

Generative AI and Prompt Engineering in Operations using Oracle

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ABSTRACT

Generative AI and Prompt Engineering has brought a new era in machine capabilities, where systems capture the natural language and create a customized new output. Taking references from various sources, the Gen AI compiles a unique focused output as required by the user via the series of question and answers, where were strategically laid out using Prompt Engineering. Using historical data and responses, the questions are formulated and positioned carefully to guide the user to provide responses that best explain the needs. This information collected from various sources are properly structured and conditional sequence defined that can dictate the solution path to take and there by identifying the right answer. This can be leveraged in any part of the business operations to guide the users and automate the solution provision. With Oracle ERP and Cloud being one of the most structured, with every validation and flow clearly defined, using Gen AI and Prompt engineering, the organizations can build a comprehensive solution that can work with the users in educating and guiding them on the process and by providing solutions to the problems, which can effectively eliminate the support needed from the experts or support team, thereby eliminating the dependency and reducing the turnaround time.

Keywords: Gen AI, Prompt engineering, Generative AI, Machine learning, L1 automation, Natural language processing (NLS), Interactive learning, Adaptive programming, Operational assistance using AI.

1. Introduction

“Generative AI or generative artificial intelligence refers to the use of AI to create new content, like text, images, music, audio, and videos.”

- Definition by Google Cloud (1)

“Prompt engineering is the process where you guide generative artificial intelligence (generative AI) solutions to generate desired outputs.”

- Definition from AWS (2)

Generative AI and Prompt Engineering are two closely related technologies that so each other in providing services to the end user. With carefully planned and positioned questions prompt engineering gathers all required information that is fed

into the generative AI for creating customized solution. Oracle has fused these capabilities into their cloud systems to provide easy come off fast and seamless assistance to their end users in various departments and business divisions enabling them to complete their task easily with minimal he had us and friction.

2. Oracle Generative AI

Oracle has plugged in the power of Generative AI in every part of its cloud solution, from its Infra (IaaS) to its integration solution (PaaS) to the cloud ERP (SaaS). These Generative AI use the Large Language Models (LLM) to understand the user request in its natural form and translate the into machine language, which in-turn would identify the specific performers, known as Agents, to accomplish the task. These agents designed and structures similar to a functioning business, such that they are self-sufficient to plan, manage and execute the tasks.

2.1. Generative AI agents

This is a solution, where generative AI is provided to assist the end users in various functional activities. These range from providing answers or information requested, to extremely sophisticated tasks, like working in tandem with the users and continuously monitoring them and guiding them on business practices. For example, using these generative API capabilities users can inquire about an outstanding payment or ask about a certain transaction that failed to understand the underlying problem. It can also be used to automate the tasks that are to be performed by the user like creating an invoice, or creating a journal entry as needed. The generative AI uses the workers called agents to perform the tasks requested by the user. These agents either work individually or combine with other agents to accomplish a certain task. These perform all round activities starting from planning resource allocation curating compilation and accomplish a task. These are extremely cool oriented and are designed to perform a specific duty. These agents are largely autonomous and do not need any human intervention to perform their task. It can manage the entire operations end to end starting from interacting with the user in understanding the requirement using prompt engineering and other techniques to identifying the specific agent or performing the specialized task planning the resources and eventually completing the task. Based on the operations performed by these agents they are broadly classified into four different types –

The first type is the conversational agent. As the name implies, these agents are used to interact with the end user for gathering the requirements. Depending upon the business model these end users can either be a human or another piece of software or agent that would ask a specific task to be done. These largely use LLMs to understand the requirement in case they are interacting with other humans to translate them into machine understandable language.

The next type is the supervisor agent. The responsibility of this agent is to gather the information received from the conversational agent and analyze the need and guide the underlying agents to perform the required task. It is this agent which determines the functional requirement and the eventual task that is requested. Upon identifying these needs the right functional and utility agents are identified and the task assigned to them, respectively. These agents at times take decision on behalf of humans to determine the right path forward.

The functional agents are the workers who are associated with one specific domain such as purchasing or payables or general Ledger etcetera. These have the functionalities recorded in them that defines how the module is expected to work. They have all the steps, and the rules recorded in them along with various configurations that will be leveraged by the underlying agents to perform the requested task. Some of the real-world examples of such functional agents are customer support agent, which provides interaction with the customers in answering specific questions or summary agent which reaches through a larger passage and identifies the gist of it, etc.

The last type is the utility agent. This is the ground level worker who performs the actual task. These agents are strictly associated with a narrow set of capabilities and tools depending upon the requirement each of these agents are invoked to perform a particular task. For instance, come on if the request

is to generate a code for a specific interface, in PLSQL, there will be a specific utility agent that will be triggered which was associated with this language and coding methodologies to generate the code. Similarly, there are many such utilities to actively assist generative AI in best serving the user.

3. Benefits of Generative AI in Applications

There are several benefits in leveraging these AI features in the business applications. Since these solutions have dedicated agents underneath them who have specialized task focused on a particular module or an activity one can be confident that the solution provided by these agents are accurate. These generative eggs can be used in various domains and functional tracks within the organization helping them to navigate easier and produce data-driven results.

In the General Ledger domain, the generative AI can be used to track the journal entries and out of balance entries to find the problems within. These specialized agents can dig through the balance sheets of any particular. Or the application as a whole to identify anomalies and bring them to user attention. There are also special utility agents that are designed to perform the day-to-day tasks that these business users perform such as creation of journals running reports set up activities etc. The error handling feature can assist the end users to understand the problems that they might be facing as part of the D-Day activities. Using a natural language questions, the users can track and question about a particular transaction to find the status at various stages and the problematic area that needs to be addressed. This helps both the business as well as the support team in easily identifying the errors and taking corrective actions.

The provisions such as predefined chat bots another interactive AI solution would come handy in automating the customer service operations. By educating the agents and providing enough data samplers these chat bots can effectively interact with the end users and the customers to understand their needs and provide responsible solutions. This can also be tuned in such a way that they can reroute it to other channels or agents or even a human customer representative for resolving the customer needs. This is a great way forward in terms of customer experience and other interactive services that the organization might need.

The OCI Language feature is yet another provision provided by Oracle as part of their Gen. AI feature. Using this feature the system can read any paper document that scanned or images and identify keywords and patterns and extract them and translate them into the respective relational objects. For instance, a scanned invoice received from a supplier can be fit through the generative AI solution to extract the invoice numbers the vendor information the invoice amount and backing details if any to identify the payables related information pertaining to this document. This comes in especially handy in terms of interacting with the windows and other third parties who might not have a digital interface with the company.

The document understanding feature provided by Oracle Gen. AI is the ability of these systems to read the document and understand complex business processes. This leverages the sophisticated utility agents which can scan through the documents and understand the sequence of activity status listed in the document and clearly provide a concise and sequential flow understandable by the end users. This is particularly handy

in terms of understanding any new business process that might be introduced as part of merger or process automation. Additionally, this feature also helps the developers and other IT resources in scanning through technical documents and code in identifying key tables APIs and other technical aspects that might be used as part of the implementation. The extensibility feature of the Gen. AI helps the customer to formulate a custom solution that is best fit for their industry specific needs. This allows the implementers to have a completely personalized and focused AI solution that caters to every requirement of their business.

The image recognition feature of the generative AI enables the system to scan through images and perform various necessary activities such as image matching search using images, identifying the text within the images etc. These can also be used in terms of reading some of the scanned documents where the organization leverages documents attached to mails or other means for the data entry team or processing team to create transactions. These activities are usually done manually where there is a human interaction needed to recognize the patterns and the details as part of the image and manually enter them into the system with this facility this eliminates the need for human intervention thereby avoiding any it is oversights that might happen.

Similar to the image recognition the speech recognition feature is yet another significant feature that can assist the business in their day-to-day activities. Using this feature the speech patterns can be recognized, and notes and transcripts can be created from the meetings and discussions to provide a concise and clear minute of meeting by capturing all the key information from the meeting. This eliminates the overhead of the meeting organizer or other parties to take meticulous notes and share it with the team which is quite prone two errors and information drops.

4. Conclusion

With Gen AI and Prompt Engineering, the interactions with machines has evolved from monotonic response to more interactive and diverse, where the response generated in more of a process, rather than a simple question and answer. Though it is still experimental, these technologies have shown the capabilities of AI, that was never seen before and is evident that it is more to come. In recent years, every organization has added AI as part of their IT goals and are actively pursuing solutions best suited for them. Understanding the demand and the potential, all IT product and service companies are competing against each other and have invested heavily on improving these technologies to provide more accurate and advanced capabilities. Even in its experimental form, the Gen AI and Prompt Engineering have been implemented by many companies in various capacity, particularly in the areas like customer service, sales, marketing, etc. While have had amazing success in stable environments, the reliability in more dynamic situations is still patchy. With additional sources, new set of details will influence the ability of these Gen AI technologies, which can end up getting better or worse, depending on the user's perspective and its ability to gauge and provide consistent results in any environment is yet to be judged.

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