

Chatgpt'S Human Impact on The Marketing Industry

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Abstract. Similar to earlier waves of technical progress, generative artificial intelligence, like ChatGPT, has the potential to disrupt the labor market. This study uses the Task Decomposition Replacement Probability Model to estimate the replacement rate by AI in a sample marketing company and then extrapolates the results to China's marketing industry to forecast the influence of AI on the labor market of the country's marketing sector. This study concludes that, once AI is completely implemented, more than half of employment are replaceable.

Keywords: Labor Market; Artificial Intelligence; Marketing Industry.

1. Introduction

Artificial intelligence (AI) is entering our lives at an unprecedented speed, especially with the emergence of ChatGPT, a globally popular generative AI. The rapid iteration of these series of AI has increased the popularity and application of AI at a geometric rate, and integrated with the current era of society, commerce, enterprises, and even individuals, reconstructing new social scenarios and business forms [1].

ChatGPT, a large language model created by OpenAI and based on machine learning, is a natural language processing model. It can replicate human language interpretation and generation, has sophisticated language processing skills, and can respond to human requirements in real-time, deliver quicker and more accurate services, and significantly improve the efficiency of production, service quality, and experience. ChatGPT's tremendous capabilities will undoubtedly have a dramatic influence on present and future work methods and processes and will disrupt some of our existing positions, sectors, work, and lifestyle.

Researchers have found that with the increasing popularity of the Large Language Models (LLMs), at least 80% of the American workforce will be affected, and 10% of their jobs will be replaced by LLMs [2]. Among them, 19% of the American workforce have over 50% of jobs being replaced.

However, the above research is focused on employment in the entire society. In the marketing and communication industry, which is a labor-intensive industry, what impact will the large-scale application of ChatGPT have on human resources?

This paper will explore how this industry will be affected by this new technology and how we could respond to this change. On an industry level, understanding the potential impact of artificial intelligence on labor will enable marketing companies to plan ahead and make informed decisions about their employment.

A summary of the Chinese marketing sector is given in Part 2 of this paper. A review of the literature is presented in Part 3 on how AI, particularly generative AI, may affect the labor market and the marketing industry. The methodology and data that can be used to determine the AI replacement rate in a marketing firm are presented in Parts Four and Five. Part Six and Seven discuss the findings and results and thereby extrapolate them into the whole marketing industry. Final part concludes.

2. China's Marketing Industry

Marketing services refer to a series of promotional methods and activities for enterprises to establish a brand image, enhance brand awareness, and attract new customers. They can be divided into traditional marketing and digital marketing based on their types of communication media.

Computers, mobile devices, newspapers and magazines, and television are considered the four major mainstream marketing media in China. From 2017 to 2021, the scale of China's marketing

service market grew rapidly, from 675.4 billion yuan to 1237.5 billion yuan, with a compound annual growth rate of 16%. In 2022, the scale of the marketing service market in China reached 1326.71 billion yuan, a year-on-year increase of 1.8%. In the future, with the sustained and stable development of China's economy, the overall marketing service market in China will still maintain a good growth trend. According to the report by the Chinese market research company Gonyin in 2023, it is expected that the scale of China's marketing service market will reach 1683.24 billion yuan by 2025 [3].

Marketing services can be segmented based on the types of media they propagate, including traditional marketing such as newspapers, magazines, television, radio, and outdoor advertising, as well as digital marketing that promotes products or services through digital channels such as social media, mobile applications, and websites. In 2021, digital marketing accounted for 56.9% and traditional marketing accounted for 43.1%.

In China's marketing service market, the advertising industry has the highest proportion, with its market share increasing from 75.7% in 2018 to 78.4% in 2022, indicating an increase in proportion; The market share of public relations decreased overall from 2018 to 2022, with a market share of 5.7% in 2022.

This paper will explore the potential impact of generative AI on this large and, currently, growing market.

3. Literature Review

3.1. Labor market disruptions brought by AI

The U.S.-EU Trade and Technology Council performed research in 2021 to evaluate the effect of AI on future workforces. In terms of how AI will affect the labor market more generally, it has the potential to increase productivity, generate new employment opportunities, and raise living standards. However, because AI is capable of carrying out "non-routine" tasks that were previously thought to be the exclusive domain of humans, it is anticipated that it would disrupt a wide range of jobs and responsibilities. Workers may have difficult transitions if their jobs change or the skills they need change.

People belonging to various demographic groups who are exposed to new technology are affected in various ways. Wailin Wong, host of The Indicator from Planet Money, claimed in an interview with National Public Radio that new technologies usually favor highly rewarded, college-educated professionals while displacing others [4]. For instance, computers, according to a generation of economic research, have had a significant role in the rise of inequality.

AI, though, might produce unexpected outcomes. It has been extensively argued that AI might benefit middle-skill employees in unanticipated ways, which is a substantial departure from prior research on the effect of technology on employees over the course of the last four decades. AI might aid in reestablishing the middle class. An empirical study by Brynjolfsson, Li, and Raymond examined the customer service division of a major software firm and discovered that ChatGPT significantly increased employee productivity. What's more intriguing is that the majority of those increases came from lower skilled workers, whilst the higher skilled ones only exhibited minor improvement. In other words, AI helped close the productivity gap between workers with lower skill levels and those with higher skill levels. Additionally, Wailin Wong said that AI is learning from training examples created by humans, such as what makes an effective interaction. The most competent and knowledgeable people are already doing this, but the most recent hires will gain the most from access to AI.

A study by the investment bank Goldman Sachs estimates that by 2023, over two-thirds of U.S. employment would have seen some level of automation thanks to AI. They also predict that among the exposed occupations, anything between 25% and 50% of their workload might be replaced. However, not all of the mechanized work will result in job losses. The majority of jobs and industries are only partially susceptible to automation, so even though AI will undoubtedly have a substantial impact on the labor market, it is more likely to supplement employment than to replace it. The impact

of AI will differ depending on the industry. For example, just 6% and 4% of work in the construction and maintenance industries might be automated, compared to 46% and 44% in the administrative and legal professions [5].

Eloundou, Manning, Mishkin, and Rock evaluate professions based on their alignment with LLM capabilities, incorporating both human knowledge and GPT-4 classifications, in response to the ChatGPT with LLM capabilities in particular. According to our research, the introduction of LLMs may have an influence on at least 10% of the work tasks performed by 80% of U.S. workers, and at least 50% of the duties performed by about 19% of workers [6].

3.2. Impact of AI in marketing and communication

Mike Maynard, the CEO of a marketing firm, claims that while AI may be able to automate some operations and increase productivity, it is unlikely to totally replace marketing personnel in the near future. AI will undoubtedly replace certain components of traditional marketing, but by and large, it will probably be the repetitive, monotonous duties, like analytics. AI won't replace creativity or decision-making, though [7].

The marketing sector can effectively use AI in the following ways in particular: To assist organizations in achieving their objectives, marketing utilizing artificial intelligence efficiently automates data collecting and behavioral targeting. Using preprogrammed algorithms, computers gather and process data using AI. Consumer behavior, including how they browse material, reply to affiliate marketing offers, and engage with content and social media posts, is used to gather information. Taking it a step further, AI automatically contacts clients or prospects who display a particular behavior. The utilization of technological tools, platforms, and analytics allows for this type of behavior targeting.

4. Methodology

This paper first draws inspiration from the ideas of the working paper written by Eloundou, Manning, Mishkin and Rock. The study employs a novel rubric which evaluated different occupations based on their alignment with LLM capabilities, incorporating both human expertise and GPT-4 classifications. The authors use the O*NET database, also known as Occupational Information Network [1], which is a free online database based on standardized professions in the United States. This database has complete occupational descriptions across the USA labor force. The authors of this working paper analyze the replacement rate of different types of workers.

The 2023 "AIGC" Development Research Report by Tsinghua University serves as another source of inspiration for this paper's calculations of the replacement rates of various worker categories. The reports introduced a model called Task Decomposition Replacement Probability Model, in which a job position could be separated into many different parts, each with a different probability of being displaced by AI [8]. For example, the job of a secretary can be decomposed into four parts, each with different probabilities of being displaced.

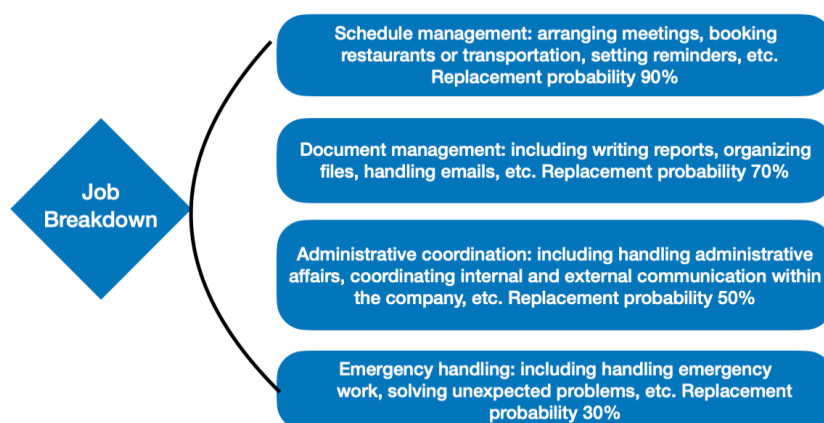


Figure 1 Job breakdown of a secretary

If these four parts are assumed to be 25% each, then $(90\% * 25\% + 70\% * 25\% + 50\% * 25\% + 30\% * 25\%) = 60\%$. Based on this theoretical assumption, 60% of the secretarial work can be replaced by AI.

This paper will take one marketing company as an example, collecting the job types each with different tasks and then calculate the replacement rate of different types of workers with the Task Decomposition Replacement Probability Model. Finally, the results of replacement rate can be extrapolated to the market overall.

5. Data

Company X as an example based on Bule Media Group, has 1007 employees in the marketing industry. Their business will be majorly focused on the marketing services for automobile brands. The table below includes all position titles and job descriptions in this company.

According to the 2015-2022 China's National Recruitment Dataset from the MetroDataTech, the specific work tasks for each profession can be determined under the Chinese industry standards.

Table 1 Positions and job descriptions in Company X

Category	Position Setting	Task	Current Number
Planning Business	Strategic personel	To provide customers with stage brand strategy, product strategy	50
	Planner	Develop and complete stage planning scheme (including market analysis)	100
	Senior Copywriter	Leader speech manuscript writing, industry analysis articles	20
	Common Copy	General press releases, newsletters, Q&A, social content	200
	Account Operation	Customer official account operator in social business	50
Design	Creative Director	Provide creative points for important events, TVC and large-scale activities	10
	Art Director	Design planning and guidance of visual works (graphic + video)	30
	Designer	Creates visual work	70

	Creative Copy	Advertising, social media copywriting content (e.g., text on the poster, content simplification)	20
	Creative Planning	Visual business planning program, such as television advertisement	10
Media	Media Director	Planning of media delivery strategy, management of high-level media relations, team management, and execution of crisis events	40
	Media Manager	Execute daily media placement and maintain media relations	80
	Media Specialist	Execute daily media release work, media related reception services in offline activities	150
Sales	Account Director	Project manager	10
	Customer Representative	Specific implementation of activity items	80
Supervising	Manager	Monitor the content released by customers, monitor competing products of customers, output monitoring report and analysis	2
	Commissioner	Responsible for daily monitoring work according to customers and contact with monitoring suppliers. Provide monitoring daily	5
Purchasing	Purchasing Director	Formulate the company's phased procurement strategy, cost budget, establish and sort out the company's procurement database, and analyze the phased work	1
	Purchasing Manager	Execute purchasing tasks according to different business types. Maintain procurement database	4
	Purchasing Specialist	Supplier sourcing, optimize the company's supplier base, implement customer procurement work. Maintain procurement database	8
Operation	Director	Develop business operation workflow, establish internal database of business operation, and provide business analysis	2
	Manager	Cooperate with the company's daily implementation and approval of various projects, including project initiation income, cost budget, completion acceptance, cost settlement, etc Customer accounts receivable statistics (contact with business department, follow up collection rhythm)	4
	Commissioner	Cooperate with manager in daily work, such as document check and approval process support	7
Finance	Chief Financial Officer	Formulate the company's financial system, financial system and process establishment, formulate the company's financial budget and final accounts. Financial analysis.	1
	Accounting	Finance accounts, bank account management	4
	Financial Plan	Develop a capital plan, financial analysis.	3

		Business department performance statistics, to provide management advice to business leaders.	
	Cashier	Bank payment	3
Expense	Manager	Overall control of the approval and circulation of all payment documents	1
	Commissioner	Review all payment documents	6
Legal Affairs	Director	Establish a company legal process and deal with litigation. Staff legal training, business related legal early warning	1
	Lawyer	Advise and respond to litigation events	1
	Commissioner	Contract approval, feedback and communication. Management of company seals.	4
	Commissioner	Keep and manage all contract files	1
Human Resource	Director	Set up company rules and regulations and make phased manpower planning and budget. Deal with labor disputes	1
	Recruitment Post	Labor contract signing and management, daily staff training. Attendance management	5
	Labor Relation Post	Organize attendance record and monthly payroll	2
	Salary Post	Responsible for the planning and management of the company's main computer room, the planning of the main database, and the construction of OA system	2
IT	Director	Desktop management of all employees (e.g. software download of office computers, printing equipment management, etc.)	1
	IT Engineer - Hardware	Master database maintenance, OA system administrator (such as configuring accounts for employees, etc.)	3
	IT Engineer - Software	Develop internal application software to provide business efficiency	1
	Technology R & D	Develop internal application software to provide business efficiency	8
Administrative	Office Administrator	Daily administrative operation, reception staff	6

The table above includes a basic description of the work content of each position. Since there is currently no database like O*NET in China, and due to certain differences in the definition of professions between China and the United States, it is difficult to form an accurate mapping relationship between the professions in the O*NET database and the standard professions in China. Therefore, in order to facilitate the analysis of the impact on the marketing and communication industry in China, I adopted an indirect matching method, using real recruitment data from the Chinese market. I used 2015-2022 China's National Recruitment Dataset from MetroDataTech to link each job description to the tasks it is expected to perform [2] For example, a typical job description for a human resources department Recruitment Post (in the table above) may include the following tasks [3]:

1. Recruit new employees and handling of employee onboarding procedures
2. Arrange and conduct employee onboarding training.

3. Maintain and expand the company's recruitment channels, assist in social recruitment and other recruitment activities.

Each of the above tasks of the human resources recruitment position can be further expanded to include richer job descriptions. For example, "arrange and conduct new employee onboarding training" includes the following specific work content:

1. Write and prepare training materials.
2. Communicate and schedule training plans.
3. Improving employee skills with specific training.

Once the job structure of the "human resources recruitment specialist" profession is broken down into several or even dozens of tasks and job contents, it is necessary to separately determine how likely the content of each (e.g., "arrange and conduct new employee onboarding training") will be impacted by AI, in order to generate specific, quantifiable, and meaningful estimates of the impact of AI on this particular industry.

The article from MetroDataTech lists a total of 1639 professions, 19265 functions, and 23534 job descriptions from which I selected those relevant to the marketing industry as listed above. These specific job descriptions and work tasks, for each profession, were then fed into AI to generate an estimate of the likelihood that they will be replaced by AI.

6. Results

It was possible to forecast the replacement rate for job positions using the theory and methodology of the Tsinghua University research and the data I collected.

Table 2 Replacement rate by AI in Company X

Category	Position Setting	Current Number	Number After Replacement	Replacement Rate
Planning Business	Strategic personel	50	50	0
	Planner	100	100	0
	Senior Copywriter	20	4	75%
	Common Copy	200	40	75%
	Account Operation	50	11	75%
Design	Creative Director	10	10	0
	Art Director	30	4	85%
	Designer	70	10	85%
	Creative Copy	20	5	75%
	Creative Planning	10	10	0
Media	Media Director	40	40	0
	Media Manager	80	14	82%
	Media Specialist	150	27	82%
Sales	Account Director	10	10	0
	Customer Representative	80	80	0
Supervising	Manager	2	0	100%
	Commissioner	5	0	100%

Purchasing	Purchasing Director	1	1	0
	Purchasing Manager	4	4	0
	Purchasing Specialist	8	1	89%
Operation	Director	2	2	0
	Manager	4	4	0
	Commissioner	7	7	0
Finance	Chief Financial Officer	1	1	0
	Accounting	4	4	0
	Financial Plan	3	3	0
	Cashier	3	3	0
Expense	Manager	1	1	0
	Commissioner	6	1	82%
Legal Affairs	Director	1	1	0
	Lawyer	1	1	0
	Commissioner	4	1	81%
	Commissioner	1	0	100%
Human Resource	Director	1	1	0
	Recruitment Post	5	5	0
	Labor Relation Post	2	2	0
	Salary Post	2	2	0
IT	Director	1	1	0
	IT Engineer - Hardware	3	3	0
	IT Engineer - Software	1	1	0
	Technology R & D	8	8	0
Administrative	Office Administrator	6	2	78%

As shown in the table above, we can analyze that after large-scale utilization of AI, X Marketing Communication Company, 550 employees could be eliminated, leaving only 463 employees. This data indicates that about 53% of employees in the marketing industry are replaceable. There are about 69 million employees in the marketing industry in China, and according to the data, there are about 34 million employees who would be replaced.

7. Discussion

As the research “GPTs are GPTs: An Early Look at the Labor Market Impact Potential of Large Language Models” (Eloundou, Manning, Mishkin and Rock, 2023) has stated, attempting to describe work tasks and represent each profession by using simple labels may have inherent biases and may overlook some unique skills or tasks. Moreover, it is very important that the GPT model still has many flaws, including fabricating false information.

From the current development trend, although the emergence of ChatGPT may pose a threat to certain professions, from a macro perspective, the employment opportunities created by technology are far greater than those replaced by technology. As the current development of AI is more likely to increase working efficiency, it is unlikely to replace any job positions now. However, in the future advancement of AI, many jobs in the marketing industry are likely to be replaced. Nevertheless, every innovation in history faces fierce collisions. It can destroy old things and also give birth to new forces. Facing innovation, we should have an open mindset and think about how to make it serve humanity.

8. Conclusion

From the current development trend, although the emergence of ChatGPT may pose a threat to certain professions, from a macro perspective, the employment opportunities created by technology are far greater than those replaced by technology. As the current development of AI is more likely to increase working efficiency, it is unlikely to replace any job positions now. However, in the future advancement of AI, many jobs in the marketing industry are likely to be replaced, especially the more basic work positions. Especially when this industry is more creative compared with many different other industries; each client's requirement would be different. Therefore, compared with other industries, marketing is less replaceable, however, the basic work task still has a high replacement rate. Nevertheless, every innovation in history faces fierce collisions. It can destroy old things and also give birth to new forces. Facing innovation, we should have an open mindset and think about how to make it serve humanity.

As part of improving this research, further studies may need to collect more data in order to reach a more specific conclusion. With more time, I could gather more information from more companies to be more accurate because the paper currently bases its findings on just one company and extrapolates them to the entire industry. Even if the organizational structures of the companies in the marketing sector are similar, each business has a preference for particular jobs. The research would also be more thorough if there were data on more companies.

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