

# Competitive Analysis and Valuation Application of ChatGPT in the Artificial Intelligence Industry

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**Abstract.** In recent years, with the rapid development of computation ability based on GPU and advances in artificial intelligence, a well-known big natural language process named ChatGPT has been developed. As a matter of fact, it is a chatbot in the artificial intelligence industry and based on artificial intelligence technology with a wide range of applications. This study aims to assess the competitive position and potential value of ChatGPT in the artificial intelligence market through market competition analysis and valuation application. According to the analysis, we will introduce the technical features and background of ChatGPT. Then, by analyzing the competitors, we will assess ChatGPT's competitive advantage in the market. Finally, we will apply the relative valuation method to estimate the market potential of ChatGPT. Based on the evaluation, the competitive advantage of ChatGPT in the industry is revealed. Overall, these results shed light on guiding further exploration of valuation for artificial intelligence industry.

**Keywords:** artificial intelligence (AI); ChatGPT; valuation.

## 1. Introduction

The intelligence of machines made by humans is called Artificial Intelligence (AI). It usually refers to the technology that simulates human intelligence through computer programs. The study of AI involves implementation and methodology. The field is highly technical and specialized, with separate and extensive subfields. Large models, also known as pre-trained models, basic models [1], etc., are the product of the combination of "big data + big computing power + strong algorithms", the "implicit knowledge base" that condenses the intrinsic essence of big data, which is the carrier for the realization of artificial intelligence applications [2]. As a large-scale language model, ChatGPT is designed to provide AI chat functions [3].

ChatGPT adopts the Transformer model with the following technical features:

- Large-scale pre-training: by undergoing pre-training on a significant amount of text data. ChatGPT is equipped with rich linguistic knowledge and semantic understanding.
- Fine-tuning mechanism: By fine-tuning on specific tasks, ChatGPT is able to generate contextualized responses according to specific needs.
- Interactive learning: ChatGPT can continuously learn and improve through interaction with users, increasing the quality and accuracy of responses.

As we enter 2023, many people are suddenly familiar with ChatGPT and are discussing the conversationally capable bot in various contexts. The neologism quickly circulated in all kinds of media, especially on self-publishing platforms that are sensitive to hot issues. OpenAI has made Generative Artificial Intelligence (GAI) its main focus, and its main technical principle is to use a model to pre-learn a massive example dataset, and then utilize the model for continuous training, generate new content similar to the examples [4]. The user can improve and direct the length, format, style, level of detail and language of the dialog. Successive prompts and responses are considered for context at each stage of the dialog. Artificial Intelligence can help manufacturing companies to make greater profits, reduce the risk of the production process and increase government subsidies [5]. Artificial Intelligence sea can amend the bill or correctly assist the case officer in sentencing, he can

give similar cases and model them and compare them with the decided cases of the judge, but right now Artificial Intelligence is not very useful for justice and can be enhanced [6]. By looking back at the impact of previous industrial revolutions on society, it can be seen that the era of artificial intelligence has become an inevitable trend and is bringing about a new industrial revolution. By testing, testing, tricking and teasing ChatGPT at the same time, there seems to be a consensus that the era of artificial intelligence is really here [7].

ChatGPT will have a profound impact on society as a whole, from education systems, entertainment experiences, financial institutions, healthcare these tools can detect patterns medical data faster than humans. This is an important reference for decision makers and practitioners in the business industry [8]. When ChatGPT became the center of attention in the industry, tech giants that had been restrained suddenly felt the urgency to show their strengths in ChatGPT-like products. Within a short period of time, billions, tens of billions or even trillions of parameter scale AI big models (hereinafter referred to as "big models") have emerged one after another, and this global big model competition, triggered by ChatGPT, is becoming extremely fierce [9]. In the competition in the AI industry, OpenAI's ChatGPT and Google's Bard have become two rivals that have attracted a lot of attention. ChatGPT, a powerful language model developed by OpenAI, can generate high-quality textual replies and exhibit amazing flexibility and creativity in different tasks. In contrast, Google's Bard is also an impressive AI system that focuses on generating poetry and literature [10].

The motivation for studying the valuation analysis of Chatgpt models for competition in the AI industry is to better understand the competitive market dynamics, assess the business value, guide the technology development and facilitate the collaboration and partner selection, thus helping companies and investors to make more informed decisions. First, analyze ChatGPT's competitive advantages in the industry, using the Porter's Five Forces model and SWOT model; then, establish a suitable valuation model, and use the relative valuation method, i.e., PE model, to value ChatGPT; finally, explain the results of the valuation model, discuss ChatGPT's valuation in the industry and the possible influencing factors, and summarize the business value of ChatGPT in the industry.

## 2. Methodology

The five strengths analysis model was proposed by Michael Porter (Michael Porter) in the early 1980s. It is capable of effectively analyzing the customer's competitive environment when used in the analysis of competitive strategy. The five forces are: suppliers have the power to negotiate, buyers have the ability to negotiate, the capacity of potential competitors to enter, substituting substitutes, and the competitiveness of competitors in the industry at present. The industry's profit potential is ultimately affected by changes in different combinations of the five forces.

SWOT analysis is based on the internal and external competitive environment and competitive conditions of the situation analysis, the study of a variety of major internal strengths, weaknesses, and external opportunities and threats is closely connected to its object, etc., through the investigation of the enumeration, and The idea of the various factors matching each other to be analyzed is analyzed through a matrix form of arrangement and systematic analysis, Conclusions are generally of some type of decision making. Using this method, we can make a complete, systematic and precise study of the situation in which the research object is situated, to create the appropriate development strategies, plans, and countermeasures based on the study's results. Advantages are based on strengths, disadvantages based on weaknesses, opportunities based on opportunities, and threats based on threats. According to the complete concept of enterprise competitive strategy, the strategy should be an organic combination between what an enterprise "can do" (i.e., the organization's strengths and weaknesses) and "what it may do" (i.e., the opportunities and threats of the environment).

The PE valuation method is a common stock valuation method that assesses the fair price of a stock by calculating a company's price-earnings ratio (PE ratio), which is the ratio of a company's market capitalization to its net profit, reflecting how many times investors are willing to pay for each unit of earnings. The basic principle of the PE valuation method is that companies in the same industry

usually have similar profitability and growth prospects, so their relative valuations can be judged by comparing the PE ratios of different companies. Generally speaking, a lower PE ratio means a stock is undervalued, while a higher PE ratio means a stock is overvalued.

### 3. Results

As shown in Table. 1, ChatGPT model faces threats from other competitors, this is because the AI industry is highly competitive, and many companies are developing similar conversation generation models. In order to maintain a competitive advantage, ChatGPT models need to continuously improve their technology and innovation. Although the AI industry has a high technological threshold, ChatGPT Model has built up a large dataset and technological advantage, which creates some barriers to new entrants. However, we still need to be wary of the emergence of new technologies and companies as they may pose a threat to us. There may be other alternative products or technologies in the AI industry that are capable of providing similar dialog generation capabilities. In order to defend against the threat of alternatives, ChatGPT models need to continually improve their technology and performance. The development and operation of ChatGPT models requires a large amount of data and technical support, which makes it crucial to establish stable partnerships with data providers and technology providers. This ensures supply chain stability and cost control, thereby maintaining a competitive edge. Buyers in the AI industry are usually enterprises or organizations that have high requirements for product performance and price. In order to reduce the bargaining power of buyers, the ChatGPT model needs to satisfy buyers' needs, provide high-quality dialog generation services, and establish long-term relationships with buyers.

**Table 1.** Analysis of ChatGPT Market Competition by Porter's Five Forces Model

Threat of competitors	The market is highly competitive and faces threats from other models developed by many companies.
Threat of new entrants	The technological threshold is high, and ChatGPT model forms certain barriers for new entrants, but still need to pay attention.
Threat of substitutes	There may be products in the market that can provide similar dialog generation functions.
Bargaining power of suppliers	Due to the uniqueness of the technology, superior data quality large scale, and high brand reputation, suppliers have strong bargaining power.
Bargaining power of buyers	The buyers of this product are usually enterprises or organizations, which have high requirements for the performance and price of the product.

As shown in Table. 2, ChatGPT models have advantages in the AI industry such as technological leadership, large-scale datasets, and customizability, but also disadvantages such as semantic comprehension limitations, data privacy issues, and lack of real-time performance. However, growing market demand and opportunities for industry collaboration provide opportunities, while increased competition and technological advancements pose threats. To be specific, the discussions for each items are given as following:

For advantages:

- leading technology: ChatGPT model is developed by OpenAI and adopts advanced natural language processing technology. It has powerful dialog generation capabilities and can provide high-quality auto-replies and dialog interactions.
- Large-scale dataset: ChatGFT model is trained using a large-scale dataset, which gives it a wide range of knowledge and information in understanding and answering various questions.

- Customizability: The ChatGPT model can be fine-tuned to suit specific industry needs, which makes it capable of providing personalized solutions and customized services.
- User-friendliness: The interface and interaction design of the ChatGPT model makes it easy to use and understand without the need for specialized technical knowledge.

As for disadvantages:

- semantic comprehension limitations: although the ChatGPT model has made great strides in natural language processing, it still suffers from limitations in understanding complex or ambiguous questions. It may lead to inaccurate or incomplete answers.
- Data Privacy Issues: ChatGPT models require a large amount of data for training, which may involve user privacy issues. openAI needs to take measures to ensure the security and privacy protection of user data.
- Lack of real-time: ChatGPT model answers are grave from existing data and knowledge, and cannot provide real-time information and dynamic updates.

Regarding to the opportunities:

- growing market demand: with the development of AI technology and the expansion of its application, the demand for models that can provide high-quality dialog interactions is growing.
- Industry collaboration opportunities: the ChatGPT model can be integrated with other he AI technologies and platforms to provide more comprehensive solutions, and collaborate with other companies to develop innovative products and services.

With regard to threats:

- Increased competition: The AI industry is highly competitive and many companies are developing similar dialog generation models, which may pose a threat to the market share of ChatGPT model.
- Technological advancement: AI technology is constantly advancing, and more advanced and efficient conversation generation models may emerge, which may pose competitive pressure on the ChatGPT model.

**Table 2.** SWOT Model Analysis of Competition in the ChatGPT Market

<p style="text-align: center;">Advantages:</p> <ol style="list-style-type: none"> <li>1. leading technology</li> <li>2. Easy and comprehensive data collection</li> <li>3. Customizability</li> <li>4. user friendliness</li> </ol>	<p style="text-align: center;">Weaknesses:</p> <ol style="list-style-type: none"> <li>1. semantic understanding limitations</li> <li>2. data privacy issues</li> <li>3. lack of real-time availability</li> </ol>
<p style="text-align: center;">Opportunities:</p> <p style="text-align: center;">growing market demand. many opportunities for industry collaboration</p>	<p style="text-align: center;">Threats:</p> <ol style="list-style-type: none"> <li>1.increased competition</li> <li>2.technological advancements in other models</li> </ol>

Fig. 1 shows the comparison of PE values between the ChatGPT model and other related models. The PE value of the ChatGPT model is much higher than that of other similar models, indicating that the market values ChatGPT at a higher level. This may reflect ChatGPT's competitive advantage and potential business value in the AI industry. It is worth noting that PE value is a measure of a company's or model's return on investment and valuation, and higher P/E ratios may imply that the market is on an upward trend for the model's future growth and earnings potential.

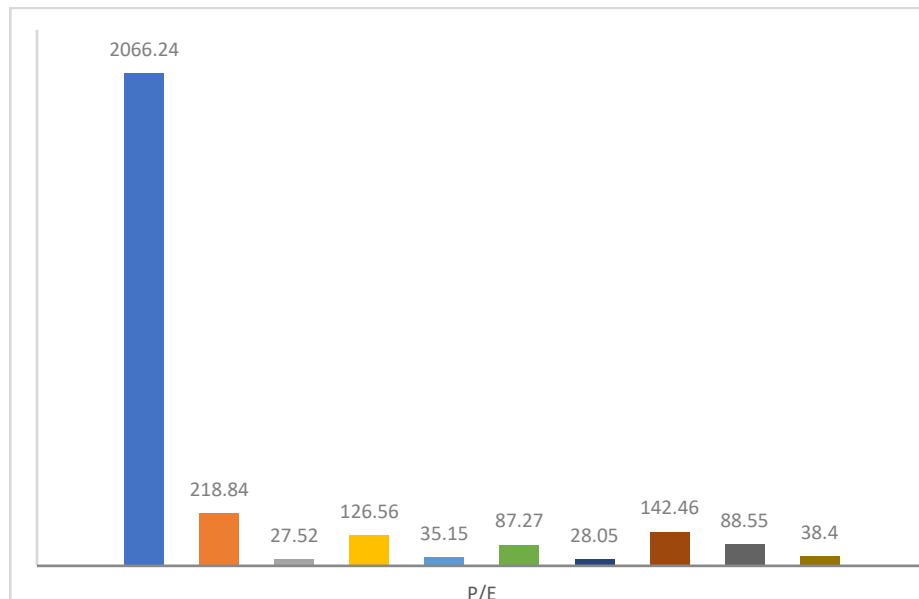


Fig. 1 Comparison of the ChatGPT model with other relevant model P/E ratios

#### 4. Discussion

ChatGPT has demonstrated strong competitiveness in the AI industry. By analyzing the competitors, we found that ChatGPT possesses obvious advantages in terms of technical features, innovativeness, and user experience. This is in line with our initial expectations, and our expectation is that ChatGPT will gain a competitive advantage in the market and develop a wide range of applications. Then, according to Fig.1, it can be seen that ChatGPT's P/E ratio is far ahead of other segments in the same industry, showing the market's high expectation of its future earnings. The significance of the research in this thesis is to evaluate the competitive position and potential value of ChatGPT in the market. However, our study may be limited by data constraints and may not reflect the market situation fully and accurately. Second, the study may have certain assumptions and limitations that may not fully capture the complexity and uncertainty of the market. In addition, our study may not have taken into account other potential competitive factors and the impact of market changes.

#### 5. Conclusion

To sum up, a high PE valuation usually means that the market has high expectations of the model's future profitability. This may be attributed to the model's strong competitive advantage, high growth potential, stable cash flows, or other positive factors. High PE valuations may also reflect market optimism about the industry or market as a whole. However, a high PE valuation may also imply that the market is overly bullish on the model and that there is an investment risk. ChatGPT's PE valuation is much higher than that of its peers, so the model demonstrates a clear competitive advantage in the AI industry, and ChatGPT is capable of gaining competitive advantage in the market place and gaining widespread adoption. This article is analyzing ChatGPT's competitive position and competitors in the market. It helps in understanding the positioning of ChatGPT in the market and its key competitive advantages, and provides information about the potential business value of ChatGPT and its potential advantages in other areas. The main point of this article is to provide in-depth analysis and insights about ChatGPT's competition, valuation, and adoption in the AI industry, which will provide valuable information and decision support to the relevant stakeholders.

## 6. Author Contribution

All the authors contributed equally and their names were listed in alphabetical order.

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