

EXPLORING CHATGPT'S EFFICACY IN IDENTIFYING POTENTIAL BUSINESS PARTNERS: A COMPARATIVE STUDY

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Abstract

Purpose. This study aims to evaluate the effectiveness of using ChatGPT for a practically important but under-researched task in the scientific literature: the preliminary search and identification of potential business partners or counterparties.

Design/Methodology/Approach. An experiment was conducted where ChatGPT was tasked with suggesting ten digital marketing agencies for each of three countries - Germany, Latvia, and Poland, including links to these agencies' homepages. The accuracy of the responses was verified. The study also compared the accuracy of responses between the latest version of ChatGPT (ChatGPT 4o) and the previous version (ChatGPT 4) connected to the Internet.

Findings. Both versions of ChatGPT were found to make a significant number of errors or inaccuracies when identifying potential business partners that met predefined criteria. Moreover, the frequency of these errors increased when searching in countries with smaller populations and economies. It was also found that the newer version, ChatGPT 4o, did not demonstrate improved accuracy compared to ChatGPT 4, which was connected to the Internet. Both versions of ChatGPT examined in the study provide a higher level of accuracy in identifying potential partners in countries with larger economies and populations.

Originality / Value / Practical Implications. This research contributes to a practical understanding of the limitations and capabilities of AI tools in identifying business partners, providing valuable information for both practitioners and researchers in the field. This study also provides a benchmark for determining the accuracy of ChatGPT in performing common and important business tasks such as preliminary search and identification of business partners. The results of the study provide a basis for future research to track the progress of language models in similar business applications. The proposed evaluation methodology can be applied to future research aimed at assessing the capabilities of language models in solving business problems.

Keywords: ChatGPT; AI language model; Identification of business partners; Risk assessment; Decision making.

JEL codes: O33, M15, D83.

Introduction

Until about the second half of 2022, AI products were mainly developed and applied for the benefit of specific large companies. The development of AI products could be afforded by a relatively small number of companies, as it required a significant amount of funding.

As a result of the launch of ChatGPT and other generative AI products, all companies, including a huge number of micro, small and medium-sized companies, as well as self-employed individuals and freelancers, have gained access to generative AI products.

Consequently, in less than a year since the advent of generative AI products, a very significant proportion of companies have begun to widely use these products. For example, according to a survey conducted in February 2023 among 1000 US companies, 49% of companies reported that they use ChatGPT, and 93% of these companies plan to expand the use of this chatbot. Another 30% of companies said they plan to start using ChatGPT, and 85% of them said they will start using it within the next 6 months (Resume Builder, 2023).

The effective application of ChatGPT is relevant for a huge number of companies and individual entrepreneurs. Thus, in 2019, there were more than 322 million MSMEs in 176 countries (World Bank, 2019). However, it would be correct to also include freelancers and self-employed individuals as business users of ChatGPT and other generative AI products. Approximately 1.57 billion people in the global workforce are freelancers (Howarth, 2024). Based on the results of the Resume Builder survey (2023), it can be assumed that at least several tens of millions of MSMEs are already using ChatGPT alone, and the number of these user categories will increase rapidly. And, as usual, when applying products built based on new technologies, one of the most important issues is to assess the capabilities of these products at this stage of their development.

Research notes that ChatGPT 4 have tremendous potential to transform marketing and provide more accurate information than previous PLMs (Rivas & Zhao, 2023) and that ChatGPT will significantly increase the effectiveness of marketers in various marketing areas (Jain et al, 2023). ChatGPT can be used as an advanced search engine (Fraïwan & Khasawneh 2023). However, it is noted that ChatGPT has difficulty handling difficult or strange situations because it lacks context understanding, although ChatGPT shows significant improvement (George et al, 2023) and that using ChatGPT at the current stage of development requires care in its application (Rana, 2023), otherwise, the results may be inaccurate (Fraïwan & Khasawneh, 2023). The literature notes a paucity of empirical research on marketing applications of ChatGPT (Grashoff & Recker, 2023).

However, we did not find articles that test the effectiveness of using ChatGPT to find counterparties or business partners of companies. Although it seems obvious that in the context of a slowdown in economic growth and the threat of a recession and, accordingly, a decrease in demand, as well as the presence of sanctions restrictions, the task of finding new buyers, buyers, suppliers and other counterparties is an important factor in the long-term sustainability of companies. Accordingly, many companies and entrepreneurs have a need to improve the efficiency of the search for counterparties that meet certain criteria and will try to use ChatGPT for this purpose.

Therefore, in this article, we plan to answer two research questions. First, how effective is the use of ChatGPT for preliminary search and identification of business partners or counterparties.

Secondly, since the literature has reported significant performance benefits with each subsequent version of ChatGPT (Plevris et al, 2023; Ahsan et al, 2023), we will examine whether the latest version of ChatGPT, ChatGPT 4o, which became available in May 2024, more effective for solving the problems of preliminary search for potential partners in the B2B segment compared to the previous version - ChatGPT 4, connected to the Internet.

As a result of our experiment, we empirically proved that both the latest versions of ChatGPT make a significant number of errors or inaccuracies when preliminary searching for potential business partners that meet certain criteria.

The article is structured as follows. In the second section, we present the theoretical background of using ChatGPT for marketing and search purposes, as well as the risks associated with using ChatGPT. In the third section, we present the research methodology. In the fourth section, we present the results of our experiment in finding business partners in the case of using ChatGPT 4.0, connected to the internet and in the case of using ChatGPT 4o and compare the obtained results. In the fifth section, we present the conclusion and recommendations for future research.

Literature Review

Generative AI products, especially ChatGPT and ChatGPT4, have great potential to transform marketing by automating tasks by providing more accurate information than previous PLMs (Rivas & Zhao, 2023). ChatGPT can be used effectively for marketing (Jain et al, 2023). When using ChatGPT, marketing tasks took less time to complete, and the result was of higher quality (Noy & Zhang, 2023). As a result of the implementation of ChatGPT, a giant leap in marketing is expected over the next few years (Rivas & Zhao, 2023).

As companies strive to achieve desired business outcomes more effectively, it's hard to imagine an aspect of marketing practice that GenAI won't touch (Peres et al, 2023). As a result of the introduction of generative AI products, particularly ChatGPT, a number of interesting tools will become mainstream, becoming a standard feature in, for example, web search (Teubner et al, 2023). Accordingly, GenAI will make modern marketing tools more accessible to MSMEs as well as individual entrepreneurs (Peres et al, 2023). ChatGPT can help small businesses improve efficiency and reduce marketing costs (Bianchini, 2023). It is also noted that further research is needed on ChatGPT as a marketing research tool (Jain et al, 2023).

Microsoft's decision to invest in ChatGPT and include it in its Bing search engine has already set off waves in search engine ecosystems (Cutler, 2023). ChatGPT has unleashed a new war in information retrieval (Rana, 2023). The paradigm shifts in access to information brought about by ChatGPT could benefit everyone using tags (Haleem et al, 2022). ChatGPT can help companies generate leads and increase conversion rates (Ahsan et al., 2023; Ray, 2023). ChatGPT helps reduce the time spent gathering information (Seetharamapura, 2023). ChatGPT can be used for market research to better understand the customer base and areas for customer expansion (Rahaman, 2023). Many users believe that ChatGPT will replace traditional search engines such as Google because it can provide simple and concise results, makes research easier and takes less time. Technological advancement with chatbots may indicate significant advances in web search (Cutler, 2023). ChatGPT can be used effectively for search (Jain et al, 2023). The introduction of ChatGPT has provided a much more efficient web search experience (George et al, 2023). ChatGPT4 is noted to have several improvements over the previous version, including overall performance and response quality (Plevris et al, 2023; Ahsan et al., 2023).

When evaluating the many opportunities that ChatGPT offers, it must be considered that any new technology should be used consciously, and its pros and cons should be understood, therefore ChatGPT should be used carefully as a research and practice tool (Jain et al, 2023). ChatGPT shows significant improvements but still struggles to handle difficult or strange situations (George et al, 2023). Without a doubt, ChatGPT is the future, but care must be taken until these products reach the required level of maturity (Rana, 2023). Although AI models such as ChatGPT are in the early stages of scaling, companies have begun to use these models in many business areas. But care must be taken when applying such models, as such models are not yet fully mature technology (Chui et al, 2022). Therefore, the use of such products requires managers to be more cautious. For example, ChatGPT sometimes generates completely inaccurate information in response to a user's question and does not have a built-in mechanism to inform the user about this or challenge the result (Chui et al, 2022). ChatGPT (like all models) is not infallible. If researchers rely too heavily on model results, they may introduce errors or inaccuracies into their research (Fraivan & Khasawneh, 2023). AI tools, particularly ChatGPT, can pose potential risks to marketers, consumers, and other stakeholders as they may extract information from inaccurate sources and therefore provide incorrect information, as well as generate responses based on information that is inherently out of date (Rivas & Zhao, 2023).

A key risk driver is GPT-4's ability to generate publicly accessible but difficult-to-find information, shortening the time users spend on research and compiling this information in a way that is understandable to a non-expert user (OpenAI, 2023).

ChatGPT is mainly trained on data up to 2021, so newer events may still need to be found in other sources of information (George et al, 2023). The accuracy of models such as ChatGPT may be questionable as they are still under development and lack context understanding (George et al, 2023). ChatGPT is a generalized pre-trained transformer (GPT) trained on an existing dataset that is at least

two years old. Therefore, latency is one of the disadvantages of GPT. It follows that GPT is only as good as the data it is trained on (Shen et al, 2023). ChatGPT ignored emotional, controversial, provocative, and manipulative questions and stuck to what it was taught (Seetharamapura, 2023). Just like humans, generative AI can make mistakes. ChatGPT, for example, sometimes "hallucinates", which means that it confidently generates completely inaccurate information in response to a user's question and has no built-in mechanism to signal this to the user. Filters are not yet effective enough to catch inappropriate content (Chui et al, 2022). ChatGPT, depending on the data it was trained on, may not be very objective in its analysis (Ahsan et al., 2023). When asking ChatGPT questions, you need to clearly define the problem and what information you plan to collect. It is also important to ask clear, concise, and specific questions and provide additional information or clarification as needed (Zierock & Jungblut, 2023). The effectiveness of LLM as a productivity tool will undoubtedly depend on the user's ability to use it (Teubner et al, 2023). Users should be aware of ChatGPT limitations and take steps to mitigate these risks (Fraivan & Khasawneh, 2023). Managers must be clear about the risks involved at the early stage of ChatGPT technology development (Chui et al, 2022). Improving the results of ChatGPT in marketing also depends on its correct application. Therefore, the use of ChatGPT in marketing needs to be carefully considered to avoid potential risks (Rivas & Zhao, 2023).

Summarizing the review of the literature, we stated that the researchers note the following aspects of using ChatGPT in the transformation of marketing and the search for customers and partners. First, ChatGPT has tremendous potential to transform marketing. Secondly, ChatGPT can be effectively used to find clients, partners and other information. Thirdly, despite the beginning of the mass use of ChatGPT, it must be considered that generative AI technologies have not yet reached the level of maturity and in some cases give insufficiently accurate and sometimes erroneous answers. Therefore, the use of ChatGPT requires caution, awareness of potential risks and taking measures to mitigate them, as well as certain knowledge from workers using ChatGPT.

However, despite the numerous mentions in the reviewed literature of the versatile capabilities of ChatGPT in marketing research, expanding the customer base and search, we did not find studies that examined the effectiveness of using ChatGPT around preliminary search and identification of potential partners and contractors.

Research Methodology

The research methodology is based on an experiment to evaluate the effectiveness of using ChatGPT for preliminary search business partners.

We planned the experiment in such a way that the experiment on finding business partners corresponded to the solution of a typical problem for companies from any sector of the economy that carry out import and/or export operations.

To correctly select the most versatile search object for the experiment, in late February and early March 2024, we conducted a survey of CEOs, COOs or CMOs of twenty-eight SMEs from various sectors - industry, wholesale and services of CEE countries that are members of the EU, which have imported and/or export operations. The survey among CEOs and TOP managers was conducted only with the purpose of identifying the most pressing marketing tasks for export companies, which may be typical for companies producing and selling various types of products or services, based on the assumption that these tasks can be effectively solved using ChatGPT.

As a result of the survey, the search for a digital marketing agency was chosen as the object of the search for a potential business partner in the three most important markets for the companies surveyed - Germany, Latvia and Poland.

We have followed the guidelines and rules outlined in the Ethical Principles for the European Economist, recommended by the European Economic Association (2022).

We conducted an experiment that included eight stages. The first six stages were aimed at testing ChatGPT's contextual understanding of responses.

The seventh and eighth stages of the experiment were aimed at assessing the accuracy of identifying potential business partners or counterparties and checking the accuracy of providing links to the home pages of companies proposed by ChatGPT.

The latter two stages are the focus of the current paper.

Stage 7. ChatGPT 4, connected to the Internet, was asked to find ten digital marketing agencies in each of three countries - Germany, Latvia and Poland - and to provide links to the websites of these digital marketing agencies.

After receiving the responses, we manually checked the links provided by ChatGPT to see if the recommended companies were digital marketing agencies and if these companies were in the countries we specified. If the link did not work or it was a link to another company, we manually searched the company's home page by company name and country affiliation and checked whether these companies were digital marketing agencies and whether these companies were in the target countries.

Stage 8. After that, we performed a similar experiment with ChatGPT 4o in the same sequence. Note that ChatGPT 4o is connected to the internet. Next, we compared the obtained response results from ChatGPT 4o with those of ChatGPT 4 connected to the Internet. The experiment was conducted in August 2024. All questions were asked from one account. Questions were asked in English. The results of the experiment for Germany are presented in Appendices 1 and 2, for Poland in Appendices 3 and 4, and for Latvia in Appendices 5 and 6.

A comparison of ChatGPT 4 connected to the Internet and ChatGPT 4o was performed due to the following reason:

1. In the recommendations on the methodology of conducting and creating the design of scientific research, it is recommended to conduct a comparison with comparable samples, data, etc., so that the results obtained can be compared.
2. Following this principle of constructing the methodology of scientific research, in the process of conducting the experiment we found that the latest version - ChatGPT 4o in solving the marketing tasks considered in the study (preliminary search for potential business partners and/or contractors by certain criteria) has slightly lower accuracy compared to the previous version - ChatGPT 4, connected to the Internet.

As a result of our comparison of the latest and previous versions of ChatGPT, we were able to draw the following additional conclusions. Firstly, for solving the problems of preliminary search and/or identification of business partners, the previous version of ChatGPT - ChatGPT4, connected to the Internet, demonstrated slightly better results than the latest version - ChatGPT 4o, which allows us to conclude that for solving the problems considered in our experiment, it is possible to use not only the latest version - ChatGPT 4o, but also the previous version - ChatGPT 4, connected to the Internet. Secondly, we noted the lack of progress in the results of the preliminary search of potential business partners and/or contractors in the ChatGPT 4o version compared to the previous version, which indicates a non-linear level of progress in subsequent versions of GPT for solving some problems in the field of information search and marketing, which is also an interesting scientific conclusion, proven by conducting an experiment and comparing the responses of ChatGPT 4o and the previous version of ChatGPT.

Research Results

Identification of digital marketing agencies received from ChatGPT

In this subsection, we check whether ChatGPT 4, connected to the Internet and ChatGPT 4.o correctly presented the answers based on the first part of our question. Namely, whether the companies presented in the ChatGPT answers are digital marketing agencies from Germany, Latvia and Poland (see Fig.1).

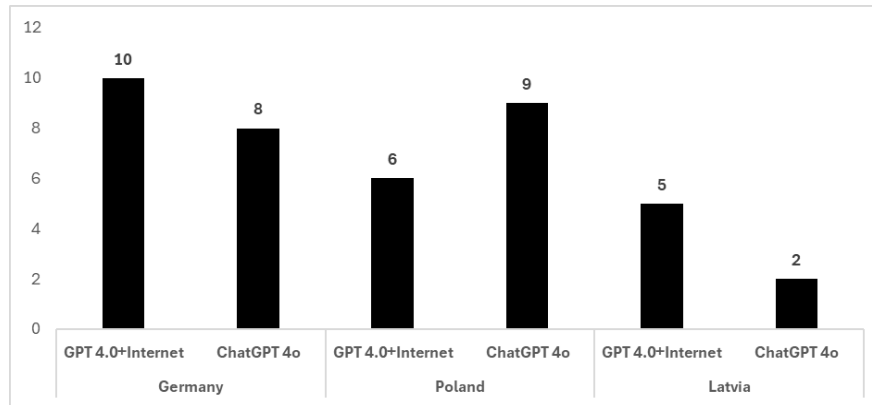


Fig. 1. Results of checking the correctness of the identification of digital marketing agencies received from GPT (Source: Created by the authors)

The analysis of the responses received showed that out of the thirty possible valid responses totalling three countries, the Internet-connected ChatGPT 4 correctly identified twenty-one companies that are digital marketing agencies. Accordingly, the validity of the answers provided by ChatGPT 4 connected to the Internet was 70%. ChatGPT 4o correctly identified nineteen companies that are digital marketing agencies, which is 63.3% valid responses. When comparing the performance of the two versions of ChatGPT, we found that ChatGPT 4 connected to the Internet, i.e. the earlier version of ChatGPT, provided results that were 6.7 percentage points more accurate than the latest version of ChatGPT, i.e. ChatGPT 4o.

In our opinion, the effectiveness of the ChatGPT versions considered in the study seems to be insufficient due to a rather high share of unreliable information, especially considering that both ChatGPT versions considered in the study are connected to the Internet.

Analysing the results obtained separately by country, we found that the most accurate answers were obtained by digital marketing agencies in Germany -18 valid answers out of 20 possible, which is 90%. The lowest accuracy of ChatGPT answers was for digital marketing agencies in Poland -15 valid answers out of 20 possible, which is 75%. The lowest accuracy of ChatGPT answers was for digital marketing agencies in Latvia - 7 valid answers out of 20 possible, which is 35%.

If we consider the results obtained in the context of the size of the economy, number of companies or population of the countries considered in the study, the size of the economy, number of companies and population in Latvia is several tens of times lower than in Germany and Poland. The size of the economy and population in Germany is several times larger than in Poland. On this basis, we can make a preliminary assumption that ChatGPT at this stage of development of this language model provides more accurate information on larger countries (in terms of size of economy, number of companies and population).

Comparing the reliability of the results obtained between ChatGPT 4 connected to the Internet and ChatGPT 4o between the three countries considered in the study, we did not find homogeneous trends. For example, ChatGPT 4 connected to the internet provided more accurate information than ChatGPT 4o for companies in Germany. Conversely, among digital marketing agencies in Poland, ChatGPT 4o provided more accurate information. Since the differences in the obtained performance results between ChatGPT 4 connected to the Internet and ChatGPT 4o differ only slightly, we cannot draw a reliable conclusion about a significant advantage of one of the two versions of ChatGPT we examined. However, we can conclude that even though the versions of ChatGPT we reviewed are the penultimate and the latest versions and both of them are connected to the Internet, the error rate in obtaining information about companies based on the company's main specialisation is quite high.

Our results correlate with the viewpoint of Chiu (2023), who finds that ChatGPT sometimes generates completely inaccurate information.

The reason for the significant number of errors may be that ChatGPT products have not yet reached a sufficient level of maturity Rana (2023). Chiu (2023) also finds that ChatGPT sometimes generates completely inaccurate information.

We note another interesting aspect in the ChatGPT responses. Each of the two versions of ChatGPT for a small country like Latvia provided a completely inconsistent list of ten digital marketing agencies. For Poland, there was only one match of recommended digital marketing agencies, and for Germany, there were four matches. Since we sent the questions from the same IP address, this fact may indicate that the reviewed ChatGPT versions have or use different sources of information and do not have sufficient domain or industry expertise.

Checking the links of digital marketing agencies represented by ChatGPT

In the era of digital technologies and the development of digital information and marketing tools, most companies operating in the B2B segment, including digital marketing agencies, have their own website or homepage, which contains some information about the company, including information about the company's specialisation and products. The availability of such information allows for a more efficient preliminary search for potential partners in the B2B segment according to certain criteria, and for digital marketing agencies to attract potential target customers more efficiently. Therefore, in this subsection, we will present the results of our testing of the websites of digital marketing agencies that were suggested as potential partners because of our queries to ChatGPT 4 connected to the Internet and ChatGPT 4o, as well as compare the effectiveness of the results obtained using the two versions of ChatGPT considered in the study.

For this purpose, we checked whether the link of the recommended ChatGPT digital marketing agencies works, and whether the specified address gives a link to the homepage of this company (see Fig. 2).

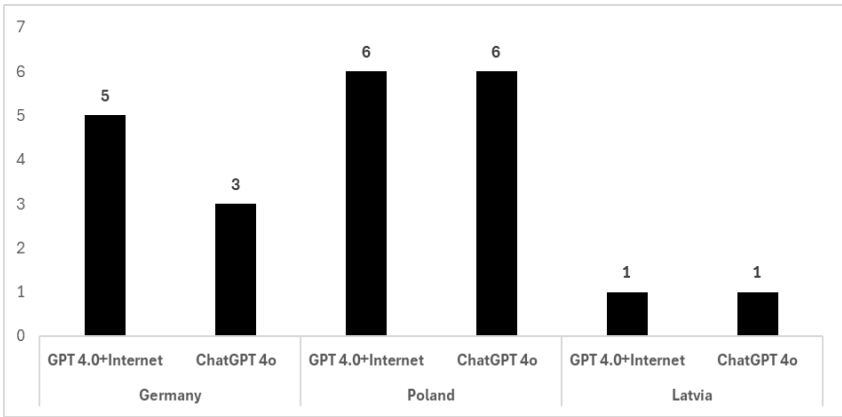


Fig. 2. Results of checking the correctness of the identification of digital marketing agencies received from GPT (Source: Created by the authors)

Our analysis shows that out of thirty ChatGPT 4 submissions, connected to the Internet via three country links, only in 12 cases (40%) information corresponding to reality was received. Namely, the link was opened, it was the link of the company mentioned in the recommendation, and the company provided services to find potential buyers. In ChatGPT 4o the accuracy of the information provided was lower - only in ten cases out of thirty (33.3%) the link opened, it corresponded to the name of the digital marketing agency recommended by ChatGPT 4o, and the agency provided digital services to find potential buyers. However, the difference in the reliability of responses between the two ChatGPT versions under such quantitative indicators cannot be considered significant and needs to be tested on a larger number of countries and a larger number of potential partners requested.

The share of correct ChatGPT answers was almost two times lower compared to the answers about the names of recommended digital marketing agencies discussed in the previous subsection of our survey. This can probably be explained by the fact that the information found on a company's homepage is more

detailed information that requires more in-depth analysis, logic and verification by ChatGPT. For example, in cases where a company's website does not match the company name, is not working or does not contain any information.

As in the previous subsection of our study, the earlier version of ChatGPT, namely ChatGPT 4 connected to the Internet, gave a slightly higher result than the latest version, ChatGPT 4o.

As in the previous subsection of our study, ChatGPT presented the least reliable results for Latvia (only 10%). However, the results obtained for Poland (40%) were more reliable than for Germany (26.7%), in contrast to the data we obtained in the previous subsection, in which the data for Germany were more reliable.

In both subsections of the study, the lowest level of reliability obtained from ChatGPT was for digital marketing agencies in Latvia. Given this fact, we can conclude that there is a significant difference in the level of reliability of ChatGPT responses to symmetric questions in the context of different countries.

As we mentioned in the previous section, perhaps the significantly lower level of accuracy of ChatGPT responses for digital marketing agencies in Latvia (and possibly other small countries) is due to the lack of depth of ChatGPT information related to small countries, including the level of domain and/or industry expertise.

We found that when applying ChatGPT 4 connected to the Internet, as well as the latest version of ChatGPT - ChatGPT 4o when using these generative artificial intelligence products for preliminary partner search in the B2B segment, a rather high number of errors and inaccuracies occur. Based on this, it can be concluded that the current use of the ChatGPT products considered in the study is not effective enough for the preliminary identification of partners or counterparties in the B2B segment.

There are several reasons why using ChatGPT may not give companies the expected results.

- Human intuition and judgment: ChatGPT is an extensive language model with the capabilities of a fully-fledged conversational AI chatbot. In response to a broad variety of cues and inquiries, the system can converse and create human-like prose since it has been trained on a large corpus of material. However, it lacks the intuitive and judgmental capabilities of a human being, which are essential when selecting business partners.
- Specialized expertise: ChatGPT is not taught any industry-specific vocabulary or jargon. This implies it could not grasp the specifics of various sectors or the requirements of various enterprises.
- Lack of Contextual Understanding: The business backdrop, industry dynamics, and unique needs of each company are not fully understood by ChatGPT. The results it produces may be excessively broad or ill-suited to the demands of the business.
- Reduced Capacity for Data Collection: There is currently no way to undertake an in-depth investigation or collect detailed information about prospective business partners using ChatGPT.
- Lack of Personalized Recommendations: Choosing the right business partners requires a deep understanding of the organization, its objectives, and the market in which it operates. It is possible that ChatGPT will provide broad suggestions that do not address the unique requirements of your business.
- Extremely Fluid and Changing Markets: Keeping up with the trends and dynamics of the market is essential for success in the business world, and finding reliable partners is no easy task. It is possible that ChatGPT's information is not current or precise enough to be useful.
- Inadequate social networking skills: Networking inside an industry is an excellent way to meet potential business partners. ChatGPT does not allow you to network with actual people or businesses.
- While ChatGPT is useful for many purposes, choosing business partners calls on skills such as human judgment, familiarity with a certain field and ability to conduct extensive study.

Conclusions

Our study has both practical and scientific significance. Our practical contribution is that we have determined the level of accuracy of answers to ChatGPT questions, which will allow employees of companies and other organizations to more consciously choose tools to more effectively preliminary search for partners and contractors and similar ones.

We also found an interesting phenomenon that ChatGPT's accuracy in preliminary searches and company identification is higher when searching in countries with larger economies and higher populations. However, due to the small number of countries and their belonging to one region, this finding is tentative and needs to be tested on a larger number of countries from different regions and continents.

In addition, we found that at this stage of development of these language models, the efficiency of using ChatGPT 4.0 connected to the Internet and ChatGPT4o for solving the problems considered in our study is practically the same. This allows companies to use either of the two considered versions of ChatGPT at their own discretion. It also indicates that the progress in the performance of subsequent versions of ChatGPT for solving some problems is not obvious.

Our study is probably the first scientific publication on the evaluation of the effectiveness of using generative AI products for preliminary search and identification of potential business partners and contractors.

Our article contributes to the scientific literature on the application of generative AI in general and for marketing purposes as follows.

First, the level of effectiveness of the ChatGPT application for preliminary search and identification of potential business partners and counterparties that we have determined can be a starting point for future research on measuring the progress of language models and comparing their effectiveness with other tools and for solving similar business problems. Secondly, the methodology we proposed for assessing the effectiveness of using language models can be used in future similar studies. Thirdly, our assumption that the level of accuracy of ChatGPT responses may depend on the size of the economy and/or population is also a scientific novelty and a hypothesis for the following research.

Our study contributes to the following theories.

First, the research contributes to theories related to the technology adoption lifecycle. The study focuses on ChatGPT's place in the lifecycle concerning business search functions and that GenAI products like ChatGPT are not yet fully mature at this stage of their development for solving business tasks like preliminary search and identification of business partners, especially in smaller or niche markets like Latvia.

Second, we contribute to Information Retrieval Theory, which focuses on how systems collect, process, and provide relevant information. The study evaluates the effectiveness of ChatGPT in extracting accurate data from companies and websites in different countries. The results of our study contribute to the understanding of the current limitations of ChatGPT as a tool for information extraction in niche business cases. The study found significant error rates (in some cases over 30%), adding empirical evidence to the broader discussion of AI accuracy and its practical limitations at this stage of ChatGPT's development.

Our research also touches upon some aspects of decision theory when using generative AI products such as ChatGPT. This is expressed in the fact that we test and demonstrate the need to evaluate the effectiveness of generative AI products planned for searching and identifying potential partners and contractors when making decisions about choosing products to solve this problem.

The level of accuracy of ChatGPT answers we have determined is also a starting point that will allow subsequent research studies to measure the progress of language models and other tools for solving such and similar business problems, as well as to apply our proposed evaluation methodology in similar future studies.

One of the main mistakes of some company employees when applying ChatGPT for solving business tasks may be the misconception that at this stage of its development, ChatGPT is a universal tool for effectively solving almost all or many information-analytical tasks. Therefore, to reduce or mitigate possible errors and risks when making decisions about using ChatGPT by companies for preliminary search and identification of potential business partners or counterparties, we have formulated several recommendations.

First, when making decisions about using ChatGPT (or other generative AI products), it is necessary to familiarize oneself with information about which tasks ChatGPT is effective and for which tasks ChatGPT is not yet effective enough. One way to obtain such information could be to ask ChatGPT about the effectiveness of ChatGPT for a specific task, which the user can ask ChatGPT himself before deciding to use ChatGPT for specific company tasks.

Second, to verify the quality of the answers received from ChatGPT, quick sample tests can be conducted based on information that the company asking the questions is confident in or that the ChatGPT information can be quickly verified to be accurate.

Thirdly, errors in ChatGPT answers may be the result of insufficient qualifications and skills of workers in using generative AI products. To obtain a more accurate answer, the user should formulate the question in as much detail as possible and describe all the parameters of the requested information, as the accuracy of the question asked influences the quality of the answer that will be received from ChatGPT.

Fourth, it is necessary to verify the answers received from ChatGPT (and other language models). The depth and frequency of verification of the responses received may depend on the level of potential risks and other negative consequences that may arise from the use of erroneous information.

Fifth, companies and entrepreneurs need to closely follow the progress of generative AI products to take advantage of new opportunities.

In addition, it should be recognized that it is already possible to extend the functionality of ChatGPT and other generative AI products, including search, due to the use of plug-ins. In addition, it can be expected that ChatGPT will soon make significant progress, including in search, also because of the ten-billion-dollar investment from Microsoft (Bloomberg, 2023a), as well as competition from significant potential competitors such as Google (Bloomberg, 2023b) and other little-known or yet unknown start-ups.

In the following research, it would be advisable to consider the level of ChatGPT's progress in the area of preliminary search of potential clients and counterparties of companies, including using plug-ins. And, to compare the efficiency of ChatGPT search with other information retrieval tools. In addition, it would be worthwhile to test our findings on a wider range of countries of different populations and economic sizes from different regions and continents.

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Conflicts of Interest

The authors declare no conflict of interest.

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Appendix 1. Checking the results obtained from GPT 4.0 + Internet

Country: Germany

Question: Write 10 digital marketing agencies from Germany. Our goal is to attract customers to our website. Add links to their websites for these agencies.

Digital marketing agencies	Digital marketing agency name check	Company link found by Google search for GPT 4.0+Internet suggested company name
1. SaphirSolution - Based in Cologne, this agency focuses on PPC, SEO, content marketing, and more, tailoring strategies to optimize customer journeys and increase business profitability. Visit SaphirSolution	Digital marketing agency	The link works
2. Jeau Digital - A small agency from Cremlingen that specializes in SEO and content marketing, aiming to provide timely and professional services. Visit Jeau Digital	Digital marketing agency	The link does not work
3. Elespacio - Located in Berlin, Elespacio offers advertising, digital strategy, and social media marketing, noted for their creative and exceptional performance. Visit Elespacio	Digital marketing agency	The link works
4. EPOS Marketing - This Düsseldorf-based agency offers branding, marketing strategy, and public relations, focusing on B2B companies. Visit EPOS Marketing	Digital marketing agency	The link does not work
5. Mediacharge - A Munich agency specializing in PPC, digital strategy, and content marketing, known for their comprehensive approach to digital marketing. Visit Mediacharge	Digital marketing agency	The link works
6. ONEDOT GmbH - Located in Michelstadt, ONEDOT offers marketing automation and comprehensive digital marketing strategies tailored to B2B services. Visit ONEDOT GmbH	Digital marketing agency	The link shows another company
7. KAIPS MARKETING® - A versatile agency based in Germany, offering services across advertising, marketing advice, and more, with a focus on manufacturing and B2B services. Visit KAIPS MARKETING®	Digital marketing agency	The link does not work
8. BlogTec - Specializing in SEO and content marketing, BlogTec is situated in Twistringen and works to enhance online visibility and drive business growth through effective content strategies. Visit BlogTec	Digital marketing agency	The link works
9. Cheetah Conversions - A Berlin-based firm offering content marketing, conversion optimization, and PPC solutions, particularly adept at serving small businesses. Visit Cheetah Conversions	Digital marketing agency	The link works
10. 3W FUTURE - Based in Leipzig, they provide a blend of corporate photography, e-commerce development, SEO, and social media marketing. Visit 3W FUTURE	Digital marketing agency	The link does not work

Appendix 2. Checking the results obtained from GPT 4o

Country: Germany

Question: Write 10 digital marketing agencies from Germany. Our goal is to attract customers to our website. Add links to their websites for these agencies.

Digital marketing agencies	Digital marketing agency name check	Company link found by Google search for GPT 4o suggested company name
1. SaphirSolution (Niederkassel, Germany) Specializes in PPC, SEO, and conversion optimization, making it suitable for driving traffic and leads to your website. Website	Digital marketing agency	The link works
2. Löwenstark (Multiple Locations) A full-service online marketing agency with expertise in e-commerce and B2B marketing, offering services like PPC, SEO, and content marketing. Website	Digital marketing agency	The link works
3. Gramercy Global Media (Berlin, Germany) Focuses on SEO, PPC, and web design, catering to the needs of B2B clients in technical fields. Website	Digital marketing agency	The link does not work
4. SEOfactory (Berlin, Germany) Specializes in SEO and content marketing, helping businesses increase organic traffic and visibility. Website	This company is not a digital marketing agency	The link does not work
5. EPOS Marketing (Düsseldorf, Germany) Known for strategic brand marketing and digital campaigns, this agency is ideal for B2B companies looking to enhance their online presence. Website	Digital marketing agency	The link does not work
6. Elespacio (Berlin, Germany) An integrated marketing agency with a focus on digital strategy, social media, and advertising, providing a comprehensive approach to digital marketing. Website	Digital marketing agency https://www.topinteractiveagencies.com/digital/agency/profile/europe/germany-deutschland/elespacio/	The link does not work
7. Die Webmeister (Essen, Germany) Offers SEO and PPC services, tailored to B2B clients aiming to optimize their digital advertising efforts. Website	Digital marketing agency	The link does not work
8. Jeu Digital (Cremlingen, Germany) Focuses on SEO and content marketing, delivering sustainable growth through targeted online strategies. Website	Digital marketing agency	The link does not work
9. Admiral Media (Berlin, Germany) Specializes in performance marketing and is recognized for driving results in competitive digital environments. Website	Digital marketing agency. But not from Germany	The link works, but digital marketing agency is not from Germany
10. HIGHER-UP Digital (Munich, Germany) Focuses on content marketing and SEO, helping B2B service providers attract more clients through tailored digital strategies. Website	Digital marketing agency	The link works

Appendix 3. Checking the results obtained from GPT 4.0 + Internet

Country: Poland

Question: Write 10 digital marketing agencies from Poland. Our goal is to attract customers to our website. Add links to their websites for these agencies.

Digital marketing agencies	Digital marketing agency name check	Company link found by Google search for GPT 4.0+Internet suggested company name
1. MTA Digital - Specializes in e-commerce performance, PPC, SEO, and social media marketing with a transparent and data-driven approach. Visit Website	Digital marketing agency	The link works
2. Webmetric - A conversion optimization company that focuses on user experience and performance marketing. Visit Website	Digital marketing agency	The link works
3. zjednoczenie - Offers digital strategy, social media marketing, and web design, serving mid-market to enterprise-level companies. Visit Website	Digital marketing agency	The link works
4. ICEA Group - Provides comprehensive digital strategies, including SEO and content marketing. Visit Website	Digital marketing agency	The link works
5. Cyboticx - Specializes in web development, custom software development, and AI to enhance digital marketing strategies. Visit Website	Digital marketing agency, but not from Poland	The link works/ Digital marketing agency, but not from Poland
6. Human Agency - A relatively new agency that provides digital strategy, advertising, and market research services. Visit Website	Digital marketing agency	The link works
7. Black Rabbit - Focuses on creating engaging and relevant B2B tech content, including video production. Visit Website	Video marketing agency (not a digital marketing agency)	The link works but this company is not a digital marketing agency
8. PROGMATIQ - Known for building websites that stand the test of time and help agencies build their brand online. Visit Website	This company is not a digital marketing agency	The link works but this company is not a digital marketing agency
9. Redvike - A development agency that also provides digital marketing services focusing on mobile and web development. Visit Website	This company is not a digital marketing agency	The link works but this company is not a digital marketing agency
10. SEMPIRE - Specializes in SEO, content marketing, Google Ads, and social media, with a strong focus on maximizing website potential. Visit Website	Digital marketing agency	The link works

Appendix 4. Checking the results obtained from GPT 4o

Country: Poland

Question: Write 10 digital marketing agencies from Poland. Our goal is to attract customers to our website. Add links to their websites for these agencies.

Digital marketing agencies	Digital marketing agency name check	Company link found by Google search for GPT 4o suggested company name
1. Bluerank - Specializes in SEO, PPC, and programmatic advertising. They have extensive experience with technology companies and have worked with global clients. Website: Bluerank	Digital marketing agency	The link works
2. Zest - A Warsaw-based agency that focuses on ROI-driven campaigns, particularly in PPC and social media marketing. Website: Zest	Agency not found	The link does not work
3. iCEA Group - Based in Poznań, they offer comprehensive digital marketing services, including SEO and e-commerce marketing, tailored for tech industries. Website: iCEA Group	Digital marketing agency	The link works
4. Verseo - Known for their expertise in Google Ads and search marketing, Verseo has a strong track record in B2B marketing. Website: Verseo	Digital marketing agency	The link works
5. Elephate - A Wrocław-based agency that focuses on SEO and content marketing, with a specialization in tech and B2B sectors. Website: Elephate	Digital marketing agency	The link works
6. JustIdea Agency - This Kraków agency provides a wide range of digital marketing services, including PPC and conversion optimization, suitable for B2B markets. Website: JustIdea Agency	Digital marketing agency	The link works
7. Tango Digital Agency - A boutique agency offering global digital marketing solutions, ideal for scaling digital products. Website: Tango Digital Agency	Digital marketing agency	The link does not work
8. MAN Digital - Specializes in account-based marketing for B2B tech companies, helping businesses sell more effectively. Website: MAN Digital	Digital marketing agency	The link does not work
9. Sempai - Offers a mix of SEO, SEM, and content marketing services, focusing on achieving high conversion rates for their clients. Website: Sempai	Digital marketing agency	The link works
10. Webrockets - A Warsaw-based agency that combines digital marketing with software development, providing tailored solutions for complex digital problems. Website: Webrockets	Digital marketing agency	The link does not work

Appendix 5. Checking the results obtained from GPT 4.0 + Internet

Country: Latvia

Question: Write 10 digital marketing agencies from Latvia. Our goal is to attract customers to our website. Add links to their websites for these agencies.

Digital marketing agencies	Digital marketing agency name check	Company link found by Google search for GPT 4.0 + Internet suggested company name
1. NoBorders: Specializes in digital strategy services. <u>Website: NoBorders</u>	Digital marketing agency https://noborders.digital/	The link from GPT does not work
2. Robler: Offers a range of digital marketing services with a focus on brand building in the digital realm. <u>Website: Robler</u>	Digital marketing agency. But not from Latvia https://robleragency.com/	The link from GPT does not work
3. Itero: Active in digital strategy and could assist with online marketing strategies. <u>Website: Itero</u>	This company is not a digital marketing agency	The link works, but it's not a link to the digital marketing agency
4. Juice Digital Agency: Specializes in digital strategy and innovative digital solutions. <u>Website: Juice Digital Agency</u>	Digital marketing agency https://juicedigage.com/	The link from GPT does not work
5. PHD Latvia: Experienced in digital strategy, providing strategic insights for digital marketing. <u>Website: PHD Latvia</u>	This company is not a digital marketing agency	The link from GPT does not work
6. Infinitum Agency: Known for digital advertising, SEO, and creative strategy. <u>Website: Infinitum Agency</u>	Digital marketing agency https://infinitum.agency/kontakti/	The link from GPT does not work
7. TrafficDog: Specializes in boosting eCommerce success and web traffic conversion. <u>Website: TrafficDog</u>	Digital marketing agency https://trafficdog.com/contact-us	The link from GPT does not work
8. Mediapark: Offers comprehensive services from project planning to UI/UX and development. <u>Website: Mediapark</u>	This company is not a digital marketing agency	The link works, but this is not a company from Latvia, but from Lithuania, and not a marketing agency
9. Bettrweb: A full-service web development agency focusing on business websites. <u>Website: Bettrweb</u>	This company is not a digital marketing agency	The link does not work
10. RealWeb Marketing Agency: Provides international digital marketing and SEO services. <u>Website: RealWeb Marketing Agency</u>	Digital marketing agency https://realweb.lv/	The link works

Appendix 6. Checking the results obtained from GPT 4o

Country: Latvia

Question: Write 10 digital marketing agencies from Latvia Our goal is to attract customers to our website. Add links to their websites for these agencies.

Digital marketing agencies	Digital marketing agency name check	Company link found by Google search for ChatGPT 4o suggested company name
1. Infinitum 8 Specializes in SEO, PPC, and content marketing with experience in the tech sector. Infinitum 8 Website	An agency with a similar name, Infinitum Agency was found. Digital marketing agency Infinitum 8 was not found.	The link works, but it's not a link to the digital marketing agency
2. WBPRO Offers comprehensive digital marketing services including SEO, social media marketing, and email campaigns. WBPRO Website	This company is not a digital marketing agency	The link from GPT 4o does not work
3. Cloudy Digital Focuses on SEO, PPC, and social media marketing for tech wholesalers. Cloudy Digital Website	Digital marketing agency. But not from Latvia	The link from GPT 4o does not work
4. Digital Marketing Group Provides services including SEO, PPC, content marketing, and digital strategy with a focus on tech industry clients. Digital Marketing Group Website	Digital marketing agency. https://www.marketing.lv/	The link from GPT 4o does not work
5. Market Me Good Specializes in SEO, PPC, and content marketing for tech and B2B clients. Market Me Good Website	Digital marketing agency. https://marketmegood.com/	The link works
6. Digital Marketing Agency (DMA) Focuses on performance marketing including SEO, PPC, and social media advertising. Digital Marketing Agency Website	Digital marketing agency. But not from Latvia https://www.digitalmarketingagency.com/	The link works, but the page is empty
7. FCR Media Latvia Offers digital marketing services such as SEO, PPC, and social media management. FCR Media Latvia Website	This company is not a digital marketing agency	The link works, but a digital marketing agency has a different name
8. SEO Guru Specializes in search engine optimization and digital advertising for tech companies. SEO Guru Website	Digital marketing agency. But not from Latvia https://www.seoguru.online/	The link from GPT 4o does not work
9. Net-Sprint Latvia Provides digital marketing services including SEO, PPC, and content marketing for tech wholesalers. Net-Sprint Latvia Website	Agency not found	The link from GPT 4o does not work
10. DEFA Latvia Focuses on SEO, PPC, and social media marketing with experience in the tech sector. DEFA Latvia Website	This company is not a digital marketing agency	The link from GPT 4o does not work