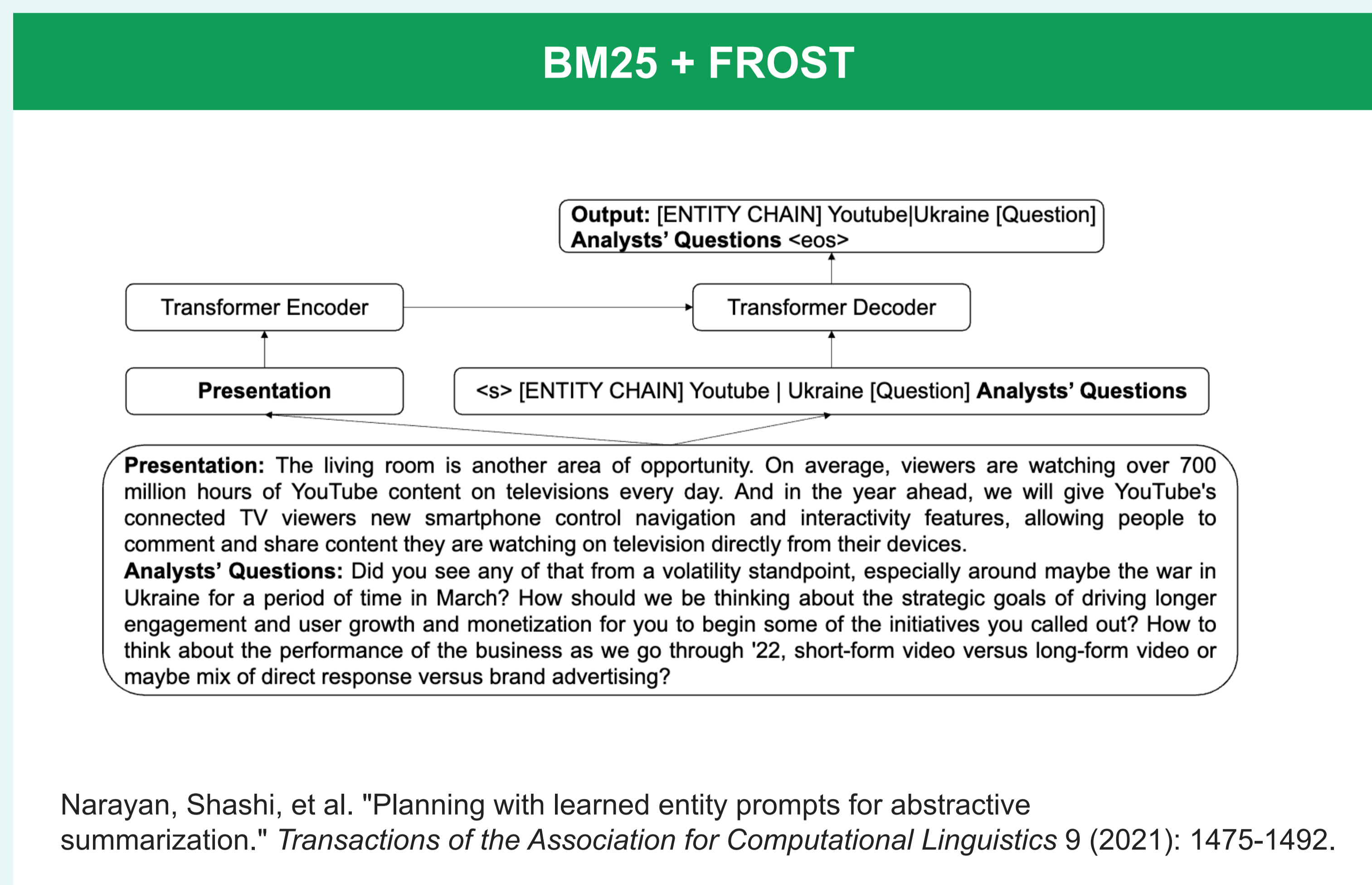
**Approach of Previous Studies**



**Proposed MQG-KR**



### BM25 + FROST



**Output:** [ENTITY CHAIN] Youtube|Ukraine [Question]  
**Analysts' Questions** <eos>

**Presentation:** The living room is another area of opportunity. On average, viewers are watching over 700 million hours of YouTube content on televisions every day. And in the year ahead, we will give YouTube's connected TV viewers new smartphone control navigation and interactivity features, allowing people to comment and share content they are watching on television directly from their devices.

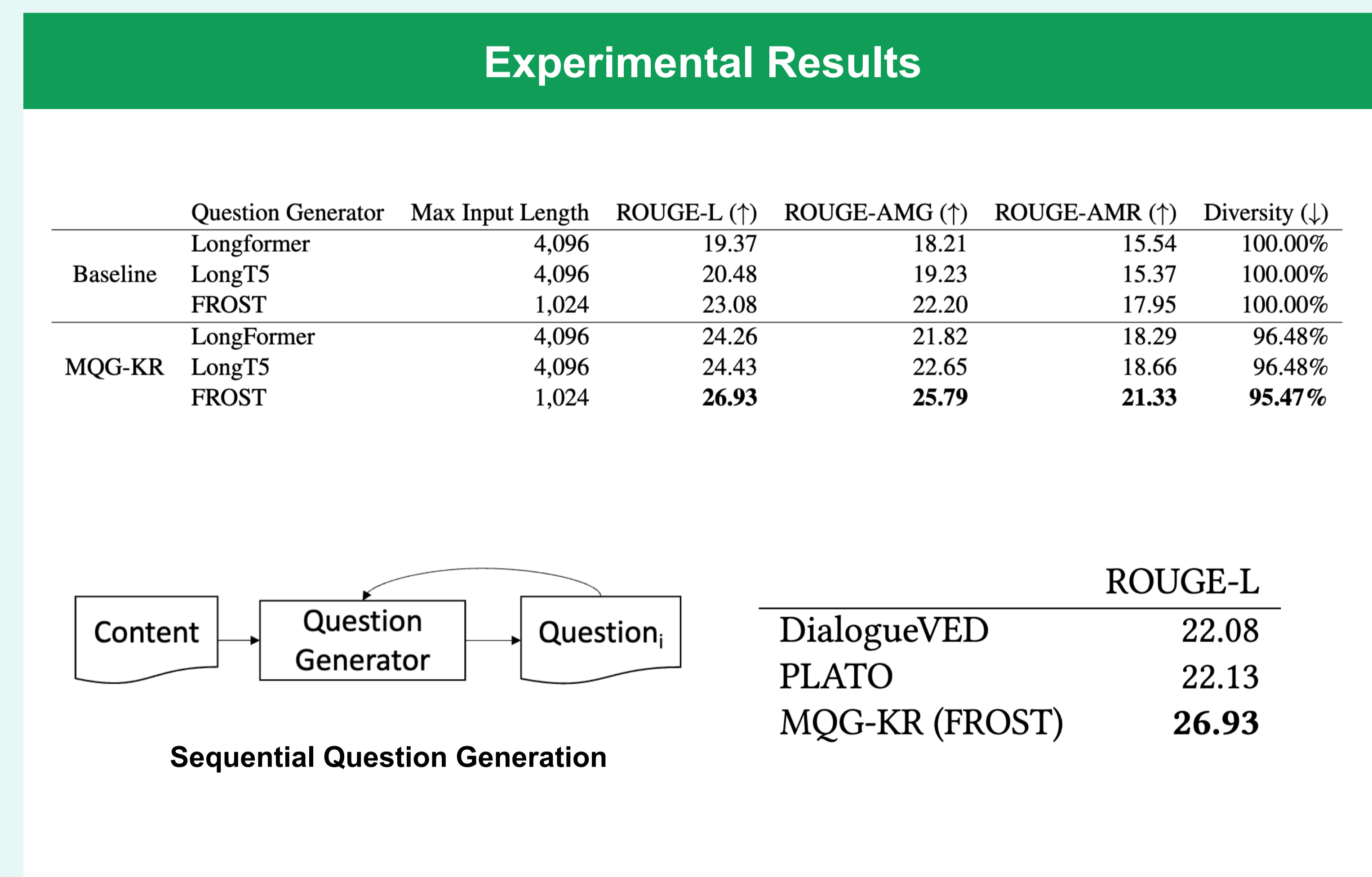
**Analysts' Questions:** Did you see any of that from a volatility standpoint, especially around maybe the war in Ukraine for a period of time in March? How should we be thinking about the strategic goals of driving longer engagement and user growth and monetization for you to begin some of the initiatives you called out? How to think about the performance of the business as we go through '22, short-form video versus long-form video or maybe mix of direct response versus brand advertising?

Narayan, Shashi, et al. "Planning with learned entity prompts for abstractive summarization." *Transactions of the Association for Computational Linguistics* 9 (2021): 1475-1492.

### Experimental Results

	Question Generator	Max Input Length	ROUGE-L (↑)	ROUGE-AMG (↑)	ROUGE-AMR (↑)	Diversity (↓)
Baseline	Longformer	4,096	19.37	18.21	15.54	100.00%
	LongT5	4,096	20.48	19.23	15.37	100.00%
	FROST	1,024	23.08	22.20	17.95	100.00%
MQG-KR	LongFormer	4,096	24.26	21.82	18.29	96.48%
	LongT5	4,096	24.43	22.65	18.66	96.48%
	FROST	1,024	26.93	25.79	21.33	95.47%

**Sequential Question Generation**



	ROUGE-L
DialogueVED	22.08
PLATO	22.13
MQG-KR (FROST)	26.93

### Future Directions

**Preparing for a Presentation:**  
 Academia Conference Presentation, Political Speech, Debate...

**Retriever and Generator:**  
 Generative IR, Large Language Models

**Question Diversity:**  
 Same Topic, Too Simple, Unprofessional

(Q1) What was the total revenue for Apple in Q1 2023?  
 (Q2) What were the markets where Apple set all-time revenue records in Q1 2023?  
 (Q3) How did COVID-19 impact the supply of iPhone 14 Pro and iPhone 14 Pro Max?  
 (Q4) What are some of the new features introduced for Apple Watch Series 8 and Apple Watch Ultra?  
 (Q5) What is the next-generation HomePod and what features does it offer?

### Numeral Understanding and Generation

**NumEval @ SemEval-2024**

Subtask	Question	Answer
QP	FED'S DUDLEY REPEATS EXPECTS GDP GROWTH TO PICK UP IN 2014, FROM [Masked] PCT POST-RECESSION AVERAGE	1
QNLI	S1: Nifty traded above 7500, Trading Calls Today S2: Nifty above 7400	Entailment
QQA	Elliot weighs 180 pounds whereas Leon weighs 120 pounds. Who has a bigger gravity pull? Option1: Elliot Option2: Leon	Option 1

<http://numeval.nlpfin.com/>

**News:**  
 At least 30 gunmen burst into a drug rehabilitation center in a Mexican border state capital and opened fire, killing 19 men and wounding four people, police said. Gunmen also killed 16 people in another drug-plagued northern city. The killings in Chihuahua city and in Ciudad Madero marked one of the bloodiest weeks ever in Mexico and came just weeks after authorities discovered 55 bodies in an abandoned silver mine, presumably victims of the country's drug violence. More than 60 people have died in mass shootings at rehab clinics in a little less than two years. Police have said two of Mexico's six major drug cartels are exploiting the centers to recruit hit men and drug smugglers, ...  
**Headline (Question):** Mexico Gunmen Kill \_\_\_\_\_  
**Answer:** 35  
**Annotation:** Add(19,16)