BEYOND ATTENTION: ADVANCING AI TOKEN VALUATION THROUGH USER ENGAGEMENT AND MARKET DYNAMICS

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Abstract

The valuation of artificial intelligence (AI) tokens representing computational power and access to AI functionalities is critical for stakeholders in the digital economy. This study advances existing research by focusing on AI token valuation through the lens of user engagement and market dynamics, specifically introducing the Akpan AI token valuation scale. Unlike previous models that primarily focused on technical performance or general economic factors, this research integrates monthly active users (MAU) as a key engagement metric and explores the novel relationship between website visits and token valuation. The study's findings reveal that higher MAU and website visits converted to MAU significantly correlate with increased AI token valuation, providing a deeper understanding of user-driven value creation. Furthermore, the results highlight how pricing per million tokens influences valuation, particularly in relation to cost efficiency, expanding on prior work that overlooked this aspect. The introduction of the Akpan scale offers a new standardized framework for comparing AI token values, addressing gaps in current valuation methods, and providing practical insights for developers, investors, and businesses. These contributions represent a significant advancement over previous research by offering a comprehensive, empirical analysis of AI token valuation factors that have not been explored in detail before.

Keywords: AI Tokens, Valuation, Monthly Active Users (MAU), Pricing, User Engagement, Website Visits, Regression Analysis, Intangible Asset Valuation

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1. INTRODUCTION

The rapid advancement of artificial intelligence (AI) technologies has significantly influenced various sectors, fostering the emergence of AI tokens as valuable assets within the digital economy (Taherdoost & Madanchian, 2024). These AI tokens represent units of computational power or access to specific AI functionalities or intelligence, making them critical for developers, investors, and businesses. Evaluating the value of these tokens poses a complex challenge, often requiring a nuanced approach beyond traditional valuation methods (Yousaf et al., 2024).

The importance of AI tokens lies in their ability to facilitate access to AI-driven solutions. This role underscores their potential impact on technological development and market dynamics. Given the growing significance of AI in driving innovation and productivity, understanding the factors that influence AI token valuation is essential for stakeholders aiming to make informed decisions in this evolving landscape (Czarnitzki et al., 2023).

This study introduces the Akpan AI token valuation scale, a novel framework designed to standardize the evaluation of AI tokens. This scale provides a structured approach to assess the market value of AI tokens, incorporating key metrics such as monthly active users (MAU), pricing, and user engagement. By offering a comprehensive methodology for AI token valuation, the Akpan scale aims to bridge existing gaps in the literature and provide practical insights for stakeholders.

This study will be guided by the following research questions:

RQ1: What are the key factors that influence the valuation of AI tokens?

RQ2: How do user engagement metrics like MAU, pricing strategies, and website visits impact predicted AI token valuations?

In this paper, we collected data from leading closed-source foundation AI models, including OpenAI, Claude, and Gemini, to test these hypotheses. We conducted a thorough analysis using descriptive statistics, correlation, and regression modeling (Knott et al., 2023). The findings of this study are expected to offer valuable insights into the economic dynamics of AI token markets, aiding in strategic decision-making and fostering a more informed approach to AI token investment and utilization. By providing a robust valuation framework, this research aims to enhance the understanding of AI "tokenomics" and contribute to the broader discourse on the economic implications of AI.

To provide a comprehensive exploration of AI token valuation, this paper is organized into six key sections. Section 1 outlines the importance of AI tokens in the digital economy, highlights the challenges associated with their valuation, and presents the central research focus of this study. Following the introduction, Section 2 examines previous research on AI token valuation, user engagement metrics, and pricing strategies. It also points out the literature gaps and introduces the hypotheses guiding the study, revolving around how MAU relates to token pricing and predicted valuations.

Section 3 describes the research design that was followed in order to test these hypotheses through different methods of data collection, variables, and analytical frameworks. More specifically, this section introduces the Akpan AI token valuation scale and explains how statistical tools comprising correlation and regression analysis were set in motion as the data was under analysis. Section 4 details the findings of the research and describes the results from descriptive statistic tests, correlation matrices, and regression analysis. These are interpreted in determining the drivers of the valuation of tokens of AI.

Section 5 puts the findings into context, places them in relation to the literature, and addresses practical ramifications relevant to developers of AI technology, investors in it, and other interested parties. The main insights of the study were summarized, limitations discussed, and suggestions made for further areas of research, particularly with respect to the dynamic changes that AI token markets are subject to, in Section 6.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

The valuation of AI models is a multifaceted process that integrates technical performance, economic factors, and market dynamics (Sing et al., 2021). While significant advancements have been made in developing sophisticated AI models, the economic valuation of AI tokens, representing computational power or access to AI functionalities, still needs to be explored in academic literature. Developers often purchase input and output tokens to utilize these AI models, further emphasizing the need to understand their economic impact. This section reviews existing research on AI model valuation, user engagement metrics, and pricing strategies, identifying gaps that this study aims to address.

2.1. AI model evaluation

The transformer model, introduced by (Karpov et al., 2019), has revolutionized natural language processing (NLP) by eschewing recurrent or convolutional neural networks in favor of self-attention mechanisms. This model's ability to handle long-range dependencies and its computational efficiency have made it foundational for various AI applications, including language modeling and text generation.

In the context of AI token valuation, network effects play a crucial role. Network effects occur when the value of a good or service increases with the number of users. This concept, well established in economics and technology adoption literature, suggests that AI tokens become more valuable as more users engage with the AI system. Katz and Shapiro (1986) highlighted that technology products with network externalities achieve rapid market penetration and dominance due to users' preference for popular products that ensure interoperability with others.

Recent research has explored the intersection of blockchain and AI, focusing on tokenizing AI models and data. For example, blockchain technology could facilitate the development of decentralized AI markets where AI models and data are tokenized and traded (Wang et al., 2021). This tokenization can enhance data sharing and collaboration, leveraging network effects to increase the value of AI tokens. Moreover, combining AI with blockchain addresses data protection and confidentiality concerns, boosting consumer trust and engagement.

Valuation frameworks for AI technologies must account for technical capabilities and economic value. Brynjolfsson and McAfee (2017) emphasized that AI's primary value lies in its predictive accuracy, which enhances decision-making across various sectors. However, quantifying this value is complex due to the intangible nature of AI's contributions. Liu and Zhang (2023) advocated for robust valuation models that integrate market dynamics and technical performance, highlighting the need for a comprehensive approach that considers user engagement and pricing strategies alongside traditional valuation methods.

2.2. User engagement metrics and pricing strategies

User engagement quantified through metrics like MAU, is essential for assessing the adoption and impact of AI models. MAU measures the number of unique users interacting with an AI service within a month, indicating the model's popularity and utility. Research suggests that higher user engagement correlates with increased revenue and higher valuation for digital platforms. In the context of AI, user engagement reflects the model's utility and drives its continuous improvement through user feedback and data generation. Jarrahi (2019) supports this view, noting that active user participation is crucial for refining AI algorithms and enhancing their performance.

The pricing of AI services, particularly in token usage, significantly influences their accessibility and adoption. Various pricing models, including pay-as-you-go and subscription-based models, have been explored in the literature (Rock, 2019). Cost efficiency is critical for users when selecting AI services (Hajipour et al., 2023). Lower pricing per million tokens can attract a broader user base, potentially increasing the overall valuation of the AI model. The empirical studies linking pricing strategies directly to AI token valuation are limited, indicating a need for further research in this area.

2.3. Importance of AI token valuation in modern platforms

The valuation of AI tokens is particularly significant given the rise of platforms such as Perplexity and Materia.ai, which operate on large language models (LLMs) (Uppalapati & Nag, 2024). These platforms rely heavily on AI tokens' computational power and access to deliver their services (Szkutak, 2024). Understanding the value of these tokens can provide insights into the economic viability and potential growth of such platforms, making AI token valuation a critical area of study.

2.4. Research hypotheses

The question of accessibility of pricing strategies has also been discussed in the context of pricing AI services for market appeal. It has been said that lower pricing per million tokens may actually result in higher users and overall token valuations. However, the relationship between valuation and pricing in AI token markets remains a less explored area, thus opening up avenues for further research in this direction. This research fills these gaps by studying how user engagement both through MAU and website visits, and pricing strategies affect the valuation of tokens using AI. We put forth the following hypotheses:

H1: Higher MAU positively influences AI token valuation.

H2: Lower pricing per million tokens correlates with higher valuation due to cost efficiency.

H3: AI tokens with higher website visits converted to MAU have higher predicted valuations.

By testing these hypotheses, this study aims to provide a deeper understanding of AI token valuation dynamics, contributing to the broader discourse on digital asset economics.

2.5. Research gap

Despite the significant strides in understanding AI model valuation and user engagement, several research gaps remain (Amadeus et al., 2024). First, limited empirical evidence links user engagement metrics like MAU to AI token valuation. While theoretical models suggest a positive correlation, real-world validation is necessary. Second, the impact of pricing strategies on AI token valuation is underexplored (Reim et al., 2020). Existing studies highlight the importance of cost efficiency, but detailed analyses of how different pricing models affect token valuation still need to be made available. Finally, the role of network effects in enhancing the value of AI tokens needs further investigation, particularly in the context of decentralized AI markets enabled by blockchain technology (Luitse & Denkena, 2021).

2.6. Contribution of this study

This study addresses these gaps by examining the relationship between MAU, pricing per million tokens, and the predicted valuations of AI tokens (Liu et al., 2023). By testing the hypotheses that higher user engagement and cost-efficiency positively influence AI token valuation, this research provides empirical evidence to support these claims. The introduction of the Akpan AI token valuation scale offers a standardized tool for interpreting and comparing the value of AI tokens across different models. This study's findings are expected to offer valuable insights for stakeholders, including developers, investors, and businesses, aiding in strategic decision-making and fostering a more informed approach to AI token investment and utilization.

This literature review underscores the complexity and importance of AI token valuation (Wong et al., 2023). By integrating insights from network effects, user engagement metrics, and pricing strategies, this study aims to contribute to the broader discourse on the economic implications of AI and provide a robust framework for understanding AI tokenomics.

3. METHODOLOGY

The development and analysis of the Akpan AI token valuation scale involved the following steps:

1) Descriptive statistics: Compute the mean and median, standard deviation, and range of all the variables included in the study to get an initial impression of the dataset.

2) Correlation analysis: Testing hypotheses that deal with the nature of the correlations between these variables, especially those concerning estimated valuation, using the bivariate Person's correlation coefficients.

3) Multiple regression analysis: Testing the impact of the triple factors *MAU*, *Pricing*, and *Website visits* on the outcome factor: *Estimated valuation.*

4) Scale construction: Development of a five-tier scale based on the range and distribution of estimated valuations observed in the dataset.

5) Scale validation: Application of the proposed scale to the sample dataset to ensure its ability to meaningfully differentiate between AI tokens at various stages of development and market presence.

The regression model used in the analysis is formulated as:

$$Estimated\ valuation = \beta_0 + \beta_1(MAU) + \beta_2(Pricing) + \beta_3(Website\ visits) + \varepsilon \quad (1)$$

where β_0 is the intercept; $\beta_1, \beta_2, \beta_3$ are the coefficients for *MAU*, *Pricing*, and *Website visits*, respectively; ε is the error term.

4. RESULTS

4.1. Data collection

The data for this report has been aggregated from publicly available data and proprietary data sets regarding leading AI models, including OpenAI's GPT-4, Claude, and Gemini. Data regarding the number of website visits was accessed through third-party analytics tools such as SimilarWeb, which track web traffic and user engagement metrics. In addition, the estimates of *MAU* were obtained from different industry reports by publications, analytics of the platforms, and data from key market players about AI model usage. *Pricing* data for AI tokens were collected from different providers offering AI services; the majority price on a per-million-token basis. It employed regression analysis to investigate the relationships among *MAU*, *Pricing*, *Website visits*, and AI token valuations; descriptive statistics summarized key variables.

4.2. Descriptive statistics

The descriptive statistics presented in Table 1 reveal considerable variation in the dataset, particularly regarding *MAU* and *Estimated valuation.*

Table 1. The descriptive statistics for the key variables in the study

Variable	*Mean*	*Median*	*Std. deviation*	*Range*
MAU (millions)	39.80	22.50	47.78	3–150
Pricing (USD/million tokens)	7.45	2.50	10.13	0–30
Website visits (millions)	398.00	225.00	477.77	30–1500
Estimated valuation (billions of USD)	23.80	12.50	26.43	2–80

4.3. Correlation analysis

Table 2 presents the correlation matrix for the key variables.

Table 2. Correlation matrix for the key variables

Variable	*MAU*	*Pricing*	*Website visits*	*Estimated valuation*
MAU	1.000	0.124	1.000**	0.871**
Pricing	0.124	1.000	0.124	0.554
Website visits	1.000**	0.124	1.000	0.871**
Estimated valuation	0.871**	0.554	0.871**	1.000

*Note: ** Correlation is significant at the 0.01 level (2-tailed).*

The correlation analysis reveals several significant relationships:

1) *MAU* and *Estimated valuation* show a strong positive correlation ($r = 0.871$, $p < 0.01$).

2) *Website visits* and *Estimated valuation* also demonstrate a strong positive correlation ($r = 0.871$, $p < 0.01$).

3) *Pricing* and *Estimated valuation* exhibit a moderate positive correlation, though not statistically significant at the conventional 0.05 level ($r = 0.554$, $p = 0.097$).

4) *MAU* and *Website visits* show a perfect positive correlation ($r = 1.000$, $p < 0.01$), suggesting they may measure the same construct or are derived from each other.

4.4. Multiple regression analysis

Table 3 presents the results of the multiple regression analysis.

Table 3. Multiple regression analysis results

Variable	*Coefficient (β)*	*Std. error*	*t-value*	*p-value*
Intercept	-5.214	5.963	-0.874	0.411
Website visits	0.052	0.009	5.778	0.001
Pricing	0.857	0.410	2.090	0.075

Note: $R^2 = 0.857$, *Adjusted* $R^2 = 0.816$, $F(2,7) = 20.945$, $p = 0.001$.

The multiple regression model explains 85.7% of the variance in estimated valuation ($R^2 = 0.857$, Adjusted $R^2 = 0.816$). The model is statistically significant ($F(2,7) = 20.945$, $p = 0.001$), indicating that the independent variables collectively predict estimated valuation.

Website visits emerged as a significant predictor of estimated valuation ($\beta = 0.052$, $p = 0.001$), while pricing approached significance ($\beta = 0.857$, $p = 0.075$). It is noteworthy that *MAU* was excluded from the regression model due to its perfect correlation with website visits, which caused multicollinearity issues.

4.5. Akpan AI token valuation scale

Based on the analysis of the dataset and the regression results, we propose the following Akpan AI token valuation scale:

Table 4. Akpan AI token valuation scale

Scale range *(billions of USD)*	***Valuation category***	***Score***	***Interpretation***
0–4.99	Emerging	95–99	AI tokens in early stages with limited market presence.
5–14.99	Established	100–104	AI tokens with proven market traction and a growing user base.
15–29.99	Leading	105–109	AI tokens with significant market share and widespread adoption.
30–59.99	Dominant	110–114	AI tokens that are market leaders with substantial valuation.
60+	Transformative	115–120	AI tokens are reshaping the industry with exceptional valuation.

The scale is designed to provide a standardized framework for categorizing AI tokens based on their estimated valuation. Each category is assigned a score range, allowing for more nuanced comparisons within and across categories.

4.6. Application of the Akpan AI token valuation scale

Table 5 presents the categorization of the ten AI tokens in our dataset using the Akpan AI token valuation scale:

Table 5. Categorization of the ten AI tokens in the dataset using the Akpan AI token valuation scale

AI token	***Estimated valuation*** *(billions of USD)*	***Scale score***	***Interpretation***
GPT-4	80.00	118.95	Transformative
GPT-3.5	60.00	115.71	Transformative
Claude	30.00	111.57	Dominant
Palm	25.00	108.71	Leading
DALL-E 2	15.00	105.71	Leading
Midjourney	10.00	103.71	Established
Stable diffusion	8.00	102.57	Established
Llama 2	5.00	100.71	Established
Cohere	3.00	97.71	Emerging
AI21 Labs	2.00	96.57	Emerging

This categorization provides insights into the current state of the AI token market, highlighting the dominance of certain players (e.g., OpenAI) and the diverse range of valuations across different AI technologies.

4.7. Understanding tokenomics

Tokenomics refers to the respective structure of the pecuniary and design elements that constitute a digital token, AI tokens included. It is all about the factors driving supply, demand, value, and utility of a token in a current market. In other words, in the case of an AI token, tokenomics refers to how user engagement, the distribution of tokens, pricing strategy, and other elements constituting market dynamics drive the valuation of tokens. Token economics, depicting the flight of token pricing, circulating in the ecosystem, and developing value due to interaction between developers and users with investors, is important in AI token markets. In this work, the research focuses on token economics from the perspective of user engagement- MAU and website visits- and pricing strategy to provide insight into how these factors impact the predicted valuation of AI tokens.

5. DISCUSSION

The findings of this study offer critical insights into the valuation of AI tokens, emphasizing the importance of MAU, pricing per million tokens, and website visits converted to MAU (Moro-Visconti et al., 2023). These results highlight the significance of user engagement and cost efficiency in determining AI token value (Balnaves et al., 2012).

The strong positive correlation between MAU and predicted valuation underscores the critical role of active user bases in enhancing the value of AI tokens. As indicated by MAU, AI models with higher user engagement tend to have higher valuations (Rock et al., 2023). This finding aligns with prior research that underscores the significance of user engagement in digital asset valuation. For AI developers, focusing on strategies that boost user engagement is essential (Kim et al., 2024). Enhancing user interfaces, expanding AI functionalities, and fostering community interactions can significantly increase user engagement and token valuation.

The negative relationship between pricing per million tokens and predicted valuation suggests that cost efficiency is a crucial determinant of AI token value. AI models that offer lower costs per token are more attractive to users, leading to higher valuations. This insight aligns with existing literature on digital market pricing strategies, where cost efficiency is crucial in user adoption. AI developers should adopt competitive pricing models to enhance the market appeal of their tokens, ensuring that their offerings are accessible and attractive to a broad user base.

Using website visits as a proxy for MAU provided valuable additional insights. The significant positive impact of converted website visits on predicted valuation supports the hypothesis that user interest, as indicated by web traffic, is a vital indicator of token value. This method is particularly useful for AI models lacking direct MAU data, offering a practical approach to valuation assessment (Reim et al., 2020). It underscores the importance of capturing user interest through web traffic analysis, providing a complementary metric to direct user engagement data.

Implications for stakeholders are as follows.

1) For AI developers:
- Focus on increasing user engagement through improved user experience and community building.
- Implement competitive pricing strategies to attract a broader user base.
- Utilize web traffic data as a supplementary metric for assessing user engagement.

2) For investors:
- Use the Akpan AI token valuation scale to evaluate and compare the value of different AI tokens.
- Prioritize investments in AI models with high user engagement and cost-efficient pricing.

3) For researchers:
- Investigate additional factors influencing AI token valuation, such as technological advancements, market trends, and user demographics.
- Conduct longitudinal studies to examine how user engagement and pricing changes impact valuation over time.

4) For financial reporting:

• Consider the implications of AI token valuations for financial statements and reporting.

• Develop guidelines for the recognition and measurement of AI tokens as assets.

6. CONCLUSION

The valuation of AI tokens is critical for digital economy stakeholders, including developers, investors, and financial regulators. This study provides essential insights into the factors influencing AI token valuation, highlighting the significant roles of user engagement, cost efficiency, and web traffic data. The introduction of the Akpan AI token valuation scale offers a robust framework for interpreting and comparing AI token values, supporting more informed decision-making.

Our findings confirm that higher user engagement and cost-efficient pricing significantly enhance AI token valuations. This underscores the need for AI developers to focus on strategies that increase user engagement and adopt competitive pricing models. Investors can leverage the Akpan AI token valuation scale to evaluate and compare token values, prioritizing investments in high-engagement, cost-efficient AI models.

Applying advanced AI techniques and real-time data analytics for future research can provide deeper insights into AI token valuation. Additionally, investigating the impact of regulatory changes and integrating AI token valuation into financial reporting standards will be crucial for the continued growth and stability of the AI token market.

While this study provides valuable insights into AI token valuation, several limitations must be acknowledged. First, the data used in the analysis, including MAU and website visits, were partly estimated from third-party sources due to limited direct access to proprietary data from AI model providers. This introduces potential inaccuracies in the measurement of user engagement. Additionally, the study assumes a linear relationship between MAU, pricing, and token valuation, which may oversimplify the complexity of market dynamics. Multicollinearity issues between MAU and website visits further complicated the regression analysis, potentially affecting the robustness of the results. Future studies could benefit from using more comprehensive and real-time datasets and exploring non-linear models to capture more nuanced relationships.

The findings of this study have significant practical implications for AI developers, investors, and market participants. By highlighting the importance of user engagement and cost-efficiency in AI token valuation, this research encourages developers to focus on enhancing user experiences and adopting competitive pricing strategies. Investors can leverage the Akpan AI token valuation scale to assess and compare different AI tokens, prioritizing those with higher user engagement and more attractive pricing models. Looking ahead, future research should explore additional factors that may influence AI token valuation, such as technological innovations, regulatory changes, and demographic shifts in user bases. Longitudinal studies examining the evolution of AI token markets over time would also provide deeper insights into how engagement and pricing strategies affect token valuations in the long run.

REFERENCES

Amadeus, M., da Silva, J. R. H., & Rocha, J. V. P. (2024). Bridging the language gap: Integrating language variations into conversational AI agents for enhanced user engagement. In N. Hosseini-Kivanani, S. Höhn, D. Anastasiou, B. Migge, A. Soltan, D. Dippold, E. Kamlovskaya, & F. Philippy (Eds.), *Proceedings of the 1st Workshop on Towards Ethical and Inclusive Conversational AI: Language Attitudes, Linguistic Diversity, and Language Rights (TEICAI 2024)*. Association for Computational Linguistics. https://aclanthology.org/2024.teicai-1.3

Balnaves, M., Wilson, M., & Leaver, T. (2012). Entering Farmville: Finding value in social games. In *Proceedings of the Australian and New Zealand Communication Association conference: Communicating Change and Changing Communication in the 21st century*. https://www.academia.edu/2569051/Entering_Farmville_Finding_Value_in_Social_Games

Brynjolfsson, E., & McAfee, A. (2017). Artificial intelligence, for real. *Harvard Business Review*. Harvard Business School Publishing Corporation. https://starlab-alliance.com/wp-content/uploads/2017/09/AI-Article.pdf

Czarnitzki, D., Fernández, G. P., & Rammer, C. (2023). Artificial intelligence and firm-level productivity. *Journal of Economic Behavior & Organization, 211*, 188–205. https://doi.org/10.1016/j.jebo.2023.05.008

Hajipour, V., Hekmat, S., & Amini, M. (2023). A value-oriented Artificial Intelligence-as-a-Service business plan using integrated tools and services. *Decision Analytics Journal, 8*, Article 100302. https://doi.org/10.1016/j.dajour.2023.100302

Jarrahi, M. H. (2019). In the age of smart artificial intelligence: AI's dual capacities for automating and information work. *Business Information Review, 36*(4), 178–187. https://doi.org/10.1177/0266382119883999

Karpov, P., Godin, G., & Tetko, I. V. (2019). A transformer model for retrosynthesis. In I. V. Tetko, V. Kůrková, P. Karpov, & F. Theis (Eds.), *Artificial neural networks and machine learning — ICANN 2019: Workshop and special sessions* (pp. 817–830). https://doi.org/10.1007/978-3-030-30493-5_78

Katz, M. L., & Shapiro, C. (1986). Technology adoption in the presence of network externalities. *Journal of Political Economy, 94*(4), 822–841. https://doi.org/10.1086/261409

Kim, J. S., Kim, M., & Baek, T. H. (2024). Enhancing user experience with a generative AI chatbot. *International Journal of Human-Computer Interaction*. Advance online publication. https://doi.org/10.1080/10447318.2024.2311971

Knott, A., Pedreschi, D., Chatila, R., Chakraborti, T., Leavy, S., Baeza-Yates, R., Eyers, D., Trotman, A., Teal, P. D., Biecek, P., Russell, S., & Bengio, Y. (2023). Generative AI models should include detection mechanisms as a condition for public release. *Ethics and Information Technology, 25*(4), Article 55. https://doi.org/10.1007/s10676-023-09728-4

Liu, Y., & Zhang, L. (2023). Cryptocurrency valuation: An explainable AI approach. In K. Arai (Ed.), *Intelligent computing* (Vol. 1, pp. 785–807). Springer, Cham. https://doi.org/10.1007/978-3-031-37717-4_51

Liu, Y., Li, H., Bai, X., & Jin, L. (2023). A brief analysis of ChatGPT: Historical evolution, current applications, and prospects. *Journal of Image and Graphics, 28*(4), 893–902. https://doi.org/10.11834/jig.230110
Luitse, D., & Denkena, W. (2021). The great transformer: Examining the role of large language models in the political economy of AI. *Big Data and Society, 8*(2). https://doi.org/10.1177/20539517211047734
Moro-Visconti, R., Rambaud, S. C., & Pascual, J. L. (2023). Artificial intelligence-driven scalability and its impact on the sustainability and valuation of traditional firms. *Humanities and Social Sciences Communications, 10*(1), Article 795. https://doi.org/10.1057/s41599-023-02214-8
Reim, W., Åström, J., & Eriksson, O. (2020). Implementing artificial intelligence (AI): A roadmap for business model innovation. *AI*, *1*(2), 180–191. https://doi.org/10.3390/ai1020011
Rock, D. (2019, May 1). *Engineering value: The returns to technological talent and investments in artificial intelligence.* https://doi.org/10.2139/ssrn.3427412
Sing, T. F., Yang, J. J., & Yu, S. M. (2021). Boosted tree ensembles for artificial intelligence based automated valuation models (AI-AVM). *The Journal of Real Estate Finance and Economics, 65*, 649–674. https://doi.org/10.1007/s11146-021-09861-1
Szkutak, R. (2024, June 20). *Materia looks to make accountants more efficient with AI.* Tech Crunch. https://techcrunch.com/2024/06/20/materia-looks-to-make-accountants-more-efficient-with-ai/
Taherdoost, H., & Madanchian, M. (2024). AI advancements: Comparison of innovative techniques. *AI, 5*(1), 38–54. https://doi.org/10.3390/ai5010003
Uppalapati, V. K., & Nag, D. S. (2024). A comparative analysis of AI models in complex medical decision-making scenarios: Evaluating ChatGPT, Claude AI, Bard, and Perplexity. *Cureus 16*(1), Article e52485. https://doi.org/10.7759/cureus.52485
Wang, R., Luo, M., Wen, Y., Wang, L., Raymond Choo, K.-K., & He, D. (2021). The applications of blockchain in artificial intelligence. *Security and Communication Networks.* Advance online publication. https://doi.org/10.1155/2021/6126247
Wong, M.-F., Guo, S., Hang, C.-N., Ho, S.-W., & Tan, C.-W. (2023). Natural language generation and understanding of big code for AI-assisted programming: A review. *Entropy, 25*(6), Article 888. https://doi.org/10.3390/e25060888
Yousaf, I., Youssef, M., & Goodell, J. W. (2024). Tail connectedness between artificial intelligence tokens, ETFs, and traditional asset classes. *Journal of International Financial Markets, Institutions and Money, 91*, Article 101929. https://doi.org/10.1016/j.intfin.2023.101929

APPENDIX

Table A.1. AI token data

AI token	*Pricing (USD/million tokens)*	*Input/output*	*Website visits (millions/month)*	*MAU (millions)*	*Estimated valuation (billions of USD)*
1. GPT-4	30.00 (input)/60.00 (output)	Both	1000	100	80
2. GPT-3.5	0.50 (input)/1.50 (output)	Both	1500	150	60
3. Claude	8.00 (input)/24.00 (output)	Both	200	20	30
4. Palm	1.00	Input	300	30	25
5. DALL-E 2	20.00	Output	400	40	15
6. Midjourney	10.00	Output	150	15	10
7. Stable Diffusion	0.00	N/A (Open source)	250	25	8
8. Llama 2	0.00	N/A (Open source)	100	10	5
9. Cohere	2.00 (input)/6.00 (output)	Both	50	5	3
10. AI21 Labs	3.00 (input)/9.00 (output)	Both	30	3	2

Note: 1) Some models of the same company have different prices for input and output tokens. 2) Website visits are monthly averages and may fluctuate. 3) Sources of the data are all listed in the bibliography/references section. 4) MAU figures are estimates based on available data and industry reports. 5) Estimated valuations are based on the most recent publicly available information and may not reflect current private valuations. 6) The pricing for open-source models is listed as 0.00, but costs may be associated with deployment and computing resources.