

Evaluating Business Plans Using Large Language Models

Ehsan KhademOlama

October 4, 2023

Contents

1	Introduction	3
2	Methodology	3
2.1	Data Collection	3
2.2	Data Preprocessing	3
2.3	Model Training	3
2.4	LinkedIn Profile Verification	3
2.5	Evaluation Metrics	4
2.6	Report Generation	4
3	Pros and Cons	4
3.1	Pros	4
3.2	Cons	4
4	Data Sources	5
4.1	Patents	5
4.2	Business Plans	5
4.3	Startup Failure Rates	5
4.4	Research Papers	5
4.5	LinkedIn Profiles	5
5	Competitor Analysis	6
5.1	Related Companies and Technologies	6
5.2	Market Gap	6

6	Recent Advancements in Large Language Models	6
6.1	Mistral AI	6
6.2	GPT-4	7
6.3	LLaMa-2	7
6.4	Other Models	7
7	Challenges and Possible Biases in LLM Fine-Tuning	7
7.1	Challenges	7
7.2	Possible Biases	7
7.3	Fine-Tuning Resources	8
8	Conclusion	8
8.1	Key Findings	8
8.2	Future Directions	8
8.3	Final Remarks	9

1 Introduction

The advent of Large Language Models (LLMs) has opened up new avenues for automating various tasks, including the evaluation of business plans and ideas. This report aims to explore the feasibility and methodology of using LLMs for evaluating business plans, particularly focusing on their success and failure rates. The report also delves into the importance of incorporating data from verified LinkedIn profiles to enhance the credibility of the evaluations.

2 Methodology

The methodology for this project involves several key steps, each contributing to the robustness and reliability of the business plan evaluations. The primary tools for this project include Large Language Models (LLMs) and various open-access databases.

2.1 Data Collection

Data will be collected from open-access databases such as the USPTO for patents and the U.S. Small Business Administration for business plans. Additional data on startup failure rates will be sourced from Failory[7].

2.2 Data Preprocessing

The collected data will undergo preprocessing to remove any inconsistencies and to format it for machine learning algorithms. This includes text normalization and feature extraction.

2.3 Model Training

LLMs will be fine-tuned using the preprocessed data. The training will aim to enable the models to evaluate the quality of business plans and predict their success rates.

2.4 LinkedIn Profile Verification

To enhance the credibility of the evaluations, LinkedIn profiles of the individuals submitting the business plans will be verified. This adds an extra

layer of trust to the evaluation process.

2.5 Evaluation Metrics

The success of the methodology will be measured using various metrics such as accuracy, precision, and recall. These metrics will help in fine-tuning the model for better performance.

2.6 Report Generation

Finally, a detailed report will be generated, summarizing the evaluation results. This report can be used by venture capitalists, co-founders, and investors for decision-making.

3 Pros and Cons

The use of Large Language Models (LLMs) for evaluating business plans offers several advantages and disadvantages:

3.1 Pros

- **Automation:** Automates the evaluation process, reducing manual effort.
- **Scalability:** Capable of evaluating multiple business plans in a short period.
- **Objectivity:** Minimizes human bias in evaluations.
- **Data-Driven:** Utilizes a large dataset for more accurate evaluations.

3.2 Cons

- **Data Sensitivity:** Requires high-quality, unbiased data for training.
- **Computational Costs:** High computational power needed for training and evaluations.

- **Interpretability:** LLMs are often considered "black boxes," making it difficult to understand their reasoning.
- **Ethical Concerns:** Potential for misuse if not properly regulated.

4 Data Sources

The data for this project will be sourced from multiple open-access databases and platforms to ensure a comprehensive and diverse dataset. Below are the primary sources of data:

4.1 Patents

Data related to patents will be collected from the USPTO Open Data and Mobility[1], The Lens[2], and Espacenet[3].

4.2 Business Plans

Information on business plans and their success or failure rates will be sourced from the U.S. Small Business Administration[4], AdvisorSmith[5], and Springer Articles[6].

4.3 Startup Failure Rates

Data on startup failure rates will be collected from Failory[7], Entrepreneur[8], and Findstack[9].

4.4 Research Papers

Additional insights will be gathered from research papers focusing on the application of machine learning in business evaluations[10].

4.5 LinkedIn Profiles

LinkedIn profiles will be used for verification purposes to add credibility to the evaluations. These profiles will be cross-referenced with the business plans submitted for evaluation.

5 Competitor Analysis

While there are companies and technologies that leverage Large Language Models (LLMs) for various business applications, none appear to focus specifically on evaluating business plans in the manner proposed in this report. This suggests a unique market opportunity for the proposed system.

5.1 Related Companies and Technologies

- **OpenAI’s GPT-3:** Primarily used for natural language understanding and generation but not specialized in business plan evaluation[11].
- **Mistral AI:** A recent LLM that claims to outperform others of its size. However, its primary focus is not on business plan evaluation[12].
- **Various NLP Startups:** These companies focus on specific NLP tasks such as sentiment analysis, chatbots, and content generation but not on evaluating business plans[?].

5.2 Market Gap

The absence of direct competitors in this specific niche indicates a market gap and presents an opportunity for the proposed system to gain a competitive edge.

6 Recent Advancements in Large Language Models

The field of Large Language Models (LLMs) has seen significant advancements in recent years. Below are some of the latest models that have been introduced:

6.1 Mistral AI

Mistral AI is a 7-billion parameter model that claims to outperform other models of its size. It has been designed for a variety of tasks, including natural language understanding and generation[13].

6.2 GPT-4

The successor to GPT-3, GPT-4 is expected to have even more parameters and capabilities, although it is still in the research phase[14].

6.3 LLaMa-2

LLaMa-2 is another recent model that focuses on multi-modal learning, integrating both text and images for a more comprehensive understanding[15].

6.4 Other Models

Various other models are also being developed, focusing on specific tasks such as translation, summarization, and question-answering[?].

7 Challenges and Possible Biases in LLM Fine-Tuning

Fine-tuning Large Language Models (LLMs) for specific tasks like business plan evaluation comes with its own set of challenges and possible biases.

7.1 Challenges

- **Data Quality:** Ensuring the quality and relevance of the training data.
- **Computational Resources:** High computational costs for training large models.
- **Model Robustness:** Ensuring the model generalizes well to unseen data.

7.2 Possible Biases

- **Data Bias:** Biases in the training data can be propagated to the model.
- **Confirmation Bias:** The model may reinforce existing stereotypes present in the data.

- **Sampling Bias:** The model may favor certain types of data over others during training.

7.3 Fine-Tuning Resources

For a more detailed guide on fine-tuning LLMs, the following resources are recommended:

- Towards Data Science Article on LLM Fine-Tuning[16].
- BD Tech Talks Article on LLM Fine-Tuning[17].
- Hugging Face Blog on LLaMa-2 for Non-Engineers[18].

8 Conclusion

This report has provided a comprehensive methodology for evaluating business plans using Large Language Models (LLMs). It has covered various aspects, including data sources, competitor analysis, recent advancements in LLMs, pros and cons, and challenges and biases in LLM fine-tuning.

8.1 Key Findings

The key findings of this report include:

- The feasibility of using LLMs for business plan evaluations.
- The absence of direct competitors, indicating a unique market opportunity.
- Recent advancements in LLMs that could be leveraged for this project.
- Various pros and cons, as well as challenges and biases, associated with using LLMs for this purpose.

8.2 Future Directions

Future research could focus on the real-world implementation of this methodology, including the development of a cloud-based service. Additionally, the fine-tuning of LLMs could be further optimized by incorporating more diverse datasets, such as patents and business plans from various industries and countries.

8.3 Final Remarks

The proposed methodology offers a promising avenue for automating the evaluation of business plans, thereby aiding venture capitalists, co-founders, and investors in making informed decisions.

References

- [1] USPTO Open Data and Mobility, <https://www.uspto.gov/learning-and-resources/open-data-and-mobility>
- [2] The Lens, <https://www.lens.org/>
- [3] Espacenet, <https://www.epo.org/en/searching-for-patents/technical/espacenet>
- [4] U.S. Small Business Administration, <https://data.sba.gov/>
- [5] AdvisorSmith, <https://advisorsmith.com/data/small-business-failure-rate/>
- [6] Springer Article, <https://link.springer.com/article/10.1023/A:1024433630958>
- [7] Failory, <https://www.failory.com/>
- [8] Entrepreneur, <https://www.entrepreneur.com/starting-a-business/the-true-failure-rate-of-small-businesses/361350>
- [9] Findstack, <https://findstack.com/resources/startup-statistics/>

- [10] Research Papers on Machine Learning in Business, <https://link.springer.com/article/10.1007/s42979-021-00592-x>
- [11] OpenAI, <https://www.openai.com/>
- [12] Mistral AI, <https://mistral.ai/>
- [13] Mistral 7B Announcement, <https://mistral.ai/news/announcing-mistral-7b/>
- [14] GPT-4 Research, <https://www.openai.com/research/gpt-4>
- [15] LLaMa-2, <https://huggingface.co/blog/Llama2-for-non-engineers>
- [16] Towards Data Science on LLM Fine-Tuning, <https://towardsdatascience.com/fine-tuning-large-language-models-llms-23473d763b91>
- [17] BD Tech Talks on LLM Fine-Tuning, <https://bdtechtalks.com/2023/07/10/llm-fine-tuning/>
- [18] Hugging Face Blog on LLaMa-2 for Non-Engineers, <https://huggingface.co/blog/Llama2-for-non-engineers>