The Impact of Social Capital on Career Adaptability in the Era of Artificial Intelligence: The Mediating Role of Career Choice

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Abstract. The rapid development of artificial intelligence (AI), mobile internet, and machine learning has significantly accelerated the emergence of machine substitution. The advent of CHATGPT has sparked renewed scrutiny of AI, with concerns arising about the potential displacement of human labor by machines. This has led to extensive research on the impact of AI on employees in the new era and the need for adaptation in an AI-infused work environment. To address this issue, this study aims to construct a novel career adaptability prediction model based on a survey conducted among 570 graduates. The objective is to empower employees in the new era by enhancing their career adaptability and enabling them to effectively navigate long-term technological changes in their respective occupational domains.

Keywords: Era of Artificial Intelligence, Career Adaptability, Social Capital, Career Choice, Exhibition Graduates.

1. Introduction

The concept of artificial intelligence (AI) was proposed in the 1950s, aiming to achieve intelligent behavior through computer programming (Turing, 1980). The advancement of computer and internet technologies has significantly propelled the progress of AI. With the advent of the Fourth Industrial Revolution, represented by AI, the intelligence level of machines has been further enhanced through the analysis of massive amounts of big data (Jeon & Suh, 2017). AI has played a significant role in various fields such as healthcare, agriculture, transportation, energy efficiency, and environmental control (Cioffi, Travaglioni, Piscitelli, Petrillo, & De Felice, 2020). Some industrialized countries are extensively applying AI to replace traditional labor, leading to concerns about job displacement caused by machines. The focus of discussions has shifted from the substitution of human labor by machines to the replacement of work by AI (Chen et al., 2021).

According to the "Robotics Humanities Timeline" jointly launched by Oxford University and Yale University, machines will be able to write programs by 2024, collaborate on high school-level essays by 2026, compose 40 famous songs by 2027, direct movies by 2028, win mathematics competitions by 2050, and conduct mathematical research surpassing human capabilities by 2059 (China-Europe Training Camp, 2023). CHATGPT has already achieved the first two functionalities. A report by MCKINSEY Global Institute (2017) predicts that AI will change the lives of everyone in the next decade, resulting in the replacement of 800 million jobs by 2030. In high-GDP countries such as the United States and the United Kingdom, approximately 25% of jobs will be replaced by AI. This will lead humans into a human-machine binary society, where people will interact with machines, making effective human-machine collaboration a persistent topic.

A study by Sun et al. (2023) found that ChatGPT-3 has 100 major categories and 626 applications, extensively used in IT, media, advertising, film, administration, and education. ChatGPT technology will have a short-term impact on certain industries and fields, replacing low-skilled or repetitive labor, and even some knowledge workers, resulting in unemployment or reduced job opportunities for some professionals. In light of the pressure brought about by AI, researching the career adaptability of university graduates and its influencing factors holds significant practical significance.

Currently, a large number of scholars have analyzed the help of AI from the perspectives of education reform, industrial upgrading, urban management, and health care (Mesk ó & G ör ög, 2020; Obschonka & Audretsch, 2020; Perifanis & Kitsios, 2023), however, there are few studies on the changes of individual's career adaptability, the influencing factors and promotion strategies in the era of artificial intelligence. This study attempts to establish a prediction model by investigating the basic conditions of social capital, career choice and career adaptability of Chinese higher education graduates in the age of artificial intelligence, to find out the influencing factors of the vocational adaptability of college graduates in the era of artificial intelligence. It is hoped that through this research, we can find a way to improve the vocational adaptability of college graduates in the era of man-machine coexistence, and feedback to the relevant departments of education, which can help colleges and universities improve the quality of personnel training, can help employees to improve the effectiveness of the work.

2. Literature Review

In the era of artificial intelligence, technologies such as machine learning, deep learning, natural language processing, and computer vision are widely applied (Aggarwal, Mijwil, et al., 2022). In this era, the development of artificial intelligence, the Internet of Things, and big data technologies have revolutionized professions and daily life. Industry 4.0 has enabled more flexible and agile integration of digital and physical technologies (Ju & Park, 2022), leading to comprehensive digital transformation in society. These advancements have profound implications for organizations and employees. Futurists predict that over half of the current jobs will be replaced by intelligent technology, AI, and robots. The impact of the Covid-19 pandemic has further accelerated the development of these technologies (Al-

Hyari & Sciences, 2023). It is essential for employees to consider how they perceive technological advancements and changes in the workplace, and how they can effectively respond to the accompanying challenges. A positive career adaptability is indispensable in this regard.

2.1. Career Adaptability

The concept of Career Adaptability was proposed by Super & Knasel (1981) in the 1980s based on the theory of vocational maturity. It refers to an individual's psychological resource that enables them to adapt smoothly to changes in their occupational roles and work environment. In the era of artificial intelligence, career adaptability can be seen as an essential skill in the workplace. It helps individuals to see possibilities in unexpected changes, make use of these changes, and recover from unforeseen outcomes (Rudolph et al., 2017). Savickas (2005) identified four dimensions of career adaptability: concern, control, curiosity, and confidence. Career adaptability is considered as an individual's selfregulation ability to proactively cope with changes in work tasks and the work environment (Tolentino et al., 2014). Chinese scholars have revised the measurement tool for career adaptability from the perspectives of psychological adaptation, skill adaptation, interpersonal adaptation, and occupational environment adaptation (Hu Lingxia, 2023). Individuals can enhance their career adaptability by participating in training programs to develop their ability to cope with career changes (Savickas & Porfeli, 2012), while managers can help employees quickly adapt to the workplace to enhance their career adaptability (Zacher et al., 2015). Research by relevant scholars has shown that factors such as promotability, employment status, job satisfaction, reduced career anxiety and work stress, and work engagement can all influence career adaptability(Guan, Yang, Zhou, Tian, & Eves, 2016; Tolentino et al., 2014; Zacher, 2014). At the same time, career adaptability affects an individual's career success, job performance, and employee well-being (Ohme & Zacher, 2015). Although previous research has explored the antecedents of career adaptability, further investigation into the factors influencing career adaptability in the era of artificial intelligence will be an important step in helping students enhance their career competitiveness.

2.2. Social Capital

Social Capital is a collection of actual or potential resources based on enduring networks of relationships. It refers to the resources that individuals perceive as accessible and usable within their social networks (Bourdieu, 1980). With the advent of the knowledge economy, social capital has become an important resource for personal development. In certain aspects, it can facilitate both individual and collective social behaviors and contribute to the achievement of people's goals (Coleman, 1988).

In the digital age, the internet has transformed the way we communicate, work, socialize, access information, create information, and rapidly share information with the world. It plays a significant role in the accumulation of social capital for students (Prayitno & Khoirunurrofik, 2020). Social capital also plays a crucial role in the job search process for university students. It not only helps them access more employment information and opportunities but also enhances trust between individuals and organizations, thus increasing occupational effectiveness to some extent (Ab Aziz, Zulkifle, & Sarhan, 2022). Previous research has demonstrated that social capital can predict career adaptability (Sou, Yuen, & Chen, 2022; Xu, Hou, Zhang, Cui, & Hu, 2023). Based on this, the following hypothesis is proposed:

H1: Social capital significantly impacts on career adaptability.

2.3. Career Choice

Career choice is a significant decision made by students based on the analysis of their professional strengths and personal interests, influenced by various factors such as job cognition, family support, friend support, work ability, business opportunities, employment security and other factors (Siddiky & Akter, 2021). In the digital tide, all occupations are facing digital transformation. The career choices of young people have become more flexible, personalized, and diversified, representing a crucial decision for every job seeker. In the context of teacher career choice, Watt and Richardson (2007) integrated the

research findings of expectancy-value theory, combining career expectations with vocational values, practical values, and achievement values. They found that social experiences, career motives, and career perceptions influence career choices. When individuals choose a career that aligns with their interests, passion, skills, abilities, values, and goals, they are more inclined to invest additional time and effort in learning and self-improvement. This alignment enhances personal professional adaptation and leads to better performance in their chosen careers (Sharif, Ahmad, & Sarwar, 2019; Siddiky & Akter, 2021). Therefore, the following hypotheses are proposed:

H2: Social capital significantly impacts on career choice.

H3: Career choice significantly impacts on career adaptability.

In summary, artificial intelligence, digital transformation, virtual reality, and the Internet of Things are key features of the 21st century. Professionals need to adapt to significant changes in the technological and social environment. Adapting to the digitization, intelligence, and remote transformation of work patterns and content will become a persistent reality. Previous studies have examined the associations between social capital, career choice, and career adaptability, demonstrating the significant impact of social capital and career choice on career adaptability (Oh, Jeong, Yoon, & Cho, 2023; J. Zhang, Yuen, & Chen, 2021). The differences in individual social capital among students can influence their career choices (Watt & Richardson, 2007). In the era of artificial intelligence, college students face a more complex job market. Social capital, through the mediation of career choice, can enhance career adaptability and better assist today's college students in improving their employ ability (H. Zhang & Zheng, 2022), providing a reliable pathway for talent development in the new era. Based on this, the following hypothesis is proposed:

H4: Career choice mediates the relationship between social capital and career adaptability.

2.4. Research Framework



Fig.1: research framework

3. Research Method

3.1. Research Object and Sampling

The target population of this study is the graduates of the exhibition major in universities in Chongqing, China, over the past five years. The research findings can provide a reference for similar majors. According to data released by the Chongqing Exhibition Industry Association's official website, there are a total of eight institutions in Chongqing that offer exhibition majors, including four universities and four vocational colleges. According to the sampling method proposed by Yamane (1967), the sample size was calculated to be about 370. The study distributed 655 questionnaires to exhibition major graduates in universities within Chongqing. After excluding questionnaires with regular or incomplete responses, 570 valid questionnaires were retained, resulting in an effective response rate of 87.02%, which met the desired sample requirement.

3.2. Research Instrument

This study utilizes a questionnaire to specifically investigate the social capital, career choice, and career adaptability of exhibition graduates in Chongqing. The survey consists of four parts.

The first part focuses on collecting demographic information, including gender, place of origin, current highest educational qualification, type of employment, and years since graduation. The second part adopts Hu Lingxia's (2023) revised questionnaire on vocational adaptability of high-skilled talents. It consists of 22 items divided into four dimensions: career psychological adaptability, career skill adaptability, career interpersonal adaptability, and career environmental adaptability. The third part of the questionnaire is based on the "Social Capital Questionnaire for College Students" revised by Guo Wenchen, Fu Jia, and Duan Yannan (2014). It was adjusted to fit the specific circumstances of exhibition graduates. This section includes 14 items divided into four dimensions: relationship perception, social support, support from relatives, and support from friends. The fourth part utilizes the "Healthcare Career Choice Scale" (HCC) developed by Liaw et al. (2017), which was modified to suit the language and context of exhibition graduates. It includes 14 items divided into three dimensions: personal interest, job perception, and job prospects.

All the scales measuring social capital, career choice, and career adaptability employ a 5-point Likert scale, where higher scores indicate better conditions.

3.3. Statistical Technique

To analyze the research data, this study employs SPSS 27.0 and AMOS 26.0 software for testing reliability and validity, assessing model fit, and conducting path analysis. These analyses aim to explore the influence of social capital on career choice and career adaptability among college students, as well as to examine the mediating role of career choice. The purpose is to validate the research hypotheses proposed in this study.

3.4. Reliability Test

In order to assess the stability and accuracy of the measurement tools used in this study, a reliability analysis, specifically a test of internal consistency, was conducted. The results are presented in Table 1. The Cronbach's Alpha coefficient for the social capital questionnaire was 0.884, for the career choice questionnaire it was 0.901, and for the career adaptability questionnaire, it was 0.961. All of these values exceed the recommended threshold of 0.70. Therefore, the measurement tools utilized in this study exhibit high reliability.

Factor	Cronbach's Alpha	Items No.
Social capital	0.884	14
career choices	0.901	14
career adaptability	0.961	22

4. Results

4.1. Demographic information

The demographic background information of the participants in this study is presented in Table 2. Over two-thirds of the sample consisted of female participants (82.8%), while one-third were male (17.2%). This gender distribution is consistent with the student composition and source of students in the exhibition major. In the field of exhibition, which is considered a new type of modern service industry, there are typically more female students than male students (Chen Tang, 2019). Approximately 70% of the students in the sample were from rural areas, while 30% were from urban areas. This distribution is influenced by the urban classification in Chongqing's development. Among the participants, 26% were engaged in exhibition-related work, while the rest were involved in non-exhibition work. This percentage is lower than the findings reported by Chen Xiangqin and Jin Shunyuan (2018). It can be attributed to the continuous development of the economic and social aspects, which has led to an increase in the required professional skills for the exhibition major. As a result, graduates in this field

are better equipped to meet the demands of the modern service industry. Considering both market demand and personal aspirations, exhibition graduates are able to achieve better development through cross-disciplinary employment opportunities.

Category	Option	Numbers (%)
Sex	male	98 (17.2%)
	female	472 (82.8%)
Places of origin	Town	170 (29.8%)
	Rural	400 (70.2%)
The highest degree at present	Higher Vocational	460 (80.7%)
	Undergraduate	105 (18.4%)
	Graduate student	5 (0.9%)
Type of work	Exhibition related work	148 (26%)
	Non-exhibition work	422 (74%)
Years of graduation	0-1 year	266 (46.7%)
	1-2 years	97 (17%)
	2-3 years	87 (15.3%)
	More than 3 years	120 (21.1%)

Table 2: Demographic information of participants (N=570)

4.2. Descriptive Analysis

The comprehensive scores of social capital (3.083 ± 0.601) , career choice (3.430 ± 0.573) , and career adaptability (3.720 ± 0.551) among the graduates of the exhibition major in Chongqing, China, reached a slightly above-average level. The results are presented in Table 3.

Table 3:	Descriptive	analysis	(N=570))

Constructs	Average	Standard deviation
Social Capital	3.083	0.601
Career Choice	3.430	0.573
Career Adaptability	3.720	0.551

4.3. Validation Factor Analysis

The results of the analysis, as shown in Table 4, indicate that the standardized factor loadings of the structural model are greater than 0.5, which effectively explains the latent variables according to Carmines and Zeller (1979). The composite reliability (CR) values are 0.700, 0.718, and 0.884, while the Average Variance Extracted (AVE) values are 0.438, 0.405, and 0.656, respectively. Although the AVE is less than 0.5, it can still be considered acceptable according to Fornell and Larcker (1981). They suggested that if the AVE is below 0.5 but the composite reliability exceeds 0.6, the construct's convergent validity is still considered adequate.

Table 4: Validation analysis									
Construct s	Indicators	Unstd	std.	S.E.	t- value	Р	squared multiple correlations	Composit e Reliabilit y	Average Variance Extracted
	CC_JP	2.006	0.698	0.123	16.31 5	** *	0.487	0.700	0.438
Career Choice	CC_WC	1.459	0.653	0.096	15.14 0	** *	0.426		
Choice	CC_PI	0.569	0.633	0.039	14.59 7	** *	0.401		
Social	SC_RP	0.590	0.726	0.036	16.19 9	** *	0.527	0.718	0.405
	SC_SS	0.548	0.716	0.032	17.13	** *	0.513		
Capital	SC_FS	0.602	0.685	0.040	14.98	** *	0.469		
	SC_RS	0.255	0.333	0.034	7.418	** *	0.111		
	CA_PP	0.623	0.893	0.024	25.94 8	** *	0.797	0.884	0.656
Career	CA_PS	2.511	0.787	0.117	21.45 4	** *	0.619		
Adaptabil ity	CA_IR	1.492	0.778	0.071	21.08 0	** *	0.605		
	CA_PE	0.563	0.776	0.027	21.12 5	** *	0.602		

***p<0.001

Discriminant validity refers to the degree to which a construct is distinct from other constructs based on empirical standards (Hair et al., 2017). In this study, the authors employed the Fornell-Larcker criteria to assess discriminant validity, as shown in Table 5. The Fornell-Larcker criterion compares the square root of the Average Variance Extracted (AVE) values with the correlations between latent variables. According to this criterion, the square root of each construct's AVE should be greater than the correlation it has with any other construct. This implies that a construct should share more variance with its own indicators than with the indicators of any other construct in the model (Hair et al., 2017).

The results presented in Table 5 demonstrate the discriminant validity, as the square root of the AVE for each latent variable (diagonal values) is mostly higher than the correlation values with other latent variables.

Table 5 Discriminant validity							
AVE 1 2 3							
Career Adaptability	0.656	0.810					
Social Capital	0.405	0.655	0.636				
Career Choice	0.438	0.717	0.562	0.662			

Note: the diagonal value is the square root of Ave.

The results of the goodness-of-fit test for the structural model are shown in Table 6. The chi-square to degrees of freedom ratio (X^2 /df) is 4.439, which is less than 5. The Goodness-of-Fit Index (GFI) is 0.946, Adjusted Goodness-of-Fit Index (AGFI) is 0.909, Comparative Fit Index (CFI) is 0.953, Normed Fit Index (NFI) is 0.941, and Tucker-Lewis Index (TLI) is 0.934. All these values are greater than 0.9. The Root Mean Square Error of Approximation (RMSEA) is 0.078, which is less than 0.08.

Overall, these results indicate that the model in this study has a good fit, as indicated by the goodness-of-fit indices.

Table 6: model fit index							
Indicators	X²/df	GFI	AGFI	CFI	NFI	TLI	RMSEA
Index value	4.439	0.946	0.909	0.953	0.941	0.934	0.078
Reference value	< 5	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	< 0.08

4.4. Correlation Analysis

The relationships between variables were examined using Pearson correlation analysis, and the results are presented in Table 7. All variables show positive correlations. Graduates with higher levels of career choice also exhibit better social capital (r = 0.402; p < 0.01) and career adaptability (r = 0.564; p < 0.01). Similarly, students with better social capital also demonstrate better career adaptability (r = 0.485; p < 0.01). The coefficients between variables indicate that the correlation between career choice and career adaptability is stronger than that between career choice and social capital.

Table 7: Pearson correlation analysis							
construct	Μ	SD	1	2	3		
Career Choices	3.44	0.60	-				
Social capital	3.09	0.58	.402**	-			
Career Adaptability	3.69	0.59	.564**	.485**	-		
N=570, **P<0.01.							

The results of hypothesis testing for the structural relationships using SEM are presented in Table 8. The path coefficient for H1 is 0.38 (CR = 6.622, p < 0.001), indicating a significant positive relationship between social capital and career adaptability. The path coefficient for H2 is 0.57 (CR = 8.649, p < 0.001), indicating a significant positive relationship between social capital and career choice. This suggests that better social capital leads to better career choices. The path coefficient for H3 is 0.49 (CR = 8.148, p < 0.001), indicating a significant positive relationship between career choice and career adaptability. All three hypotheses (H1, H2, and H3) are accepted.

Hypotheses	Path	Path coefficient	S.E.	C.R.
H1	Social Capital→Career Adaptability	0.38***	0.067	6.622
H2	Social Capital→Career Choice	0.57***	0.056	8.649
Н3	Career Choice→Career Adaptability	0.49***	0.083	8.148

Table 8: Structural model path coefficients (N=570)

Note: S.E., standard error; C.R., critical ratio.***p < 0.001.

4.5. Testing the Mediating Role of Career Choice

The results of the mediation analysis are presented in Table 9. The total effect Z-value is 11.353, the indirect effect Z-value is 4.739, and the direct effect Z-value is 5.633. All of these values are greater than 1.96, indicating that career choice partially mediates the relationship between social capital and career adaptability. Therefore, hypothesis H4 is supported. The mediation effect accounts for 42.36% of the total effect based on the percentage of the indirect effect to the total effect.

Table 9: Mediation effect analysis							
		Due la staf		Bootstrapping			
Variable	Point estimate	Coeffi	Coefficients		Bias-corrected 95%CI		entile %CI
	SE		Z	Lowe r	Upper	Lowe r	Upper
Total Effects							
Social Capital \rightarrow Career Adaptability	0.772	0.068	11.353	0.646	0.908	0.646	0.908
1		Indirect Eff	ects				
Social Capital →Career Adaptability	0.327	0.069	4.739	0.205	0.473	0.204	0.472
Direct Effects							
Social Capital →Career Adaptability	0.445	0.079	5.633	0.282	0.605	0.279	0.604

5. Conclusion

In the era of artificial intelligence, the digital transformation of businesses is a new trend in development. People are accustomed to using technologies such as cloud computing, big data, Internet of Things, block-chain, AI, BI, and digital twins to solve more business problems (Jung, 2020).

Firstly, this study shows that the social capital, career choice, and career adaptability of exhibition management graduates are at a moderate to a high level, which is consistent with the findings of previous researchers (Kalaitzaki, Tsouvelas, & Koukouli, 2021; Peng, Song, & Yu, 2021). With the strengthening trend of industrial digital transformation, artificial intelligence technology brings about new types of jobs in society. Young professionals have a significant advantage in actively learning and applying technology, enabling them to adapt to new career environments more quickly (Wang Yuxiang, 2022).

Secondly, social capital and career choice significantly impact on career adaptability, which is consistent with the conclusions of related researchers (Sharif et al., 2019; Siddiky & Akter, 2021; Sou et al., 2022; Xu et al., 2023). The exhibition industry consists of conferences, exhibitions, and festive events aimed at achieving business objectives by providing platforms for advanced product showcases and cutting-edge theoretical exchanges. Professionals in this field are exposed to new ideas and technologies over the long term (Ahmad et al., 2018). They fully recognize the importance of social capital for their career development and actively accumulate personal social capital to enhance their career adaptability. Additionally, some universities offering exhibition management programs adopt differentiated and customized talent development plans, which fully stimulate students' personal interests and professional strengths. By actively applying artificial intelligence technology to career development, they support students in selecting jobs that align with their interests, hobbies, and expertise (Wu, 2021), thereby enhancing their career adaptability.

Lastly, career choice plays a mediating role between social capital and career adaptability, which complements the research findings of H. Zhang and Zheng (2022). With the development of digital technology, people in the new era have diverse needs for a better life, and young individuals prefer new careers that align with their interests and hobbies, and they are also willing to explore new career paths (Kim, 2022). Having good social capital allows students to access more job opportunities and make career choices based on their work interests, cognitive abilities, and career prospects. For employees, higher social capital provides assistance in achieving personal-job fit during the career choice process, enabling them to adapt to their work roles more quickly, enhance career adaptability, and improve work performance (Boohene, Gyimah, & Osei, 2020). These conclusions provide valuable insights for the career development of employees and career planning for students.

6. Future Recommendations and Research Limitations

In light of the future, I would like to offer the following suggestions:

Firstly, vocational colleges should strengthen the accumulation of social capital among students. In the era of artificial intelligence, it is important to encourage students to fully recognize the benefits and facilitating role of social capital in their career development (Almeida, Byrne, Smith, & Ruiz, 2021). Building their own social capital network and establishing channels to access support from relatives, friends, and society will be crucial in enhancing students' competitiveness in the job market and alleviating the pressure of post-graduation employment. Secondly, it is essential to leverage social capital in selecting suitable job opportunities. In the new era, with the continuous support of their parents, Chinese youth do not have an immediate need to enter the workforce to meet their livelihood demands (Jun & Ming-Rong, 2023). As a result, vocational college graduates can fully utilize family support to enhance their professional abilities and educational qualifications, making it easier for them to find suitable employment. Thirdly, it is advisable to choose jobs that possess higher levels of social capital to enhance career adaptability. In the era of human-machine coexistence, machines are incapable of providing emotional and personalized services (Toh & Tay, 2022). The aspects that machines cannot replace are jobs that require creativity and innovation. Personal social capital can support individuals in achieving their work goals, providing them with better job advantages, and equipping them with higher adaptability in terms of work environment, occupational psychology, occupational skills, and interpersonal relationships.

There are several limitations to this study. Firstly, the sample used in this research mainly consists of vocational college graduates majoring in exhibition management. This occupation-specific and specialized nature of the sample may result in some bias, as the phenomenon of cross-disciplinary employment is prominent in this field. Conducting a diverse sample study targeting graduates from different majors could yield different survey results.Furthermore, this study did not conduct a comparative analysis on demographic variables. In future research, it would be beneficial to perform variance analysis based on factors such as gender, place of origin, years since graduation, job type, and salary level. This would allow for a better understanding of adaptability issues among different groups, providing valuable decision-making support for vocational education reform. These limitations indicate potential areas for future research to enhance the comprehensiveness of findings in the field of career adaptability among vocational college graduates.

Finally, this paper contributes a new research perspective to explore how to improve the vocational adaptability of skilled personnel in the age of artificial intelligence under the pressure of "Machine substitution", the relationship model of social capital, occupation choice and occupation adaptability is constructed, which can help vocational colleges to train students better and help fresh graduates to enhance their occupation adaptability.

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