

# COMPARATIVE STUDY OF LLMs FOR PERSONAL FINANCIAL DECISION IN LOW RESOURCE LANGUAGE



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## ABSTRACT

Large language models have seen rapid progress in recent times, and this has resulted in many applications in diverse fields. The ability of LLMs to make use of large-scale text makes it relevant in the financial industry and for financial tasks.

With the increasing availability of LLM models, these tasks can be considered easy or may be of use for a person who needs to track their financial lifestyle before visiting financial institutions. This study seeks to investigate the accuracy of LLM models in responding to basic day-to-day financial questions both in the English and Yoruba languages. The result shows that ChatGPT4.0 outperformed ChatGPT3.5 and Bard(LaMDA) in all three phases. The result shows that these language models can be improved to fit in low-resource languages.

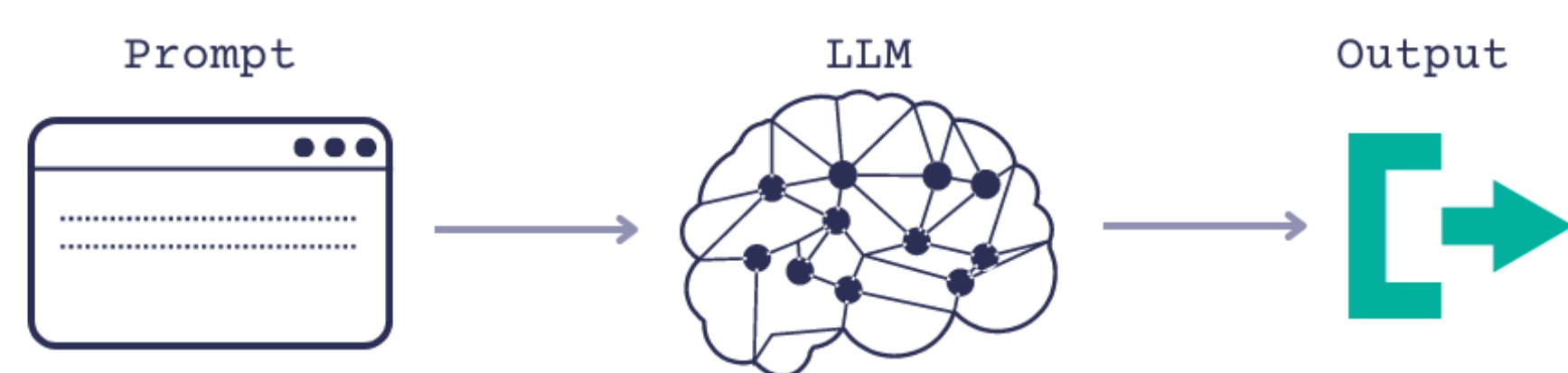


Fig 1: An image showing the steps to Q and A in LLMs(source)

## METHODOLOGY

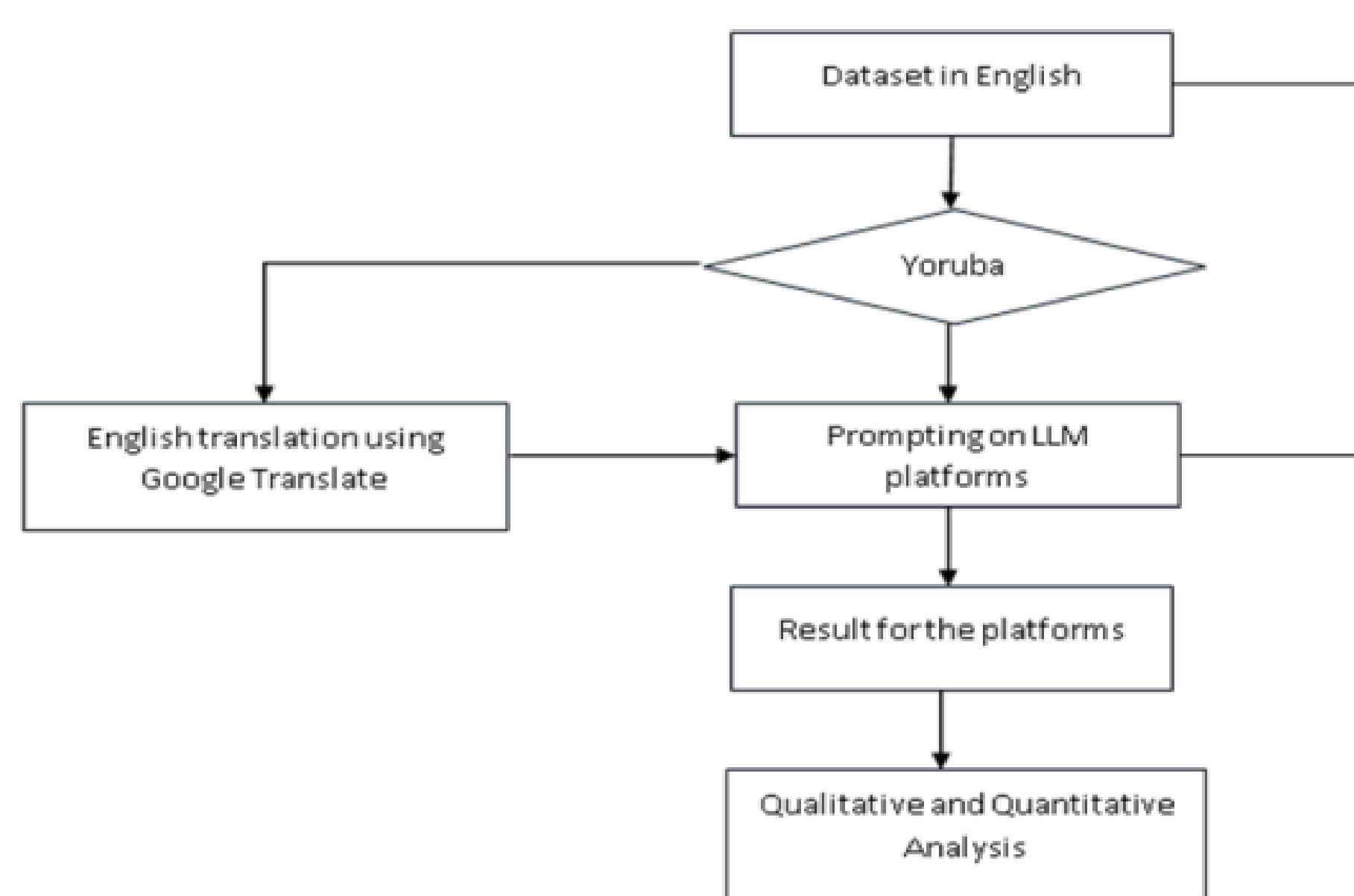


Fig 2: Methodology Workflow of Research Work

## RESULT

	GPT 3.5	GPT 4.0	Gemini
English Question	0.67	0.83	0.50
Yoruba Finance Question	0.00	0.44	0.00
Google Translation English	0.50	0.67	0.50

Fig 3: A Table showing results for each step

ChatGPT 4.0 outperformed ChatGPT 3.5 and Bard (LaMDA) in English language accuracy, correctly answering 83% of questions. However, the models occasionally make errors, especially in complex calculations. In Yoruba translation, ChatGPT 4.0 correctly addressed 44% of queries, highlighting the challenges in accurately interpreting Yoruba texts. The absence of responses from Bard and ChatGPT 3.5 reveals limitations in dealing with languages with fewer resources for training and development. Re-translation performance declined, possibly due to inaccuracies or omission of crucial information.

## RESULTS

Repeat the above calculations for each month until you reach the end of the loan term, which is 6 months in this case.

Here's an example of how the first few months of the amortization schedule would look:

Month	Outstanding Balance	Monthly Payment	Monthly Interest	Portion Reducing Debt
1	N500,000.00	N86,245.04	N5,000.00	N81,245.04
2	N418,754.96	N86,245.04	N4,187.55	N82,057.49
3	N336,697.47	N86,245.04	N3,366.97	N82,878.07
4	N253,819.40	N86,245.04	N2,538.19	N83,706.85
5	N170,112.54	N86,245.04	N1,701.12	N84,543.92
6	N85,568.62	N86,245.04	N855.69	N85,389.35

This schedule shows how the loan is gradually paid off over the course of 6 months, with each payment reducing the outstanding balance. The interest portion decreases, and the principal portion (portion reducing debt) increases with each payment.

Fig 5: GPT 4.0 response to question on Amortization

Amortization Schedule

Period	Outstanding balance before payment	Monthly payment	Portion of interest on outstanding balance	Payment contributing toward reducing debt	Outstanding balance after payment
1	500,000	83,333.33	9,999.99	73,333.34	426,666.66
2	426,666.66	83,333.33	8,139.99	75,193.34	351,473.32
3	351,473.32	83,333.33	6,743.32	76,589.98	274,883.34
4	274,883.34	83,333.33	5,708.80	77,624.53	197,258.81
5	197,258.81	83,333.33	4,993.47	78,339.86	118,918.95
6	118,918.95	83,333.33	4,274.11	79,059.22	39,859.73

Fig 6: GPT 4.0 response to question on Amortization

## CONCLUSION AND RECOMMENDATION

- LLM models perform better in English financial data.
- Performance drops when complex calculations prompts.
- LLM models perform poorly in Yoruba due to incorrect language understanding.
- Translation of Yoruba prompts into English drops performance by 16%.
- Need for improved models to capture more languages for a wider audience.

## REFERENCES

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