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The role of AI and big data in increasing the success of e-commerce assistance and its implications on the quality of MSME capacity development models with disabilities

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A B S T R A C T

The aim of this research is to analyze the influence of the role of AI and big data in increasing the success of e-commerce assistance and its implications for the quality of the capacity development model for MSMEs with disabilities in Serang City, Semarang City and Banjarmasin City, Indonesia. The sample in this study was 184 respondents consisting of 3 (three) regions including Serang City, Semarang City and Banjarmasin City, Indonesia. Sampling technique using technique random sampling. Data collected through questionnaires was then analyzed using SEM-PLS. The results of research and data analysis show that: The role of AI directly has a positive and significant effect on increasing the success of e-commerce assistance; Big Data directly has a positive and significant effect on increasing the success of e-commerce assistance; The role of AI directly has a positive and significant influence on the Quality of the MSME Capacity Development Model; Government Big Data directly has a positive and significant effect on the Quality of the MSME Capacity Development Model; Increasing the Success of E-Commerce Assistance directly has a positive and significant effect on the Quality of the Capacity Development Model for MSMEs with Disabilities in Serang City, Semarang City and Banjarmasin City, Indonesia. Increasing the Success of E-Commerce Assistance is able to mediate indirectly on the Role of AI and Big Data on the Quality of the Capacity Development Model for MSMEs with Disabilities in Serang City, Semarang City and Banjarmasin City, Indonesia.

1. Introduction

In the current digital era, information and communication technology has become the main driver of business transformation in various sectors (Abbate et al., 2019). One technology that has a significant impact is Artificial Intelligence (AI) and Big Data (Yu et al., 2022; Zhan et al., 2018). These two technologies not only change the way companies operate, but also open up new opportunities to increase efficiency and innovation (Biea et al., 2023). AI, with its ability to analyze large amounts of data and make accurate predictions (Umair & Dilanchiev, 2022; Yadegaridehkordi et al., 2020), has become an invaluable tool in a variety of business applications (Krishnan & Mariappan, 2024). On the other hand, Big Data enables the collection, storage and analysis of data on a large scale (Tamym & Benyoucef, 2024; Thathsarani & Jianguo, 2022), providing deep insights into consumer behavior and preferences (Radicic & Petković, 2023; Sabri et al., 2023; Sivarajah et al., 2020). The combination of AI and Big Data can provide significant competitive advantages for companies, including in the e-commerce sector (Hendrarso et al., 2023).

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MSMEs in Indonesia have an important role in the national economy, especially in creating jobs and encouraging economic growth (Aljauza & Machdum, 2024). However, many MSMEs, especially those owned by people with disabilities (Qureshi et al., 2023), still faces various obstacles in developing its business (Matt & Rauch, 2020; Mikalef et al., 2019; Morgan et al., 2006; Moyne & Iskandar, 2017). The main challenge faced is limited access to technology, market information and adequate resources to compete in the ever-growing e-commerce market (Khwarazmita & Churiyah, 2024). E-commerce has become an important platform for MSMEs to reach a wider market (Bag et al., 2021; Baral et al., 2023; Begum et al., 2024). However, the success of MSMEs in utilizing e-commerce is very dependent on appropriate and effective mentoring support (Bawack et al., 2022). This is where the role of AI and big data becomes crucial. AI can help MSMEs optimize marketing strategies, personalize customer experiences (Ali et al., 2021; Arjang et al., 2023; Arora & Siddiqui, 2022), and data-based decision making (Nichifor et al., 2021). Meanwhile, big data provides invaluable information regarding market trends, consumer behavior and competitor analysis, all of which can be used to increase the competitiveness of MSMEs (Morgan et al., 2006). E-commerce assistance is one strategy that can help Micro, Small and Medium Enterprises (MSMEs) to adapt to changes in technology and markets (Widiastuti et al., 2024). This assistance becomes more effective with the application of AI and Big Data (Al Batayneh et al., 2021; Al-Jumaili et al., 2023; Arshad et al., 2023; NA Aziz & Long, 2023), which can help MSMEs optimize business processes, improve customer experience, and identify new market opportunities (Nainggolan et al., 2023). However, the challenges faced by MSMEs, especially those managed by people with disabilities, are still quite large (Aziz et al., 2024; Biea et al., 2023; Chen et al., 2024). They often face limitations in access to technology, resources and adequate training (Sabri et al., 2023). Therefore, this research aims to explore how AI and Big Data can increase the success of e-commerce assistance and its implications for the quality of the capacity development model for MSMEs with disabilities in Serang City, Semarang City and Banjarmasin City. By understanding the role of AI and Big Data in this context, it is hoped that effective strategies can be found to support the capacity development of MSMEs with disabilities, so that they can be more competitive and contribute significantly to the local economy (Radicic & Petković, 2023; Tamym & Benyoucef, 2024). This research will focus on Persons with Disabilities in Serang City, Semarang City and Banjarmasin City. These three cities were chosen because they have quite a large number of people with disabilities and have the potential for developing MSMEs for people with disabilities. Data will be collected through surveys, interviews and observations. Identifying the influence of the role of AI and Big Data on increasing the success of e-commerce support for people with disabilities in their MSMEs in these three locations can provide a better understanding of the role of AI and Big Data in improvingQuality of MSME Capacity Development ModelPersons with Disabilities.

This research aims to analyze the influence of the role of AI and Big Data on the quality of the MSME capacity development modelPeople with Disabilities in Serang City, Semarang City and Banjarmasin City. It is hoped that the results of this research can provide a better understanding of the importance of applying AI and big data in increasing the success of e-commerce assistance for MSMEs with disabilities. Apart from that, it is also hoped that this research can provide recommendations and an effective capacity development model to support the growth and sustainability of MSMEs for people with disabilities in these three cities.

Based on several expert opinions and gap phenomena that have been found, researchers are interested in reviewing this research with the theme The Role of AI and Big Data in Increasing the Success of E-Commerce Assistance, and the Implications for the Quality of MSME Capacity Development ModelsPeople with Disabilities in Serang City, Semarang City and Banjarmasin City.

2. Literature review

2.1 The Relationship between the Role of AI in Increasing the Success of E-Commerce Assistance

AI can analyze large and complex customer data to identify patterns and trends that are difficult for humans to spot (Sissodia et al., 2024). By using machine learning methods, AI can study customer behavior, preferences and purchasing tendencies. By analyzing this data, AI can help E-commerce companions to better understand customer behavior, predict product preferences, and provide relevant recommendations (Sun & Finnie, 2004). This increases the opportunity to increase sales conversions and improve customer satisfaction (Bawack et al., 2022). AI can be used in the automation of E-commerce companion operational tasks such as inventory management, shipping, and customer support (Singh, 2021). For example, AI chatbots can provide automated and fast support to customers by answering frequently asked questions, processing product returns, or providing promotional offers (Zhang et al., 2021). This helps save time and human resources, improve operational efficiency, and provide faster service to customers (Choshin & Ghaffari, 2017b). AI enables E-commerce companions to provide more personalized customer experiences. By analyzing customer data, AI can provide relevant product recommendations based on customer preferences and purchasing history (Singh, 2002). This allows E-commerce companions to design shopping experiences tailored to customer preferences, increase customer loyalty, and strengthen the relationship between companions and customers (Ikumoro & Jawad, 2019). AI can help support better decision making in marketing strategies. By analyzing market and customer data, AI can identify specific customer trends, patterns and preferences (Saeed et al., 2005a). E-commerce companions can use this information to adjust their marketing campaigns, optimize targeting strategies, and customize content based on customer

preferences and needs (Wang et al., 2023). Thus, they can increase the effectiveness of their marketing campaigns, increase sales conversions and gain a competitive advantage in the market (Jain et al., 2021). Overall, the role of AI in E-commerce assistance is critical to increasing success (Raji et al., 2024). With its ability to recognize patterns, predict customer behavior, improve operational efficiency, and provide personalized customer experiences, AI can help E-commerce partners achieve higher revenues, increase customer satisfaction, and achieve greater success in the world of E-commerce (Kashyap et al., 2022). In an effort to increase the success of e-commerce assistance, of course the important role that must be paid attention to is the role of AI, this is very crucial because to increase the success of e-commerce assistance, support from the role of good AI as a database in determining decisions, especially for MSMEs(Khrais, 2020). This is confirmed by research conducted by Kouhihabibi (2021); Krishnan & Mariappan (2024); Molla & Licker (2001); Nichifor et al., (2021); and Ping (2019) which states that the role of AI is able to significantly influence increasing the success of e-commerce assistance.

H_1: *The role of AI influences increasing the success of e-commerce assistance.*

2.2 The Relationship of Big Data to Increasing the Success of E-Commerce Assistance

With Big Data, E-commerce partners can collect and analyze large amounts of data about their customers' behavior (Ye & Jonilo, 2023). This data includes information about preferences, shopping habits, transaction history, and more (Zhu, 2021). By analyzing this data, E-commerce partners can better understand their customer profiles, identify purchasing trends and patterns, and provide a more personalized experience (Zerbino et al., 2018). This improves the companion's ability to identify and meet customer needs, increases customer satisfaction, and generates higher sales (Ajah & Nweke, 2019). With Big Data, E-commerce companions can collect and analyze data about the market more quickly and accurately. This data includes information about industry trends, competitor behavior, customer preferences, and so on (Tan et al., 2002). By analyzing this data, E-commerce partners can understand market trends, identify new opportunities, and optimize their business strategies. This allows E-commerce companions to stay relevant and competitive in a rapidly changing market (Akter & Wamba, 2016). Big Data can help E-commerce partners manage their inventory more efficiently (Saeed et al., 2005). By analyzing data on demand and sales, E-commerce companions can predict future inventory needs, optimize stock, and avoid inventory shortages or excesses. This reduces the risk of loss and increases operational efficiency (Ansari et al., 2019). By exploring Big Data, E-commerce partners can identify their customers' preferences and behavior in more depth. Companions can use this data to optimize their marketing strategies, target customers with relevant offers, and set prices more effectively (Rosário & Raimundo, 2021). Thus, E-commerce companions can increase the success of their marketing campaigns, increase the number of transactions, and increase their revenue (Asensio, 2017). Overall, Big Data plays an important role in increasing the success of E-commerce assistance (Pramudito, 2021). By collecting, analyzing, and interpreting big data, E-commerce partners can gather deeper insights about customers and markets, improve inventory management, and optimize their marketing strategies (Oprescu, 2019). This in turn increases customer satisfaction, increases sales, and achieves greater success in the world of E-commerce (Behl et al., 2019). In increasing the success of e-commerce assistance, of course the important role that must be paid attention to is big data, this is very crucial because to increase the success of e-commerce assistance, the role of big data is needed to increase knowledge for people with disabilities (Choshin & Ghaffari, 2017). This is confirmed by research conducted by Ferreira et al. (2017); Golicic et al., (2002); Kalla (2024); Kauffman et al., (2012); and Molla and Licker (2001) which states that Big Data is able to significantly influence the increase in the success of e-commerce assistance.

H_2: *Big Data has an influence on increasing the success of e-commerce assistance.*

2.3 The Relationship between the Role of AI and the Quality of MSME Capacity Development Models

AI enables MSMEs to carry out more sophisticated and in-depth data analysis (Sariyer et al., 2021). By using techniques such as machine learning, MSMEs can collect, analyze and interpret data more efficiently and accurately (Subagja et al., 2023). This enables MSMEs to gain deeper insight into their business, understand market trends, identify new opportunities and optimize capacity development strategies (Abaddi, 2024). By using AI, MSMEs can make smarter and more informed decisions. AI systems can analyze data quickly and generate recommendations based on identified patterns and trends (Santosa & Surgawati, 2024). This allows MSMEs to make more accurate decisions, optimize business operations, and develop more effective capacity development strategies (Abrokwah-Larbi & Awuku-Larbi, 2024). AI can be used to automate routine tasks in developing MSME capacity. This can help save time and resources, as well as eliminate human error (Ristyawan, 2020). Or, it can be used to automatically manage complex business processes, such as inventory management, pricing, or automated marketing (Triwahyono et al., 2023). By automating these tasks, MSMEs can increase their efficiency and productivity, thereby improving the quality of the capacity development model (Appiah Fening et al., 2008). AI can help MSMEs to personalize their customer experience (Yun, 2022). By using technology such as chatbots or content personalization, MSMEs can present individually relevant information or offers to customers (Ramanathan et al., 2024). This increases customer satisfaction, increases loyalty, and helps MSMEs in expanding their capacity by retaining existing customers and attracting new customers (Behl et al., 2022).

Overall, the role of AI has a significant impact on the quality of the MSME capacity development model (Mukherjee et al., 2024). By leveraging AI for analysis, decision making, task automation, and customer personalization, MSMEs can improve the efficiency, effectiveness, and quality of their capacity development models. This will contribute to the overall growth and success of MSME businesses (Bhatti et al., 2022). In improving the quality of the MSME Capacity Development Model, of course the important role that must be paid close attention to is the role of AI, this is very important considering that the two are interconnected in terms of agency accountability (Chatterjee et al., 2022). This is confirmed by research conducted by Dey et al., (2024); Dutta & Kannan Poyil (2024); Kulkarni et al., (2024); Kumar et al., (2022); and Lidiawan (2024) which states that the role of AI is able to significantly influence the quality of the MSME capacity development model.

H_3: *The role of AI influences the quality of the MSME capacity development model.*

2.4 The Relationship of Big Data to the Quality of MSME Capacity Development Models

Big Data allows MSMEs to collect and analyze large amounts of data, including customer data, sales transactions, market behavior, and so on. By having access to this data, MSMEs can conduct more in-depth analysis of their business. This analysis can help them understand customer needs, market trends, and optimize capacity development strategies (Aziz, 2019). Big Data provides richer and more accurate insights about MSME businesses, so that MSME owners can make better and smarter decisions. Information obtained from Big Data analysis can help MSMEs to identify new opportunities, optimize business operations, and develop more effective marketing strategies. By making better decisions, the quality of the MSME capacity development model can be improved (Behl et al., 2022). Big Data allows MSMEs to understand market demand more specifically and in depth. By analyzing customer data and market trends, MSMEs can identify customer needs and preferences more accurately. This allows them to develop capacity development models that better suit market needs, improving the quality of the products or services offered (Bhatti et al., 2022). Big Data can help MSMEs find significant innovation and differentiation opportunities in their business. By analyzing data and identifying market trends, MSMEs can develop new ideas to meet customer needs in unique ways. This innovation can help MSMEs improve the quality of their capacity development model, differentiate them from competitors, and achieve better growth in their business (Coleman et al., 2016). Overall, Big Data has great potential to improve the quality of MSME capacity development models. By utilizing data in analysis and decision making, MSMEs can optimize business operations, understand market needs, and create added value for their customers. This will contribute to improving the quality of the overall MSME capacity development model (Hartono et al., 2021). In the Quality of the MSME Capacity Development Model, of course the important role that must be paid close attention to is Big Data, this is also very important, because to carry out the Quality of the MSME Capacity Development Model, it is necessary to manage Big Data which is of course in accordance with current business conditions (Jha & Sahoo, 2021). This is confirmed by research conducted by Maroufkhani et al., (2020, 2023); Sariyer et al., (2021); Zheng et al., (2022) which states that Big Data is able to significantly influence the Quality of the MSME Capacity Development Model.

H_4: *Big Data influences the Quality of MSME Capacity Development Models*

2.5 The Relationship between Increasing the Success of E-Commerce Assistance and the Quality of MSME Capacity Development Models

With E-Commerce assistance, MSMEs can expand their market reach. Through the E-Commerce platform, products or services offered by MSMEs can be accessed by consumers in various regions or countries. This opens up opportunities for MSMEs to increase their sales and achieve more significant growth (Achmad, 2023). Through E-Commerce assistance, MSMEs can gain the knowledge and skills needed to develop and manage an online business (Sugiharto, 2024). They can learn about digital marketing strategies, using E-Commerce platforms, inventory management, sales recording, and so on. By having this knowledge and skills, MSMEs can develop better and more effective capacity development models (Amornkitvikai et al., 2022). By adopting E-Commerce assistance, MSMEs can increase efficiency and productivity in their business operations (Simanjuntak et al., 2022). The use of technology and automation can help MSMEs manage inventory, process orders and carry out other administrative activities. In the long term, this will help MSMEs to develop more effective and efficient capacity development models (Cakranegara et al., 2022). E-Commerce Assistance can help MSMEs collect data about sales, customer preferences and market behavior. This data can be used to carry out in-depth analysis of MSME businesses, which in turn can help in developing strategies and better decision making (Ramadhanti & Slamet, 2020). By having a better understanding of markets and consumers, MSMEs can develop more appropriate and successful capacity development models (Choshin & Ghaffari, 2017). Overall, E-Commerce assistance can increase the success of MSMEs in developing their business online (Kirom et al., 2022). This increase in success directly impacts the quality of MSME capacity development models, helping them to be more effective, efficient and competitive in an increasingly digital business environment (Farida et al., 2017). In the Quality of MSME Capacity Development Model, of course an important role that must be considered is the important role of Increasing the Success of E-Commerce Assistance (Gao et al., 2023). This is confirmed by research conducted by Ghobakhloo et al., (2015); Ha (2020); Hendrawan et al., (2018); Kilay et al., (2022); Kirom

et al., (2022) which states that Increasing the Success of E-Commerce Assistance can significantly influence the Quality of the MSME Capacity Development Model.

H_5: *Increasing the Success of E-Commerce Assistance affects the Quality of the MSME Capacity Development Model.*

H_6: *The Relationship between the Role of AI in influencing the Quality of MSME Capacity Development Models through Increasing the Success of E-Commerce Assistance.*

H_7: *Big Data Relationships influence the Quality of MSME Capacity Development Models through Increasing the Success of E-Commerce Assistance.*

3. Research Methods

3.1 Research Design

The research method uses associative quantitative research methods by looking for relationships between variables, data collection is carried out using survey techniques using questionnaires distributed to respondents.

3.2 Types of research

The type of research used in this research is causality research, namely research that seeks explanations in the form of cause-effect relationships between several concepts or several variables or several strategies developed in management (Sugiyono, 2015). This research is directed at describing the existence of a causal relationship between several situations described in the variables, and on that basis a general conclusion is drawn (Ferdinand, 2014).

3.3 Place and Time of Research

The location of the research was carried out in the city Attack Banten Province, City Banjarmasin, South Kalimantan Province, and City Semarang, Central Java, Indonesia. The research was conducted over a period of 3 months, starting from May to August 2024.

3.4 Population and Sample

Population is a combination of all elements in the form of events, things or people who have similar characteristics which is the center of attention of a researcher because it is seen as a research universe (Ferdinand, 2014). The population in this research is MSMEs People with Disabilities in City Attack Banten Province, City Banjarmasin, South Kalimantan Province, and City Semarang, Central Java. A sample is a subset of a population, consisting of several members of the population (Moleong, 2021). This subset is taken because in many cases it is impossible for us to examine all members of the population, therefore we form a representative population called a sample (Ferdinand, 2014). The technique for determining the number of samples refers to the opinion of Ferdinand (2014), namely a minimum of 5 times the number of indicators. The number of indicators for the 4 variables is 23 indicators, so the number of samples is (23×8=184) respondents. The sampling technique used is random sampling, that is, sampling of population members is carried out randomly taking into account the conditions that exist in the population to be studied, each population has the same opportunity as the others to be selected as members of the sample (Ferdinand, 2014).

3.5 Data Collection Instrument (Grid)

Table 1
Research Instruments

No	Variables	Indicators	Item No
1	The role of AI is how AI can be used in various aspects of life, including in business and industry.	Data analysis and understanding	RAI1
		Business process automation	RAI2
		Product and service development	RAI3
		Improved marketing and sales	RAI4
2	Big Data is a term used to describe very large and complex data sets that cannot be processed using traditional data processing methods.	Transaction volume	BD1
		Customer data	BD2
		Social media data	BD3
		Operational data	BD4
		Business management analysis	BD5

Table 1
Research Instruments (Continued)

No	Variables	Indicators	Item No
3	Increasing the Success of E-Commerce Assistance is an effort made to increase the level of success and growth of online business for e-commerce players.	Sales growth	ISEM1
		Visit and traffic levels	ISEM2
		Customer conversion	ISEM3
		Customer retention rate	ISEM4
		Customer trust	ISEM5
		Cost savings and efficiency	ISEM6
		Customer feedback:	ISEM7
4	The quality of the MSME Capacity Development Model is the extent to which a model or approach used to increase the capacity of MSMEs (Micro, Small and Medium Enterprises) is effective and successful.	Relevance	QCDM1
		Suitability	QCDM2
		Affordability	QCDM3
		Effectiveness	QCDM4
		Continuation	QCDM5
		Collaboration	QCDM6
		Support	QCDM7

3.6 Method of collecting data

The data used in this research uses secondary data and primary data. Secondary data was taken from BPS statistical data for Serang City, Banten Province, City Banjarmasin, South Kalimantan Province, as well as City Semarang, Central Java and from other trusted sources. The research theory study was also taken from several references from relevant previous research, from electronic data references and from library references (Ghozali, 2015). Meanwhile, the primary research data uses data obtained from questionnaire data. The method for collecting data is to use accidental sampling techniques (Ghozali, 2018).

3.7 Data Analysis Methods

The data analysis used in this research is quantitative analysis. Quantitative analysis is used to answer problems using Partial Least Square (PLS) analysis (Hair & Brunsveld, 2019). PLS as an alternative to Structural Equation Modeling, which has a weak theoretical basis, can be used as theory confirmation (Hair et al., 2017). PLS is a method that uses the SEM (Structural Equation Modeling) model which is used to overcome the problem of relationships between complex variables but the data sample size is small. The SEM method has a minimum data sample size of 100 (Ghozali & Latan, 2017).

4. Results

4.1 Outer Model Testing

The PLS analysis carried out begins with the Outer Model which measures the validity test with loading factors (Hair & Brunsveld, 2019). For indicators of each variable that are less than 0.6, the loading factor value will be dropped from the model (Hair et al., 2014). The results of the convergent validity test after the invalid indicators were dropped from the complete model are in Table 2 as follows:

Table 2
Outer Model

	Big Data	Increasing the Success of E-Commerce Mentoring	Quality of Capacity Development Mode	Role of AI
BD1	0.802			
BD2	0.744			
BD3	0.817			
BD4	0.881			
BD5	0.877			
ISEM1		0.884		
ISEM2		0.958		
ISEM3		0.882		
ISEM4		0.881		
ISEM5		0.825		
ISEM6		0.874		
ISEM7		0.772		
QCDM1			0.705	
QCDM2			0.872	
QCDM3			0.833	
QCDM4			0.717	
QCDM5			0.763	
QCDM6			0.786	
QCDM7			0.762	
RAI1				0.864
RAI2				0.855
RAI3				0.872
RAI4				0.744

Then a discriminant validity test was carried out. The Big Data value obtained was 0.882; Increasing the Success of E-Commerce Mentoring by 0.946; Quality of Capacity Development Mode is 0.881; and Role of AI of 0.856. So it can be concluded that the model has met discriminant validity.

Table 3
Construct Validity and Reliability

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Big Data	0.882	0.884	0.914	0.682
Increasing the Success of E-Commerce Mentoring	0.946	0.948	0.956	0.757
Quality of Capacity Development Mode	0.881	0.898	0.908	0.585
Role of AI	0.856	0.881	0.902	0.698

Source: Processed data, 2024.

Based on the table, it can be seen that the Cronbach's Alpha value for all constructs is > 0.6, where the acceptable limit value for Cronbach's alpha is greater than 0.6 (Hair et al, 2011). Thus, all constructs have met construct reliability.

4.2 Inner Model Testing

Inner model describes the relationship between latent variables based on substantive theory. In assessing the model with PLS, start by looking at the R-squares for each dependent latent variable. The results of inner model testing can see the relationship between constructs by comparing the significance and R-square values of the research model (Ghozali & Latan, 2017).

Table 4
R-Squares Value

	R Square	Adjusted R Square
Increasing the Success of E-Commerce Mentoring	0.380	0.373
Quality of Capacity Development Mode	0.861	0.858

Source: Processed data, 2024.

The R-square value of the variable Increasing the Success of E-Commerce Assistance is 0.380 in Table 4 shows that 38 percent of the variable Increasing the Success of E-Commerce Assistance is explained by the Role of AI and Big Data variables, while 62 percent is explained by variables outside the model. Likewise, the Quality of MSME Capacity Development Model variable with an R-Square value of 0.861 means that 86.1 percent of the variability is explained by the variable Increasing the Success of E-Commerce Assistance, Big Data, and the Role of AI, while 13.9 percent is explained by the variable in outside the model. The R-square value as shown in Table 4 is 0.380 and 0.861, which means moderate. The Q^2 value of structural model testing is carried out by looking at the Q^2 value (predictive relevance). To calculate Q^2 you can use the formula:

$Q^2 = 1 - (1-R12)\ (1-R22) = 1 - (1-0.380)\ (1-0.861) = 0.914$

The results of Q^2 calculations show that the Q^2 value is 0.914. According to Hair et al., (2012), the Q^2 value can be used to measure how good the observation values produced by the model and its parameter estimates are. The Q^2 value>0 (zero) indicates that the model is said to be good enough, while the Q^2 value<0 (zero) indicates that the model lacks predictive relevance. In this research model, the construct or endogenous latent variable has a value Q^2>0 (zero) so that the predictions made by the model are considered relevant.

4.3 Direct Effect Testing

Hypothesis testing regarding the influence of the variables Role of AI, Big Data, Increasing the Success of E-Commerce Assistance, Quality of the MSME Capacity Development Model is presented in Fig. 1.

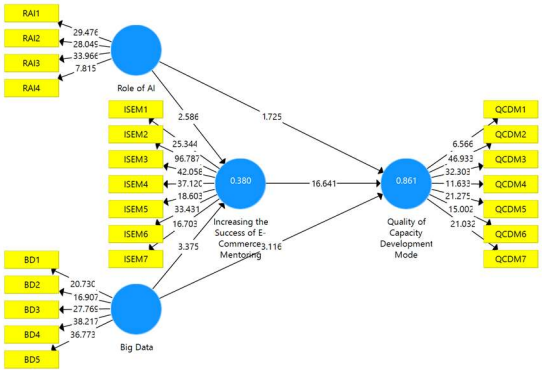

Fig. 1. Statistical t value of the Path Analysis Model

Testing of hypotheses in the PLS method is carried out using simulations for each hypothesized relationship, in this case the bootstrap method is carried out on the sample. The bootstrap method also functions to minimize the problem of non-normality of the research data used. In this study, the T-table value with a significance of 5% was previously determined to be 1.652. All path coefficients have statistical t values above 1.652.

Table 5
Direct Effect

	T Statistics	T Table	P Values	Information
Big Data → Increasing the Success of E-Commerce Mentoring	3.375	1.652	0.001	Positive and Significant
Big Data → Quality of Capacity Development Mode	3.116	1.652	0.002	Positive and Significant
Increasing the Success of E-Commerce Mentoring → Quality of Capacity Development Mode	16.641	1.652	0.000	Positive and Significant
Role of AI → Increasing the Success of E-Commerce Mentoring	2.586	1.652	0.010	Positive and Significant
Role of AI → Quality of Capacity Development Mode	1.725	1.652	0.005	Positive and Significant

Source: Processed data, 2024.

The results of the path coefficient obtained in the first hypothesis between the Role of AI in Increasing the Success of E-Commerce Assistance are obtained by the T Value$_{Statistics}$As big as2.586 ≥ 1.652 with a significant P-Value value of 0.010 ≤ 0.05, it is concluded that there is a significant influence between the Role of AI in Increasing the Success of E-Commerce Assistance. A positive value on the path coefficient means that the better the role of AI, the better the increase in the success of e-commerce assistance. The results of the path coefficient obtained in the second hypothesis between Big Data and Increasing the Success of E-Commerce Assistance are obtained by the T value$_{Statistics}$, 3.375 ≥ 1.652 with a significant P-Value value of 0.001 ≤ 0.05, it is concluded that there is a significant influence between Big Data on Increasing the Success of E-Commerce Assistance. A positive value on the path coefficient means that the better the Big Data, the better the increase in the success of e-commerce assistance. The path coefficient results obtained in the third hypothesis are betweenThe role of AI in the quality of the MSME capacity development model obtained a TStatistics value of 1.725 ≥ 1.652 with a significant P-value of 0.005 ≤ 0.05. It was concluded that there was a significant influence between the role of AI in the quality of the MSME capacity development model. A positive value on the path coefficient means that the better the role of AI, the better the quality of the MSME Capacity Development Model. The path coefficient results obtained in the fourth hypothesis between Big Data and the Quality of the MSME Capacity Development Model obtained the T Value$_{Statistics}$As big as3.116 ≥ 1.652 with a significant P-Value value of 0.002 ≤ 0.05, it is concluded that there is a significant influence between Big Data on the Quality of the MSME Capacity Development Model. A positive value on the path coefficient means that the better the Big Data, the better the quality of the MSME Capacity Development Model.
The results of the path coefficient obtained in the fifth hypothesis between Increasing the Success of E-Commerce Assistance and the Quality of the MSME Capacity Development Model are obtained by the T Value$_{Statistics}$As big as16.641 ≥ 1.652 with a significant P-Value value of 0.000 ≤ 0.05, it is concluded that there is a significant influence between Increasing the Success of E-Commerce Assistance on the Quality of the MSME Capacity Development Model. A positive value on the path coefficient means that the better the increase in the success of e-commerce assistance, the better the quality of the MSME capacity development model.

Table 6
Direct Effect

	T Statistics	T Table	P Values	Information
Big Data → Increasing the Success of E-Commerce Mentoring → Quality of Capacity Development Mode	3,481	1,652	0.001	Positive and Significant
Role of AI → Increasing the Success of E-Commerce Mentoring → Quality of Capacity Development Mode	2,494	1,652	0.013	Positive and Significant

Source: Processed data, 2024.

From the results of the analysis of Specific Indirect Effects in the sixth hypothesis using SmartPLSV.3.2.9 as in Table 6 Specific Indirect Effects above, it was found that the relationship between the role of AI and the quality of the MSME Capacity Development Model through the mediation of Increasing the Success of E-Commerce Assistance obtained a value of TStatistics = 3.481 ≥ 1.652, P -Value 0.013 ≤ 0.05 is positive. A positive value on the path coefficient means that the better the role of AI, the better the quality of the MSME Capacity Development Model through Increasing the Success of E-Commerce Assistance. Apart from that, the results of the analysis of Specific Indirect Effects in the seventh hypothesis using SmartPLSV.3.2.9 as in Table 6 Specific Indirect Effects above found that the relationship between Big Data and the Quality of the MSME Capacity Development Model through the mediation of Increasing the Success of E-Commerce Assistance obtained a value of TStatistics =3,481≥ 1.652, P-Value 0.001 ≤ 0.05 is positive. A positive value on the path coefficient means that the better the Big Data, the better the quality of the MSME Capacity Development Model through Increasing the Success of E-Commerce Assistance.

5. Discussion

5.1 The Influence of the Role of AI on Increasing the Success of E-Commerce Assistance

Based on the findings from the research results, the first hypothesis can be interpreted that the role of AI can have a positive and significant influence on increasing the success of e-commerce assistance for people with disabilities in Serang City, Semarang City and Banjarmasin City. This means that the increasing role of AI will increase the success of e-commerce support for people with disabilities in Serang City, Semarang City and Banjarmasin City. This research is confirmed by research conducted by Kouhihabibi (2021); Krishnan & Mariappan (2024); Molla & Licker (2001); Nichifor et al., (2021); and Ping (2019) which states that the role of AI is able to significantly influence increasing the success of e-commerce assistance. AI can analyze large and complex customer data to identify patterns and trends that are difficult for humans to spot (Sissodia et al., 2024). By using machine learning methods, AI can study customer behavior, preferences and purchasing tendencies (Aulia et al., 2024; Biea et al., 2023). By analyzing this data, AI can help E-commerce companions to better understand customer behavior, predict product preferences, and provide relevant recommendations (Sun & Finnie, 2004). This increases the opportunity to increase sales conversions and improve customer satisfaction (Bawack et al., 2022). AI can be used in the automation of E-commerce companion operational tasks such as inventory management, shipping, and customer support (Singh, 2021). For example, AI chatbots can provide automated and fast support to customers by answering frequently asked questions, processing product returns, or providing promotional offers (Zhang et al., 2021). This helps save time and human resources, improve operational efficiency, and provide faster service to customers (Choshin & Ghaffari, 2017). AI enables E-commerce companions to provide more personalized customer experiences. By analyzing customer data, AI can provide relevant product recommendations based on customer preferences and purchasing history (Singh, 2002). This allows E-commerce companions to design shopping experiences tailored to customer preferences, increase customer loyalty, and strengthen the relationship between companions and customers (Ikumoro & Jawad, 2019). AI can help support better decision making in marketing strategies. By analyzing market and customer data, AI can identify specific customer trends, patterns and preferences (Saeed et al., 2005a). E-commerce companions can use this information to adjust their marketing campaigns, optimize targeting strategies, and customize content based on customer preferences and needs (Wang et al., 2023). Thus, they can increase the effectiveness of their marketing campaigns, increase sales conversions and gain a competitive advantage in the market (Jain et al., 2021). Overall, the role of AI in E-commerce assistance is critical to increasing success (Raji et al., 2024). With its ability to recognize patterns, predict customer behavior, improve operational efficiency, and provide personalized customer experiences, AI can help E-commerce partners achieve higher revenues, increase customer satisfaction, and achieve greater success in the world of E-commerce (Kashyap et al., 2022). In an effort to increase the success of e-commerce assistance, of course the important role that must be paid attention to is the role of AI, this is very crucial because to increase the success of e-commerce assistance, support from the role of good AI as a database in determining decisions, especially for MSMEs (Khrais, 2020). In doing so, AI helps e-commerce become more responsive, efficient, and relevant to customers, all of which contribute to increasing the success of e-commerce assistance. This research means that in an effort to increase the success of e-commerce assistance, it is also necessary to increase the role of AI for people with disabilities in Serang City, Semarang City and Banjarmasin City. If the role of AI in MSMEs can be increased, it will have a significant impact on increasing the success of e-commerce assistance.

5.2 The Influence of Big Data on Increasing the Success of E-Commerce Assistance

Based on the findings from the research results, the second hypothesis can be interpreted as saying that Big Data can have a positive and significant influence on increasing the success of e-commerce assistance for people with disabilities in Serang City, Semarang City and Banjarmasin City. This means that the increasing increase in Big Data will increase the success of E-Commerce Assistance for Persons with Disabilities in Serang City, Semarang City and Banjarmasin City. This research is confirmed by research conducted by Ferreira et al., (2017); Golicic et al., (2002); Kalla (2024); Kauffman et al., (2012); and Molla & Licker, (2001) which states that Big Data is able to significantly influence the increase in the success of e-commerce assistance. With Big Data, E-commerce partners can collect and analyze large amounts of data about their customers' behavior (Ye & Jonilo, 2023). This data includes information about preferences, shopping habits, transaction history, and more (Zhu, 2021). By analyzing this data, E-commerce partners can better understand their customer profiles, identify purchasing trends and patterns, and provide a more personalized experience (Zerbino et al., 2018). This improves the companion's ability to identify and meet customer needs, increases customer satisfaction, and generates higher sales (Ajah & Nweke, 2019). With Big Data, E-commerce companions can collect and analyze data about the market more quickly and accurately. This data includes information about industry trends, competitor behavior, customer preferences, and so on (Tan et al., 2002). By analyzing this data, E-commerce partners can understand market trends, identify new opportunities, and optimize their business strategies. This allows E-commerce companions to stay relevant and competitive in a rapidly changing market (Akter & Wamba, 2016). Big Data can help E-commerce partners manage their inventory more efficiently (Saeed et al., 2005). By analyzing data on demand and sales, E-commerce companions can predict future inventory needs, optimize stock, and avoid inventory shortages or excesses. This reduces the risk of loss and

increases operational efficiency (Ansari et al., 2019). By exploring Big Data, E-commerce partners can identify their customers' preferences and behavior in more depth (Molla & Licker, 2001; Oprescu, 2019; Pramudito, 2021). Companions can use this data to optimize their marketing strategies, target customers with relevant offers, and set prices more effectively (Rosário & Raimundo, 2021). Thus, E-commerce companions can increase the success of their marketing campaigns, increase the number of transactions, and increase their revenue (Asensio, 2017). Overall, Big Data plays an important role in increasing the success of E-commerce assistance (Pramudito, 2021). By collecting, analyzing, and interpreting big data, E-commerce partners can gather deeper insights about customers and markets, improve inventory management, and optimize their marketing strategies (Oprescu, 2019). This in turn increases customer satisfaction, increases sales, and achieves greater success in the world of E-commerce (Behl et al., 2019). In increasing the success of e-commerce assistance, of course the important role that must be paid attention to is big data, this is very crucial because to increase the success of e-commerce assistance, the role of big data is needed to increase knowledge for people with disabilities (Choshin & Ghaffari, 2017). It can then be concluded that Big Data helps e-commerce to better understand customers, improve operational efficiency, and create more effective marketing strategies, all of which contribute to increasing mentoring success. This research means that in an effort to increase the success of e-commerce assistance, it is also necessary to improve Big Data for Persons with Disabilities in Serang City, Semarang City and Banjarmasin City. If Big Data for MSMEs with Disabilities can be improved, it will have a significant impact on increasing the success of e-commerce assistance.

5.3 The Influence of the Role of AI on the Quality of MSME Capacity Development Models

Based on the findings from the research results, the third hypothesis can be interpreted that the role of AI can positively and significantly influence the quality of the Capacity Development Model for MSMEs for Persons with Disabilities in Serang City, Semarang City and Banjarmasin City. This means that the increasing role of AI will improve the quality of the MSME Capacity Development Model. This research is confirmed by research conducted by Dey et al., (2024); Dutta & Kannan Poyil (2024); Kulkarni et al., (2024); Kumar et al., (2022); and Lidiawan (2024) which states that the role of AI is able to significantly influence the quality of the MSME capacity development model. AI enables MSMEs to carry out more sophisticated and in-depth data analysis (Sariyer et al., 2021). By using techniques such as machine learning, MSMEs can collect, analyze and interpret data more efficiently and accurately (Subagja et al., 2023). This enables MSMEs to gain deeper insight into their business, understand market trends, identify new opportunities and optimize capacity development strategies (Abaddi, 2024). By using AI, MSMEs can make smarter and more informed decisions. AI systems can analyze data quickly and generate recommendations based on identified patterns and trends (Santosa & Surgawati, 2024). This allows MSMEs to make more accurate decisions, optimize business operations, and develop more effective capacity development strategies (Abrokwah-Larbi & Awuku-Larbi, 2024). AI can be used to automate routine tasks in developing MSME capacity. This can help save time and resources, as well as eliminate human error (Ristyawan, 2020). Or, it can be used to automatically manage complex business processes, such as inventory management, pricing, or automated marketing (Triwahyono et al., 2023). By automating these tasks, MSMEs can increase their efficiency and productivity, thereby improving the quality of the capacity development model (Appiah Fening et al., 2008). AI can help MSMEs to personalize their customer experience (Yun, 2022). By using technology such as chatbots or content personalization, MSMEs can present individually relevant information or offers to customers (Ramanathan et al., 2024). This increases customer satisfaction, increases loyalty, and helps MSMEs in expanding their capacity by retaining existing customers and attracting new customers (Behl et al., 2022). Overall, the role of AI has a significant impact on the quality of MSME capacity development models (Mukherjee et al., 2024). By leveraging AI for analysis, decision making, task automation, and customer personalization, MSMEs can improve the efficiency, effectiveness, and quality of their capacity development models. This will contribute to the overall growth and success of MSME businesses (Bhatti et al., 2022). In improving the quality of the MSME Capacity Development Model, of course the important role that must be paid close attention to is the role of AI, this is very important considering that the two are interconnected in terms of agency accountability (Chatterjee et al., 2022). Thus, AI increases efficiency, personalization, and access to necessary resources, which overall improves the quality of MSME capacity development models. This research means that in an effort to improve the quality of the MSME Capacity Development Model, it is also necessary to increase the role of AI for people with disabilities in Serang City, Semarang City and Banjarmasin City. If the role of AI in MSMEs can be increased, it will have a significant impact on the quality of the MSME capacity development model.

5.4 The Influence of Big Data on the Quality of MSME Capacity Development Models

Based on the findings from the research results, the fourth hypothesis can be interpreted as saying that Big Data can have a positive and significant influence on the Quality of the Capacity Development Model for MSMEs with Disabilities in Serang City, Semarang City and Banjarmasin City. This means that the increasing Big Data will increase the quality of the MSME Capacity Development Model. This research is confirmed by research conducted by Maroufkhani et al. (2020, 2023); Sariyer et al. (2021) and Zheng et al., (2022) which states that Big Data is able to significantly influence the Quality of the MSME Capacity Development Model. Big Data allows MSMEs to collect and analyze large amounts of data, including customer data, sales transactions, market behavior, and so on. By having access to this data, MSMEs can conduct more in-depth analysis of their business. This analysis can help them understand customer needs, market trends, and optimize capacity development strategies (Aziz, 2019).

Big Data provides richer and more accurate insights about MSME businesses, so that MSME owners can make better and smarter decisions. Information obtained from Big Data analysis can help MSMEs to identify new opportunities, optimize business operations, and develop more effective marketing strategies (Bhatti et al., 2022a; Chatterjee et al., 2022; Dey et al., 2024; Dutta & Kannan Poyil, 2024). By making better decisions, the quality of the MSME capacity development model can be improved (Behl et al., 2022). Big Data allows MSMEs to understand market demand more specifically and in depth. By analyzing customer data and market trends, MSMEs can identify customer needs and preferences more accurately. This allows them to develop capacity development models that better suit market needs, improving the quality of the products or services offered (Bhatti et al., 2022). Big Data can help MSMEs find significant innovation and differentiation opportunities in their business. By analyzing data and identifying market trends, MSMEs can develop new ideas to meet customer needs in unique ways. This innovation can help MSMEs improve the quality of their capacity development model, differentiate them from competitors, and achieve better growth in their business (Coleman et al., 2016). Overall, Big Data has great potential to improve the quality of MSME capacity development models. By utilizing data in analysis and decision making, MSMEs can optimize business operations, understand market needs, and create added value for their customers. This will contribute to improving the quality of the overall MSME capacity development model (Hartono et al., 2021). In the Quality of the MSME Capacity Development Model, of course the important role that must be paid close attention to is Big Data, this is also very important, because to carry out the Quality of the MSME Capacity Development Model, it is necessary to manage Big Data which is of course in accordance with current business conditions (Jha & Sahoo, 2021). Thus, Big Data enables MSMEs to make better decisions, identify opportunities, and adjust business strategies, all of which improve the quality of their capacity development models. This research means that in an effort to improve the quality of the MSME Capacity Development Model, it is also necessary to improve the quality of Big Data. If Big Data for MSMEs with Disabilities can be improved, it will have a significant impact on the Quality of the MSME Capacity Development Model.

5.5 The Effect of Increasing the Success of E-Commerce Assistance on the Quality of MSME Capacity Development Models

Based on the findings from the research results, the fifth hypothesis can be interpreted that increasing the success of e-commerce assistance can have a positive and significant influence on the quality of the capacity development model for MSMEs with disabilities in Serang City, Semarang City and Banjarmasin City. This means that the increasing success of E-Commerce Assistance will increase the quality of the MSME Capacity Development Model. This research is confirmed by research conducted by Ghobakhloo et al., (2015), Ha (2020), Hendrawan et al., (2018), Kilay et al., (2022) and Kirom et al. (2022) which states that Increasing the Success of E-Commerce Assistance can significantly influence the Quality of the MSME Capacity Development Model. With E-Commerce assistance, MSMEs can expand their market reach. Through the E-Commerce platform, products or services offered by MSMEs can be accessed by consumers in various regions or countries (Aziz, 2019; Behl et al., 2022b; Jha & Sahoo, 2021). This opens up opportunities for MSMEs to increase their sales and achieve more significant growth (Achmad, 2023). Through E-Commerce assistance, MSMEs can gain the knowledge and skills needed to develop and manage an online business (Sugiharto, 2024). They can learn about digital marketing strategies, using E-Commerce platforms, inventory management, sales recording, and so on. By having this knowledge and skills, MSMEs can develop better and more effective capacity development models (Amornkitvikai et al., 2022). By adopting E-Commerce assistance, MSMEs can increase efficiency and productivity in their business operations (Simanjuntak et al., 2022). The use of technology and automation can help MSMEs manage inventory, process orders and carry out other administrative activities (Choshin & Ghaffari, 2017; Farida et al., 2017; Gao et al., 2023). In the long term, this will help MSMEs to develop more effective and efficient capacity development models (Cakranegara et al., 2022).

E-Commerce Assistance can help MSMEs collect data about sales, customer preferences and market behavior. This data can be used to carry out in-depth analysis of MSME businesses, which in turn can help in developing strategies and better decision making (Ramadhanti & Slamet, 2020). By having a better understanding of markets and consumers, MSMEs can develop more appropriate and successful capacity development models (Choshin & Ghaffari, 2017). Overall, E-Commerce assistance can increase the success of MSMEs in developing their business online (Kirom et al., 2022). This increase in success directly impacts the quality of MSME capacity development models, helping them to be more effective, efficient and competitive in an increasingly digital business environment (Farida et al., 2017).

In the Quality of MSME Capacity Development Model, of course an important role that must be considered is the important role of Increasing the Success of E-Commerce Assistance (Gao et al., 2023). It follows that successful e-commerce assistance provides MSMEs with the tools, knowledge and access necessary to increase their business capacity, which improves the quality of the overall capacity development model. This research means that in an effort to improve the quality of the MSME Capacity Development Model, it is also necessary to increase the increase in the success of e-commerce assistance for people with disabilities in Serang City, Semarang City and Banjarmasin City. If increasing the success of e-commerce assistance to MSMEs can be increased, it will have a significant impact on the quality of the MSME capacity development model.

5.6 The Influence of the Role of AI and Big Data on the Quality of MSME Capacity Development Models through Increasing the Success of E-Commerce Assistance

Based on the findings from the research results, the sixth and seventh hypotheses can be interpreted that the role of AI and Big Data can positively and significantly influence the quality of the MSME Capacity Development Model through increasing the success of e-commerce assistance for people with disabilities in Serang City, Semarang City and Banjarmasin City . This means that through the mediation of Increasing the Success of E-Commerce Assistance to MSMEs, the Role of AI and Big Data has had a fairly large positive impact on the Quality of the Capacity Development Model for MSMEs with Disabilities in Serang City, Semarang City and Banjarmasin City. The findings of this research indicate that increasing the success of e-commerce assistance significantly improves the quality of the MSME capacity development model by moderating the relationship between the role of AI and big data on the quality of the capacity development model for MSMEs for people with disabilities in Serang City, Semarang City and Banjarmasin City. This also shows how increasing the success of e-commerce assistance for people with disabilities in Serang City, Semarang City and Banjarmasin City can significantly influence the relationship between the role of AI and Big Data on the quality of MSME capacity development models, and the type of mediation carried out, namely partial mediation. , with this type of competitive partial mediation, it can have an impact both directly and indirectly on the quality of the MSME Capacity Development Model for Persons with Disabilities in Serang City, Semarang City and Banjarmasin City. This shows that the independent variable has a strong ability both directly and indirectly on the dependent variable, and competitive partial mediation occurs if the coefficient is positive. AI helps MSMEs personalized customer experiences and automate business processes in e-commerce, thereby increasing the effectiveness and efficiency of assistance. This allows MSMEs to learn more quickly and implement effective strategies. Big Data gives MSMEs access to in-depth data analysis about markets, customers and trends, which is used in e-commerce assistance to direct more accurate and responsive business strategies. Through AI and Big Data, MSMEs can leverage more sophisticated e-commerce strategies, increasing their mentoring success and competitiveness in the digital marketplace. With AI and Big Data supporting successful e-commerce assistance, MSMEs gain better knowledge, skills and tools to develop their overall capacity, improving the quality of MSME capacity development models.

6. Conclusion

The aim of this research is to analyze the influence of the role of AI and Big Data on increasing the success of e-commerce assistance and its impact on the quality of the capacity development model for MSMEs with disabilities in Serang City, Semarang City and Banjarmasin City, Indonesia. Based on the discussion of the findings in this research, it can be concluded that the role of AI and Big Data directly has a positive and significant influence on increasing the success of e-commerce assistance for people with disabilities in Serang City, Semarang City and Banjarmasin City; Apart from that, the role of AI, Big Data and Increasing the Success of E-Commerce Assistance directly has a positive and significant influence on the Quality of the MSME Capacity Development Model for Persons with Disabilities in Serang City, Semarang City and Banjarmasin City; Increasing the Success of E-Commerce Assistance is able to mediate the Role of AI and Big Data on the Quality of the Capacity Development Model for MSMEs with Disabilities in Serang City, Semarang City, and Banjarmasin City, Banten Province, Indonesia. So it can be concluded that in an effort to improve the quality of the MSME Capacity Development Model for Persons with Disabilities in Indonesia, important factors that must be improved include the role of AI, Big Data, and Increasing the Success of E-Commerce Assistance.

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