



# TransientTables: Evaluating LLMs' Reasoning on Temporally Evolving Semi-structured Tables

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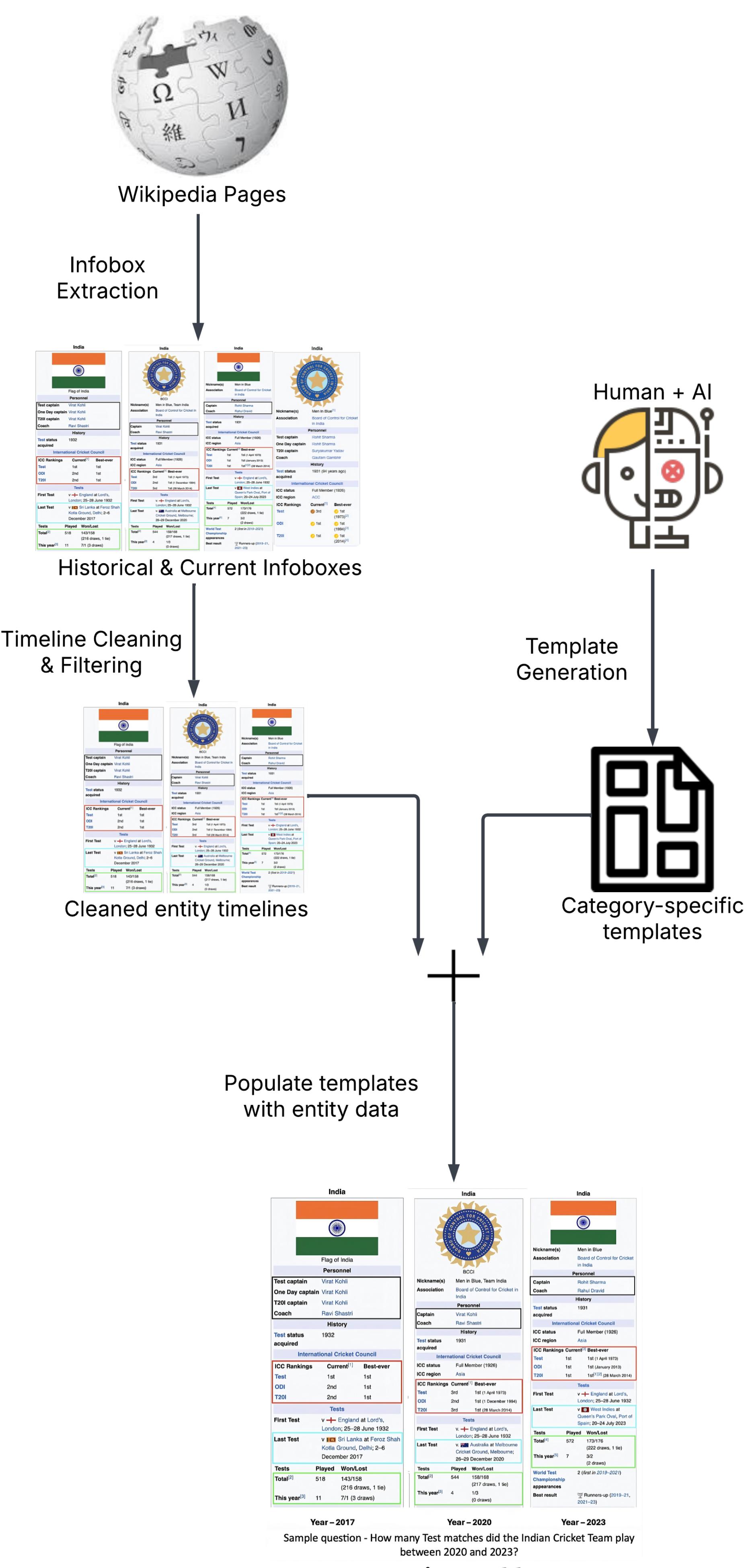
## Introduction

Information is inherently **transient** and subject to **periodic or non-periodic updates**. We present a QA dataset on temporally evolving information in tables.

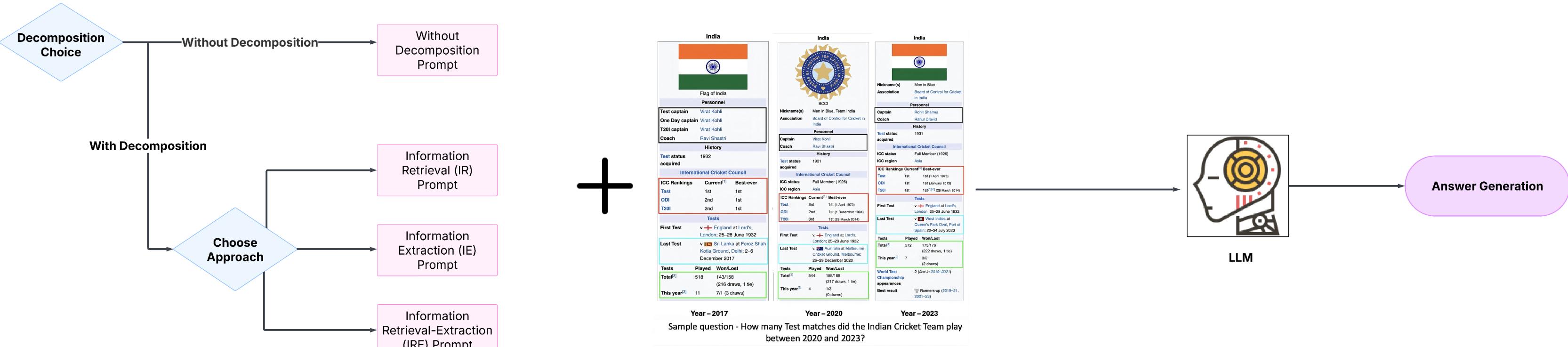
Sample question - How many Test matches did the Indian Cricket Team play between 2020 and 2023?

## Dataset Creation

TRANSIENTTABLES contains **3,971 QA pairs** derived from over **14,000 tables**, spanning **1,238 entities** across multiple time periods.



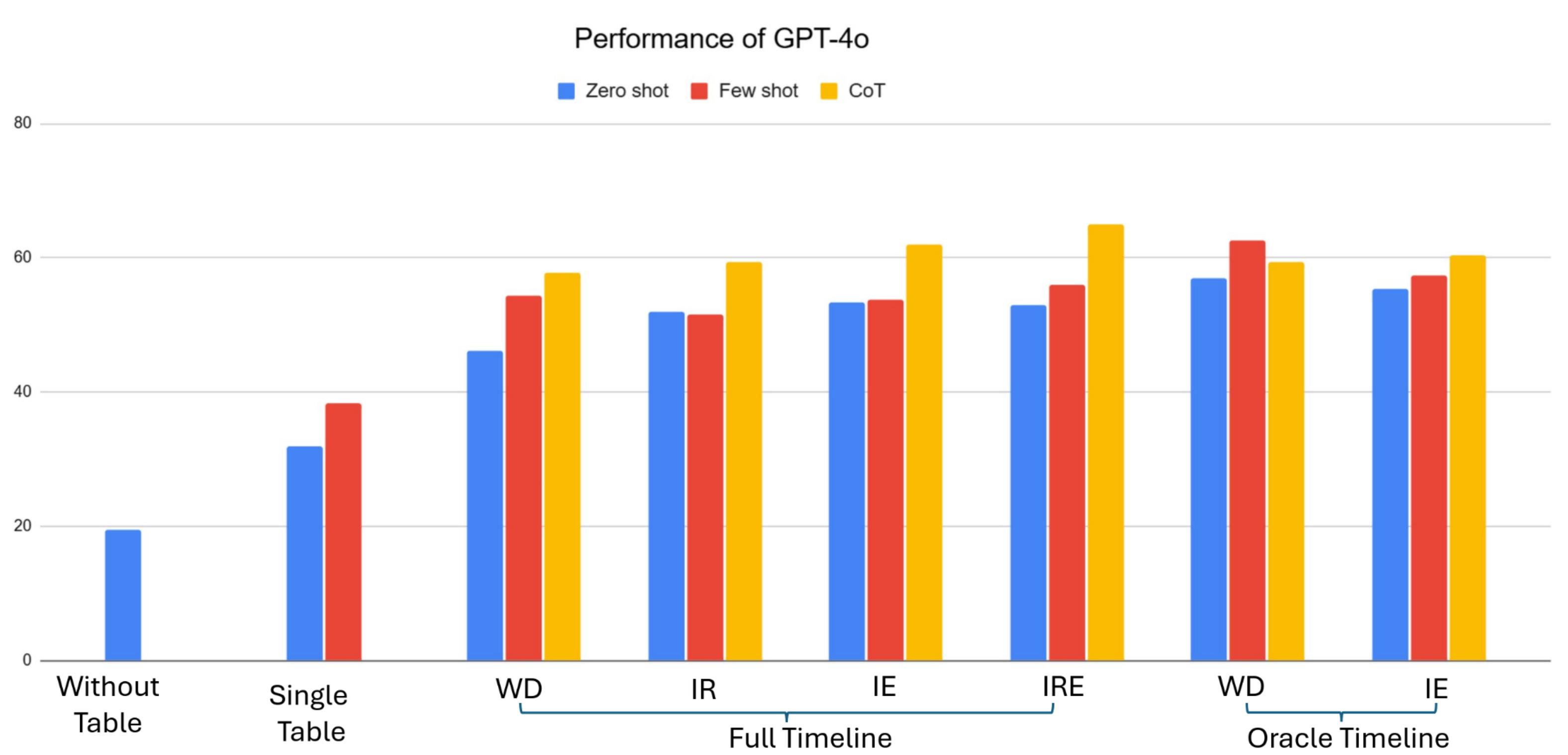
## Modelling Techniques



### Task Decomposition Approaches:

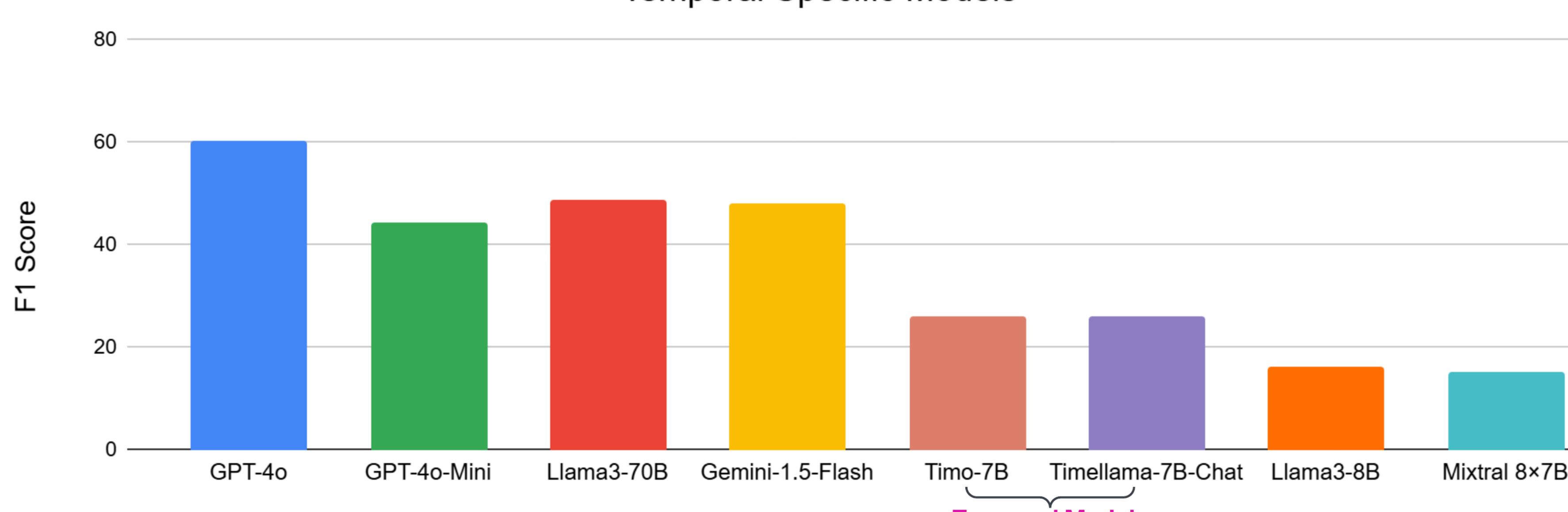
- Without Decomposition (**WD**): Direct answer generation
- Information Retrieval (**IR**): Table retrieval + Answer generation
- Information Extraction (**IE**): Key extraction + Answer generation
- Information Retrieval-Extraction (**IRE**): Table retrieval + Key extraction + Answer generation

## Key Results



Breaking down the task improves performance.

### Temporal Specific Models



Temporal-specific models show improvements but still trail behind larger general-purpose models

## Future Work

- Extending to diverse structures beyond tables.
- Neuro-symbolic learning for interpretability.

## References

- [1] TempTabQA: Temporal Question Answering for Semi-Structured Tables. Gupta et al., EMNLP 2023.
- [2] TIQ: A Benchmark for Temporal Question Answering with Implicit Time Constraints. Jia et al., WWW 2024.



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