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Generative AI Approaches and Implications for Product Managers

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Initiatives: Product/Service Discovery and Validation

Generative AI is attracting significant attention from enterprises, investors and technology providers, with many large tech companies and startups already building solutions on generative AI. Product managers must act now to address opportunities and ward off threats.

Overview

Key Findings

- A great deal of confusion and trepidation exists among product managers regarding the future course of development of generative AI (GenAI) and its impact on their products/services.
- Generative AI requires particular attention by product managers as it stands out in its potential to accelerate, elevate or alter the value propositions of many products and services.
- Rapid proliferation of GenAI-based solutions will require specific tools to build, integrate, deploy, maintain and manage.
- In the initial days of GenAI technology, the market will be filled with tools rather than finished solutions for clients.

Recommendations

Product managers keen on leveraging generative AI as part of their product/service discovery and validation must do the following:

- Map where, how and when the four new GenAI-based approaches — foundation models, embedded applications, enabling tools and custom services — can be leveraged into your product portfolio and roadmaps.

- Decide whether to embed GenAI (API services from foundation models) in your core product, develop new offerings or do both, by reviewing the impact of augmenting existing features or adding new functions in your core product.
- Mine the growing opportunities in the GenAI-enabling tool market (for both build tools and use tools) by performing a gap analysis of this market to determine potential areas to expand first with new or updated products and services.
- Address the solution development opportunity (custom projects) for technology and service organizations' clients by identifying business problems that could be addressed leveraging GenAI-powered solutions.

Analysis

This research has been adapted from How Generative AI Technology Impacts Offering Strategies for Tech CEOs.

The past year has seen a proliferation of offerings such as ChatGPT, Dall-E and Stable Diffusion that shows the remarkable potential of generative AI. These solutions, enabled by large language models (a class of foundation models), are a large step forward in what such technologies can do. While these models showed the power of generative AI, their use extends into many aspects of technology products and services. These solutions are still in infancy and prone to many errors and risks. Nevertheless, Generative AI provides a range of capabilities that can be applied in various scenarios (see Innovation Insight for Generative AI), but also shows glimpses of how it can upend the status quo of many technology products and services.

Generative AI today is dominated by some of the largest tech companies and a surge of well-funded startups. A multitude of startups and open-source communities are offering technologies, tools, applications, services and more. Most enterprises and technology vendors that serve them are curious and have started adoption, but Gartner's interactions indicate that their current plans are slight and incremental.

Generative AI will impact a broad swath of products and services. The usage of it in products is a spectrum – varying from generalized use cases to specific uses to drive competitive advantage. Hence, it is vital for product managers to investigate, experiment, and hypothesize what might be possible, where, with what and how as this technology continues to evolve. This document provides product managers an early view of the GenAI-based approach to markets that are evolving around generative AI. This view should provide product managers a framework to both navigate the various markets as they evolve and leverage the opportunities and innovation from their market in their own products and services.

Four Types of Generative-AI-Based Approaches to the Market

Gartner expects four types of approaches to take shape and get established in six to 12 months (see Figure 1). They vary in intent, participants and the opportunities they present to product managers.

Figure 1. Expected Generative AI Market Approaches Within Six to 12 Months

Expected Generative AI Market Approaches Within Six to 12 Months

1 Foundation Models			2 Applications		3 Enabling Tools	
Foundation Models	Fine-Tuned Models	Domain Models	Embedded Applications	Native Applications	Build Tools	Use Tools
A121 Labs, Alibaba, Amazon Web Services (AWS), Anthropic, Baidu, BigScience, Google, Meta, Microsoft, OpenAI, Stability AI	AWS, Databricks, Hugging Face, U.C. Berkeley	Bloomberg, IBM, Microsoft, MyWave.ai, OpenAI, Stanford University	Adobe, Google, Microsoft	Function Specific: Cogram, Jasper, Lavender, Notion, Rytr, Tome Vertical Specific: Harvey AI (Legal)	IBM, NVIDIA, SambaNova Systems	Fiddler AI, LangChain, LlamaIndex, Weaviate
4 Custom Services						
Custom service offerings that involve one or more of these areas and may integrate other systems and technologies.						

Source: Gartner
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Category 1: Foundation Models

Foundation models are the backbone of many generative AI solutions, including ChatGPT. A big subset of them are language-based and are referred to as large language models (LLMs). Foundation models are mostly available as cloud-based services from the likes of Anthropic, Cohere, Google, Hugging Face, Meta, Microsoft and OpenAI. But there are on-premises deployments as well: For example, Hugging Face transformers enable deployment of BERT, GPT-2 and RoBERTa on-premises. Many others can be deployed on-premises to allay customer concerns about control and privacy. The landscape of providers here include big tech giants, venture capital (VC)-funded startups, open-source organizations and more.

This category has three subcategories:

- **Foundation models:** Foundation models are trained on a broad set of data that can be used for different tasks, with additional fine-tuning. They are called foundation models because of their critical importance and applicability to a wide variety of downstream use cases, due to large-scale pretraining of the models. Examples include A121 Labs' Jurassic-1, Alibaba's M6, AWS's Amazon Titan, Baidu's ERNIE, BigScience's BLOOM, Google's BERT and LaMDA, Meta's LLaMA, OpenAI's GPT-4 (see Quick Answer: What Is GPT-4?) and Stability AI's StableLM.
- **Fine-tuned models:** Fine-tuned models are developed by training preexisting models with data for a specific purpose, improving the performance of the model in a specific aspect. Open-source initiatives have been successful in reducing the cost and training time for fine-tuning models that were hitherto the domain of only the well-funded tech companies. Examples include Databricks' Dolly 2.0 (fine-tuned from EleutherAI's Pythia models), Meta's RoBERTa (fine-tuned from Google's BERT) and U.C. Berkeley's Vicuna (fine-tuned from Meta's LLaMa).
- **Domain models:** The model is trained with data in the source domain to match the target domain, where the data is scarce. The idea of domain adaptation is to tweak the data or features in the source domain so the performance matches and suits the target domain. Examples include Bloomberg's BloombergGPT (finance), IBM's MoLFormer-XL (molecular structures), MyWave.ai (airlines), and OpenAI's Codex (code generation).

Implications for Product Managers

- For most product managers, this market is a source of innovation to leverage in their products and services, to enhance and augment existing features and functionalities, and/or to offer as an entirely new capability in their products and services.
- Developing a foundation model (own intellectual property [IP]) and monetizing it may not be an option due to the significant investment required to build such models and the specialized nature of their development and use.
- For a limited set of well-funded tech providers that have proprietary data that has high internal or industry value, an opportunity exists for product managers to create fine-tuned models that can be used for embedded applications (see the Category 2: Applications section).
- In the recent past, open-source efforts have proven to be adept in fine-tuning models at much less cost. As costs decline, fine-tuning will become more appealing to product managers.

Recommendations for Product Managers

The following provides a variety of ways product managers in technology and service companies must consider the use of foundation models:

- If you possess a vast quantity of domain-specific and unique data, then you should do a cost-benefit analysis to determine if you should invest in developing your own model, either by fine-tuning a foundation model or building one ground up. Note that the benefit will be present only if you are able to identify a market or a potential to significantly augment your core product capabilities.
- Determine if your development roadmap can be accelerated by use of code-generation tools powered by generative AI foundation models.
- Cast a wide net to view innovations from big tech, AI pure plays and open-source communities.
 - However, ensure that they build an architecture that reduces switching costs if they need to shift to a better or more suitable platform in this fast-moving arena.
 - Evaluate/gauge the risk due to issues of inaccuracies, hallucinations and other errors caused by foundation models, and invest based only on having mitigations in place.

- Use foundation models as an aspect of both enhancing current process designs and methods (e.g., delivery) and determining new ones.

Category 2: Applications

This category will be among the largest with a multitude of specialist providers for GenAI-leveraged products and services from startup and established technology providers. The application focus can be quite broad, serving large market segments or a narrow subsegment. This category will likely have a lot of overlap in the niche solutions provided by many different providers, with some having focuses on, for example, geographies, verticals and functions. Generative AI apps will have two broad subcategories:

- **Embedded applications:** These are enterprise software applications that are embedded with generative AI model APIs, such as Microsoft Teams embedded with ChatGPT API. This will likely be another big category, where many software application providers will have generative AI embedded within the applications they have as part of their portfolio.
 - All large enterprises use applications from the major application suite vendors, such as Microsoft (Office 365), Oracle, Salesforce and SAP.
 - A few midsize application providers will soon include generative AI in new versions of their software, to enhance the capabilities of the application in meaningful ways.
 - The generative AI capabilities will be leveraged to provide new features that were never possible before, or to enhance current ones. For example, Microsoft will shortly launch its OpenAI-assistant-enhanced Office 365 suite, enhancing the user experience significantly; and Grouper, an intelligent document processing (IDP) platform provider, has API integration with OpenAI's API for its internal marketing content development.
- **Native apps:** These are SaaS-based apps that have generative AI as their core proposition. Examples include Jasper, Rytr and Writesonic for content creation; Cogram, Notion and Supernormal for workforce productivity; Algolia, Glean and Sana for knowledge management; Exscientia and Insilico Medicine for biotech; Harvey AI for legal; Microsoft (Copilot) for code generation; Midjourney for image generation; Lavender for sales email coaching; and Tome for creative writing and PowerPoint presentation generation.

Implications for Product Managers

Embedded applications and native applications are opportunities for product managers, but for different reasons:

- **Embedded apps:** Product managers for existing products or services can leverage generative AI API services to turn their application into an embedded application that has better or new features enabled by generative AI. In the early days, the feature with the highest benefit will be foundation-model-powered interaction/query interface for users for the majority of applications. A minority of domain-specific applications can benefit from using domain-specific foundation models.
- **Native apps:** These are applicable for a minority of product managers that are keen on developing new applications based on generative AI services as a core. In the early days, these include applications that can extensively use the generated output such as text, image or code. This terrain mostly consists of startups. Marketing, productivity, media, travel and software are some of the initial areas for such native apps. Product managers must be cautious about not trying to invest too much in areas that are likely on the periphery of the capabilities of foundation models since those areas may not remain separate and be consumed by the growing scope of the foundation models themselves.

But, this area will provide a rich source of innovation to both enhance your products with new or better features and expand into adjacent areas in their market. This market is rife with new entrants and new techniques, and it will be subject to turbulence for a few years to come.

Product managers will rely on one or more underlying generative AI services enabled by foundation models. While it is important for product managers to harness this innovation, it is also important for them to not get too tied to particular foundation models. Both of these areas can also give rise to new competitive threats from companies that leverage generative AI to offer a better value proposition or a radically different one.

Recommendations for Product Managers

The following provides a variety of ways product managers in technology and service companies must consider the use of foundation models.

- Explore addition of new capabilities to your core product such as search, chat or other features by combining current data with the capabilities of foundation models using techniques such retrieval augmented generation (RAG) architecture.

- Focus on developing reusable and asset-based services to help their clients identify useful ways to turn their current applications into generative AI embedded applications.
- Establish a process to regularly evaluate and partner with complementary native generative AI applications to strengthen your value proposition. For example, if you are offering a product in a sales automation solution, then a possible partner could be a GenAI-enabled SaaS provider that could potentially enhance your core sales automation capabilities with sales email coach capabilities.
- Track your key competitors more closely to discover how they are enhancing/augmenting their products so that you can respond quickly. The same should be done for new competitors that may spring up.

Category 3: Enabling Tools

This category comprises a variety of tools that facilitate building effective generative AI solutions and also those tools needed to leverage those solutions effectively. Note that many tools in this category are not exclusive to generative AI, but also applicable to other areas of AI.

- **Build tools:** These tools are needed to create a generative AI solution. They include tools that enable creating the models, training the model, preparing the data, and performing tests and other services that may be required to get the generative AI solution ready. In addition, developers rely heavily on open-source tools and libraries. Examples of such tools include SambaNova's platform to build solutions; IBM's watsonx.ai, a development tool for generative AI solutions; and NVIDIA's AI Enterprise solution for building and deploying such solutions.
- **Use tools:** Tools in this area are used when generative AI solutions are applied in real-world scenarios — the "inference" phase of AI use. These tools help leverage the generative AI solutions as part of other applications or embedded apps or extend the use of generative AI through API or other means. Services provided by these tools include the ability to provide a workflow for business tasks that will leverage generative AI solutions, the ability to fetch and integrate other data sources such as the web, internal file stores and other databases. The market is in the early stages of use of generative AI — many tools are in early stages, and open-source solutions are common. Examples of such tools include Fiddler.ai for model observability, LangChain for providing a workflow across foundation models and other software, LlamaIndex for using external data with foundation models, and Weaviate for storing data.

Implications for Product Managers

- It is vital for product managers to understand the tools that can help them realize the potential of generative AI, both in development and in production.
- It is important to understand that the team possesses the appropriate “build” tools to suit your use of generative AI. However, the “use” tools play a role in determining how generative AI will provide value in your product or service in real-world use.
- These tools help complement generative AI with other products, processes and data from other sources. Use of such tools can make use of generative AI seamless for your customers and enhance the value for them rather than GenAI being a stand-alone feature that may not be used by all. For example, if use of GenAI requires augmenting initially with data from other sources, you may have to leverage a vector database as part of the flow to store the data before querying the generative AI model that you use.
- The “use” tools for generative AI are in the early stages of evolution and will involve significant evolution and churn. Nevertheless, careful application of such tools can help accelerate and amplify your use of generative AI.

Recommendations for Product Managers

Product managers in technology and service companies must consider and decide the most appropriate, initial use of enabling tools:

- Determine if the suite of enabling AI tools for your teams are robust enough to handle additional requirements for use of generative AI. If not, augment or replace them with ones that accelerate the use of generative AI.
- Perform a gap analysis of the generative AI tool market against the need to determine potential areas to expand, first with new or updated products and services.
- Stay current on the growing set of tools to enable use of generative AI, including the ones that provided agent services, automated execution, model chaining and retrieval augmentation.

Category 4: Custom Services

This category will primarily comprise service firms offering strategic advice, business consulting, system integration, software development and other services. The scope of such services span all areas of the generative AI market highlighted above.

The scope of services may vary from being deeply technical and cutting-edge to being just embedded API services, depending on the risk appetite of client organizations. Enterprises are likely to use a variety of ways to adopt generative AI.

Custom services can involve many of the other categories highlighted above. Among them, embedded and native applications are likely to be embraced more by enterprises, with a much smaller subset fine-tuning domain models or building their own enabling tools.

As the market expands in enterprises, projects are likely to expand in scope, cost and investment required. Samples include:

- Services to help enterprises or other tech providers fine-tune models and test them.
- Services to help turn in-house enterprise applications to generative-AI-embedded applications.
- Business consulting services to help enterprises determine what new native applications can be built for a compelling return on investment.
- Services to help industry-specific project needs, such as using generative AI in drug discovery for a pharmaceutical company, in oil field exploration for an oil and gas company, and in large and deep simulation projects for astronomical research agencies.
- Services to modernize legacy applications using new code-generation capabilities of generative AI.

Implications for Product Managers

- This category is most suitable for service companies and product managers in such companies.
- While the temptation will be present to leverage existing software development approaches or frameworks, care must be taken to ensure that you do justice to leverage the potential of generative AI.
- Since the scope of generative AI is vast and it demands new skills and approaches, providers will need to strengthen the skills of their teams.
- Initial differentiation will be appreciated from those who invest in new accelerators, frameworks and approaches that are reusable.

- Open-source communities (such as Hugging Face) and academia play a key role in generative AI, and technology and service providers must continuously keep themselves current and up to date.

Recommendations for Product Managers

The following provides a variety of ways product managers must address the growth of custom projects:

- Create new offerings that are unique to generative AI or require unique approaches and skills, and target early adopters now; adjust offerings based on market feedback over time.
- Develop methodologies and models to build and evaluate various project options against business metrics in areas such as marketing effectiveness or customer satisfaction.
- Strengthen generative AI skills and offerings by partnering with technology companies or open-source initiatives with core generative AI offerings that are in the same market of industry.

Conclusion

The four categories, their characteristics and the competitors represent the expected trajectory based on the investments, actions and the participants in the current generative AI terrain.

We do not expect the broad contours of the landscape to shift much, but there will be some additions and changes within them.

Large investments that have been made in industry and academia will result in new innovations that result in more subcategories, and they will further impact other parts of the landscape. The hype in generative AI will temper, but the technology will remain and grow as a powerful force in the economy and society.

Product managers must start now, but be prepared to adjust their plans and make use of new opportunities as they arise in this fast-moving landscape.

Recommended by the Authors

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