



# Question Craft

**Presented by Khush Agarwal**

# Problem

- Traditional study methods (re-reading, note review) rely on **passive learning**, reducing retention and understanding.
- Passive techniques **limit long-term retention** and comprehension of complex topics.
- Ineffective exam prep stems from a **lack of dynamic, tailored question sets**.
- **Active recall** (answering/retrieving questions) boosts retention and critical thinking.
- A solution is needed: customized, varied question sets to improve engagement, comprehension, and confidence.



# Introducing QuestionCraft

Question Craft is a web application which aims to develop an AI-powered system that enhances student learning and engagement through **automated question generation and evaluation.**

## Scope:

- Educational documents (PDFs under 200 pages)
- High school business learners and instructors
- generating diverse question-answer pairs
- practice and learn from provided pdfs.





**OCR from PDFs**

**Automatic Topic Identification**

**Question Customization**

**Dynamic Question Generation**

**Other Features:**

Summary  
Explanation  
Source  
Fast Mode

**Intuitive User Interface**



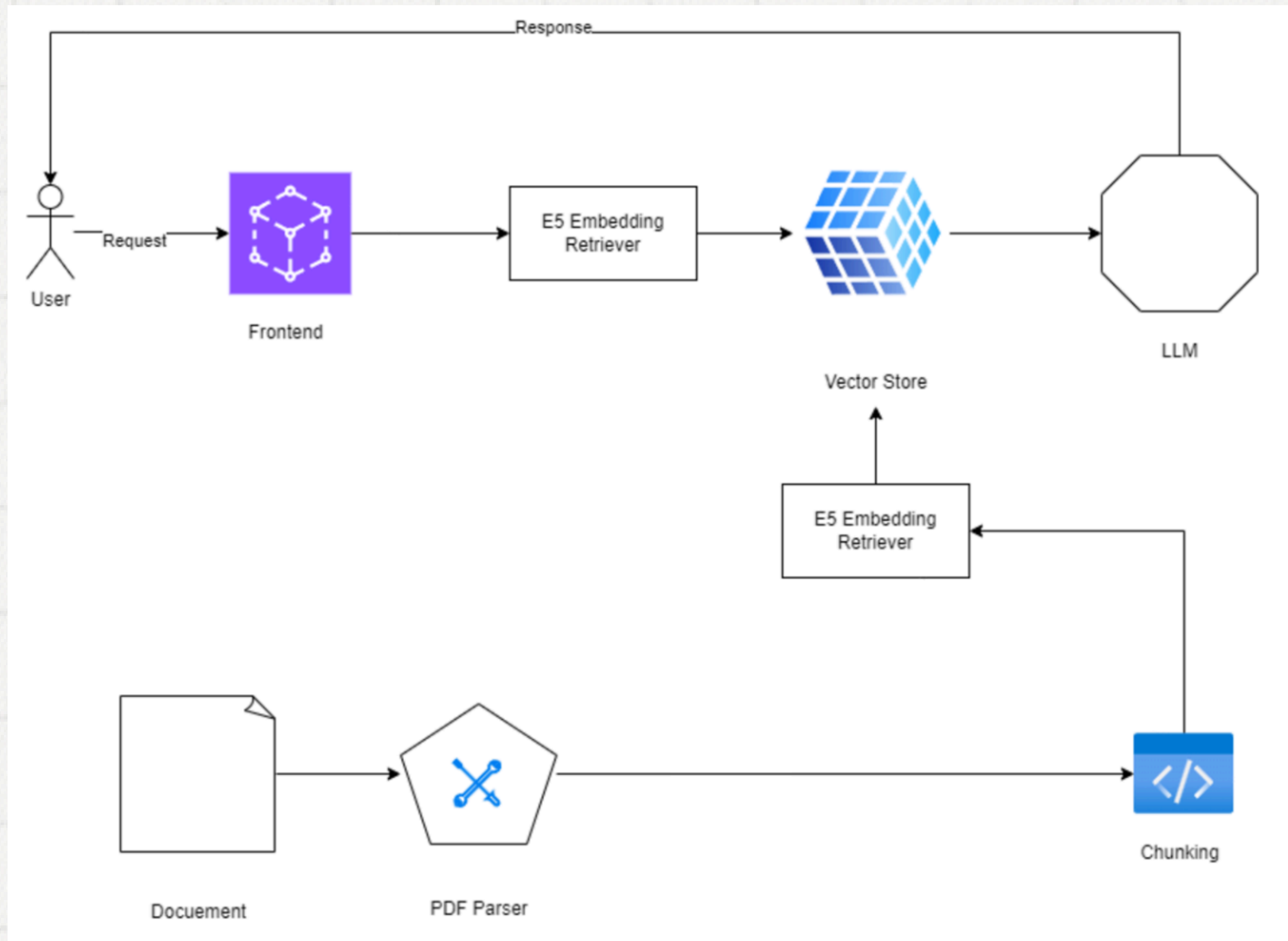


# How it works?

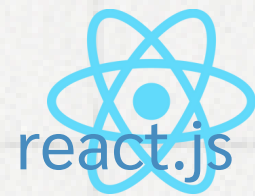
Let's see a demo



## Assessment Module



### Front-end



### Back-end



FastAPI Python



### LLMS

hermes-3-llama-3.1-405b

llama-3.1-405b-instruct

qwen-2-7b-instruct

Embedding Model: ggrn/e5-small-v2

### LLM Tooling



LangChain

Provider: OpenRouter

OpenRouter  
Embedding Provider: HuggingFace

### Other-tools

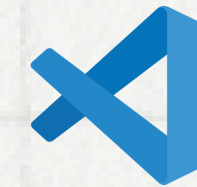


POSTMAN

PDF: pypdfium2



OCR: PaddleOCR



visualstudio code




github



Relevance




General Quality  
Quality



Answers

# Evaluation

Judge LLMs



Single Output  
Scoring (without  
reference)



2 PDF,  
3 Topics per pdf,  
231 Total Questions



```
relevance_prompt_template = ChatPromptTemplate.from_messages([
    ("system", """"Evaluate the relevance of the question based on the provided context and topic.
    A relevant question evaluates the understanding of the topic from the given context,
    should only include information present in the context, avoids inventing new details, and not contradict the context.
    Return one of the following relevancy scores between 1-5.
    \n\n{format_instructions}"""),
    ("user", """"
    Question: {question}
    Topic: {topic}
    """)
], )
```

#Provide guide on a quality question

```
general_quality_prompt_template = ChatPromptTemplate.from_messages([
    ("system", """"Evaluate the quality of the question based on the provided context and topic.
    A high-quality question is grammatically correct, coherent, and relevant to the context and topic.
    Return one of the following quality scores between 1-5.
    \n\n{format_instructions}
    """),
    ("user", """"What is the quality of the question?
    Question: {question}
    Topic: {topic}
    """)
])
```

```

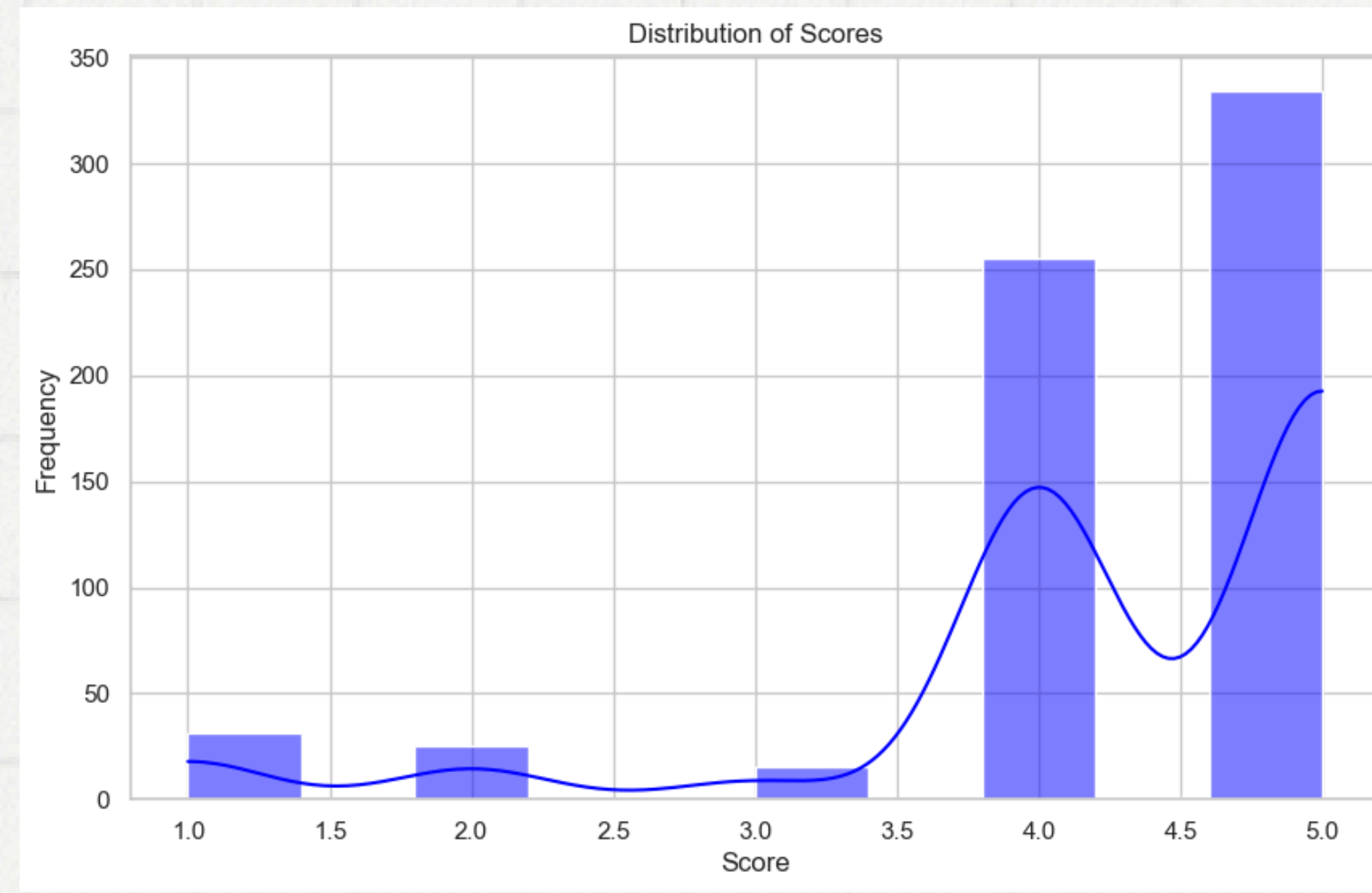
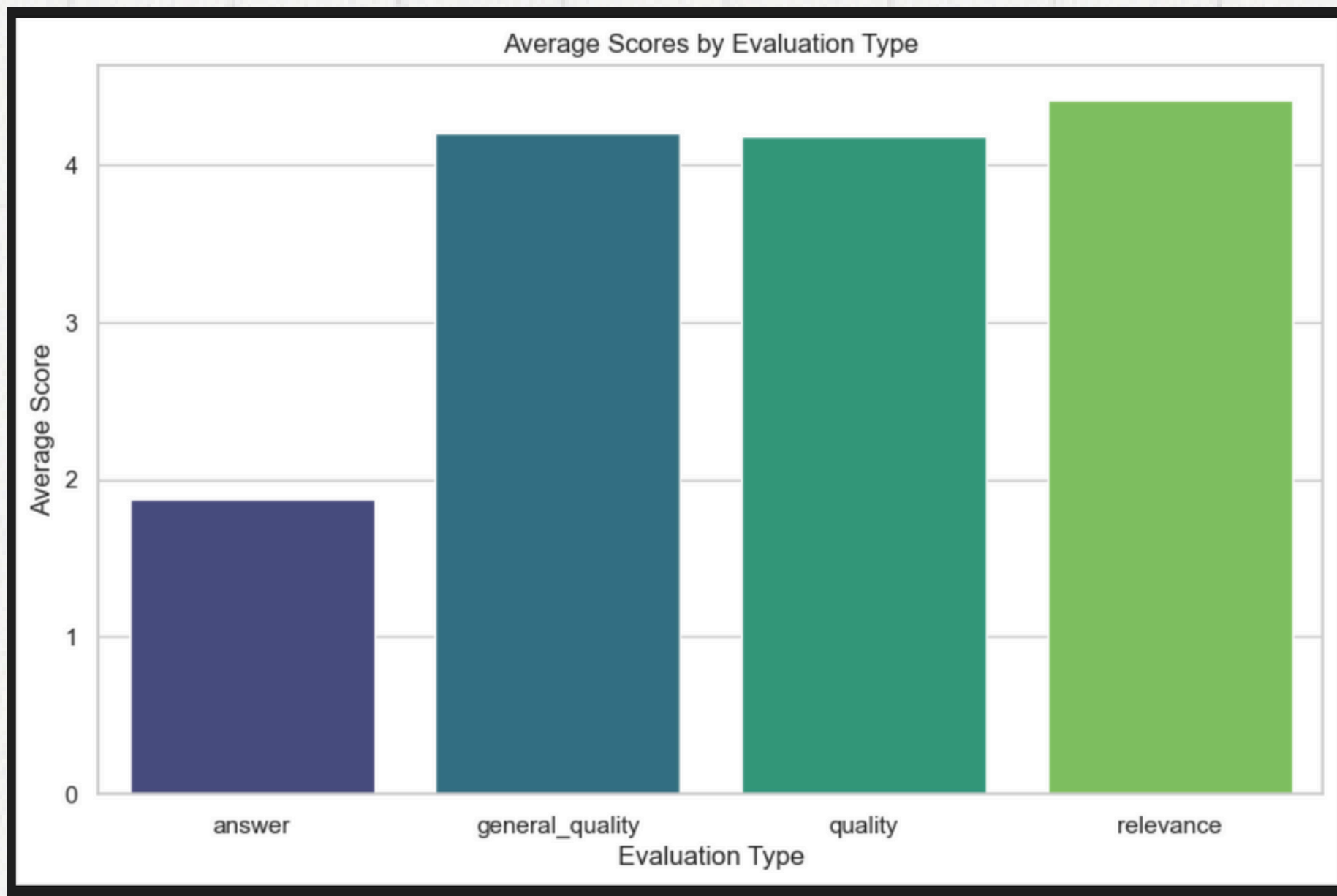
mcq_quality_prompt_template = ChatPromptTemplate.from_messages([
    ("system", """"Evaluate the quality of the multiple-choice question based on the provided context and topic.
    Use the following criteria:
        Is the question clear, concise, and unambiguous?
        Is the question relevant to the topic?
        Are the distractor options plausible and reasonable, avoiding obvious incorrect answers?
        Is the correct answer definitively correct and unambiguous?
        Does the question challenge the learner to think critically or apply their knowledge beyond rote memorization?
        Return a score between 1 and 5, where 1 is the lowest quality and 5 is the highest quality.
    \n\n{format_instructions}
    """),
    ("user", """"
    Question: {question} \n\n
    Topic: {topic}
    """)
])

```

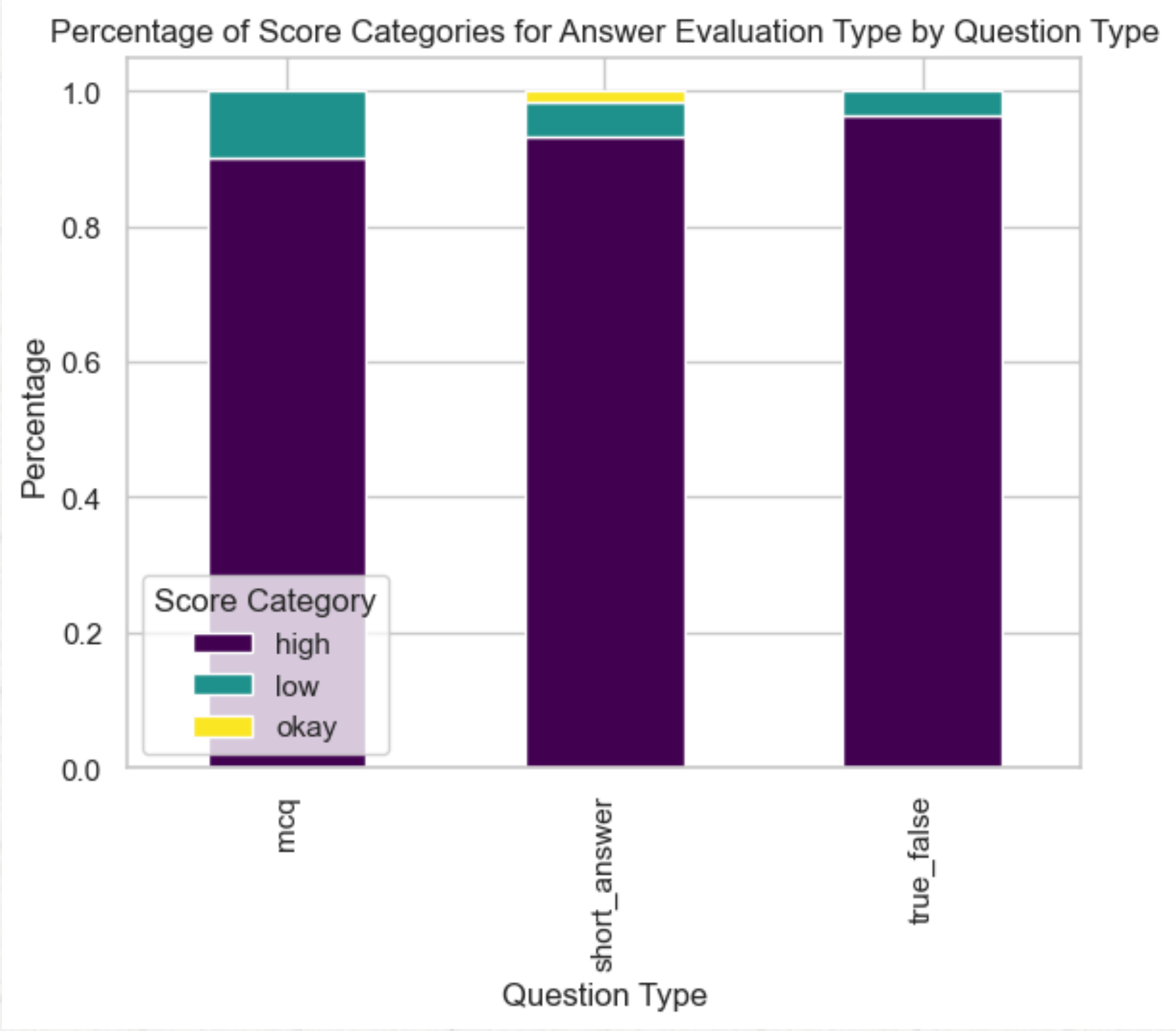
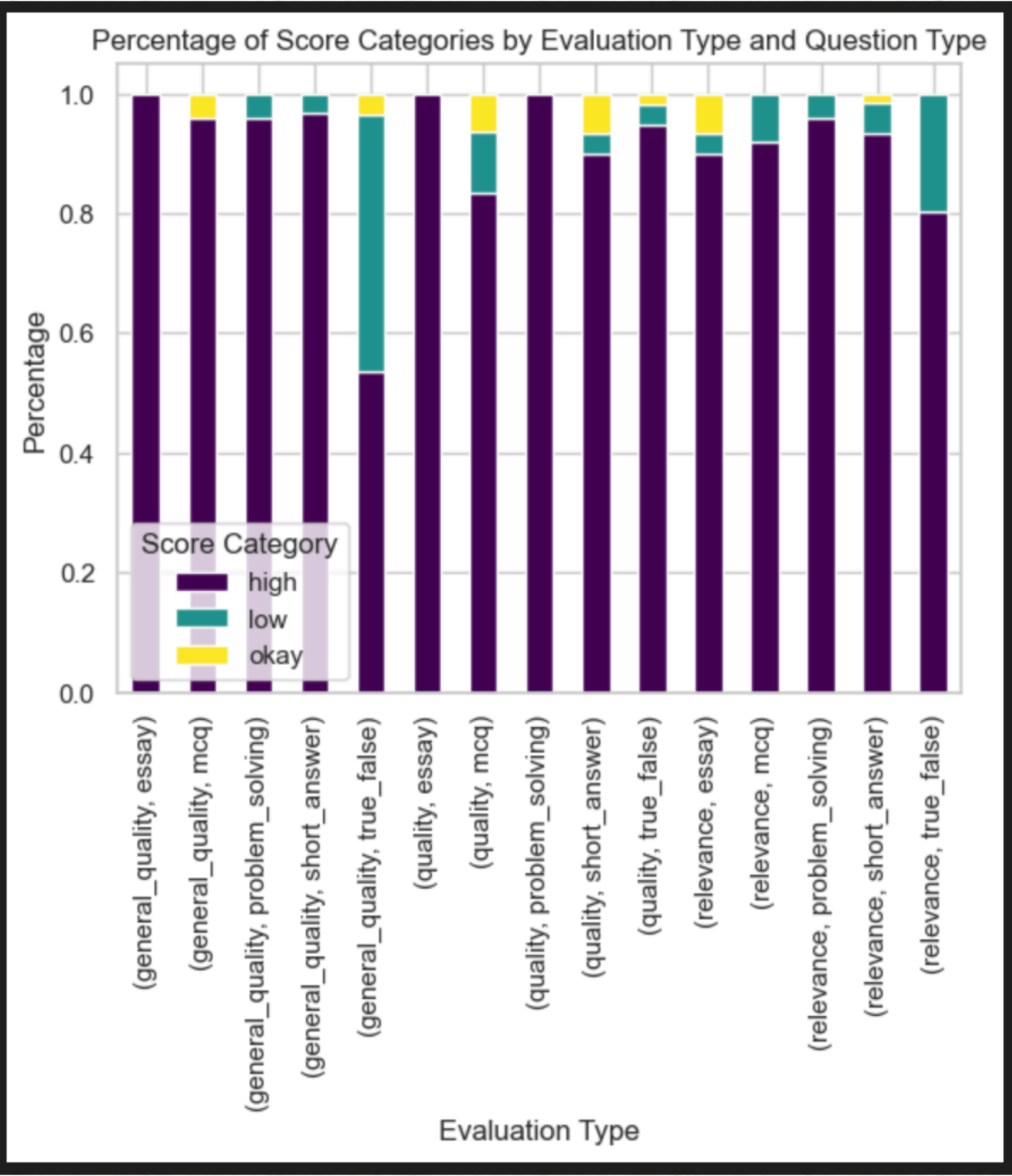
```

answer_evaluation_prompt_template = ChatPromptTemplate.from_messages([
    ("system", """"Evaluate the correctness of the answer.
    Use the following criteria:
        Does the answer provide a correct response to the question?
        Is the answer relevant to the question and topic?
        Return a score of 0 if the answer is incorrect, a 1 if the answer is partially correct, and a 2 if the answer is fully correct.
    \n\n{format_instructions}
    """),
    ("user", """"
    Question: {question} \n\n
    Topic: {topic}
    """)
])

```



**Answer Score from 0-2, Others: 1-5**





Score	Reason	Eval Type	Question Type
2	The question is well-structured and clear, but it is not directly related to the given topic of Finance. It would be more appropriate for a topic like Marketing or Business Strategy.	general_quality	problem_solving
1	The question is not actually a question, but rather a statement. It is incomplete and lacks coherence and relevance to the given topic of supply chain management.	general_quality	true_false
1	The given text is not a question at all. It appears to be an excerpt from a journal article about a company's supply chain process, with no clear question being asked.	general_quality	true_false
2	The question is relevant to the topic of supply chain management and sales representative compensation. However, the question itself is not very clear or concise. The options are also not very plausible, as they are all percentages of the amount sold, which are quite high. The correct answer is also not definitively correct, as there could be other factors that influence the pay of sales representatives. The question does not challenge the learner to think critically or apply their knowledge beyond rote memorization.	quality	mcq
2	The statement is clear and straightforward, but it does not directly relate to the key concepts of the triple bottom line (economic, social, and environmental sustainability). The partnership with Siemens to develop an MIS system primarily impacts economic factors like reducing labor costs, but the question doesn't make the connection to the triple bottom line clear.	quality	true_false
1	The question is about SF's supply chain and tea growers, which is not directly related to the given topic of organizational issues and internal communications.	relevance	true_false

1	The question is about SF's supply chain and tea growers, which is not directly related to the given topic of organizational issues and internal communications.	relevance	true_false
1	The question is about the financial impact of a marketing strategy, which is not directly related to the given topic of organizational issues and employee discontent within the company.	relevance	mcq
0	The given question cannot be answered based on the provided source text. The source text asks about characterizing the internal communications at SF, but does not contain enough information to determine if they are open and transparent, poor and ineffective, top-down with limited feedback, or collaborative and inclusive. More context about SF's internal communications would be needed to select the correct option.	answer	mcq
0	The question is about the likely outcome of SF creating a lower-end brand, which relates to marketing strategy and financial impact. The given topic of 'Organizational issues' is not directly relevant to answering this question.	answer	mcq

# OCR Limitations

Limitation Type	Description
Max Page Size	230 pages
Diagram/Image Support	Not supported
Formula Parsing Issues	Misses lines, dashes, and some Greek letters
OCR Accuracy Limitation	Limited accuracy in text extraction
Parsing Time	High time taken to parse documents

**\*Time taken to generate questions can be very long (~1 min per question type)**