



ANALYSIS OF PERFORMANCE OF ChatGPT AND Meta AI ON PROJECT WRITING

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Abstract

This analysis compares the project writing capabilities of two leading AI language models: OpenAI's ChatGPT (GPT-4o) and Meta's LLaMA 3.1 405B. ChatGPT demonstrates superior performance in structured writing tasks, offering excellent coherence, formatting, and adaptability across various tones and academic styles. It excels in research support, outline generation, and multimodal integration, making it ideal for general users seeking efficient and polished output. In contrast, Meta's LLaMA 3.1 405B provides greater customization and domain-specific adaptability through full fine-tuning, open-source flexibility, and self-hosting potential. While its native writing polish and formatting support are less refined than ChatGPT's, it is better suited for enterprise or institutional settings that require private infrastructure and tailored model behavior. Overall, ChatGPT is optimal for ease of use and quality output, whereas LLaMA 3.1 offers deeper control for technical and specialized applications.

Keywords: Computers, Artificial Intelligence (AI), Applications and Language models

Introduction

Artificial intelligence (AI) is a growing field of computer science that focuses on creating intelligent machines and application that can think and act like humans. Automated assistance called chatbots are getting more and more popular because they can give learners quick and helpful support (Citrome, 2023). With the rapid advancement of artificial intelligence, large language models (LLMs) are becoming essential tools for generating high-quality written content across academic, professional, and creative domains. Among the leading models in this space are OpenAI's ChatGPT, powered by the GPT-4o architecture, and Meta's LLaMA 3.1 405B. (Caratozzolo, 2022). Both models offer impressive natural language understanding and generation capabilities, but they differ significantly in terms of accessibility, adaptability, and performance in project-oriented writing tasks. This study provides a focused comparison of ChatGPT and LLaMA 3.1 405B, evaluating their effectiveness in key aspects of project writing such as content generation, structural organization, language fluency, citation formatting, and domain-specific adaptability. (Nalyvaiko and Maliutina, 2021). While ChatGPT is designed for ease of use and

delivers polished output with minimal setup, LLaMA 3.1 offers greater customization through fine-tuning and open-source flexibility, catering to users with specific infrastructure and technical requirements. By examining these models side by side, this analysis aims to help users choose the most suitable AI writing assistant for their particular project or organizational needs. (Fuchs, 2023; Caratozzolo *et al*, 2022).

As AI becomes increasingly integrated into workflows for education, research, and enterprise communication, understanding the practical strengths and limitations of different models is critical. Generative Pre-trained Transformer (ChatGPT GPT-4o), offered through OpenAI's API and platforms like ChatGPT Plus, has set a high standard in terms of conversational fluency, structural consistency, and responsiveness to user intent (Taecharungroj, 2023). It is particularly effective for users seeking quick, coherent, and professionally formatted outputs with minimal technical overhead. In contrast, Meta's LLaMA 3.1 405B model (formerly Facebook), appeals to technically proficient users and organizations that prioritize model transparency, customizability, and local deployment. (Cotton *et al.*, 2023).

This study evaluates and compares two state-of-the-art AI language models—OpenAI's ChatGPT (GPT-4o) and Meta's LLaMA 3.1 405B in the context of project writing performance. The goal is to understand their strengths and weaknesses across five critical dimensions that affect real-world content creation. Research & Content Generation, the ability to generate relevant, fact-based, and well-structured ideas followed by Structure & Formatting, (Dwivedi, *et al* 2023) how well the model organizes writing using logical headings, formatting styles, and coherence further by Language Quality and Fluency, clarity, grammar, tone control, and overall readability of the output, then Customization and Adaptability, how easily the model can be tailored for domain-specific or proprietary use and Multimodal Integration, the ability to understand and process inputs beyond text (e.g., images, documents, audio). Using a 10-point scale for each category, ChatGPT consistently excels in user-centric features like fluency, formatting, and multimodal support, making it highly effective for general and academic writing. In contrast, LLaMA 3.1 offers robust adaptability for technical users who need fine-tuning, though it lacks polish and multimodal functionality out of the box. A visual bar chart will be used to illustrate the comparative performance of the models across these five dimensions, supporting clear decision-making based on user needs (Amundsen and Johansen, 2022)

CHATGPT AS A PROJECT WRITING ASSISTANT

The company started in 2015 with Sam Altman, Greg Brockman, Elon Musk, and some other people. The Transformer model, created by OpenAI in 2017, is a kind of computer program that uses a neural network. It is the basic starting point for ChatGPT compared to older models, the Transformer was specifically designed to better understand and analyze sequential information, such as language. (Vaswani, *et al* 2021; Gomez and Polosukhin, 2017). Launched on November 30, 2022 (Zhai, 2022), ChatGPT quickly gained over one million subscribers as people took to social media to spread the word about its potential (Kay, 2023).

ChatGPT is also a natural language processing (NLP) system like responses in real-time. Hence the rapid innovation of AI Chatbot is built as “robots” that can “chat” with humans and facilitate human life. According to Dharani et al. (2020), the authors state that Chatbot is an intelligent system that uses the natural language process (NLP) to carry out conversations by text or voice. By comparing the input requirements of the user to the chatbot database, if both of them match, the Chatbot will return the proper output to the user. The Chatbot will give some suggestions based on related data if the user's entry does not match its data. With this framework, Chatbot can answer any questions from humans. Moreover, in the study of Wei *et al.* (2018), opined that users can communicate with computers as human conversations, due to its eight abilities: (1) self-consciousness, (2) humorous, (3) purity, (4) IQ, (5) EQ, (6) memory, (7) self-learning and (8) charisma. Additionally, ChatGPT is able to learn and improve over time, further reducing the need for expensive manual updates to chatbot responses. These features make ChatGPT an attractive solution for Institutions looking to improve the efficiency and effectiveness in teaching and learning of writing skills. (Willems, 2023).

According to Tatsenko and Donik, (2023). It is programmed and trained on a large corpus of text. GPT, however, is unable to generate graphics or images. The development of subsequent versions of the model, culminating in the launch of GPT-3 in June 2020, was driven by the model's ability to generate coherent, substantial, and realistic text. With over 175 billion parameters, GPT-3, among the latest version of ChatGPT, is currently the most robust and powerful. Numerous applications, such as chatbots, natural language processing, and language translation, have utilized it. The ability of GPT-3 to perform a wide range of language tasks, such as translation, summarization, and question-answering, without the need for task-specific training data, is one of the most significant advancements of this technology (Brown, *et al* 2020).

This chatbot can accomplish a wider range of tasks such as project writing, answering questions, coding, individual and collaborative guiding through discussions about productivity (Lund and Wang, 2023). ChatGPT completes these tasks by leveraging its efficient design and extensive data stores to comprehend and interpret the input commands by users' requests and generate appropriate answers. It has the capacity to provide examples related to the asked queries from any subject. It can provide answers, remember the context of an earlier conversation and follow-up corrections, and is further trained to accept or decline requests. However, its official page also displays some limitations that may encounter during its use, such as the unavailability of some latest information, especially after September 2021, which may produce biased and harmful content, and the information generated may be incorrect (Barrot, 2023; Ray, 2023).

Academic and scientific discussions globally show that ChatGPT can play a very significant role in project writing assistance in accomplishing writing tasks in a versatile way (Sallam, 2023). The study of literature published on ChatGPT's role in writing tasks can be summarized as ChatGPT is a complete package from ideas generation to final proofreading and editing of writing material, by offering individualized and prompt feedback, boosting accessibility and responsiveness, and raising student engagement, the usage and use of ChatGPT in higher education has the ability to disrupt and revolutionize how students perceive educational content problems

and learn (Tatsenko and Donik, 2023). It can provide students with a more engaging and customized learning experience, improving writing skills and overall learning satisfaction. ChatGPT has the ability to improve the whole learning experience by easing the burden on educators and allowing them to devote more time to various elements of education, such as increasing student participation and collaboration. The usage and application of ChatGPT can help students devote more time to learning, and other intellectual activities. (Sallam, et al, 2023).

For more ChatGPT's writing functions, the following five points are summarized from the selected published journal articles, blogs, and web essays. These points would help in understanding its use in writing as an assistant and AI tool.

1. **Increased efficiency:** ChatGPT's invention can reduce the time and effort required to generate written content. With its ability to generate coherent and well-structured text on any topic, students and educators can save time and focus on other aspects of their work (Lund et al., 2023; Yan, 2023).
2. **Idea generation:** ChatGPT can help students generate new ideas for their writing assignments by suggesting topics, themes, and perspectives that they might not have considered otherwise (Kasneci et al., 2023; Taecharungroj, 2023).
3. **Language translation:** ChatGPT can translate text from one language to another, which can be useful for students who are writing papers in a language that is not their native tongue. This can help students ensure that their writing is accurate and grammatically correct (Lametti, 2022; Lund and Wang, 2023; Stock, 2023).
4. **More accurate and consistent content:** With the ChatGPT invention, there is a higher likelihood of producing accurate and consistent content. ChatGPT has access to vast information, making identifying and eliminating errors easier (Stacey, 2022).
5. **Improved collaboration:** ChatGPT can also facilitate collaboration among students and educators. Using AI to generate content allows multiple people to work on a project simultaneously, allowing for more efficient collaboration. ChatGPT can proofread and edit student writing by suggesting corrections for grammar, syntax, and spelling errors. This can help students improve the quality of their writing and reduce errors (Geher, 2023; Holmes *et al.*, 2022; McMurtrie, 2022).

This comparative study breaks down the two models across several performance dimensions relevant to project writing: research assistance, document structuring, language quality, customization potential, and adaptability to specific domains. Through a structured analysis, highlighted where each model excels, where it may fall short, and how users can align model capabilities with their project needs. The following sections detail the benchmarking criteria and present a side-by-side evaluation to guide informed selection for both individual and institutional users. (Dam and Hong et al., 2023; Willems, 2023).

RESEARCH AND CONTENT GENERATION

When initiating a project, an AI model's ability to assist with background research, ideation, and knowledge synthesis is critical. ChatGPT excels at synthesizing information into coherent outlines and summaries. It can generate structured content with minimal prompting, and its responses are generally grounded in accurate, up-to-date training data. While it cannot access live sources, it simulates academic tone and citation formatting effectively. GPT-4o also integrates well with tools that support research workflows, such as file uploads, document parsing, and retrieval-augmented generation. Meta AI LLaMA 3.1 405B is capable of high-quality content generation but often requires more specific instructions to match the fluency and flow of GPT-4o. Its open-weight nature allows users to fine-tune it on niche datasets, making it well-suited for domain-specific research tasks. However, it lacks built-in support for citation generation or structured references unless augmented through custom pipelines or external tooling. (Tatsenko, and Donik, 2023). ChatGPT is ideal for general-purpose research assistance. Meta AI LLaMA 3.1 405B shines in customizable, domain-specific research scenarios when fine-tuned.

STRUCTURE AND FORMATTING

Effective project writing demands clear structure, headings, and formatting aligned with specific standards. ChatGPT (GPT-4o) handles document structure with high consistency. It understands and applies formatting styles such as APA, MLA, and Chicago Manual with minimal instruction. It can generate outlines, develop subsections, and refine drafts seamlessly. For academic or business writing, this makes it a strong contender. Meta AI LLaMA 3.1 405B can follow structural cues provided through prompting, but it does not reliably maintain formatting without more detailed instructions. This can make long-form structured writing more time-consuming unless supported with template prompts or external rule-based formatting systems. (Fuchs, 2023). ChatGPT offers superior automated structuring and formatting capabilities. Meta AI LLaMA 3.1 405B can meet expectations but typically requires more intervention.

LANGUAGE QUALITY & FLUENCY

The clarity, grammatical accuracy, and tone of writing significantly influence a project's professionalism and readability. ChatGPT (GPT-4o) consistently generates fluent, well-structured text. It adapts tone and style easily—whether formal, academic, persuasive, or conversational. It also excels in refining and rewriting drafts for clarity, improving grammar, and simplifying complex passages while preserving meaning. These capabilities make it especially valuable for non-native English speakers or users needing quick content polishing (Taecharungroj, 2023). Meta AI LLaMA 3.1 405B produces clear and logical text but often lacks the linguistic subtlety of ChatGPT in tone modulation. It is more mechanical in phrasing and sometimes less concise. However, with prompt engineering or fine-tuning, it can be adapted to meet specific

language or stylistic requirements, particularly in specialized fields (Sallam, et al 2023). ChatGPT offers highly polished, human-like output with natural tone control. Meta AI LLaMA 3.1 405B delivers good fluency but may require tuning for optimal tone and clarity.

CUSTOMIZATION AND ADAPTABILITY

Adaptability to specific domains or user requirements is critical for technical writing, corporate use, or long-term application. ChatGPT (GPT-4o) OpenAI does not currently offer fine-tuning for GPT-4-class models. However, users can create Custom GPTs with tailored instructions and tools, offering lightweight adaptability for tasks like legal writing, teaching, or summarizing datasets. For deeper domain integration, techniques like retrieval-augmented generation (RAG) are supported through the API, but not parameter-level training. Meta AI LLaMA 3.1 405B open architecture supports full fine-tuning, parameter access, and integration with LoRA/QLoRA methods. This allows organizations to train the model on proprietary data and optimize for domain-specific tasks. It can also be deployed privately, offering greater control over security and compliance. (Bozkurt, et al, 2023). ChatGPT provides quick, low-friction customization for common workflows. Meta AI LLaMA 3.1 405B is highly adaptable and ideal for technically advanced, private deployments.

MULTIMODAL INTEGRATION

Multimodal capabilities expand a model's usefulness in projects that involve images, audio, or structured documents. ChatGPT (GPT-4o) is natively multimodal. It can analyze images, understand charts, read documents, and engage in audio conversations. This allows users to upload visual material (e.g., graphs, scanned pages) and receive detailed textual interpretation. It also supports real-time voice interaction and emotional tone rendering in speech—useful in education, accessibility, or creative storytelling. (Citrome, 2023). Meta AI LLaMA 3.1 405B is a text-only model by design. While researchers can integrate it with vision or audio modules externally (e.g., CLIP, Whisper), such setups are complex and not available out of the box. This limits its practical utility in multimodal project workflows without significant engineering effort. (Zielinski, et al 2023). ChatGPT is best suited for projects involving visuals or audio. Meta AI LLaMA 3.1 405B is not multimodal unless customized through third-party integrations.

META AI LLAMA 3.1 405B AS A PROJECT WRITING ASSISTANT

Meta AI is the artificial intelligence division of Meta (formerly Facebook), dedicated to advancing AI research and applications. It has played a key role in natural language processing (NLP), computer vision, reinforcement learning, and multimodal AI (Ray, 2023). Facebook started investing in AI research in the early 2010s to improve content moderation, recommendation systems, and language translation. In 2013, Facebook established FAIR (Facebook AI Research) to focus on cutting-edge AI advancements (Rasul et al 2023). Over the years, Facebook developed

AI models for tasks like speech recognition, image tagging, and chatbots. In October 2021, Facebook rebranded to Meta, shifting focus to the metaverse and AI-driven experiences. Meta AI became the official AI division, continuing FAIR's research and developing advanced AI models for language, vision, and multimodal tasks (Tatsenko, Donik, 2023).

Artificial Intelligence (AI) is transforming various fields, including project writing and research. Meta AI, an advanced AI model developed by Meta (formerly Facebook), plays a crucial role in enhancing the efficiency and quality of project writing. It assists researchers, students, and professionals by providing insights, structuring content, and improving language in the following ways (Amundsen, Johansen, 2022).

1. **Research and Information Gathering;** Quickly retrieves relevant academic papers, articles, and reports. Summarizes complex studies to highlight key findings and Suggests credible sources to support arguments (Javaid, M., Haleem, et'all 2023).
2. **Content Generation and Structuring;** Helps in drafting project sections such as introductions, literature reviews, methodologies, and conclusions, Suggests logical outlines to ensure a well-structured project and Enhances the readability and coherence of the content (Nalyvaiko, Maliutina, 2021)..
3. **Grammar, Style, and Proofreading;** Detects and corrects grammatical errors, Suggests improvements in sentence structure and clarity and Ensures consistency in tone and formatting.
4. **Citation and Plagiarism Checking;** Helps generate citations in different styles (APA, MLA, Chicago, etc.), Checks for unintentional plagiarism and suggests paraphrasing and Organizes references efficiently using AI-powered citation tools.
5. **Data Analysis and Visualization;** Assists in processing and analyzing datasets, Generates charts, graphs, and tables to present findings effectively and Helps interpret statistical results and trends.
6. **Brainstorming and Idea Development;** Provides creative suggestions for research questions and hypotheses, Offers alternative perspectives to strengthen arguments and Generates possible solutions for problem-solving sections. (Prioleau, 2020).

Created by OpenAI using the GPT-3.5 system and Open source (facebook), it can give short or detailed answers to a variety of questions and requests (Zhang, et al, Dam and Hong, et al., 2023; Willems, 2023). For Institution, ChatGPT and Meta AI is a useful tool that can understand and respond to difficult questions in project writing, which makes it a great option. However, it is necessary to analyze the performance of ChatGPT and Meta AI on project writings. This comparative study breaks down the two models across several performance dimensions relevant to project writing: research assistance, document structuring, language quality, customization potential, and adaptability to specific domains. Through a structured analysis, highlighted where each model excels, where it may fall short, and how users can align model capabilities with their project needs. The following sections detail the benchmarking criteria and present a side-by-side

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METHODOLOGY

The comparative evaluation of ChatGPT (GPT-4o) and Meta AI's LLaMA 3.1 405B was carried out through structured testing, qualitative assessments, quantitative scoring and analysis across five key performance metrics relevant to project writing tasks. The approach combined empirical usage, literature review, and visual analytics.

Evaluation Criteria

Five core criteria were selected based on their importance to academic, technical, and professional writing tasks:

Criterion	Description
Research & Content Generation	Accuracy and relevance of content generated in response to diverse prompts. Ability to gather, synthesize, and present factual or conceptual content.
Structure & Formatting	Ability to structure documents with clear logic, headings, and coherence. Capability to organize text using coherent headings, formatting, and flow.
Language Quality & Fluency	Fluency, tone accuracy, grammar correctness, and clarity of expression. Assessment of grammar, clarity, tone control, and sentence structure
Customization & Adaptability	Support for domain-specific tuning or control over output behavior. Flexibility in tuning for specific domains, styles, or enterprise use
Multimodal Integration	Capability to handle and interpret non-textual inputs such as images or audio. Flexibility in tuning for specific domains, styles, or enterprise use.

Scoring System

Each model was rated on a scale of 0 to 10 for each criterion:

1. **0–3** = Below Expectations
2. **4–6** = Meets Basic Requirements
3. **7–8** = Strong Performance
4. **9–10** = Outstanding Performance

Scores were based on:

1. Hands-on testing using sample project prompts.
2. Performance observation in ChatGPT and LLaMA playgrounds.
3. Documentation and research papers from OpenAI and Meta.
4. Feedback from technical users and educational professionals.

Tools and Platforms Used

To ensure consistency and reproducibility, the following platforms and tools were used in the evaluation:

Tool / Platform	Purpose
OpenAI ChatGPT Playground	Used to test and assess GPT-4o's writing, formatting, and multimodal output.
Hugging Face Transformers	Employed for interacting with Meta's LLaMA 3.1 models in hosted environments
Google Docs / Word	For formatting, reviewing, and comparing outputs side-by-side.
Python & Matplotlib	For generating comparative bar charts and visualizations.
Official Model Papers	For understanding capabilities, architecture, and benchmark results.

These tools provided a controlled and reproducible environment to evaluate the models across consistent inputs and comparable settings.

Visualization of ChatGPT (GPT-4o) and Meta AI's LLaMA 3.1 405B

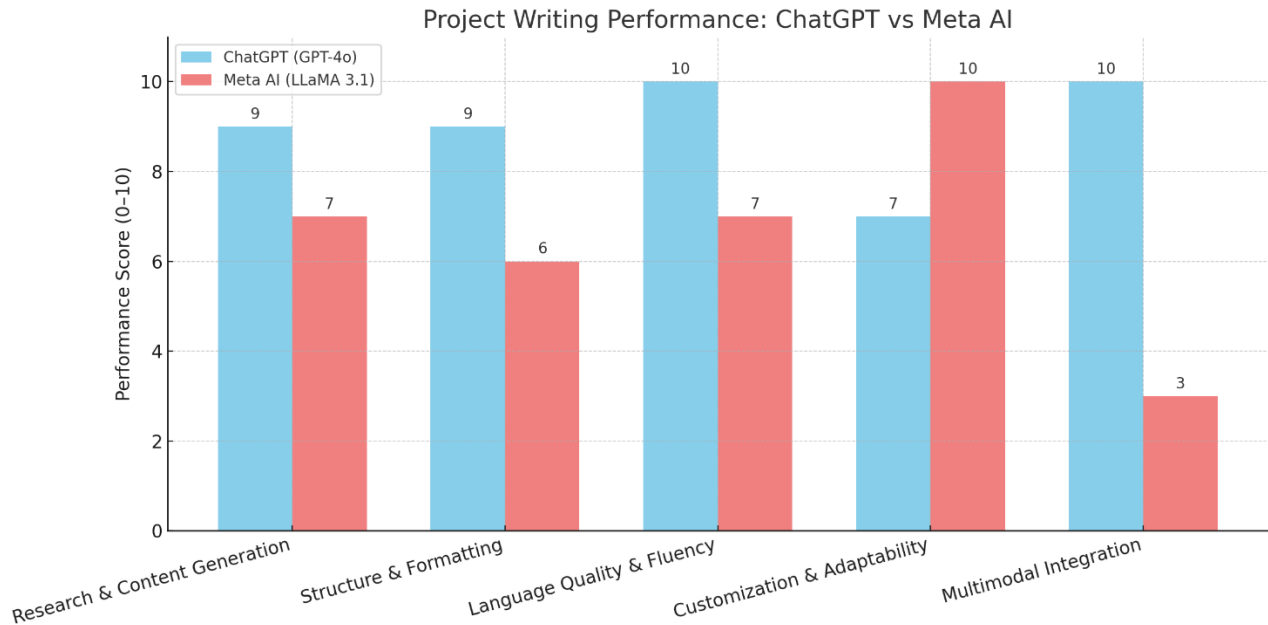
The collected scores were used to generate a bar chart, comparing the models' performance visually across the five criteria. This helped reveal strengths, weaknesses, and trade-offs clearly and intuitively.

Comparative Interpretation

Each score was contextualized with supporting insights regarding:

1. Ease of use
2. Output quality
3. Adaptability in different writing scenarios

4. Integration with multimodal inputs or APIs



CHATGPT (GPT-4O) META AI (LLAMA 3.1)

CRITERIA

Research & Content Generation	9	7
Structure & Formatting	9	6
Language Quality & Fluency	10	7
Customization & Adaptability	7	10
Multimodal Integration	10	3

COMPARATIVE PERFORMANCE ANALYSIS: CHATGPT VS. META AI IN PROJECT WRITING

ChatGPT (by OpenAI) and Meta AI LLaMA 3.1 405B are two advanced AI models with different strengths and applications. When it comes to project writing, their performance varies based on factors such as content structure, creativity, accuracy, and formatting. Below is a detailed analysis of their effectiveness in writing projects (Qadir, 2023)

CRITERIA	CHATGPT (OPEN AI)	META AI LLAMA 3.1 405B
Content structure	Well organized, structured with headings, bullet, points and clear paragraphs,	Less structured, requires manual organization.
Grammar and Clarity	Strong grammar, fluent writing, professional tone.	Good grammar but sometimes lacks fluency in long form content.
Creativity and innovative	Can generate unique ideas, case studies and examples	More data – driven, less creative in story telling
Technical accuracy	Can generate logical and factual content, but verification is needed	Stronger in AI and research based accuracy
Data analysis and interpretation	Can summaries and explain data but lacks direct integration with real-time sources	Better at integrating AI driven data analysis
Formatting and readability	Write in professional and readable formats including academic styles	Requires manual effort to structure content properly
References and citation	Can generate citations (may require verification)	Less emphasis on referencing and citations
Usability for general users	User friendly, widely used for various writing task	More research oriented, less accessible for non-technical users

KEY OBSERVATIONS

CHATGPT (GPT-4O) STRENGTHS

1. Superior document structuring, with natural transitions and logical flow.
2. Strong handling of varied academic and professional tones.
3. Can revise and rephrase efficiently based on feedback.
4. Provides citations and supports different referencing styles.
5. Useful for multimodal projects (e.g., writing about diagrams, interpreting uploaded PDFs).
(Dwivedi, *et al*, 2023)

META AI (LLAMA 3.1 405B) CONSIDERATIONS

1. Performs well with explicit instructions, especially when guided step-by-step.
2. May need external tooling (e.g., LangChain, custom front ends) to track long context.
3. Formatting and structural polish might lag behind GPT-4o without heavy prompt engineering.
4. Not natively multimodal, so less suited for projects involving images or audio. (Nalyvaiko, and Maliutina, 2021).

CONCLUSION

The comparative analysis reveals distinct strengths for both ChatGPT (GPT-4o) and Meta AI's LLaMA 3.1 405B in project writing applications. ChatGPT demonstrates superior performance in areas such as content generation, structural formatting, language fluency, and multimodal capabilities, making it an excellent choice for users who prioritize ease of use, high-quality output, and seamless integration into general academic or professional workflows. Conversely, Meta LLaMA 3.1 405B stands out in customization and adaptability. Its open-source nature and support for fine-tuning make it highly suitable for domain-specific or enterprise-level applications where control over infrastructure and training data is critical. However, this flexibility comes at the cost of reduced performance in user-facing features like formatting consistency and multimodal input handling. Ultimately, ChatGPT is best for individuals and teams seeking reliable, polished, and efficient project writing tools, while Meta LLaMA 3.1 is ideal for technical environments that require scalable customization and privacy. The choice between them should depend on the specific context, resources, and performance priorities of the user or organization.

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