Quick Answer: What Must Product Managers New to AI Know?

Published 28 September 2022 - ID G00778029 - 7 min read

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Initiatives: Product/Service Design and Creation

> A vast majority of tech products and services will use artificial intelligence over time, many in a profound way. All product managers need to develop a clear understanding of what AI is, and what they can and cannot do with it in their products and services.

Quick Answer

What must product managers new to AI know?

- **Definition:** Artificial intelligence (AI) is a different paradigm from traditional computing. AI applies advanced analysis and logic-based techniques to interpret events, support and automate decisions and take action.
- **Technology:** AI technology consists of many techniques. Many are in use and the popular ones include machine learning (ML), natural language processing (NLP), computer vision and graph technologies, among others.
- **Customers:** Enterprises, technology companies and startups are increasing their use of AI techniques and there is significant room for further use.
- **Products and services:** AI can be used to both improve existing products, services and processes, as well as develop new ones.
- **Competition:** Technology companies of all sizes and shapes invest in AI, both to develop AI tools and technologies, and to use AI in their products, services, operations or other areas.
- **Application:** Successful use of AI requires starting with the right business problem or key opportunity that can benefit from AI and where there is high-quality knowledge and data and knowledge are available.

- **Risks:** The use of AI brings unique risks, the key ones being poor performance, unpredictable costs, inadvertent bias in decisions and the inability to explain how decisions were made.

More Detail

Definition

AI is a different paradigm from traditional computing. AI applies advanced analysis and logic-based techniques to interpret events, support and automate decisions, and take action.

- AI technologies can enhance the value proposition of all products and services and also enable the creation of new ones.
- Product managers can use the techniques of AI to offer new features (or products or services), enhance the performance attributes of current features, reduce costs, respond faster or offer a better customer experience.

Technology

AI technology consists of many techniques. Many are in use and the popular ones include machine learning, natural language processing, computer vision and graph technologies. The techniques in AI vary in their purpose and methods. Many applications of AI use a combination of AI techniques, referred to as composite AI. The techniques continue to evolve, and a few key ones that product managers can use today are:

- **Machine learning** — Machine learning (ML) is an AI technique that solves business problems by utilizing statistical models and other algorithms to extract knowledge, identify segments and patterns, and make predictions from data. Deep learning is a variant of ML.
- **Natural language processing** — Natural language processing (NLP) enables an intuitive form of communication between humans and systems, as well as the analysis of the contents of communications. Virtual assistants are enabled by NLP and other technologies.
- **Computer vision** — Computer vision is a process and set of technologies that involve capturing, processing and analyzing real-world images and videos to allow machines to extract meaningful, contextual information from the physical world.

- **Graph technologies** — Graph technologies refer to graph data management and analytics techniques, which enable the exploration of relationships between entities such as organizations, people or transactions.
- **Other AI techniques** — Many other techniques, such as rule-based systems, optimization techniques, agent-based reasoning, and physics-based AI provide critical reasoning and knowledge capture capabilities.

Customers

Enterprises, technology companies, and start-ups are increasing their use of AI techniques and there is significant room for further use.

- Adoption of AI is increasing, but there remains a large growth potential. In a Gartner survey on the usage of AI in organizations, 47% of respondents indicated that they are already using AI. Further, 64% plan to deploy new AI projects within the next two years. But only 13% say that they are using AI across several processes in several units, indicating the large potential for further use.
- AI's broad scope and variety of techniques leave no sector immune to it. These impacts are more in business-to-consumer domains at present, but increasing in business-to-business domains.
- AI's use is in all areas including functional (such as sales, service and operations), vertical (such as banking, healthcare and retail), and technical (such as security and software development).
- Customers use technology providers across many areas including AI tools and technologies, business and IT services, as well as adopt features enabled by AI in current products and services.

Products and Services

AI can be used to both improve existing products, services, and processes as well as develop new ones.

- AI techniques can be used in products and services in a variety of ways. The key ways to apply AI are to automate certain tasks, augment humans for decisions and develop adaptive systems, enhancing customer experience and improving product development processes.

- Customers are the main source of input for unmet and undermet needs in current products and services. But to identify innovative and new uses of AI, product managers need to plan internal innovation and collaboration with partners and not rely only on customers.

Competition

Technology companies of all sizes and shapes invest in AI, both to develop AI tools and technologies and to use AI in their products, services, operations or other areas. Technology companies invest in AI for two objectives:

- **Building AI tools and technologies:** Big tech companies (such as Alibaba, Amazon, IBM and Microsoft) play a leading role in developing AI technologies and tools. Their vast scale of business across sectors provides them with extensive amounts of data, which is fuel for AI. But there are many competitive products and services from companies that focus mostly on AI-related products and services (such as Aera Technology,BigPanda, Dataiku and OpenAI) and other enterprise technology companies (such as Salesforce, SAS Institute and TIBCO Software). Many models, tools and technologies in AI are open-sourced.
- **Using AI across many areas of their business:** Technology companies, new and old, in all areas, including software, services and hardware, are leveraging AI for business value. Gartner sees technology providers applying AI across products and services, customer engagement, marketing and sales, and operations.

Application

Successful use of AI requires starting with the right business problem or key opportunity that can benefit from AI, where there is high-quality knowledge and data available.

- Certain business areas are more conducive to the application of AI — areas where probabilistic and logic-based reasoning are needed and that possess large amounts of good quality data. These areas could be current unsolved or under-solved business problems, as well as completely new functionality that provides additional value to the user.
- AI usage is different in some aspects from traditional software development. AI requires a new artifact — the model adds new steps such as development, training/retraining, and testing, deploying and monitoring the model, and it further demands data prepared to help the cause of training.

Risks

The use of AI brings unique risks, the key ones being poor performance, unpredictable costs, inadvertent bias in decisions and the inability to explain how decisions were made.

- AI solution performance may not be consistent and can degrade or drift over time, depending on the volatility of the challenge and change in the underlying conditions; this needs to be planned for and can further increase the total costs.
- Many AI techniques rely on models that learn how to perform tasks based on advanced analysis of data. The way such AI technique models learn leads to certain issues unique to AI:
  - Bias: Many datasets are not perfect representations of the real world and carry biases based on what data was gathered and how. When such data is used to train AI models, it can implant such biases in the model, biases that we would like to avoid at best or that may be illegal at worst.
  - Explainability: Many AI techniques learn how to do a task by logic-based and probabilistic reasoning, techniques that result in models that are not explainable or readable to humans. This can be unacceptable where issues such as accuracy, fairness and safety are paramount.
- Preventing such issues across all aspects of AI use — model training, data selection, technology development, and quality assurance — is important.

Recommended by the Authors

Emerging Technologies and Trends Impact Radar: Artificial Intelligence, 2021

What Is Artificial Intelligence? Ignore the Hype; Here's Where to Start

Quick Answer: How Is AI Making Applications More Intelligent?

Evidence

2021 Gartner AI in Organizations Survey. This survey was conducted to understand the keys to successful AI implementation and the barriers to the operationalization of AI. The research was conducted online from October 2021 through December 2021 among 699 respondents from organizations in the U.S., Germany and the U.K. Quotas were established for company size and for industries to ensure a good representation across the sample. Organizations were required to have developed AI or intended to deploy AI within the next three years.

Respondents were required to be part of the organization's corporate leadership or report into corporate leadership roles, and have a high level of involvement with at least one AI initiative. Respondents were also required to have one of the following roles when related to AI in their organizations: determine AI business objectives, measure the value derived from AI initiatives, or manage AI initiatives development and implementation. The survey was developed collaboratively by a team of Gartner analysts and Gartner's Research Data, Analytics and Tools team. Disclaimer: Results of this survey do not represent global findings or the market as a whole, but reflect the sentiments of the respondents and companies surveyed.