



INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Prompt Engineering In The Era Of Artificial Intelligence

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Abstract: The field of Artificial Intelligence (AI) has grown as a minor subset of computer science to become an influential technology in our lives. It assists students in their learning, professionals at work and aids farmers make better decisions on their crop. The effectiveness of AI systems depends on the manner in which people interact with them. The design of accurate and relevant instructions to such systems has become one of the critical skills of effective human AI interaction, which is referred to as prompt engineering. In this paper, the author explains what prompt engineering is and how it can be utilized and enhanced the performance of large language models, such as ChatGPT, Claude, and Google Gemini, in various practical scenarios.

Index Terms - Artificial Intelligence, Prompt Engineering, Large Language Models, Zero-shot Prompting, Chain-of-Thought, Human-AI Interaction, Applied AI, Responsible AI Design, Six-Step Method, Real-World Applications, Education.

I. INTRODUCTION

In recent years, Artificial Intelligence (AI) has quietly become a part of everyday life. What was once discussed mainly in research circles is now something people use in countless ways. Students often rely on AI tools like ChatGPT to understand difficult lessons, while farmers turn to AI-based systems to plan their crops or get advice about weather conditions. Voice assistants such as Alexa and Siri have also made AI more familiar and easy to use, helping people organize their work, learn new things, and make day-to-day decisions without much effort. The way we ask questions or give instructions to these systems has a strong influence on the kind of responses we get. When instructions are clear and specific, AI tends to give answers that are more accurate and relevant. Early language models such as GPT-2 and GPT-3 made this relationship even more visible. They showed that the quality of a prompt directly affects the quality of the output. Researchers like Chen et al. (2023) and Sahoo et al. (2024) found that structured and detailed prompts can significantly improve an AI model's reasoning and accuracy. Their work laid the foundation for what is now known as prompt engineering — the practice of framing inputs thoughtfully to guide AI toward better answers. When prompts are too short or vague, the results are often confusing or incomplete. A little extra detail can make a big difference. For instance, if a student simply writes, "Explain photosynthesis," the answer will likely remain broad and general. But if the same student adds more direction, such as, "Explain photosynthesis in simple terms for a class 9 science lesson," the explanation becomes more focused and easier to grasp. Prompt engineering is not a skill limited to programmers or AI experts. It is something anyone can learn to make their interaction with AI more effective — whether it's a student completing homework, a teacher preparing class material, or a small business owner looking for quick insights. This paper introduces a simple and practical method for creating better prompts and explores how such an approach can improve the overall communication between humans and AI. The goal is to make the use of AI tools clearer, easier, and more meaningful for people from all walks of life.

II. LITERATURE REVIEW

A. Early Developments in Prompt Engineering

This also led to the importance of prompt engineering since the usage of early AIs such as GPT-2 and GPT-3 grew. One of the biggest "aha!" The change of direction with regards to the way you pose the question was one of the moments where people working with AI take a turn. Even a slight alteration of your words may bring you to the other extreme answer. It is not just a feeling but researchers have in fact tested it. Indicatively, investigations by Chen and his colleagues (2023) and subsequently, by Sahoo and others (2024) were able to investigate this and provided substantial evidence. They demonstrated in their work that you can get the AI to respond not only in a more logical way but also far more useful when you provide it with precise instructions and include good details thereof. This is the one discovery that made the difference. It just showed that it is not a minor additional task to learn how to communicate with AI effectively, a process that is sometimes referred to as prompt engineering. As a matter of fact, it is equally crucial as the development of AI technology itself.

B. Key Techniques

Several prominent techniques have emerged in prompt engineering:

- **Zero-Shot Prompting:** Direct queries without examples (e.g., "Translate this into Hindi").
- **Few-Shot Prompting:** Providing illustrative examples before posing the query.
- **Chain-of-Thought Prompting:** Encouraging step-by-step reasoning before delivering the final answer.
- **Role Prompting:** Assigning a specific role to the AI (e.g., "Act as a cybersecurity expert").

C. Need for Simplification

As soon as we began communicating with people about AI, we saw something. Each person has his or her way of posing questions or giving instructions. Tutorials are abundant, although the majority of them are aimed at tech experts. A language becomes so crammed with technical terminology that those who are not part of that group will simply give in. This occurred on a few occasions we observed in classrooms as well. The students and teachers would start at an interest but after they got into the complex things they stopped paying attention. They did not fail to understand, they simply presented the information in a different manner. The fact that made us think, why does it have to be so complex to know about AI? We began with picking out the best of what was already in existence, and paraphrasing it in plain, simple language. Our intention was to make AI more approachable and user-friendly, ensuring that its applications are understandable for everyone whether a student completing assignments, a teacher preparing lessons, or a farmer planning agricultural activities.

III. PROPOSED METHODOLOGY

The concept initially was based on something very ordinary which was the explanation by the teacher about a difficult subject at school. An effective instructor presents complex topics in smaller, comprehensible segments and ensures that learners clearly understand each step before proceeding. That daily routine was the foundation of the presently known Geeta Six-Step Method. The goal was to avoid unnecessary complexity and maintain a simple, structured approach. It was merely to ensure that the plan was easy to construct and easier to be learned by the AI. Therefore, rather than a single lengthy and confusing word, the prompt has been divided into straight and straight forward steps. All these steps help in small tasks but when combined, they help in making the final message clearer and easier to digest. It is in practical terms, much similar to a teacher listening to a student and consequently interpreting the question correctly and then responding in a manner, which makes sense. This approach aims not merely to generate an answer, but to produce responses that accurately reflect the user's intent and context.

IV. IMPLEMENTATION

We assessed the Six-Step Method with GPT-4, GPT-3.5, and Google Gemini in three tasks categories:

The general workflow of the Six-Step Method of the proposed approach to prompt engineering is depicted in Figure 1. This is initiated by the raw input of a user, which undergoes sequential stages six in the form of structured stages that include Context, Task, Persona, Format, Example, and Tone to create a refined and optimized prompt. This organized structure allows the use of large language models to help understand the intent of users, which leads to more accurate and context-specific answers.

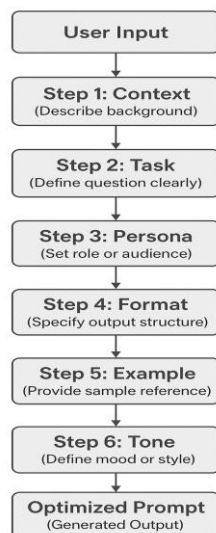


Figure 1. Workflow of the Six-Step Prompt Engineering Method

TABLE 1: THE SIX-STEP METHOD FOR PROMPT ENGINEERING

Step	Name	Purpose
1	Context	Describe the background
2	Task	Clearly define the question
3	Persona	Set the role or audience
4	Format	Specify the output structure
5	Example	Provide a reference sample
6	Tone	Define the mood or style

1. Educational writing
2. Agricultural advice
3. Professional writing

Four prompting styles, Zero-Shot, Few-Shot, Chain-of-Thought and the Six-Step Method were tested on each of the tasks. Feedback was collected 25 of them are students, 25 professionals, and 15 rural users. We also created Lexica, a web-based application, which rearranges prompts entered by users automatically according to the Six-Step Method. The tool is freely available at: <https://lexica.streamlit.app/>. Such deployment shows the practicality of our approach that offers immediate timely optimization to end-users.

V. RESULTS AND DISCUSSION

A. Comparative Analysis of Techniques

The effectiveness of each prompting technique was assessed based on accuracy, clarity, ease of use, and user satisfaction. The results are summarized in Table 2.

Table 2: Comparative Performance of Prompting

Techniques

Prompting Technique	Accuracy	Clarity	Ease of Use
Zero-Shot	60%	Medium	Easy
Few-Shot	75%	High	Moderate
Chain-of-Thought	80%	Very High	Moderate
Six-Step	92%	Excellent	Very Easy

B. Real-Life Case Study

The first question that was asked was by a farmer in Meerut who asked, “What shall I cultivate in monsoon?” He was told, try rice or maize, " a reply that was a general one. Following the usage of the Six-Step Method:

I am a Meerut small farmer whose soil is sandy and gets very little rain. Please recommend 3 monsoon crops that have higher profitability with lesser water. Explain as if I’m a beginner.” The fine prompt produced an individual reply:

1. Pearl millet - drought resistant and rich in yield.
2. Moong dal - short growing period, enhances the soil fertility.
3. Groundnut—profitable, and does well in sandy soil. This case shows that a well-coordinated prompting can be utilized to successfully convert generic AI responses into context-specific and actionable information.

VI. CONCLUSION AND FUTURE WORK

Timely engineering based on human-AI communication is the key to efficiently cut through the boundaries of technical industries to allow the common people. According to our analysis, the Six-Step Methodology will be able to enhance the readability, veracity and relatability of AI-generated content that will be useful not only to students, but also to farmers and professionals. Future directions are:

- Making the tools like Lexica available as browser extensions and learning systems.
- Intelligent artificial intelligence of immediate optimization algorithms.
- The promotion of using the regional languages to make it more accessible to the rural users. Finally, the use of well-structured prompts that would facilitate making more informed choices should increase AI answers, which would help to be responsible in using intelligent systems.

VII. ACKNOWLEDGMENT

The authors are thankful to Mr. Anmol Chaudhary to have mentored, encouraged and provided effective feedback to them in writing this study. The authors too credit Meerut Institute of Technology as having aided them in terms of academic assistance and a good research environment. It is devoted to students, educators, and farmers who are always learning how to implement AI to the real world.

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