



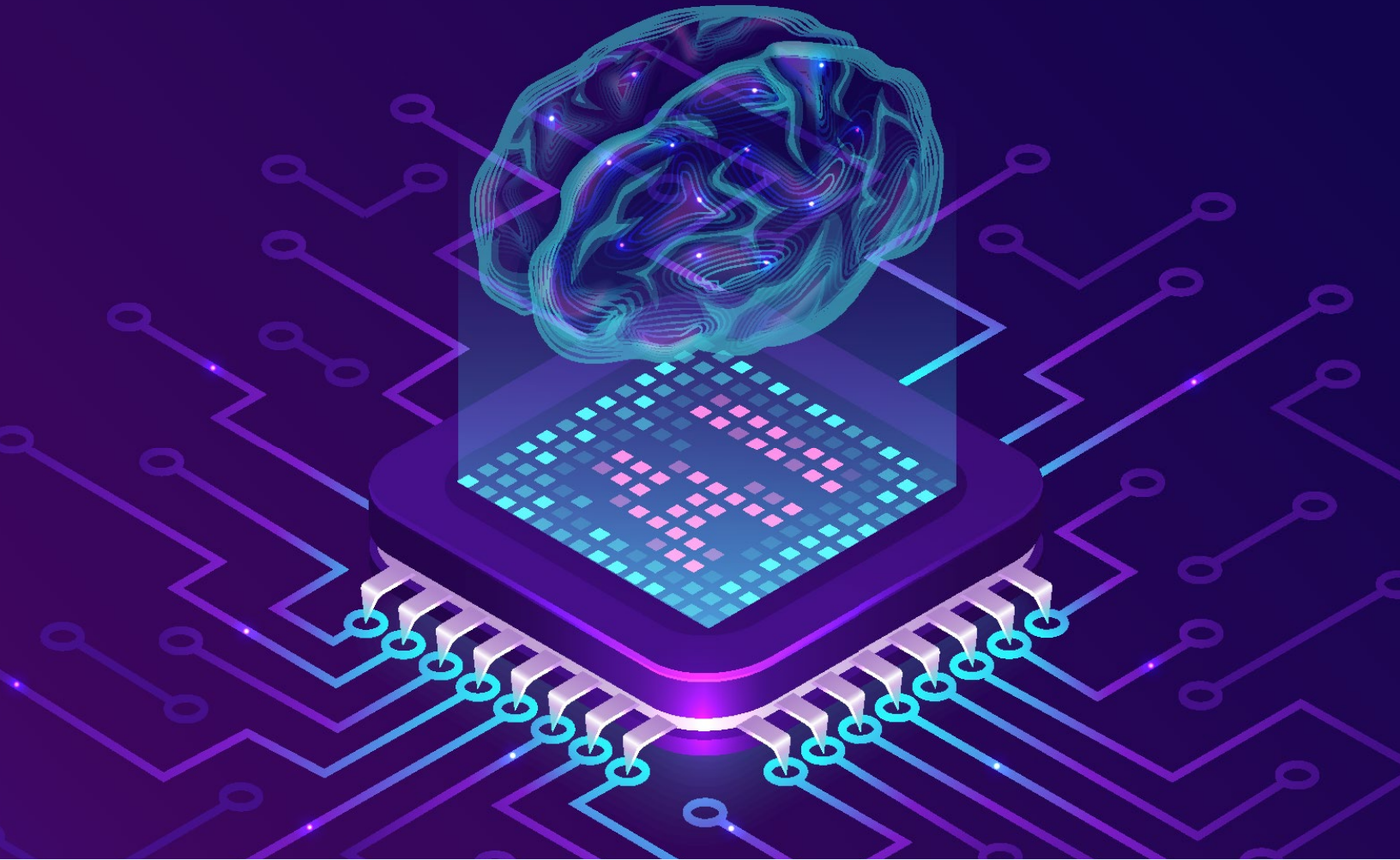
UNLOCKING THE POTENTIAL OF CHATGPT: ENHANCING PRODUCTIVITY & EXPERIENCE ACROSS THE ENTERPRISE

Abstract

ChatGPT is fine-tuned from GPT-3.5, a language model trained to produce text. ChatGPT was optimized for dialogue by using Reinforcement Learning with Human Feedback (RLHF) - a method that uses human demonstrations to guide the model toward desired behaviour. In this POV, we will discuss how ChatGPT will affect our everyday lives, whether it is for a software engineer developing the most complex artificial intelligence systems, or for diverse stakeholders be it business users, citizens developers, knowledge workers, end users of systems and more.

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Introduction

ChatGPT is an AI chat bot created by the company called OpenAI. OpenAI is a research and development company was founded in 2015 and since then they have come out with various tools one of the most popular has been a system called DALL-E which is an AI generative image tool.

It is first imperative to understand what ChatGPT really is before moving forward. This is an acronym for the Chat Generative Pre-Trained Transformer. GPT Models were trained using text databases found on the web. This included a whopping 570GB of data obtained from books, web texts, Wikipedia, articles, GitHub stack Overflow and other pieces of writing on the internet. The system was fed three hundred billion words in total.

As a language model (NLP), it works on probability, being able to guess what the next word should be in a sentence. As they have trained on large corpus, it is able to understand certain aspects of language - sentence formation, word prediction and can use probability to determine the likelihood of what the next word should be. What sets this technology apart is that it continues to learn while guessing what the next word should be, constantly improving its understanding of prompts and questions to become the ultimate know-it-all.

So, one of the major differences between Traditional search/ semantic search uses AI models for text matching, essentially closest embedding is matched along with PageRank algorithm, whereas ChatGPT can understand some of the context and the nuance of what you are asking and provide results accordingly So, ChatGPT is opinion (Chatbot answers) and the other is information and source of it.

There are different versions of GPT-3 named as ada, babbage, curie, and DaVinci. The most capable model is DaVinci, while Ada is the fastest. The ChatGPT is fine-tuned from a model in the GPT-3.5 series, which finished training in early 2022. ChatGPT and GPT 3.5 are trained on an Azure AI supercomputing infrastructure. GPT 4.0 is slated to be released this year in 2023.

We foresee that the ChatGPT's relevance will grow exponentially as organizations adopt it. Eventually, ChatGPT will pull in personal data and enterprises will have their own customized ChatGPT instance with all relevant private data fed to it. For example, if you work for Infosys, you could rummage through internal data by using ChatGPT as a personal buddy or it can provide essential support to customers by enabling them to find the answers they need quickly.

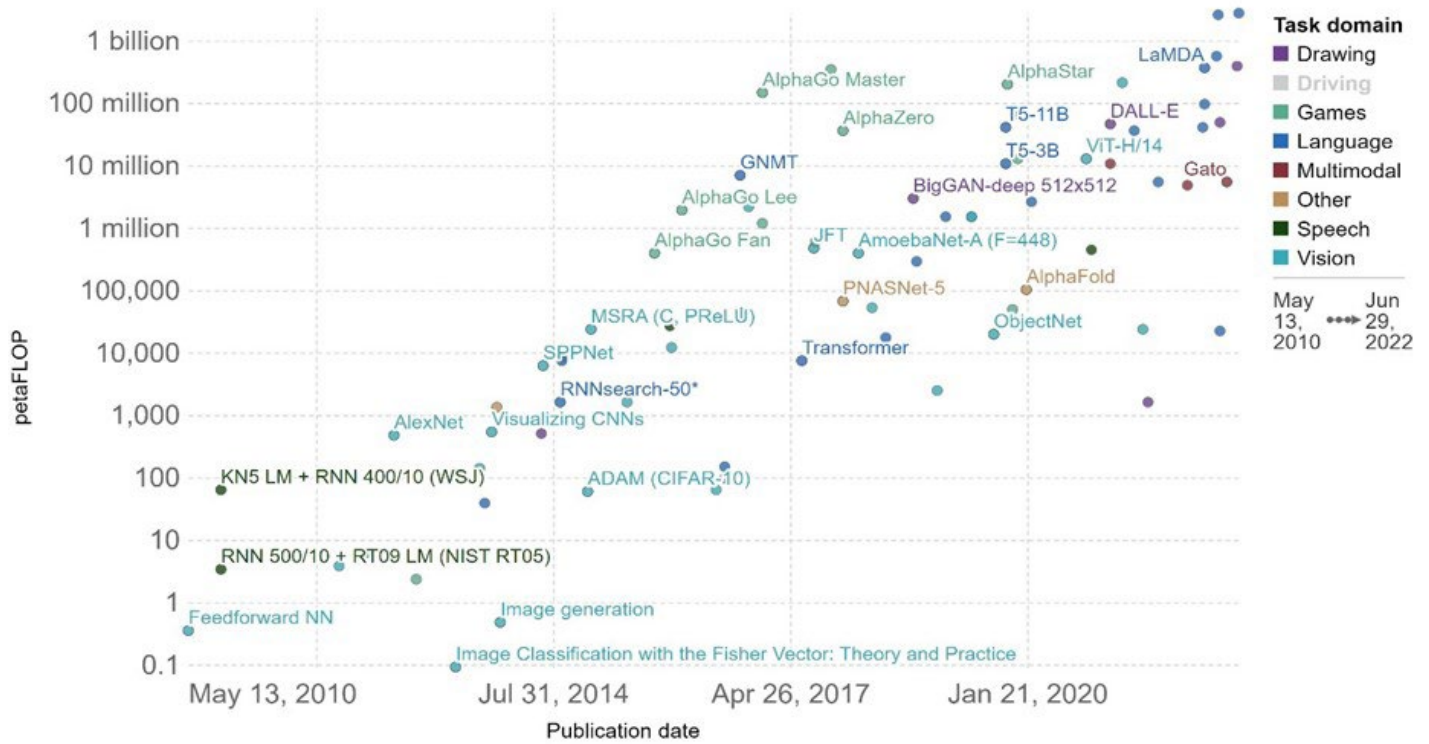
Background

We see there is a lot of excitement this year than last year on AI, and it is because of that exponential growth of the power of the AI models, if we just look at what has happened between GPT-3 to 3.5 these are not linear progress.

Computation used to train notable artificial intelligence systems

Our World in Data

Computation is measured in total petaFLOP, which is 10^{15} floating-point operations¹.



Source: Sevilla et al. (2022)

OurWorldInData.org/artificial-intelligence • CC BY

Note: Computation is estimated based on published results in the AI literature and comes with some uncertainty. The authors expect the estimates to be correct within a factor of 2.

1. Floating-point operation: A floating-point operation (FLOP) is a type of computer operation. One FLOP is equivalent to one addition, subtraction, multiplication, or division of two decimal numbers.

Source: <https://ourworldindata.org/grapher/ai-training-computation?time=2010-05-13..2022-07-01>

Figure 1

Let us take steps back and see how AI has been evolved over the years.

Year	Type	Method Used
1st Generation AI (1990)	Machine Learning "how" Learning Algorithms	<ul style="list-style-type: none"> Supervised Training from Scratch
2nd Generation AI (2010)	Deep Learning "features" Architectures	<ul style="list-style-type: none"> Supervised Fine Tuning of Foundation Model
3rd Generation AI (2017)	Foundation Models "functionalities" Models	<ul style="list-style-type: none"> Self-Supervised Training Few-Shot (Supervised) Learning Prompt Engineering of Foundation Model

1st Generation AI: The first generation of AI, also known as “Good Old-Fashioned AI (GOFAI),” focused on developing rule-based systems. These systems are created by explicitly programming a set of rules into the computer, and they were only able to perform tasks that the rules explicitly defined.

2nd Generation AI: The second generation of AI, also known as “Expert Systems,” focused on creating systems that could mimic human expertise in specific domains. These systems can reason and make decisions based on the knowledge they had been provided.

3rd Generation AI: The third generation of AI, also known as “Artificial General Intelligence” (AGI) or “Strong AI” focuses on creating systems that can learn from and make predictions about data. **These systems are based on neural networks, which are modelled after the human brain and can learn from experience.** They are currently the most advanced AI systems and can perform tasks such as image recognition, natural language processing, and game-playing at superhuman levels.

The field of AI is constantly evolving, and new techniques and approaches are being developed all the time, which will lead to

further advancements in the future.

OpenAI is a research organization that has developed several notable **AI systems that fall under the category of third generation AI, also known as “Deep Learning.”** OpenAI is an AI research and deployment company with a mission to ensure that artificial general intelligence benefits all of humanity.

OpenAI developed a large-scale language model called GPT over multiple years and iterations. This model evolved with training on massive amount of general-purpose data on an internet scale. The latest GPT 3.5 is opened to public via chatGPT (a browser based chatbot) interface to public.

chatGPT opened a window for everyone to understand capabilities offered by GPT 3.5. Simultaneously OpenAI opened APIs to access and integrate with GPT commercially.

Throughout the following sections, we will discuss how GPT will affect our everyday lives, whether it is for a software engineer developing the most complex artificial intelligence systems, or for diverse stakeholders be it business users, citizens developers, knowledge workers, end users of systems and more.

Capabilities

Artificial Intelligence use cases have been traditionally used for analysing information and making decisions based on the analysed information – termed Cognitive AI. Generating content for a focused use case has always been a challenge. Generative AI is the field in AI wherein the information or content is generated by systems. Current research and developments have exposed us to below forms of Information Generation

- Use case explanation
- Content summarization
- Code generation
- Image and video generation

- Music generation

With the advancements in the research of AI, the world is now able to witness the content generated by these systems. ChatGPT is a conversational language model developed by OpenAI. It is based on the GPT-3 (Generative Pretrained Transformer 3) architecture and is fine-tuned for generating human-like text in conversational contexts. It is capable of understanding and generating text for various tasks, such as answering questions, generating responses in a chat, and completing sentences or paragraphs. It is known for its ability to generate high- quality text that is difficult to distinguish from text written by humans.

ChatGPT is capable of a wide range of natural language processing (NLP) tasks, including:

Capability	Usage
Generating human-like text in response to prompts	<ul style="list-style-type: none"> • Explain a piece of code in human understandable language. • Find the time complexity of a function.
Generating text based on a given context	<ul style="list-style-type: none"> • Create code using a natural language instruction. • Generate documentation for the code • Precise solutions to build execution errors • Find and fix security vulnerabilities in code
Translating text from one language to another	<ul style="list-style-type: none"> • Translate from one programming language to another • Convert SQL queries from one DBMS to another (say Oracle to PostgreSQL) • Translate natural language to SQL queries.
Answering questions	<ul style="list-style-type: none"> • Generate Q & A on provided knowledge base • Summarize a long description • Learn new languages and libraries faster with on-the-fly working examples generated by ChatGPT.
Ability to fine-tuned for specific tasks or domains	<ul style="list-style-type: none"> • Customer service • Technical support • Creative writing.

Table 2

Reimagining Work, Workforce and Workplace

As part of its ongoing collaboration with OpenAI, the firm behind the well-known chatbot ChatGPT, Microsoft is placing a **significant wager on artificial intelligence by incorporating the technology into business emails, presentations, and spreadsheets.**

The tech giant announced earlier this week it opened access to its Azure OpenAI Service, which uses Microsoft cloud computing technology to allow companies to use AI tools like ChatGPT, according to a company press release. "With Azure OpenAI Service

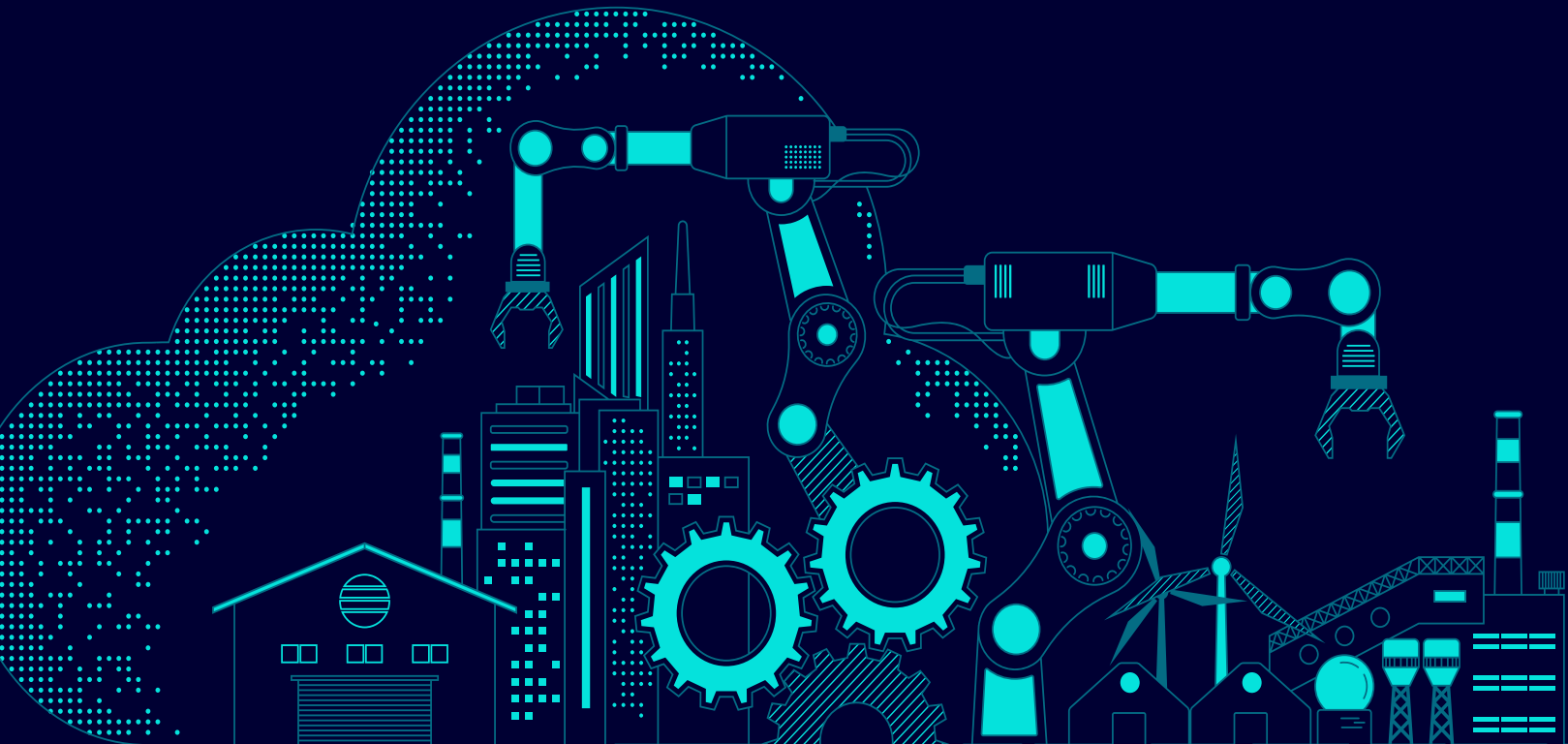
now generally available, more businesses can apply for access to the most advanced AI models in the world" the announcement states.

When ChatGPT is integrated with Microsoft's PowerAutomate suite, **it has the potential to unlock a plethora of new capabilities** and automations for example currently PowerAutomate enables users to automate workflows by connecting various apps and services. ChatGPT could be integrated with PowerAutomate to provide users with a natural language interface to trigger these automations and interact with the data flowing through the workflows.

ChatGPT can help in reimagining work, workforce, and workplace some of the examples are mentioned below:

- With easy access to automate and enhance AI capabilities, Employees will have more time to concentrate on challenging and crucial activities as a result.
- ChatGPT can be used to enhance communication within a company by giving staff members a natural language interface for information access and task completion.
- ChatGPT offers a conversational interface for customers to connect with a business, which can be utilized to improve customer service. Sales can go up and customer satisfaction can go up.
- Managers and executives can utilize ChatGPT to evaluate data and provide insights that can help them make better decisions.
- ChatGPT can be used to build virtual teams that are always available, allowing companies to grow their operations and cut costs.

It is worth noting that this integration of ChatGPT with existing low code no code tools will allow users to automate their processes using natural language processing and artificial intelligence, which can help reduce human errors, increase efficiency, and provide better customer service.



Applying ChatGPT capabilities to SDLC

If we take a bird's eye view of SDLC. It comprises of following phases. Each of these phases today are hugely human centric with bits and pieces of automation and tooling across every individual phase. ChatGPT as we will see in every example and illustration how it can fit in as one common tool across all these. In the table below, for each phase of the SDLC a prescriptive index value is provided (range 1 to 10). Higher value of the prescriptive index would means lower the requirement for the human to be in loop to validate and correct the output.

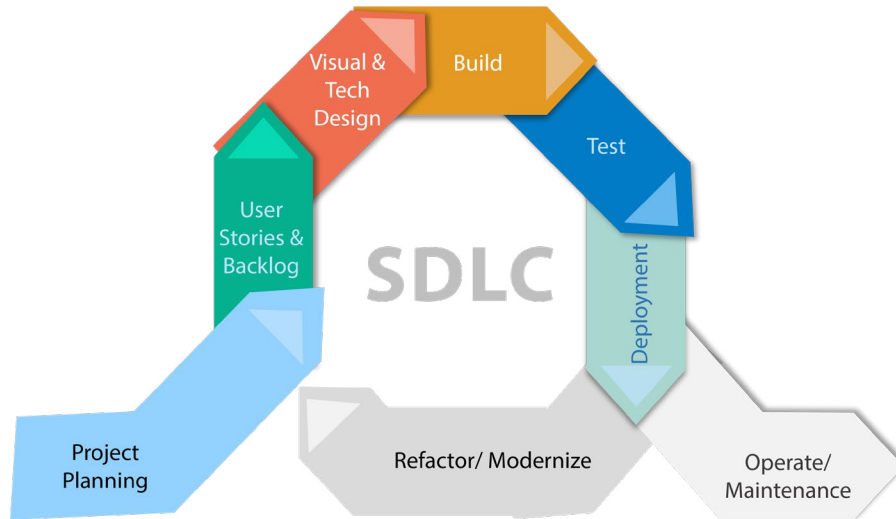


Figure 2

Life Cycle Stage	Task where ChatGPT can assist	Priscriptive Index
Project Planning	<ul style="list-style-type: none"> Task/user story estimation Resource allocation Identifying dependencies 	3
User Stories and Backlog	<ul style="list-style-type: none"> User Story Creation Backlog Item Creation Prioritization 	5
Visual and Technical Design	<ul style="list-style-type: none"> Modelling Taking Technology Choices Technology Implementation 	4
Build	<ul style="list-style-type: none"> Code Generation Finding quick solution for small coding problems Refactoring and identifying boiler plate code Code Review Identifying vulnerabilities Unit test case generation 	8
Test	<ul style="list-style-type: none"> Test case generation Test case documentation Bug reporting Test automation 	7
Deployment	<ul style="list-style-type: none"> Installation and Integration Verification Training Monitoring and Rollback if needed 	4
Operate/Maintenance	<ul style="list-style-type: none"> Incident and Problem management Updates and bug fixing, to improve and update the software. Knowledge management Documentation 	4
Refactor/Modernize	<ul style="list-style-type: none"> Understanding legacy code Functional Grouping Automated Code conversion Getting detailed explanation of Code 	7

Table 3

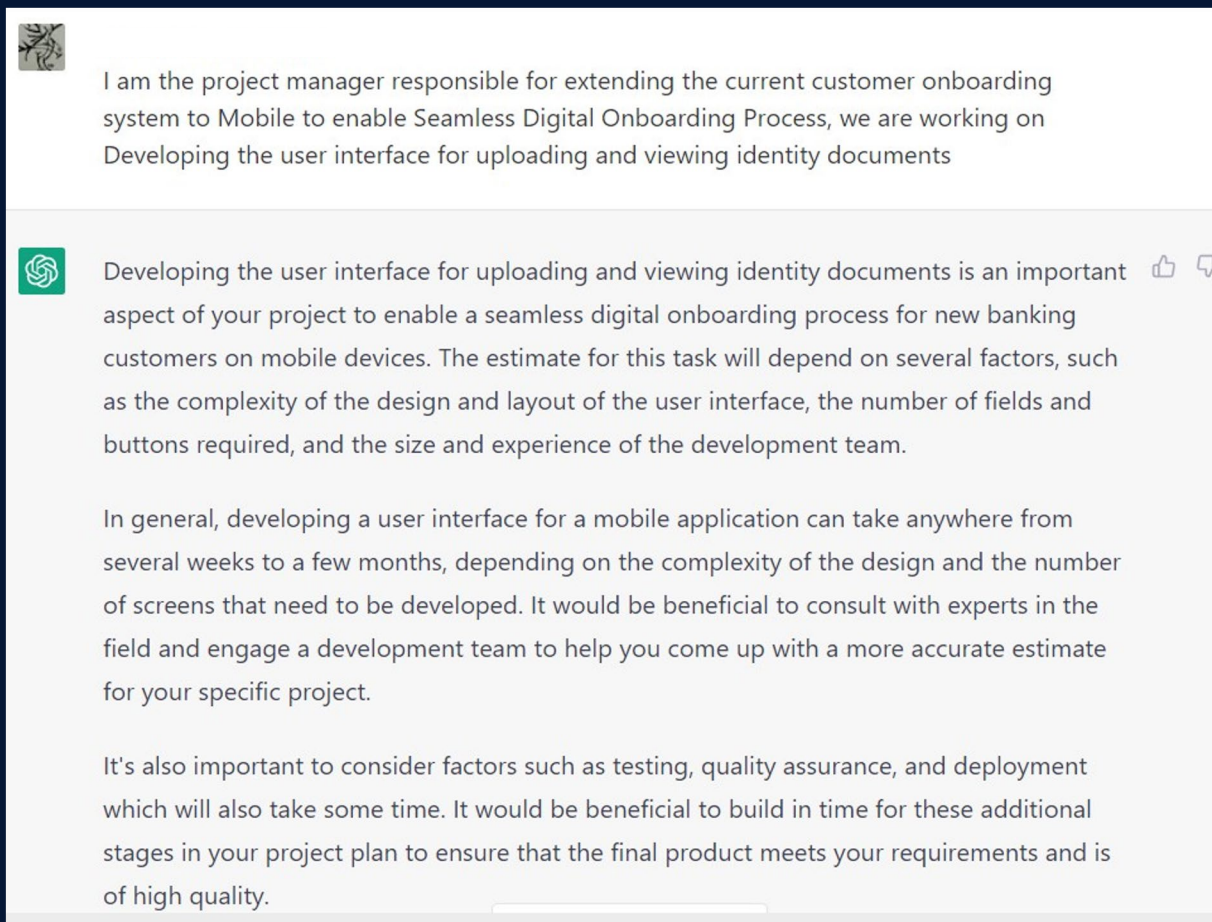
Project Planning Phase

ChatGPT's natural language processing capabilities can potentially help with project planning in a few ways:

Tasks	How ChatGPT Can help?
Generating project plans	It could be used to generate project plans by allowing project managers to provide natural language input describing the project objectives, tasks, and timelines and generating a structured document outlining the project plan
Task estimation	It could be used to help estimate the effort required to complete tasks by allowing project managers or developers to provide natural language input describing the tasks and generating estimates of the effort required to complete those tasks.
Resource allocation	It could be used to help allocate resources to tasks by allowing project managers or resource managers to provide natural language input describing the tasks and the available resources and generating a plan for allocating those resources to the tasks
Identifying dependencies	It could be used to help identify dependencies between tasks by allowing project managers or developers to provide natural language input describing the tasks and generating a diagram or document outlining the dependencies between those tasks

Table 4

For example, when we input the requirement regarding the effort needed to develop User Interface for Uploading and Viewing identity document, below is the response it gives.



I am the project manager responsible for extending the current customer onboarding system to Mobile to enable Seamless Digital Onboarding Process, we are working on Developing the user interface for uploading and viewing identity documents

Developing the user interface for uploading and viewing identity documents is an important aspect of your project to enable a seamless digital onboarding process for new banking customers on mobile devices. The estimate for this task will depend on several factors, such as the complexity of the design and layout of the user interface, the number of fields and buttons required, and the size and experience of the development team.

In general, developing a user interface for a mobile application can take anywhere from several weeks to a few months, depending on the complexity of the design and the number of screens that need to be developed. It would be beneficial to consult with experts in the field and engage a development team to help you come up with a more accurate estimate for your specific project.

It's also important to consider factors such as testing, quality assurance, and deployment which will also take some time. It would be beneficial to build in time for these additional stages in your project plan to ensure that the final product meets your requirements and is of high quality.

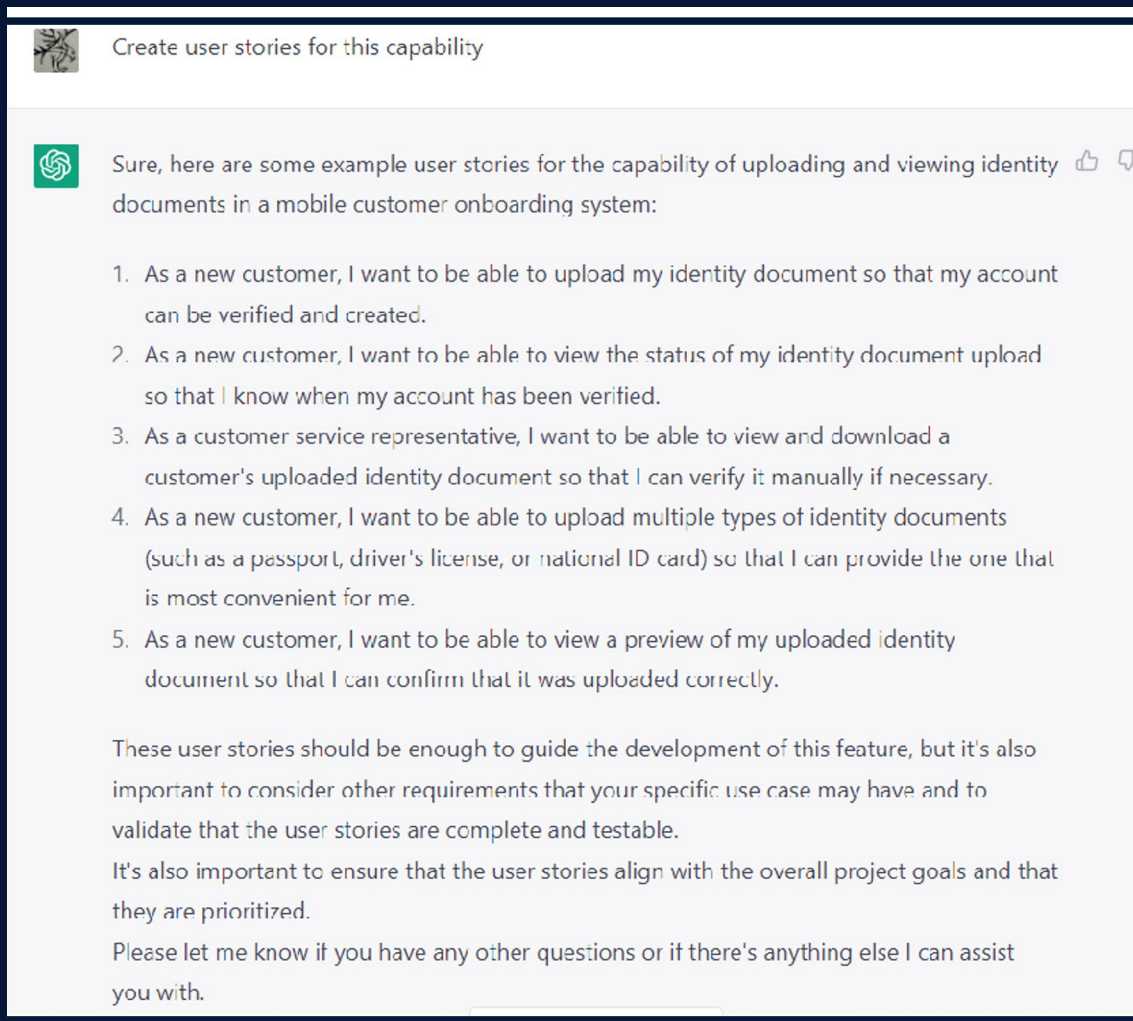
User Stories and Backlog Management Phase:

ChatGPT's natural language processing capabilities can potentially help in creating user stories and backlogs by allowing stakeholders and product owners to provide natural language input and generating structured and well-formatted user stories and backlog items.

Tasks	How ChatGPT Can help?
User Story Creation	It could be used to generate user stories by allowing stakeholders and product owners to provide natural language input describing the desired functionality from the user's perspective and generating user stories that capture the functionality in a format that is consistent with the user story template.
Backlog Item Creation	It could be used to generate backlog items by allowing stakeholders and product owners to provide natural language input describing the desired functionality and generating backlog items that capture the functionality in a format that is consistent with the backlog template (e.g., Title, Description, Acceptance Criteria, and Estimated Effort).
Prioritization	It could be used to help prioritize user stories and backlog items by allowing stakeholders and product owners to provide natural language input describing the importance and urgency of the functionality and generating a prioritized list of user stories and backlog items

Table 5

For example, when we ask ChatGPT to provide user stories for the User Interface capability for Uploading and Viewing the document, it does. It preserves the context of the previous answer.



Create user stories for this capability

Sure, here are some example user stories for the capability of uploading and viewing identity documents in a mobile customer onboarding system:

1. As a new customer, I want to be able to upload my identity document so that my account can be verified and created.
2. As a new customer, I want to be able to view the status of my identity document upload so that I know when my account has been verified.
3. As a customer service representative, I want to be able to view and download a customer's uploaded identity document so that I can verify it manually if necessary.
4. As a new customer, I want to be able to upload multiple types of identity documents (such as a passport, driver's license, or national ID card) so that I can provide the one that is most convenient for me.
5. As a new customer, I want to be able to view a preview of my uploaded identity document so that I can confirm that it was uploaded correctly.

These user stories should be enough to guide the development of this feature, but it's also important to consider other requirements that your specific use case may have and to validate that the user stories are complete and testable.

It's also important to ensure that the user stories align with the overall project goals and that they are prioritized.

Please let me know if you have any other questions or if there's anything else I can assist you with.

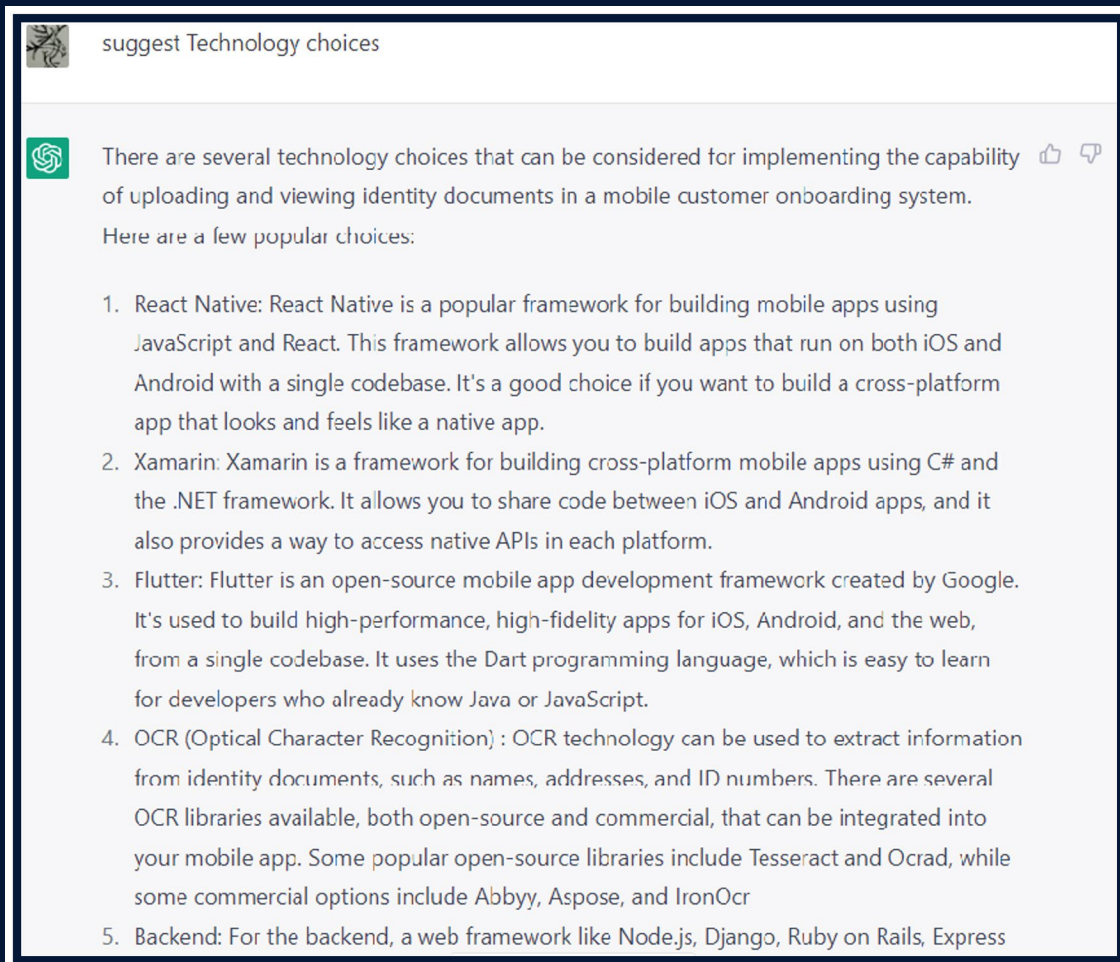
Visual And Technical Design Phase

Post user stories a typical first step in laying out architecture is to determine actors of the system and their interaction with the system. GPT comes very handy in getting these details out.

Tasks	How ChatGPT Can help?
Modelling	It could be used to rightly points out actors in the system and their interactions with the system. Although GPT currently does not have capabilities to draw visual diagrams but with OpenAI's DALL-E offering for image processing, this could very well be on its way in next version of GPT. In its present form, GPT offers huge gains in modelling with its language and context processing capabilities.
Software Design	It could be used to get suggestions for software architecture and design patterns, based on the specific requirements of the project.
Technology Choices	It could be used to make technology choices for the specific requirement.
Prototyping	It could be used to generate code snippets and pseudocode to implement specific functionality, which can help to quickly prototype and test different design options

Table 6

For example, when we ask ChatGPT to provide technology choices for the User Interface capability for Uploading and Viewing the document, it does.



suggest Technology choices

There are several technology choices that can be considered for implementing the capability of uploading and viewing identity documents in a mobile customer onboarding system. Here are a few popular choices:

1. React Native: React Native is a popular framework for building mobile apps using JavaScript and React. This framework allows you to build apps that run on both iOS and Android with a single codebase. It's a good choice if you want to build a cross-platform app that looks and feels like a native app.
2. Xamarin: Xamarin is a framework for building cross-platform mobile apps using C# and the .NET framework. It allows you to share code between iOS and Android apps, and it also provides a way to access native APIs in each platform.
3. Flutter: Flutter is an open-source mobile app development framework created by Google. It's used to build high-performance, high-fidelity apps for iOS, Android, and the web, from a single codebase. It uses the Dart programming language, which is easy to learn for developers who already know Java or JavaScript.
4. OCR (Optical Character Recognition) : OCR technology can be used to extract information from identity documents, such as names, addresses, and ID numbers. There are several OCR libraries available, both open-source and commercial, that can be integrated into your mobile app. Some popular open-source libraries include Tesseract and Ocrad, while some commercial options include Abbyy, Aspose, and IronOcr
5. Backend: For the backend, a web framework like Node.js, Django, Ruby on Rails, Express

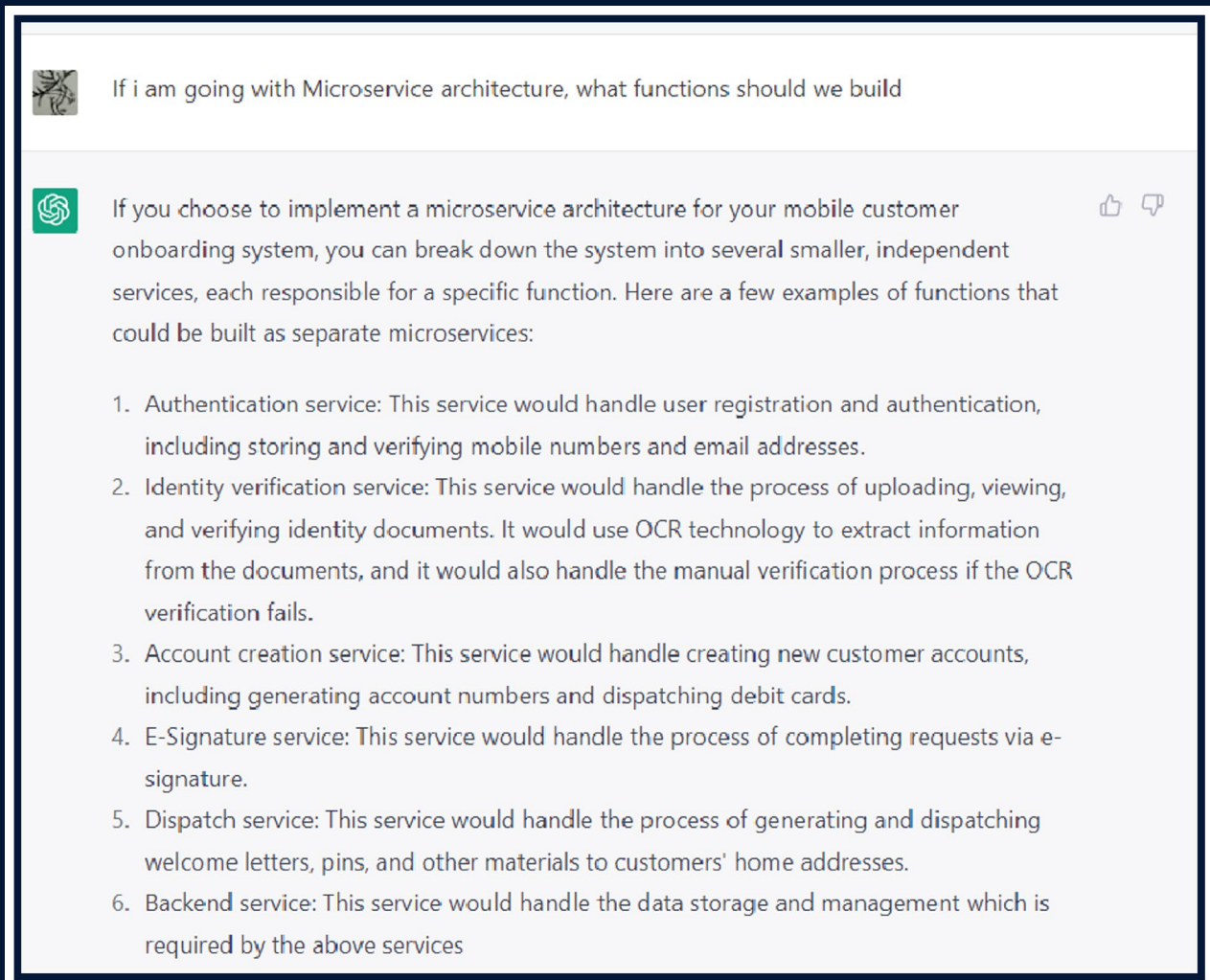
Build Phase

ChatGPT's natural language processing capabilities can potentially help in creating user stories and backlogs by allowing stakeholders and product owners to provide natural language input and generating structured and well-formatted user stories and backlog items.

Tasks	How ChatGPT Can help?
Code Build	It could Provide an optimized implementation for a code snippet. Generate unit tests for your scripts. Generate and Explain code/commands based on the requirement.
Code Debugging	It could help in finding quick solution for small coding problems. ChatGPT not only suggests better written code, but it also finds and fixes bugs in the code.
Code Quality	It could be used to Improve code quality, enforce good practices, and Detect Vulnerabilities in the code
Documentation	It could be used in creating technical documentation such as user manuals, developer guides, and API reference documentations

Table 7

For Example, if we ask ChatGPT on various functions that are needed to achieve mobile customer onboarding system it returns with right details.

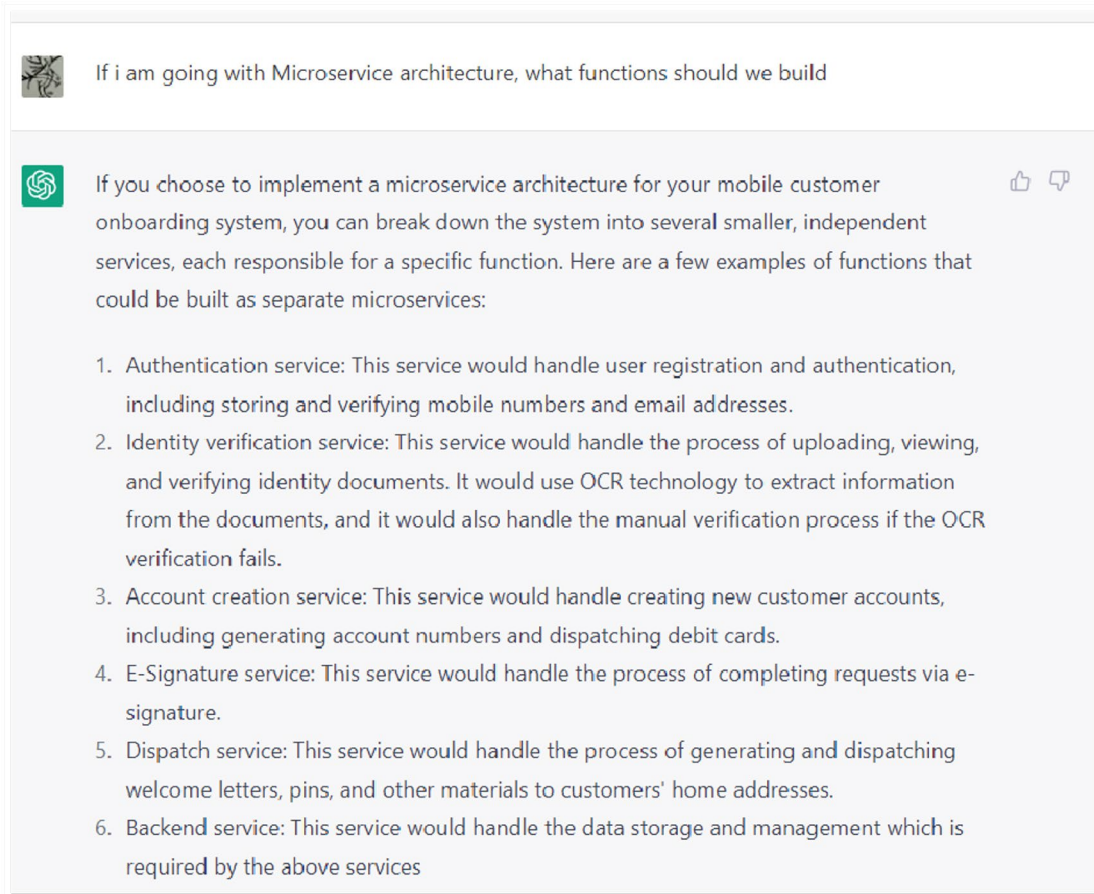


If i am going with Microservice architecture, what functions should we build

If you choose to implement a microservice architecture for your mobile customer onboarding system, you can break down the system into several smaller, independent services, each responsible for a specific function. Here are a few examples of functions that could be built as separate microservices:

1. Authentication service: This service would handle user registration and authentication, including storing and verifying mobile numbers and email addresses.
2. Identity verification service: This service would handle the process of uploading, viewing, and verifying identity documents. It would use OCR technology to extract information from the documents, and it would also handle the manual verification process if the OCR verification fails.
3. Account creation service: This service would handle creating new customer accounts, including generating account numbers and dispatching debit cards.
4. E-Signature service: This service would handle the process of completing requests via e-signature.
5. Dispatch service: This service would handle the process of generating and dispatching welcome letters, pins, and other materials to customers' home addresses.
6. Backend service: This service would handle the data storage and management which is required by the above services

As developer if we are stuck with an issue and are looking for help and debugging the code, ChatGPT can assist there as well. For example, if we ask ChatGPT to find the bug in a particular piece of code as below.



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6. Backend service: This service would handle the data storage and management which is required by the above services

As we can see in the answer, ChatGPT not only suggests better written code, but it also finds and fixes bugs in the code.

So the correct code would be something like this:

```
int minval(int A[], int n) {
    if(n<=0) return INT_MAX; //check if the array is empty
    int currmin = A[0];
    for (int i=1; i<n; i++)
        if (A[i] < currmin)
            currmin = A[i];
    return currmin;
}
```

Keep in mind that this is just one possible solution, and the exact implementation will depend on the requirements of the program.

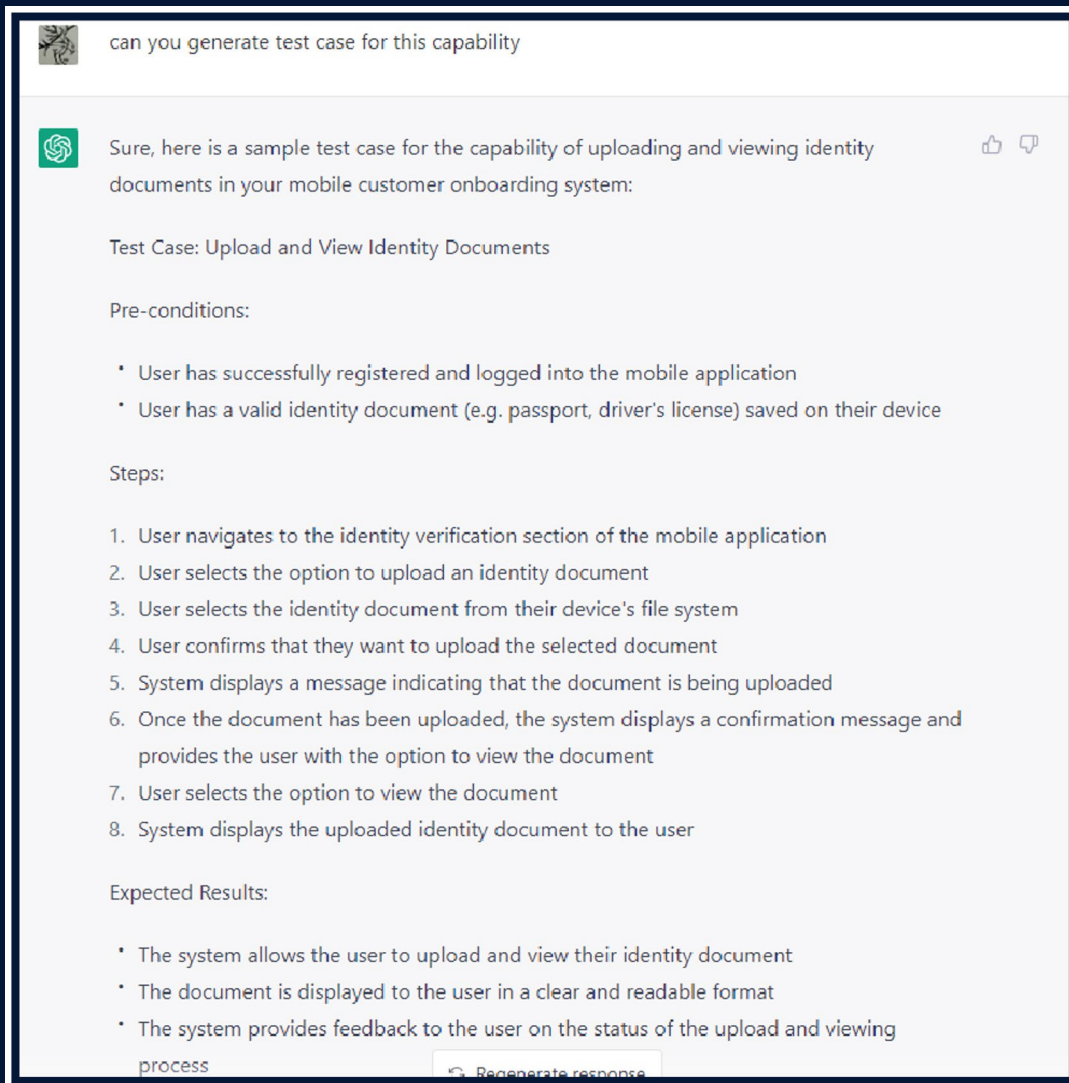
Test/Validation phase

With its superior general language processing and analytical capabilities can potentially help with testing in a few ways as described below:

Tasks	How ChatGPT Can help?
Test case generation	It could be used to generate test cases by allowing testers to provide natural language input describing the desired test cases and generating test code that implements those test cases. This can be useful in generating test cases for different scenarios and edge cases that might be overlooked by manual testing.
Test case documentation	It could be used to generate test case documentation by allowing testers to provide natural language input describing the test cases and generating a document outlining the test cases, including their expected results and pass/fail criteria
Bug reporting	It could be used to generate detailed bug reports by allowing testers to provide natural language input describing the bugs they have found and generating a structured report outlining the steps to reproduce the bug, its impact, and the expected behaviour.
Test automation	It could be used to generate automated test scripts by allowing testers to provide natural language input describing the desired test cases and generating code that automates those test cases

Table 8

For example, when we ask ChatGPT to provide test cases for the User Interface capability for Uploading and Viewing the document, it does.



can you generate test case for this capability

Sure, here is a sample test case for the capability of uploading and viewing identity documents in your mobile customer onboarding system:

Test Case: Upload and View Identity Documents

Pre-conditions:

- User has successfully registered and logged into the mobile application
- User has a valid identity document (e.g. passport, driver's license) saved on their device

Steps:

1. User navigates to the identity verification section of the mobile application
2. User selects the option to upload an identity document
3. User selects the identity document from their device's file system
4. User confirms that they want to upload the selected document
5. System displays a message indicating that the document is being uploaded
6. Once the document has been uploaded, the system displays a confirmation message and provides the user with the option to view the document
7. User selects the option to view the document
8. System displays the uploaded identity document to the user

Expected Results:

- The system allows the user to upload and view their identity document
- The document is displayed to the user in a clear and readable format
- The system provides feedback to the user on the status of the upload and viewing process

Regenerate response

Operate

ChatGPT can be used to assist with Operational support in several ways:

Tasks	How ChatGPT Can help?
L1 support	It could be used to answer frequently asked questions (FAQs) and provide basic troubleshooting assistance. This can help reduce the number of simple requests that need to be handled by support team.
L2 Support	It could be used to provide more detailed troubleshooting assistance and help escalate more complex issues to L3 support. Code translation to algorithms or familiar coding language for quicker analysis and solutioning
L3 Support	It could be used to provide subject matter expertise and assist L3 support agents in resolving complex issues.
Knowledge Management	It could be used to Consolidate digital knowledge into central searchable interface for knowledge democratization

Table 9

For example, ChatGPT is highly effective in providing answers to questions like

- How to resolve “can’t access the oracle server”?
- How to predict more accurate sales data using AI?

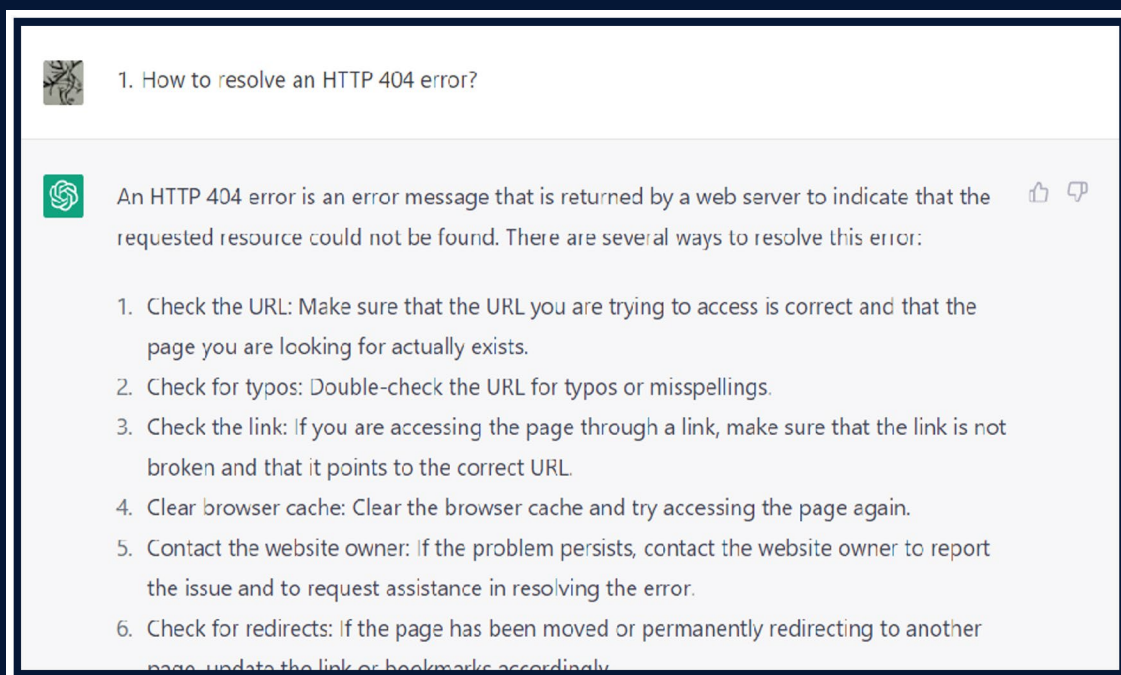
Response Generated by ChatGPT

- ChatGPT suggested ten steps checking all aspects of the OSI model including connection string, server availability, database

server logs, network connectivity

- ChatGPT provided seven steps including obtaining historical sales data, using machine learning algorithms (decision tree, neural networks, linear regression), using external data (economic indicators), ensemble methods, time-series forecasting (ARIMA, Exponential smoothing, LSTM), using AI-based forecasting tools, and monitoring the results

Even for a non-technical user, the responses generated by GPT are comprehensive in nature



1. How to resolve an HTTP 404 error?

An HTTP 404 error is an error message that is returned by a web server to indicate that the requested resource could not be found. There are several ways to resolve this error:

1. Check the URL: Make sure that the URL you are trying to access is correct and that the page you are looking for actually exists.
2. Check for typos: Double-check the URL for typos or misspellings.
3. Check the link: If you are accessing the page through a link, make sure that the link is not broken and that it points to the correct URL.
4. Clear browser cache: Clear the browser cache and try accessing the page again.
5. Contact the website owner: If the problem persists, contact the website owner to report the issue and to request assistance in resolving the error.
6. Check for redirects: If the page has been moved or permanently redirecting to another page, update the link or bookmark accordingly.

Refactor/Modernize

Large scale refactor/modernization programs in general have an extremely low success rate as they tend to overrun budgets, timeline and fail to deliver at times. The usual challenges in such programs are

- Inability to slice and dice the legacy code base, map them to functional L0 level capabilities and group them into clusters for an incremental transformation approach.
- Unable to understand legacy systems through code base and

minimal documentation in an accelerated timeline.

- Lack of matured and reliable tools to auto convert legacy code to target technology stack without carrying over the monolithic characteristics and the technology debt.

ChatGPT can be used in transformation programs with the above challenges. They can be combined with traditional rule-based systems and predictive models to create end to end solutions. The benefits include accelerated timeline, risk free modernization and improved system agility.

Tasks	How ChatGPT Can help?
Understanding legacy code	It could be used to understand what a piece of code is doing precisely, as you can use ChatGPT and ask it to provide an explanation.
Automated Code conversion	It can also be used to convert code from one language to another
Documentation	This is especially useful to documenting legacy code and to understand/learning legacy/modern technologies

Table 10

For example

The screenshot shows a user asking for an explanation of the following JCL code:

```
INCLUDE COND=((Type,EQ,Loan,AND,Balance,GT,Level1),OR,
              (Type,EQ,Check,AND,Balance,LE,Level2))
```

The AI response explains that this code specifies an INCLUDE condition for a SORT operation. It details the two conditions joined by an OR operator:

- First condition:** Type,EQ,Loan,AND,Balance,GT,Level1. This checks if the field "Type" is equal to "Loan" and the value of the field "Balance" is greater than "Level1".
- Second condition:** Type,EQ,Check,AND,Balance,LE,Level2. This checks if the value of the field "Type" is equal to "Check" and the value of the field "Balance" is less than or equal to "Level2".

The AI concludes that records meeting either of these conditions will be included in the output.

ChatGPT Industry Specific use cases for Financial Services

ChatGPT, a large language model, can be used in a variety of ways in the banking industry to improve customer service, automate processes, and provide financial advice.

Some examples of use cases include:

Areas	How ChatGPT can help?
Customer service	It can be used to create a virtual assistant that can provide customers with answers to their questions and help them complete tasks such as account registration, password reset, and account balance inquiries.
Fraud detection	It can be used to analyse customer interactions and identify patterns of behaviour that may indicate fraudulent activity.
Financial advice	It can be used to provide customers with personalized financial advice based on their individual financial situation and goals.
Chatbots for banking services	It can be used to create chatbots that can help customers with account management, money transfer, balance inquiry and other banking services.
Automated customer support	It can be used to automatically answer common customer questions, which can free up human agents to handle more complex inquiries.
Credit scoring and loan application processing	It can be used to automatically process loan applications, verify customer information, and make credit decisions based on the applicant's creditworthiness.
Personal finance management	It can be used to assist customers with personal finance management, such as budgeting, saving, and investing.
Know your customer	It can be used in the process of KYC to validate companies' or individuals' information over the Internet, as well as for document extraction, validation, and classification.

Table 11

These are just a few examples of how GPT can be used in the banking industry, the possibilities are endless as the technology advances and the banking industry adapts to the modern technology. It is important to note that the implementation of any technology should comply with the regulations and guidelines set by the financial regulators.



ChatGPT for Marketing


To excel in digital marketing, you must focus on three essential elements: providing relevance, value, and altering your audience's mindset. Individuals involved in devising communication strategies, social media management, website building, and marketing can potentially benefit from ChatGPT. However, it is important to use ChatGPT as a reference tool and improve your approach rather than relying blindly on its answers.

ChatGPT can be used for marketing in a variety of ways, such as:


- Generating product descriptions and ad copy.



- Answering frequently asked questions on a company's website or social media.
- Creating personalized email or SMS campaigns.
- Generating chatbot conversations for customer service or sales.
- Predictive analytics on customer behaviour and market trends.
- Content generation for social media and blog posts.
- Personalized product recommendation for e-commerce website.
- Generating audio and video scripts for advertising.
- Creating interactive chat-based surveys and polls.
- Generating SEO optimized content for websites.

For example, when we ask ChatGPT to compose a mail notifying customer about the new onboarding capability introduced in the mobile apps, below output is generated



Write and Email customer notifying the new onboarding capability introduced via Mobile banking App



Subject: New Onboarding Capability now Available on our Mobile Banking App  

Dear valued customer,

We are excited to announce the launch of a new onboarding capability on our mobile banking app. This new feature allows you to easily open a new account and complete your onboarding process directly from your smartphone or tablet.

To get started, simply download the latest version of our mobile banking app from the App Store or Google Play, and follow the instructions to open a new account. The process is quick and easy, and you can complete it in just a few minutes.

Once your account is open, you will be able to access all of the features and services offered by our bank, including online banking, mobile deposit, and more. Plus, you can now view your account information, check balances, and make payments all from your mobile device.

We are confident that you will find this new onboarding capability to be convenient and user-friendly, and we look forward to serving all of your banking needs. If you have any questions or need assistance, please don't hesitate to contact us.

Thank you for choosing our bank for your banking needs.

Best regards,
[Your bank name]

ChatGPT-as-a-Service for Enterprise Conversational Interfaces

An enterprise's digital capabilities can be enabled or enhanced by ChatGPT's AI-as-a-Service capabilities. Do note ChatGPT Specific API capabilities are yet to be announced.

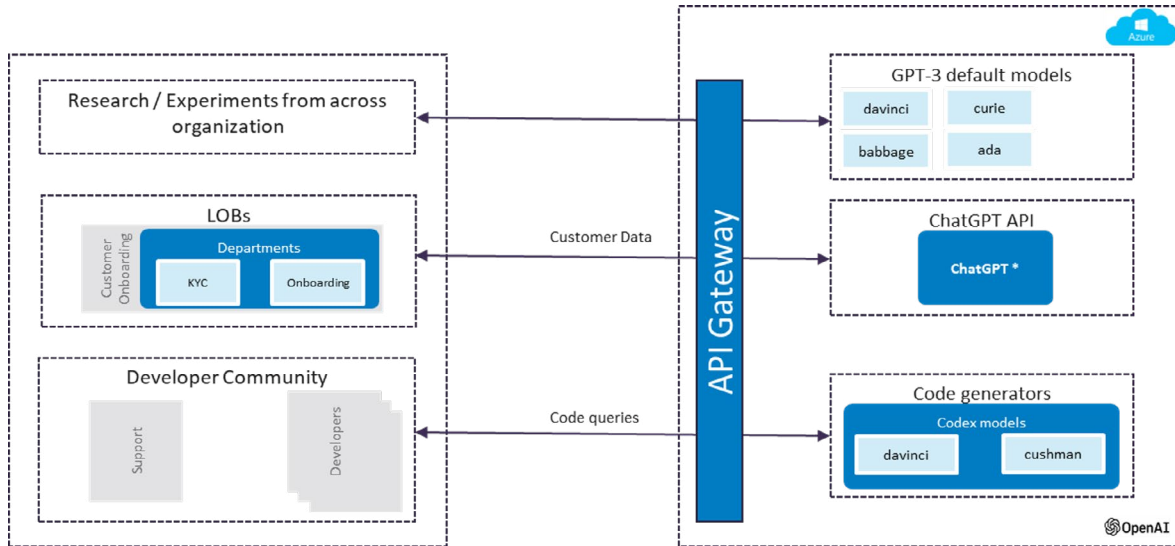


Figure 3

Infosys Accelerator	Description	How ChatGPT can be used to enhance the capability?
Infosys Cloud Infrastructure Validation	Infosys Cloud Infrastructure Validation (ICIV) is a comprehensive, cost-effective, and cloud-agnostic platform that helps enterprises assess their cloud readiness and build powerful cloud infrastructure.	It can be extended to generate test case automatically given the context of the infrastructure setup
Infosys DevSecOps Platform	The Infosys DevSecOps Platform (IDP) is a Cloud first, No Code DevSecOps platform powered by AI/ML driven insights. It is an Enterprise grade platform that enables digital transformation with security built-in across the value stream.	The ability to generate IaC can be utilized to integrate with already available large repository of templates.
Infosys Personalized Smart Video	Infosys Personalized Smart Video is a digital experience platform which transforms any video into an engaging personalized experience. It enables real-time personalization with seamless data integration and no technical expertise or training requirements.	Using the customer data hyper personalized videos can be generated improving the customer experience of the user.
Infosys Knowledge Studio	Infosys Knowledge Studio (IKS) is a platform to visualize, analyse, navigate, and query knowledge graphs. It provides various data consumption and knowledge inference features. It supports natural language-based information extraction and provides a feature rich & easy to use query builder for business users.	Extend the platform to include a searchable interface for knowledge democratization
Infosys Migration Platform	Infosys Migration Platform helps in accelerating and automating client's modernization journey. IMP supports twenty-five plus technologies including various flavours of applications and databases and its growing.	<p>The ability to It can also be used to convert code from one language to another can be utilized to bring down the learning time needed for modern technologies. This can also limit the need of SMEs to validate conversions.</p> <p>For example</p> <ul style="list-style-type: none"> Infosys Data Migration platform can benefit by SQL transformation capabilities offered by ChatGPT Large Scale Mainframe transformation can be greatly aided by generating documentation for mainframe code <p>Areas like converting legacy C++ code to Java or any other Object-Oriented language can be aided by ChatGPT</p>

Table 12

Considerations

Use of Web-API

- Explicit client approvals are required to adopt these solutions for our clients' use cases, as this involves calling an external Web-API
- The alternative is to go the open-source model route (which at present is subpar compared to OpenAI's offerings and has a dependency on the availability of large amount of data and compute)

Human-in-the-loop requirement

- When using large transformer-based models for both text and code-related use-cases, a human-in-the-loop is necessary (for pre-and-post processing and verification)

Context window limitations

- There are currently context window limitations with OpenAI's GPT3.5, which require pre-processing of the input by creation of logical chunks of data as input to the API.
- The individual outputs should then be logically stitched together and verified (largely applicable to code-related use-cases)

Challenges

ChatGPT has dominated headlines since its launch in November 2022, with the platform quickly surpassing a million registered users. While conversational artificial intelligence chatbots have numerous advantages, there are several potential today the knowledge is embedded in the model and it will have to be refreshed with latest information/knowledge:

- In a production environment, ChatGPT will require significant computational resources and may be prohibitively expensive for some organizations.
- ChatGPT is only as good as the data it is trained on. The performance of the model will be negatively affected if the data used to train it is of poor quality.
- ChatGPT is a language model, and it can understand human language, but it might not understand all dialects or languages.
- A large amount of sensitive customer data is processed by ChatGPT, which can pose significant privacy and security risks. It will be important to ensure that appropriate measures are in place to protect this data from unauthorized access or breaches to enhance its capabilities, but it might require additional work and resources.
- Due to ChatGPT's black-box nature, it is difficult to understand how the model makes its decisions. This can be a challenge for compliance and regulatory purposes.
- As with any machine learning model, ChatGPT is only as unbiased as the data it is trained on. If the data used to train the model contains biases, they will be reflected in the model's output. It will be important to be aware of and address any biases in the training data.
- ChatGPT, while removing restrictions and even improving these tools' ability to generate malicious output.

Legal Approvals

Before we all get too deep into using ChatGPT or other AI tools to create things for us, we need to address some of the questions raised around content ownership, attribution, and intellectual property.

Ownership of output : The question of who can claim copyright or ownership over AI-generated works is not clear. Requester, who just used a tool to generate the text or OpenAI? This will need some time to get resolved.

Infringement risks : As AI-generated content becomes more widely used, there is a risk that it could infringe on the rights of others or be duplicative of other content. For example, a ChatGPT generates code based on a pre-existing work without permission could be considered infringing. A class action lawsuit has been filed against Microsoft/ GitHub/ OpenAI on the use of publicly available code for training their models

Data protection risks : The data that OpenAI used to train its chatbot is problematic for several reasons. First, there was no approval taken by the company before the data was used, we do not know how our information will be used, and we don't know how long they will store the data. There is also a possibility of personal information data to be revealed outside of the context it was originally intended to be used.

Legal Approvals may be required : Infosys has been advised on engaging our internal Legal team for their review/ opinion on planned engagements; our clients may be required to do the same.

General Do's & Don'ts for Code Generation

- It is fine to use for POC, Infosys internal project and for development & documentation purposes of Infosys owned IP Assets (Products, Platforms etc.).
- DO obtain explicit consent from client (in the SOW) for usage of AI systems. Such consent is legal obligation as per several local laws.
- Discuss with client amendment of the contract to include additional clause/T&Cs required for generative AI usage (connect with IPReview@infosys.com).
- DO NOT input any data confidential to client for prompting response (such as sensitive tech details, financial details etc.).
- DO NOT input any persona/ information to prompt response (such as name, address etc.). Follow Security by Design & Privacy by Design guidelines without fail.
- DO Run scans for the generated code thru DevSecOps Ecosystem (Sonar, CAST, fortify etc. or similar tools in the pipeline) to identify and remediate security issues.
- DO Run all open-source license compliance related scans for AI generated code.

Summary

The most “transformative” technology created to date is ChatGPT. The historical moment when AI can produce non-biological intellect free of evolutionary bias is here. With contextual and geographical awareness, ChatGPT can resolve common issues and automating several operations that were previously the unique purview of humans.

- OpenAI is the only large-scale general-purpose AI made available to public
- Due to non-profit, for public mission of OpenAI and its open nature, it has potential for being taken up for adoption and integration with existing IT Systems by organizations across the world
- As exhibited by chatGPT, it has advanced capabilities for huge productivity gains from a software development perspective
- OpenAI offerings are general purposes AI, which means they are trained for all purposes so unlike other special purpose AI, there is need to train it for a specific need. It is already trained on a huge data set and is plug and play.
- The offering has been made available as SaaS through APIs. Hence integration with existing IT systems becomes very straight forward.
- As per data privacy policy of OpenAI, there is complete control on content (includes both input and output from and to OpenAI APIs) for the consumers of APIs.
- Legal Approvals may be required.

As AI becomes more accessible and easier to use, the distinction between human and machine creativity will continue to blur. With output of generative AI becoming identical to that of humans, explainable AI becomes a reality for moral decision-making and for reducing some of the business risks related to faster AI deployments. Along with this, **data governance frameworks and technologies will emerge to maintain relevance and compliance with changing legal and societal systems.**

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