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Optimizing Performance and Increasing the Reliability of Small and Medium Enterprises Using a Modified Hybrid Artificial Intelligence Model

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Abstract

Artificial intelligence and blockchain are among the most popular technologies. Combining the two technologies also harbors manifold potentials. For instance, blockchain can help address specific AI-related difficulties, and vice versa, AI offers opportunities to improve the blockchain's mining process or smart contracts. The fusion of blockchain and artificial intelligence (AI) marks a paradigm shift in supply chain, ensuring data privacy and facilitating secure data transmission. Artificial intelligence and other advanced technologies are increasingly recognized as essential catalysts for increasing productivity due to their ability to transform all operations inside and outside companies. However, empirical research on how AI acquisition can improve the outcomes of different levels of companies, such as customer acquisition capacity and corporate performance, is in its infancy. Artificial Intelligence (AI) has been used to assess the performance of companies. This article builds on the impact of the hybrid AI model on operational plans to help with emerging studies at the organizational level, which has received limited attention so far. Particularly in the context of developing economies that are still under research, the model also provides insight into the role of intermediary layers in the relationship between AI uptake and rapid operational planning with high accuracy and a high reliability factor.

Keywords: Artificial Intelligence, Modified Multi-Medium Models, Small and Medium Enterprises, Optimization

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1. Introduction

The modern era requires advanced solutions, and existing businesses are adopting technologies to meet customer expectations [1]. Customers demand quick and accurate responses, which requires the use of accurate and intelligent response systems. From this perspective, companies are introducing AI technologies to create an intelligent system that can respond quickly to the ever-changing business environment [2]. Through such technologies, companies with problem-solving capabilities can improve. Productivity and efficiency in customer service and other Growth and development have been shown to improve [3].

The use of AI technology to help organizations achieve and maintain a competitive advantage relies on the full adoption of such technology throughout business processes [4]. Because of the vital role that IT plays in enabling end-to-end business operations to develop and maintain business value, and to strengthen the supply chain and business value [5]. However, most of the available literature focuses on only two aspects of recruitment, which are critical factors of attraction and IT-based.

In addition, it can be suggested that there is more than the application of artificial intelligence alone to improve the performance and evolution of companies and to positively promote the business sector. Hence, one of the initial efforts to fill the mentioned gap, especially in small and medium-sized enterprises, is from the perspective of the emerging economy, which indicates that artificial intelligence in marketing significantly affects the financial performance of customer performance and the internal business process, learning and growth about SMEs, and the mediating role of accounting automation in the layer [6]. It will reveal the intermediate in the adoption of AI in the field of small and medium-sized enterprises. On the other hand, the relationship between AI and competitiveness in SMEs is positively significant, highlighting the significant positive relationship between AI-based business model innovation and technological and strategic enablers for businesses, focusing on SMEs [7]. Samuel, in 1959, defined machine learning as “the field of study that gives computers the ability to learn without being explicitly programmed. Machine learning (ML) technology powers many aspects of modern society, from web searches to content filtering on social networks to recommendations on e-commerce websites, and it is increasingly present in consumer products, such as cameras and smartphones [23]. Machine learning has been developed over a long period; now it is a relatively complete technical framework with mature algorithms, and has developed techniques such as deep learning, reinforcement learning, and federated learning [22]. Deep learning was introduced by Hinton et al. (2006) [24]. Deep learning was based on the concept of an artificial neural network (ANN). In terms of working domain, deep learning (DL), a branch of machine learning (ML) and artificial intelligence (AI), is nowadays considered a core technology of the Fourth Industrial Revolution (Industry 4.0) [25]. Deep learning is among the current trending technologies and has seen tremendous growth over the last years. This area of study has led to a resurgence in neural network research, often referred to as "new-generation neural networks." When properly trained, deep networks have achieved remarkable success in various classification and regression tasks. [26] Deep learning (DL) differs from traditional machine learning in terms of efficiency, particularly as the volume of data increases. DL technology employs multiple layers to represent the abstractions of data,

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thereby constructing computational models. Although deep learning requires a significant amount of time to train a model due to the large number of parameters, it requires much less time to execute during testing compared to other machine learning algorithms [27]. The model training of machine learning employs a large amount of sensitive data, and data privacy is a critical issue. At the same time, data is distributed in different organizations. These decentralized data are usually heterogeneous and unbalanced; therefore, it is difficult to combine them. In 2016, Google introduced federated learning, which merges machine learning with distributed computing. In federated learning, participants only need to share their own training model parameters rather than their original data, thereby enhancing data privacy to a certain extent. As a result, federated learning represents an innovative method in the field of machine learning.

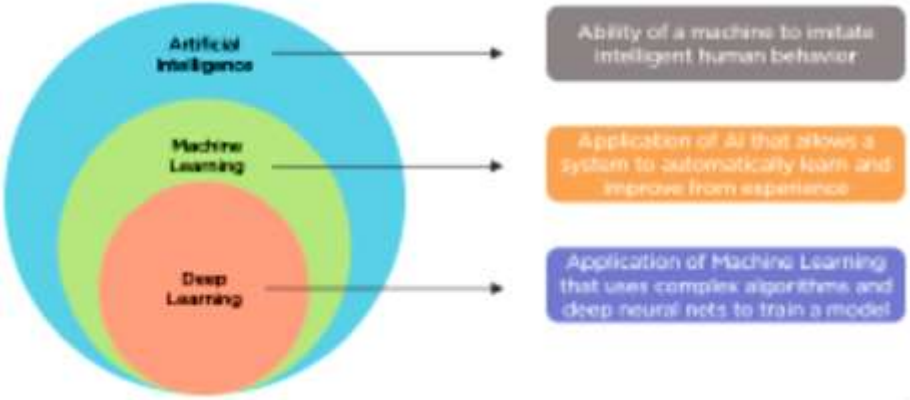

Fig. 1. Differences between artificial intelligence, machine learning, and deep learning

It shows a different pattern of the impact of artificial intelligence on productivity and innovation growth in small and medium-sized enterprises and the significant impact of artificial intelligence on the operational and economic performance of companies Small and medium-sized enterprises revealed that the adoption of industrial IoT in small and medium-sized enterprises increases organizational performance [8,9]. In modern, AI-based methods, companies can use AI to improve performance and supply chain orientation and agility. However, how AI uptake affects organizational performance still needs to be explored. Mainly because the limitation of access to the data, as a constraint, has made it difficult to comprehensively assess this relationship between the intermediate layers. It has increased the uptake of AI but still lacks a comprehensive understanding of the implications associated with its performance [11,13].

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Fig. 2. Fundamentals of Blockchain Technology

For example, the ability to attract AI for promotion is not entirely clear. In addition, under what circumstances does AI acquisition affect customer acquisition bias and organizational performance. It still needs further investigation. The volatility of the business environment, the increasing uncertainty in global markets, coupled with the rapid advancement of technology, have led companies to recalibrate the ability to respond quickly and adapt flexibly [10].In this study, it has been tried to address the gaps mentioned in the existing challenges by using the dynamic capability perspective framework, and in particular, its main goal is to provide a more comprehensive understanding of the relationship between AI absorption and the optimal performance of small and medium-sized enterprises [12]. In this way, a modified parallel multi- mediary model has been presented in order to investigate the relevant and determinative mechanisms of organization in order to optimize performance and confidence factor. Dynamic capabilities perspective theory has received significant scientific attention to better understand the importance of an organization's strategic capabilities and their impact on performance. This theory is based on the concept that dynamic capabilities can transform a company's current positions, resources, and operational capabilities [16,17]. and as a result, create new situations and solutions for the optimal use of its strategic assets [19]. Therefore, in this paper, a theoretical framework for the study of A theoretical model from the perspective of economics has been proposed and presented. The term "Artificial Intelligence" (AI) was first coined in 1956 [20]. In recent years, there has been increased interest in applying AI in various settings to inform decision-making and facilitate predictive analytics McKinsey Global Institute, for example, has predicted that the AI market will grow to 13 trillion dollars by 2030 [21]. The research of AI covers a wide range of topics, including machine learning, computer vision, and natural language processing. Importantly, machine learning is an essential technology allowing AI to imitate human thought and behavior, and most current AI programs are based on it [22].

2. Theoretical background of dynamic intelligence capability

The dynamic capabilities perspective theory has attracted considerable scientific attention to better understand the importance of an organization's strategic capabilities and their impact on company-wide competitive performance At the same time [14,15], it has provided companies with the optimal opportunity to develop and optimize their resources,

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and emphasizes the maintenance and growth of the superior operational capabilities required to perform and synchronize operational procedures [18].

This theory is based on the concept that dynamic capabilities change the current positions, resources, and operational capabilities of a company, thereby creating new solutions for the optimal use of its strategic assets. However [21], this theory has been studied more widely in developed countries [20]. However, developing markets have distinct capabilities and resources in terms of socio-cultural and economic environment. Artificial intelligence has recently attracted a lot of attention among researchers and professionals. This effect was facilitated primarily due to the abundance of databases, which is referred to as data-driven artificial intelligence, as well as the advent of cloud computing, the computing power of machines and then deep learning, and in reinventing almost every aspect of business management to greater productivity and a long-term competitive advantage, as the reason for the increased interest of companies in this technology.

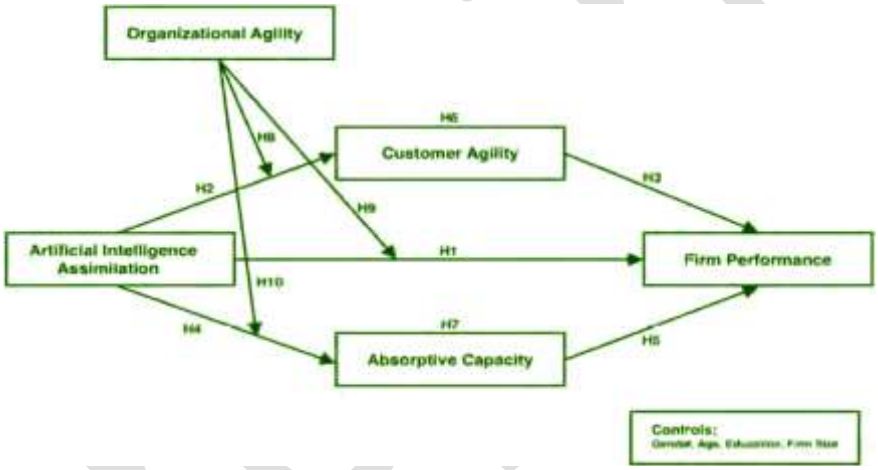

Fig. 3. Conceptual framework.

AI may be used to enhance the customer service experience, leading to improved organizational performance such as non-financial and financial performance, where the use of AI allows supply chains to respond dynamically to unstable environments and reduce potentially costly decisions for EMSs.

Due to its potential importance in increasing operational optimization and market agility in the survival of commercial companies, it has become a key research topic. While IT uptake is an important sign of successful IT deployment and the creation of IT-based business value and improved organizational performance. Some researchers consider IT uptake to be a set of uniquely necessary and imperfectly table competencies that companies mainly need to gain a competitive advantage in a dynamic and turbulent environment, given the uncertain and dynamic environment in which EMS operates. We suggest that the integration and rout in of technology throughout the operational activities of EMSs should develop their capabilities to support their performance in the best possible way.

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3. Organizational agility and absorption

Organizational agility as an asset of an organization, a set of organizational practices and procedures that produce a specific result. In addition, manufacturing companies are asked to understand the impact of agility and create a robust framework to increase their overall performance. This function is like a convergent process and covers IT and strategic optimization, ultimately increasing efficiency and improving system performance. It also plays a key role in the digital delivery of the economic systems of companies, especially small and medium-sized enterprises. Operational realization is the capacity of a company to recognize various opportunities in an inefficient market and to take the necessary social measures to quickly deal with the situation and exploit such opportunities. Agile companies have the flexibility to quickly search for innovative ways to get things done, proactively analyze and adapt to events, and exploit operational opportunities, allowing organizations to leverage their diverse assets and adapt to industry developments that are often unpredictable.

Additionally, it is increasingly seen as a valuable asset that companies use to obtain the information they need to improve and manage decision-making and gain a competitive advantage. Recently, researchers have claimed that operational research is mainly related to companies' responses to sub-processes. Therefore, in order to fully understand the processes, it is necessary to provide a more appropriate explanation The concept of AC, first introduced in macroeconomics, highlights the capacity and ability of a company to effectively use, absorb, and exploit external resources and know-how for business purposes. The AC concept is a vital factor in facilitating the expansion of a manufacturer. This can effectively ensure the company's capabilities by effectively implementing a distinct set of procedures within the organization, reforming and gradually organizing.

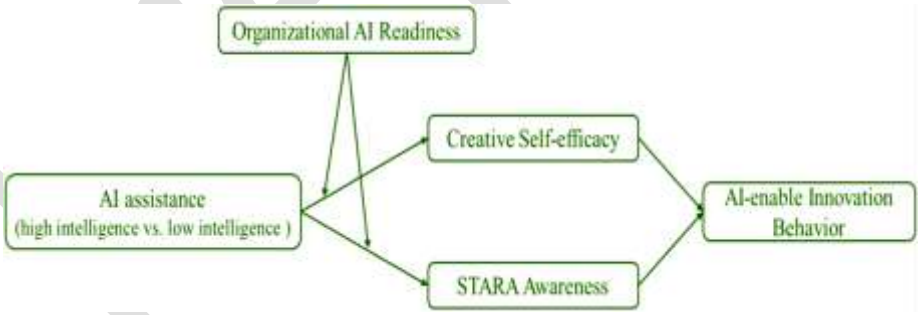

Fig.4. Theoretical model

AI-powered companies are equipped to transform processes and services that enhance their organizational performance, and the adoption of information technology promotes business value creation and improves a company's effectiveness and efficiency.

Organizations around the world are using AI capabilities to improve customer engagement. From this perspective, Amazon and Netflix are leveraging AI-powered technologies to deliver personalized offers to their customers and subscriber base around the world and their agility towards their subscribers and customers.

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CA enables companies to continuously adapt to customer-centric opportunities by reacting proactively and launching new product promotions and services to increase the profitability of the industry position and competitive advantage, and previous research has also shown that it can predict new product achievements. Accelerate the manner and speed at which organizations identify and leverage innovative possibilities and accelerate the creation of a new product that enhances organizational performance. Companies that have more CA. Matching the demands and needs of customers with products and Their service is easy and significantly impacts customer satisfaction. Organizations like Amazon and Netflix, in particular, are using personalized product recommendations based on individual marketing and price optimization to boost CA and increase sales.

4. Moderated Multi-Medium AI Model

It is anticipated that companies will be able to benefit from the uptake of AI as a new source of knowledge while at the same time using it as a tool towards learning. This can affect the concept and aspects of AI and is related to a company's changing capability that companies' technology choices can influence. The AI attraction hypothesis has a positive effect on absorption capacity. Acquire information and data on customer-centric opportunities that enable innovations and competitive actions. Companies need to develop customer-centric programs. To establish their ability to identify market opportunities and build capacity to generate and exploit development knowledge based on these arguments and past research and data, place customer analytics as a key mechanism of communication between IT infrastructure and system optimization in high value and position. In addition, it has enabled CA's IT infrastructure to drive competitive activities, their organizational goals. This capability is the cornerstone of modern companies in managing instability and uncertainty.

A learning model is a deep learning algorithm that takes the input data and assigns it to each of the available data based on the degree of importance (learnable weights and biases) and is able to differentiate them from each other. The Conv Net algorithm requires less "pre-processing" compared to other classification algorithms. While the filters of the initial methods are manually engineered, the Conv Nets acquire the ability to learn these filters/specifications when trained enough.

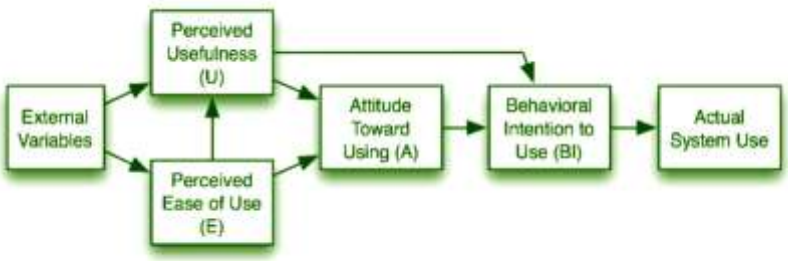

Fig. 5. Structure of Model

The present study, by advancing a multi-mediated model modified by linking the acquisition of artificial intelligence with three outcomes at the organizational level,

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especially in the field of small and medium-sized enterprises, makes an important contribution to the theorizing and modeling of artificial intelligence, and is one of the first studies to use the theory of multi-layered hybrid AI capabilities to investigate the impact of AI attraction on financial performance, in addition to multi-mediating roles CA and the Moderating Role of Relationships in a Developing Economy By providing empirical evidence on the vital and attractive role of AI in increasing productivity in the SME context, especially in a developing economy, it bridges the gap in the literature flow, which is characterized by a lack of empirical evidence of the limitations of access to data, particularly in the business sector.

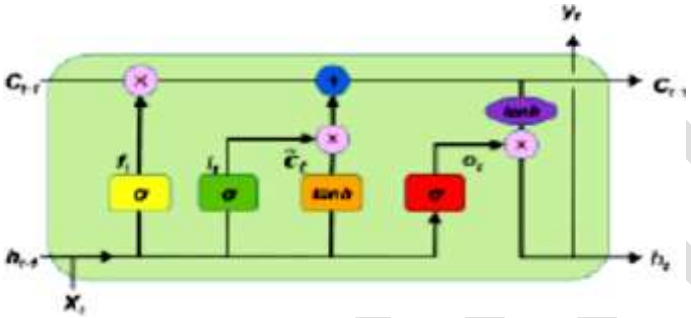

Fig.6. LSTM structure with the memory block

Therefore, in line with the results obtained, it expands AI enablers and reinforces the concept that companies that use AI-related technologies. They will only be able to create and acquire business value if they are appropriately involved in end-to-end processes The company should be merged. In this study, descriptive statistics were tested using SPSS software to search for missing data and relevant outliers and determine whether the collected data had a normal distribution. In addition, descriptive statistics have been calculated in understanding the frequency and percentage of the respondents' demographic information. In this study, confirmatory factor analysis (CFA) of AMOS statistical software has been used to estimate data and information. In this analysis, multiple estimation factor (EFA) has been used for statistical criteria to perform the one-factor test, and the results show that there are five different factors, each of which has a specific value higher than 1, explaining a total of 67.221 of the total variance, and only 3.451 of the total variance can be explained by the first extracted factor. This is below the recommended threshold of 500.

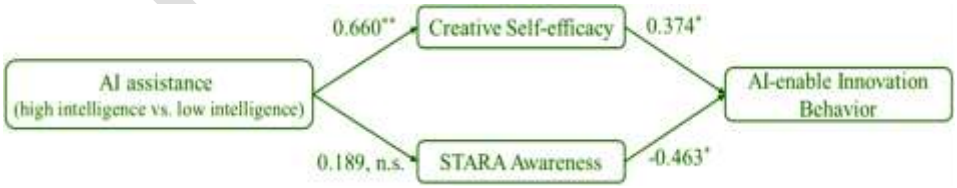

Fig. 7. Results of structural equation modeling (study1) Note: N = 103. This is a simplified version of the actual model. *$p < 0.05$, **$p < 0.001$.

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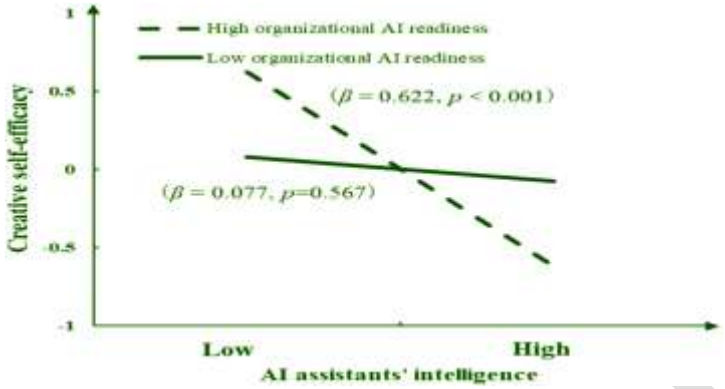

Fig. 8. The moderating effect of organizational AI readiness on the relationship between AI-assistant intelligence and creative self-efficacy.

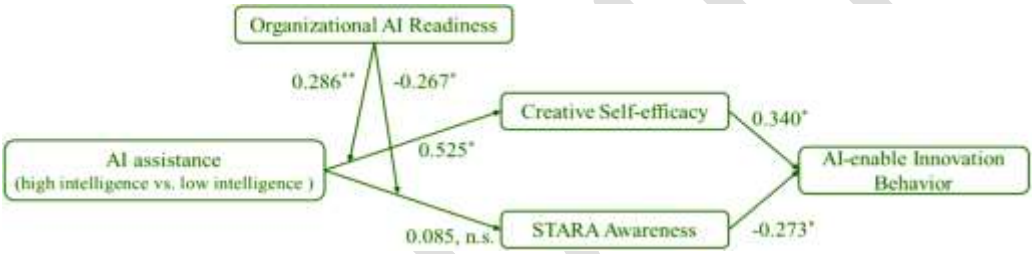

Fig. 9. Results of structural equation modeling (study2) Note: N = 191. This is a simplified version of the actual model. *$p < 0.05$, **$p < 0.001$.

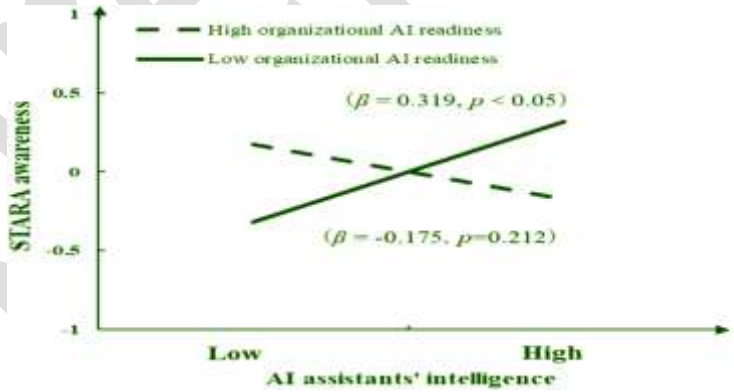

Fig. 10. The moderating effect of organizational AI readiness on the relationship between AI-assistant intelligence and STARA awareness.

5. Management Implications of Using the Artificial Intelligence Model

These findings have important practical implications for managers and small and medium-sized enterprises looking to invest in AI-based business value solutions. It offers. Due to the lack of resources and capabilities of small and medium-sized enterprises due

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to their size, they often face difficulties in implementing advanced technologies, and this study provides recommendations for managers to maximize the use of AI.

In this sense, corporate executives can only develop and realize the full value of AI if they are able to absorb intelligence. Invest in company-wide processes and complementary capabilities, including operational accounting and operational accounting. The findings of this study can serve as a reference point for managers and encourage them to pay enough attention to how AI absorption is developed.

Managers need to consider the resources they need to attract AI to improve their capabilities. Resources of this type include enterprise IT infrastructure, a company's digital culture and employee technology literacy, and more Recognizing the competencies of these resources and other categories of resources can significantly impact the ability to absorb AI. Since the transformation of the system in organizations, especially in developing economies, is still in its early stages.

Recruiting AI can be difficult due to the lack of employees with AI expertise to allow it to be adopted and integrated into various corporate procedures.

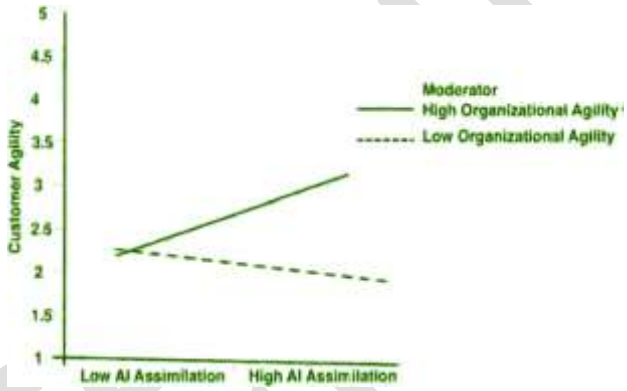

Fig. 11. The moderating role of OA in the link between AI assimilation and CA (low OA = 1SD and high OA = +1S

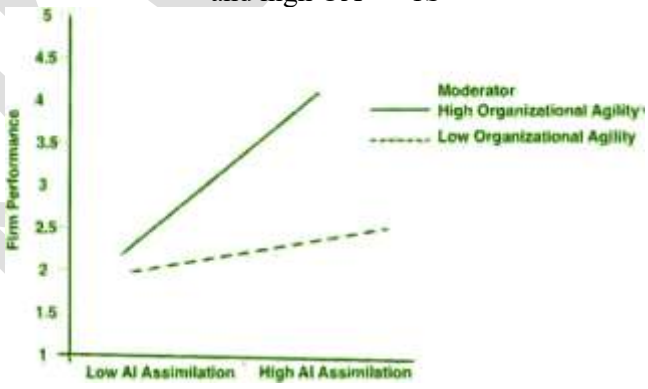

Fig. 12. The moderating role of OA in the link between AI assimilation and FP (low OA = 1SD and high OA = +1SD)

So companies should hire their employees Teach in skills related to IT recruitment. The final findings of the present study showed that AI absorption has a positive effect on CA. This finding should encourage management of small and medium-sized enterprises to increase their knowledge on how to use AI technologies to support CA, especially in

complex and turbulent environments. In a modern world that is facing unprecedented disruptions. AI uptake can be crucial for small and medium-sized enterprises as they can use AI tools to create more value for customers and companies. The findings of the study also reveal the indirect role of AI in attracting AI for company performance.

This shows that LA and AC are complementing the ability to remove AI to achieve corporate performance. Therefore, the management of small and medium-sized enterprises must pay sufficient attention to the needs of customers in order to benefit from the benefits of attracting artificial intelligence for high company performance. Small and medium-sized enterprises should strive to achieve a higher degree of excellence by integrating knowledge gained from abroad into existing procedures and expertise in order to adapt to new configurations of resources.

Such resources include the organizational IT infrastructure, a company's digital culture, and employee technology literacy, among others. Understanding the competencies of these and other categories of resources can significantly impact the ability to adopt AI. Since the transformation of organizations, especially in developing economies, is still in its early stages, AI adoption can be challenging due to the lack of employees with high AI expertise to adopt and integrate it into various company procedures. Therefore, companies should train their employees in the skills related to adopting IT.

The findings of this study also reveal the indirect role of AI absorption for firm performance. This suggests that LA and AC complement AI absorption capabilities to achieve firm performance. Hence, the management of SMEs should pay sufficient attention to customer needs to reap the benefits of AI absorption for high firm performance.

SMEs should strive to achieve a higher degree of integration of externally acquired knowledge into existing routines and expertise to implement new resource configurations to take advantage of market opportunities. This can enable the firm to create services and products that are in line with the ever-evolving business environment and thus enhance their performance.

6. Conclusion

This paper contributes to the emerging body of research on AI at the organizational level, which has received limited attention so far, by examining the impact of AI adoption on operational plans, particularly in developing economies, which are still understudied. The findings of this study also reveal the indirect role of AI adoption for firm performance. This suggests that LA and AC complement AI adoption to achieve firm performance. Hence, SME management should pay sufficient attention to customer needs to reap the benefits of AI adoption for high firm performance.

SME should strive to achieve a higher degree of integration of externally acquired knowledge into existing routines and expertise to implement new resource configurations to take advantage of market opportunities. This can enable the firm to create services and products that are in line with the ever-evolving business environment and thus enhance their performance. Furthermore, the results of AI adaptation can help SME managers understand the level of agility in their firm. This, in turn, emphasizes the impact of AI adoption on CA performance and highlights the need for rapid action to increase the agility of SME.Finally, the study findings suggest that management of SMEs should

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consider C and AC as important complements and DA as a critical organizational factor when building core capabilities to create business value and improve performance. This can be achieved by implementing the necessary strategies that support Changi practices.

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