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The Influence of Network Embeddedness on Innovation Performance of MSMEs. The Mediating Role of Ambidextrous Organizational Learning

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Abstract
Based on resource-based view (RBV) and organizational learning theories, the study has built theoretical conceptual model of multiple networks embedding influencing enterprises' l innovation performance from the perspective of organizational learning. The work discussed the internal mechanism of ambidextrous organizational learning activities affected by embedded relationship, embedded structure and embedded resource influencing technological innovation performance. Through obtaining data form 305 respondents in management of MSMEs in Sierra Leone, the study systematically validated the conceptual model with the structural equation model. It showed that embedded relationship, embedded structure and embedded resource in enterprise organization network can effectively improve the enterprise's organizational learning capability, bringing significant promotion in innovation performance. Wherein, the embedded relationship and embedded resource can promote not only the innovation performance of the enterprise, but also the performance by improving the knowledge management ability of the enterprise. While, the promotion effect of embedded structure to enterprises' technological innovation majorly relies on the fully-mediated The macroscopical trend of modern enterprise networking development and the innovation performance model of Micro, Small and Medium Enterprises (MSME's) also has gradually developed from the single model by taking a new paradigm of network embeddedness and regulated by ambidextrous organizational learning. Many studies (Zahra, Ireland et al. 2000, Yli‐Renko, Autio et al. 2001, Uzzi 2018) have found that network embedding has generally become one of the most important factors that even determine the enterprise innovation portfolio. Networks enhance firms' accessibility to new knowledge, external resources, technologies and new market opportunities (GF1). Polanyi proposed the concept of embeddedness in 1968 and defined it as the degree to which economic activity is constrained by noneconomic institutions. This phenomenon has seen diverse classification but still maintains its central core denotation of organizational relationship and their related economic activities. Morone and Taylor (2004) argues network embedding is one of the most important features in modern organization relationships. Echols and Tsai (2005) define Network embeddedness as a concept regarding "the structure of a firm's relationship with other firms—specifically, the extent to which a firm is connected to other firms" and it was classified into three dimensions by Inkpen and Tsang (2005), namely, cognitive, structural and relational embeddedness. Cognitive embeddedness, on the other hand, represents the shared representations, goals, norms, faith and experience among network members (Le Breton-Miller and Miller 2009, Gölgeci, Ferraris et al. 2019).

Structural embeddedness is also considered as the amount of information the focal firm could obtain from its network, which largely depends on the position of the firm in the network and the number of members in the network (Mazzola, Perrone et al. 2015). Relational embeddedness founded on trust is explained as the degree of quality and cohesive social interaction among network members acting as a community of organizations (Lin, Fang et al. 2009, Wang and Chen 2012). We based this study on resource-based view (Barney 1991, Grant 1991) since network embeddedness provides MSME's with external resources, which could be used to complement internal resources, for competitive advantage. knowledge-based view (KBV) suggested by Grant (1996) is applicable since Innovative knowledge largely represent resources. Network embeddedness concept has been used widely in innovation research to demonstrate its influence to various aspects of innovation in firms. The study of (Mazzola, Perrone et al. 2015) in assessing the effect of network embeddedness on new product development found that the relations between centrality and structural holes had an increasing effect on new product development, while structural holes had no significant effect. Different network positions yielded different payoffs in new technology exploration (Gilsing, Nooteboom et al. 2008) which implies the interaction of network embeddedness in innovation performance has a multiplicative effect on subsidiaries' knowledge transfer (Dezi, Ferraris et al. 2019). (2018). Balland, Dam et al. (2014) clearly illustrated that the business dynamic position, status and the extent of close to the center network in the cluster network directly affect enterprises' ability in studying network embeddedness in industrial cluster innovation.

Organizational learning is also essential for MSME's innovation with external partners (Al-Harrasi 2014).

Scholars agree that firms across organizational boundaries to obtain resources and integrate capabilities of external partners (Yang, Liu et al. 2011) not only maintain moderate RE but also have a high level of learning capacity (Al-Harrasi 2014, Bahrami, Kiani et al. 2016, Bai, Wu et al. 2021). OLC absorb and integrate knowledge and technology needed for service innovation (Bai, Wu et al. 2021). Most study focus on knowledge sharing and trust as mediating variables. Qammach (2016) tested the mediating role of knowledge sharing in the relationship between IT ability and IT support to forecast the innovation performance in the mobile industry. Maciel and Chaves (2017) investigated the mediating role of knowledge sharing on informational status in intraorganizational networks. Akram, Lei et al. (2020) examined the mediating effect of knowledge sharing on the mechanism of organizational justice affecting employee innovative work behavior while Li and Kang (2019) argued that an enterprise, obtaining external resources through knowledge sharing is a passive process depending on the status quo of the partners. Ambidextrous organizational learning is a process of actively acquiring external resources (Bai, Wu et al. 2021) and knowledge which are more important for enterprise innovation. Ambidextrous organizational learning could influence network embeddedness to enhance technological innovation performance since. Li and Kang (2019) believes the deeper the degree of embedding among enterprises, the more advantages enterprises have in improving technological innovation performance through exploitative learning. Nevertheless, few studies have examined the mediating effect of ambidextrous organizational learning. Therefore, the main objective of this paper is to explore the influence of network embeddedness on the innovation performance of MSME's in Sierra Leone, as well as the possible interdependencies among these knowledge linkages. This research will seek to help explain the dynamic role of ambidextrous organizational learning in MSME's through explicit consideration of its influence on innovation outcomes. We adopt the SEM-PLS framework to study interdependences among the dual network embeddedness, innovation performance of enterprises and ambidextrous organizational learning. The rest of the study is arranged as literature review, methodology, results and conclusion.

2. Literature Review

The direct relationship between network embeddedness and innovation performance in various enterprises is well documented in literature. It is well documented that that network resources can promote innovation performance (Sun, Dang et al. 2014). Shi and Zhu (2015)state that network embeddedness can promote enterprise innovation performance. It is also stated that organizational learning has a partial mediating effect on innovation performance. He, Pei et al. (2021) conducted a study among manufacturing enterprises concluded that ambidextrous capabilities can enhance innovation performance. Knowledge network capability has an effect on innovation. This means the ability of a firm to take advantage of knowledge capabilities of partners and allies can influence the innovation outcomes of that firms' products and services (Tong and Han 2021). Another study of manufacturing firms in China conducted by Zhao, Osman et al. (2017) found that relational embeddedness, which is when a firm makes of resources that they have access to because of relationships they have with other firms in their network, is positively related to innovation performance. By sourcing and leveraging this knowledge, firms can gain a competitive advantage over rival without access to these and similar resources and can therefore not match the innovation outcomes (Dezi, Ferraris et al. 2021).

2.1 Empirical Literature

A separate study on industrial clusters conducted by (Gebreeyesus and Mohnen) found that the effect of network embeddedness on innovation performance is not equal among firms. While it remains true that any level of network embeddedness inevitable raises the innovation level in firms (Boschma and Wal 2006), different types of networks carry different assets and information and therefore affect the performance differently (Rodan and Galunic 2004). Innovation has become increasingly socialized, i.e., based on interactions and knowledge flows between economic entities such as firms (suppliers, buyers, and competitors), research organizations, and public organizations. Different networks offer unique opportunities for the presence of a wide array of such linkages. A prominent feature of embeddedness is widespread inter-firm networks supporting frequent and repeated knowledge sharing and collaborative innovation. Some networks are mostly characterized by the presence of powerful leading firms (knowledge gatekeepers) that are able to perform various aspect of R&D and facilitate the "bridging enterprises" linking other organizations in their network with the outside world (Boschma and Wal 2006). Other firms that may be smaller but are highly specialized in a certain area (technology gatekeepers) share and exchange knowledge with only a few selected firms through subcontracting or project collaboration. Those that have better capabilities as compared to those that lack skills for effective knowledge transfer are isolated within the networks (Giuliani and Bell 2005).

Speaking on the importance of network embeddedness for innovation Cong, Zou et al. (2017) stated that it is the most important feature in any modern organization. It facilitates the innovation process, shorter production cycles and advance production processes (Wincent, Thorgren et al. 2014). A study conducted on SMEs in Zhejiang Province in China found that network embeddedness has a positive impact on innovation performance and that

relationship is mediated by knowledge acquisition (Ma & He 28). Although the embedded relationship, integrated structure and shared resources provide conducive conditions for enterprises to obtaining critical knowledge, technology and other resources, these technical resources usually cannot directly be utilized by enterprises. Instead, they need to be assimilated, unified and digested before building competitive advantage, which requires companies with strong knowledge management capabilities. Through the collaborative efforts, investment, cross-training, mutual exchange of workers and other forms of activities, enterprises can achieve multi-level transfer and access of information and knowledge. The knowledge will be filtered, combined, innovated, and then be used for themselves. Two other studies went on the elaborate that the degree to which network embeddedness affect innovation performance is mediates by organizational learning (Jia and Zhang 2014).

For enterprises, knowledge can fundamentally promote the performance of knowledge management, thereby promote the innovation performance of enterprise, and it needs to construct on the basis of network embedded, to form a stable long-term strategic cooperative partnership in order to be able to effectively promote the external access for knowledge, injects innovation vitality for the enterprises Therefore, during the process of exploring the relationship between the network embedding and innovation performance, we should fully consider the impact of ambidextrous organization learning in it. Choosing ambidextrous organizational learning as an intermediate variable, this work explored embedded relationship, network embedded structure and embedded resource's impact on the enterprise technology innovation performance in the perspective of explorative and exploitative organizational learning. Through combing theories, the study built a "network embedding – organizational learning - innovation performance" concept model, and empirically tested MSMEs in Sierra Leone.

2.2 Theoretical Basis

This study is derived from Resource Based View (RBV) and Organizational Learning Theory (OLT). Resources that arise through network relationships can be leveraged to improve innovation performance and give competitive advantage. RBV scholars emphasize the accumulated internal resources and capabilities of an organization are the drivers for innovation and propose that for strategic resources to confer competitive advantage, they must be valuable, rare, imperfectly imitable and difficult to substitute (Barney 1991). Network resources "are assets that are owned by the firm's partners but can potentially be accessed by the firms through its ties to these partners" (Lavie 2007). This school of thought extends the traditional RBV view so as to incorporate resources of a firm's alliance partners into the framework of strategic analysis. Another group of scholars has adopted a relational view, that network resources are interfirm resources and routines which reside in interorganizational ties, such as knowledge sharing processes (Dyer and Nobeoka 2000). These definitions are more appropriate for today's business setting in which network competition is more important than organization competition. This means companies in one network trust each other and cooperate to accumulate shared resources that can be used to gain an overall competitive advantage over other firms.

(Bai, Wu et al. 2021) define organizational learning (OL) as a process of knowledge acquisition between an organization and its environment, the enhancement of an organization's capability to take effective action (Bahrami, Kiani et al. 2016), and the capability to maintain or improve performance within an organization based on experience (Hussein, Omar et al. 2016). OL is important for innovation and profitability. According to Tohidi and Jabbari (2012), OL is the main factor of an organizations' innovation and profit making. The mediation effect of OL has been observed in tech innovation and knowledge alliance (Hirata, Asaba et al. 2000). This is because to obtain the resources, knowledge and culture needed for innovation, good relationships with various important partners is needed (Hong, Zheng et al. 2019). OL Theory therefore, argue that the ability to form a firm's advantages is guided by how well it can learn from its external environment, absorptive capacity, internalizing of knowledge and making use of opportunities to make profit). Extend research on the subject further categorizes OL as ambidextrous organizational learning (AOL) (Andriopoulos and Lewis 2009). This is the process of having two components: explorative and exploitative learning abilities. This means an ambidextrous organization has both the ability to explore new opportunities and learn new knowledge as well as being able to exploit existing Knowledge fully (Simsek, Heavey et al. 2009).

Basing on this theoretical foundation the study drew up the following theoretical framework:

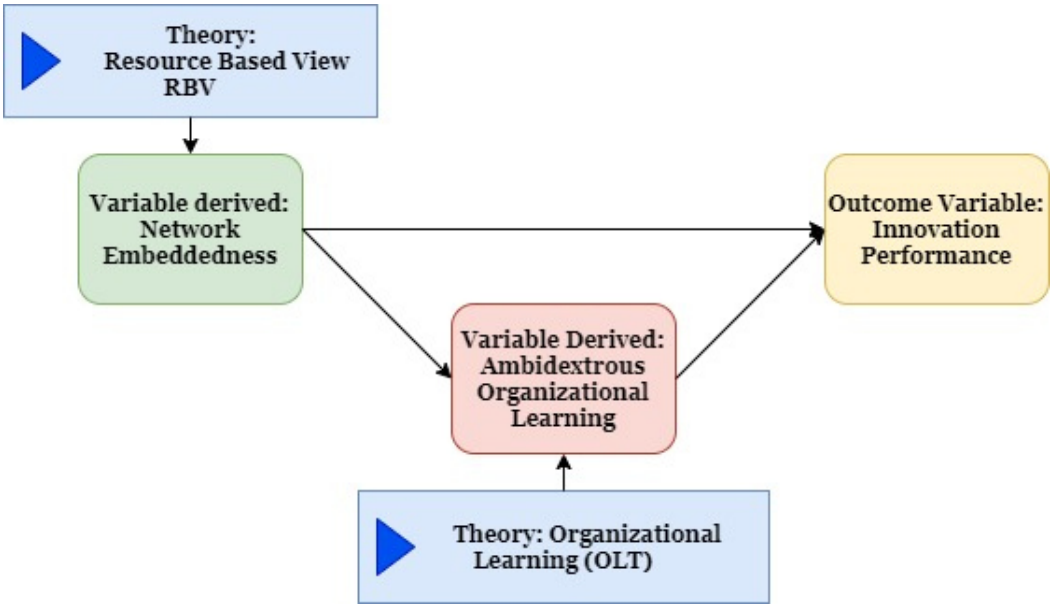

Figure 1: Theoretical Framework

Our literature review highlights the inconclusively of evidence around the effects of internal linkages on innovation performance and the role of interdependence between network embeddedness and organizational learning in explaining innovation in enterprises. It is the opinion of the author that further evidence is needed to extend the theoretical and empirical approaches used I prior studies, in particular to a developing, low-income country.

3. Hypothesis Development

3.1 The relationship between network embeddedness and innovation performance

Innovation performance in this paper refers output realized through the cooperative innovation between MSMEs and external partners in the network. Many scholars have discussed the relationship between innovation performance and network embeddedness. For example, Gebreeyesus and Mohnen (2013) prove that relationship embedding in the network means that firms could promote the transmission of knowledge and the opportunity of learning from each other through communication and coordination, so as to improve innovation performance (Bai, Wu et al. 2021). In terms of the relationship between network embeddedness and service innovation performance, relevant literature is scarce. Chien, Chen et al. (2012) find that network embeddedness has a remarkable impact on the performance of service innovation in e-marketplaces(Akgün, İmamoğlu et al. 2014). The embedded features of firms in a network not only affect the acquisition and use of resources but also affect their behavior and finally bring about the difference in performance and competitive advantages between firms. In the context of Sierra Leone, with the changes in the competitive environment and diverse needs of customers, micro, small and medium-sized enterprises continue to carry out alliance innovation. Due to the lack of relevant theoretical research, it is difficult to support the management and sustainable development of ambidextrous organizational learning. Therefore, it is hypothesized that:

H_1: Network embeddedness positively affects innovation behavior

3.2 *The relationship between network embeddedness and ambidextrous organizational learning*

From the perspective of RBV, a firm acquires and integrates the resources and capabilities of external partners across organizational boundaries, in addition to maintaining a high degree of embeddedness with partners and building the appropriate relational embedding configuration, must have a high level of learning capacity (Akgün, İmamoğlu et al. 2014). In other words, the performance of innovation activities could be improved by absorbing and integrating the resources needed for innovation from the perspective of learning (Gachanja, Nga'nga' et al. 2020). Network resources could be continuously converted into the practice of firms (Hussein, Omar et al. 2016). To improve the learning capacity of service innovation, a firm may rely on good external relationships to obtain new product information, understand customers and market demands, integrate the information and knowledge distributed by network members, and form a complete knowledge base through close relationships (Antunes and Pinheiro 2020). Ebers and Maurer (2014) argue that network embeddedness has a positive impact on AOL. The longer the relationship between firms lasts, the higher the frequency of cooperation. The greater the intensity of cooperation is, the easier it is to form trust between each other (Hong, Zheng et al. 2019). Trust among network partners improves the accuracy of knowledge acquired from external partners and becomes an effective mechanism

to ensure the quality and reliability of information and knowledge obtained from partners. From these, it is hypothesized that:
H_2: Network embeddedness has a positive effect of ambidextrous organizational learning

3.3 *The relationship between ambidextrous organizational learning and innovation performance*
AOL consists of explorative learning and exploitative learning. The former is used to absorb external information and knowledge, including the capacity to acquire and digest knowledge (Hong, Zheng et al. 2019). The latter is adopted to integrate and apply internal and external knowledge (Huang and Huang 2019). In the context of MSME's, AOL plays a vital role in the process of searching and applying internal and external knowledge and information and integrating it into innovative activities. Organizational learning could increase the innovative knowledge of an organization through continuous exploration and discovery (Bahrami, Kiani et al. 2016). The abundant knowledge the organization has accumulated through learning would help it to take advantage of favorable opportunities, make profits for the firm, and promote its innovation performance. The findings of many scholars verify that AOL has a positive influence on organizational innovation capacity. For example, (Tohidi and Jabbari) prove that organizational learning is a critical factor for organizational innovation and introduced five factors of organizational learning on product innovation performance. Turi et al. argue that cognitive learning factors have a significant impact on sustainable organizational development (2019). Ali et al. propose that, under the same organizational conditions, organizational learning could increase the capacity of an organization to innovate (2018). Therefore:
H_3: *Ambidextrous organizational learning has a positive effect on innovation performance*

3.4 *The mediating role of AOL*
Based on Organizational Learning Theory, AOL is very important for firm innovation. Tohidi and Jabbari analyze that learning is the main factor for an organization to maintain innovation, so as to make it a profitable firm (2012). AOL depends on the external environment, and the core of the external environment is the microenvironment built between the firm and its network partners. According to its strategic objectives, the firm determines the number of network partners and the level of embeddedness. However, whether the knowledge, information, and other resources acquired through relational embedding could contribute to the improvement of innovation performance and the degree of performance improvement would depend on the ability to absorb and integrate knowledge and information. In addition, organizational learning is not only the learning of knowledge but also the absorption of culture, adaptation of environment, and other soft aspects. According to the above reasoning and deduction, AOL may have a mediating effect on relationship between network embeddedness and innovation performance. Therefore, it is proposed that:
H_4: Ambidextrous organizational learning mediates the relationship between network embeddedness and innovation performance
From these we can draw up the following conceptual framework:

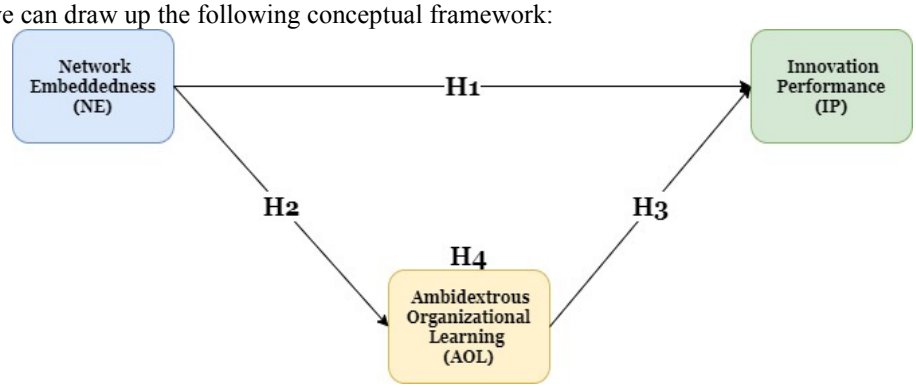

Figure 2: Conceptual Framework

4. Research Design
4.1 *Sample and Data Collection*
Data were collected by telephone inquiry, emails and questionnaire. In the process of the data collection, the researchers sent emails and made phone calls to managers who are very familiar with the situation, confirming to the importance of the research and the rationality of the research framework, and making a preliminary discussion on the questionnaire items in this study. Adhering to Covid-19 epidemic control protocols, the response of the questionnaire was compiled with the assistance of an online questionnaire software (SurveyMonkey). In ensuring the quality of the survey questionnaire, the respondents were required to be familiar with the cooperative matters of the enterprise. The degree of respondents' familiarity with the external cooperation affairs of enterprises is a

crucial control factor and divided into five level scale: very unfamiliar, unfamiliar, common, familiar, and very familiar, and only the familiar and very familiar interviewees were invited to complete the questionnaire. In this survey, a total of 400 questionnaires were issued, 348 of which were completed and returned. Out of the number received, 43 had invalid response and they eliminated after the follow up could not yield results. A total of 305 valid questionnaires were used for further analysis, with an effective recovery rate. Table 1 presents the structure characteristics of the sample.

Table 1 Structure characteristics of the sample

Variable	Item	Sample size n= 305	Percentage (%)
Gender	Male	156	51
	Female	149	49
Firm size	<50	73	24
	No. of Employees: 50~100	171	56
	>100	61	20
	<100,000	174	57
	Asset size (USD): 100-250,000	79	26
	>250,000	52	17
Respondents Familiarity with business	Very unfamiliar	9	3
	Unfamiliar	15	5
	Common	37	12
	Familiar	110	36
	Very familiar	134	44
Corporate experience	Very not rich	21	7
	Not rich	37	12
	Common	37	12
	Rich	85	28
	Very rich	125	41

4.2. *Measurements of Research Variables*

The questionnaire includes questions on network embeddedness, innovation performance, and ambidextrous organizational learning based upon the previous studies. As most of these variables are difficult to be measured objectively and quantitatively, this study adopts the Likert five-grade scale scoring method to measure them. A Likert scale of 1 to 5 indicates disagreement to agreement or a transformation from low to high.

4.2.1 Measuring network embeddedness

Different definitions of network have been used in the empirical studies on network embeddedness. In this study we focus on embeddedness in local business networks, which include linkages with buyers, suppliers, and competitors of mainly MSME's. In section three we have shown that these business networks are the main source of knowledge for MSME's and are mainly in the form of information and experience exchange. Nevertheless, we try to differentiate the knowledge content of these business interactions from the simple goods (or trade) based relationship between buyers and suppliers. The intensity of the relationship with business partners concerning knowledge sharing is defined as the sum of the number of buyers, suppliers, and competitors with whom MSME's collaborates on information and experience exchange. This is consistent with other studies Gilsing, Nooteboom et al. (2008), who focus on the sources of information and exchange of knowledge irrespective of its connection to the flow of goods. In this work network embeddedness was a first-order variable with eight latent factors as similarly, used in the study of (Cong, Zou et al. 2017) : the quality, strength, durability of relationship, network density, enterprise network centrality, structural holes, strategic resources possessed by enterprises and its cooperative.

4.2.2 Measuring innovation performance

Innovation is "the process by which firms master and implement the design and production of goods and services that are new to them, irrespective of whether they are new to their competitors, their countries, or the world" (Mytelka 2000). In measuring innovation performance, we asked five related first-order questions as Dogbe, Tian et al. (2020) and Gebreeyesus and Mohnen (2013): We are able to develop new products/services with speed, we are able to launch new products/services on time, our new products/services are innovative, our new products/services improve corporate image and we are able to improve managerial skill. These innovation activities could be categorized in the standard way as new products, new processes, and organizational changes towards enhancing performance.

4.2.3 Measuring ambidextrous organizational learning

Ambidextrous organizational learning (AOL) is the ability and advantages enjoyed by MSME's to learn from its external environment, absorbing and internalizing knowledge, and making use of exiting knowledge and market

opportunities to make profits for enterprises (Farsani, Bidmeshgipour et al. 2012). Ambidextrous organizational learning is based on existing knowledge and experience, identifying, digesting, and absorbing external technical knowledge and developing new products of symbolic market trends and could be refined into knowledge acquisition ability, recognition ability, and understanding and digestion ability (Tohidi and Jabbari 2012). We adopted same measurement model of (Chung, Yang et al. 2015) in assessing the two first order variables being explorative (EPR) and exploitative (EPT) learning of AOL is a second order variable comprising of two first order explorative learning EPR1; In information search, we focus on acquiring knowledge of product/service strategies that involved experimentation and high market risks. EPR 2; We prefer to collect information with no identifiable strategic market needs to ensure experimentation in the new product/service development. EPR 3; Our aim is to acquire knowledge to develop a product/service that led us into new areas of learning such as new markets and technological experience) and exploitative learning also with 3 latent factors (EPT1; We emphasize the use of knowledge related to our existing product/service experience. EPT2; We search for the usual and generally proven methods and solutions to new product/service development problems. EPT3; Our aim is to search for information to refine common methods and ideas in solving problem in the new product/service development). The reliability and Validity of the variables is shown in Table 2.

Table 2: Test results of reliability and validity

Variable	Items measuring	Factor Loading	Reliability (Cronbach's α)
Network Embeddedness (NE)	NE1: Quality of network relationships	0.735	0.792
	NE2: Strength of network relationships	0.631	0.776
	NE3: Durability of network relationships	0.651	0.783
	NE4: Network Density	0.673	0.799
	NE5: Enterprise Network Centrality	0.479	0.787
	NE6: Structural Holes	0.493	0.792
	NE7: Strategic Resources of Enterprise	0.697	0.748
	NE8: Strategic resources of network	0.503	0.801
Innovative Performance (IP)	IP1: New products/services with speed	0.694	0.867
	IP2: New products/services in time	0.509	0.785
	IP3: Innovative new products/services	0.632	0.882
	IP4: Improved Corporate image	0.637	0.749
	IP5: Improved Managerial Skills	0.575	0.765
Ambidextrous Organizational Learning (AOL= EPR+EPT)	EPR1: Knowledge Acquisition	0.526	0.775
	EPR2: Information of New products/services	0.674	0.763
	EPR3: Knowledge of new markets and tech	0.632	0.752
	EPT1: Use existing Knowledge and experience	0.651	0.831
	EPT2: Use usual, proven methods	0.623	0.882
	EPT3: Refine common methods and ideas in problem solving	0.681	0.812

4.3 *Model Calculation*

To effectively understand and analyze the internal relationship and interaction strength between the variables, we design structural equation model, as shown in Figure 3. Specific decomposition is as follows. Network embeddedness is designed as a first-order exogenous variables made up of eight latent constructs. Innovative performance is also a first order exogenous variable made up of 5 latent constructs. Ambidextrous Organizational Learning is a second-order construct made of 2 first order exogenous variables with 3 latent variables each.

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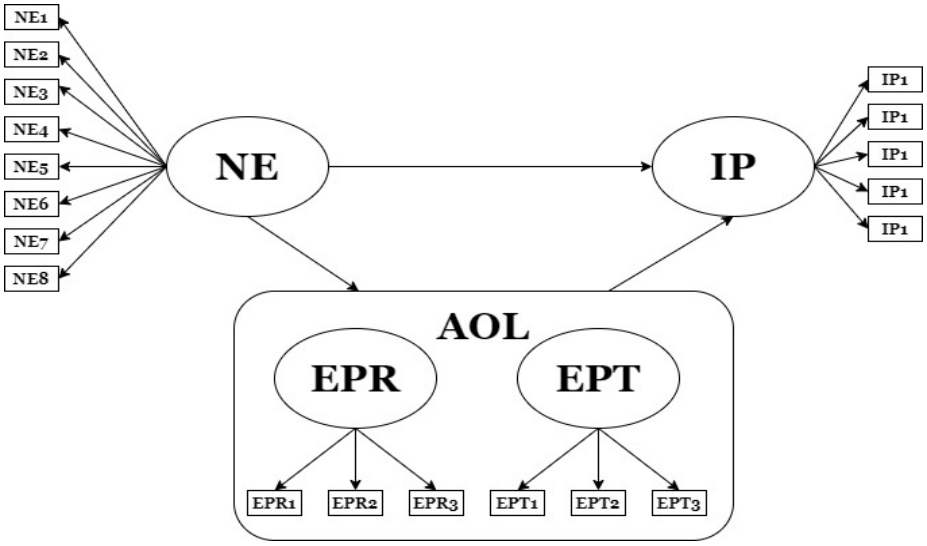

Figure 3: Mechanism model of network embeddedness on innovation performance under the influence of ambidextrous organizational learning

Test indicators of impact mechanism model of innovation performance include chi-square index (χ2/df), goodness of model fit index (CFI, GFI, TLI, NFI, IFI) and the root mean square error of approximation (RMSEA). In this work, Table 3 shows the fitting situation of the overall theoretical models. Wherein, χ2/df is 2.993 (between 1 and 3). The index values of IFI, CFI, and NFI are at levels above 0.9. Though indicators of GFI, TLI do not reach the level of 0.9 (closes to 0.9), indicating that all the fitting indicators reach acceptable levels. Moreover, RMSEA = 0.068 < 0.080. Therefore, all relevant indicators values are within the acceptable range.

Table 3: Analysis of Goodness-of-fit of the structural equation model

Fitting indicators	χ2	F	χ2/df	RMSEA	CFI	GFI	NFI	IFI	TLI
Value of fitting indicators	284.318	5	2.993	0.068	0.068	0.068	0.943	0.876	0.862

4.3.1 Calculation of results

After the calculation of relevant data, Figure 4 shows the structural equation model, illustrating the effects of network embeddedness on innovation performance. In this work, the analysis of the data results of hypothesis H1 (embedded network relationship has a significant positive effect on innovation performance) and hypothesis H2 (embedded network relationship has a significant positive impact on organizational learning) are as follows. As Figure 4 shows, the path coefficient of the impact of embedded relationship on organizational learning is 0.602, with a significant level of 0.001. It indicates that hypothesis H1 obtains support from the operation of result equation model. Similarly, the path coefficient of the impact of embedded network relationship on innovation performance is 0.502, with the same significant level. Namely hypotheses H1 and H4 acquire data analysis support. The results further show that company's network embeddedness significantly promotes organizational learning and innovation performance. In other words, it is of great importance to build high-quality, multi-level, long-term and stable relationship between companies and members of the network, enhancing their organizational learning and innovation performance.

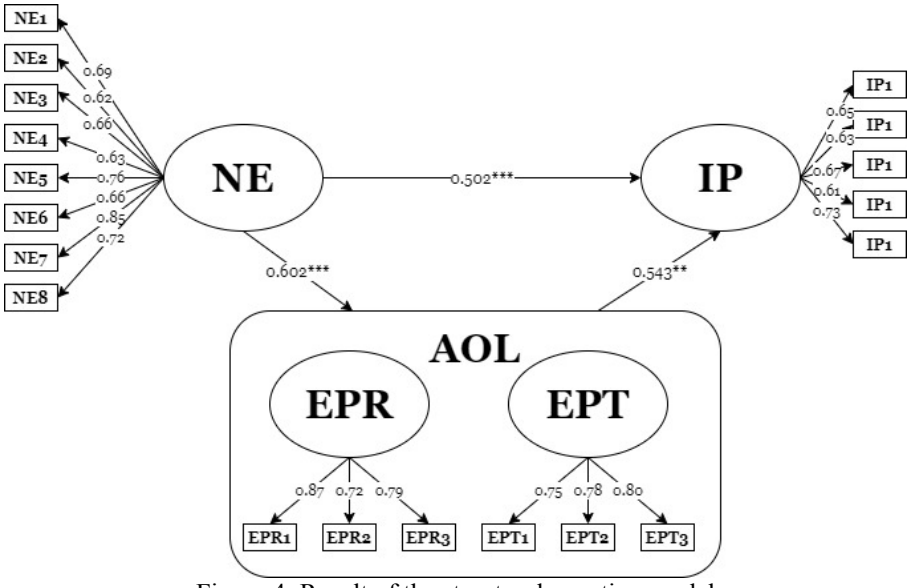

Figure 4: Result of the structural equation model

In this work, the analysis of the data results of hypothesis H3 (organizational learning has a significant positive effect on innovation performance) are as follows. According to Fig. 4, the path coefficient of the impact of organizational learning on innovation performance is 0.543, with a significant level of 0.01. It indicates that hypothesis H3 obtains support. Therefore, hypothesis H3 (organizational learning has a significant positive effect on innovation performance) is verified by structural equation, which is consistent with the conclusion of regression analysis earlier. From another level, in terms of the impact of embedded structure on innovation performance, this conclusion indicates that organizational learning plays a mediating role in this perspective fully.

4.3.2 Test of Mediating Effect of AOL

Based on the conceptual model of the impact mechanism of NE on the IP constructed in Figure 2, we set up the initial SEM (see Figure 3) and then use SmartPLS software to analyze the initial SEM. +e fitting results are obtained as shown in Table 3. The hypotheses are then verified according to this model as:

Hypothesis 1: NE has a positive effect on IP, with a standardized coefficient of 0.32 and a probability level of 0.001.

Hypothesis 2: RE has a positive effect on OLC, with a standardized coefficient of 0.44 and a probability level of 0.001.

Hypothesis 3: AOL has a positive effect on IP, with a standardized coefficient of 0.11 and a probability level of 0.05.

Hypothesis 4: As shown in Figure 4, NE, AOL, and IP are simultaneously entered into the SEM for path analysis. The results show that when the regression coefficients between NE and AOL and between AOL and IP are significant, the regression coefficient between NE and IP is also significant. It indicates that AOL partially mediates the relationship between NE and IP.

4.3.3 Model Interpretation

In the SmartPLS software, the index of Square Multiple Correlations depicts the explanatory degree of NE on IP. In this study, the degree to which AOL and IP are explained is shown in Table 4. The results show that the explanatory degree of AOL is 0.524, and the explanatory degree of IP reaches 0.687.

Table 4: Results of model interpretation

	AOL 0.524	IP 0.684
NE	√	√
AOL		√

5. Analysis and Discussion

Under the view of ambidextrous organizational learning, we conducted empirical research on the impact of network embeddedness on l innovation performance. The results show that hypotheses we proposed are basically verified. Overall, from the perspective of ambidextrous organizational learning, we built the theoretical model of the impact mechanism of network embeddedness on innovation performance. In this model, the enterprise ambidextrous organizational learning is a central part. Furthermore, the level of ambidextrous organizational learning directly determines the success of innovation as well as the level of innovation performance. Meanwhile, in the structure model of ambidextrous organizational learning, knowledge acquisition is the most core part. Four

factors that stand out in this model: knowledge acquisition, knowledge integration, knowledge creation, and knowledge application. Based on it, the factor loading coefficient of knowledge acquisition is the highest, reaching 0.87. That is, knowledge acquisition is the most important among the four factors, which is consistent with the actual situation of enterprise ambidextrous organizational learning in fact. Knowledge is the most intensive input elements of innovation. As a result, the multi-channel knowledge acquisition ensures knowledge reserve, providing the basis to guarantee smooth implementation of knowledge integration, knowledge creation and knowledge application for the subsequent enterprises. It also indicates that, to improve the competitiveness in the era of knowledge economy, enterprises must establish multi-level and comprehensive knowledge acquisition channels, providing effective protection for the input of knowledge and innovation resource of enterprises. In the second important place is knowledge application, which is the final output product of knowledge acquisition, knowledge integration as well as knowledge creation. Therefore, as an important input feature of enterprise innovation, the effectiveness of knowledge application has a direct impact on the construction of core competitiveness. Moreover, it is the key to the success of enterprise innovation and the continuous improvement of innovation performance.
Based on the regression analysis of relationship between embedded relationship and ambidextrous organizational learning, the strength, quality and durability of relationships related to embedded relationship promote enterprise ambidextrous organizational learning and innovation performance. All of them pass the significance verification. According to correlated results of analysis, it is crucial for the enterprise and network members to maintain high-quality, deep-seated, and multi-faceted long-term cooperative relationship. For the reason that it expands the source of knowledge and improves the quality of knowledge acquisition. Additionally, it achieves large-scale range of knowledge integration and enhances application capabilities of knowledge. Consequently, new knowledge is created, applied to the development of new products, promoting innovation performance. Under the view of ambidextrous organizational learning, we built theoretical model about impact mechanism of multi-network embeddedness on innovation performance. From the perspective of network embeddedness, it does not play a direct role in innovation performance, but indirectly influences innovation performance, with ambidextrous organizational learning playing an intermediary role. Figure 3 shows the direct effect of network embeddedness on innovation performance is significant. Therefore, it signifies that ambidextrous organizational learning completely plays an intermediary role in the effect of network embeddedness on innovation performance, with their own conduction mechanisms. This also shows that, while maintaining the other conditions remain unchanged, the variable of network embeddedness ascends a unit, and innovation performance will increase 0.502 units totally. This work suggests that dense network reduces the development and living space of enterprises, resulting in a depressing feeling within the enterprise. Moreover, it stifles innovation vigor and desire. With a long history, enterprises at the network center position tend to form a step-by-step development model and operation mechanism, increasing barriers to the implementation of effective innovation. Therefore, its impact on innovation performance can only be achieved by their ambidextrous learning activities. From the point of view of embedded resources in the theoretical model, it not only has a direct effect on the innovative performance, but also influences innovation performance indirectly through organizational learning. Based on the SEM model in Figure 4, the direct effect of network resources on performance is 0.237 while the indirect effect is 0.262 (0.578 × 0.453). That is, the variable of embedded resources produces overall impact effect through the impact of it on l innovation performance and the conduction mechanism of ambidextrous learning. Namely keeping the other conditions unchanged, the variable of embedded resources increases a unit, and the technological innovation performance will increase. According to the regression analysis of relationship between embedded resources and ambidextrous learning, we conducted the analysis of the impact of embedded resources (related to strategic resources possessed by the enterprises and its cooperative) on ambidextrous learning and technological innovation performance. All pass the significance test with data support. Therefore, from the results of the entire empirical analysis, it can be concluded that the differentiated strategic resources owned by the company is crucial to the survival and development. Besides, it is a source of competitive advantage, and the stepping stone of establishing their position in the network as well as cooperation with other company. Meanwhile, strategic resources owned by the cooperative enterprises enable enterprises to become more powerful and effective, creating more room for development.

During the process of modern enterprise innovation activities, as its most critical core elements, knowledge has a profound impact on its innovation performance level in terms of control of the amount and improvement of the quality. This makes ambidextrous organizational learning activity (such as foreign knowledge acquisition, knowledge integration, etc.) particularly important. As a result, in the long process of development, enterprises should continuously develop its extensive and effective social networks. Additionally, it is supposed to establish their own important role in the network, and promote the effective ambidextrous organizational learning. Thus, it enhances enterprise innovation performance and builds core competitiveness of the long-term development. To better understand the impact mechanism of embedded networks on the enterprise innovation performance under different situations, this work used the basic method of regression analysis and structural equation. We built basic conceptual framework of the relationship between embedded network and ambidextrous organizational learning as well as innovation performance. On the basis of it, seven major basic hypotheses were proposed. According to

the systematic analysis of related data conducted by SmartPLS software, the obtained basic conclusions that are detailed in the following section.

6. Conclusions

6.1. *Conclusions and Discussions*

This study focuses on explaining the mediating mechanism of AOL on the relationship between NE and IP. Theoretical construction and empirical research approach are adopted. Drawing on Resource Based View and Organizational Learning theory, a theoretical model and four research hypotheses are presented. A sample of 305 respondents from MSMEs firms in Sierra Leone is analyzed to test the hypotheses. the results show that the hypotheses proposed in this paper are verified. The research conclusions are as follows.

Firstly, NE has a positive influence on AOL and IP. Data analysis shows that NE (including relationship durability, degree of cooperation, closeness of interaction, and satisfaction with the relationship) in the network has a significant positive effect on the flow of knowledge between firms, the learning capacity of firms, and IP. The conclusion supports the viewpoints of (Kalmuk and Acar 2015, Hong, Zheng et al. 2019). Secondly, AOL partially mediates the relationship between NE and IP. Data analysis shows that, after the addition of the AOL variable, the impact of NE on IP is still significant. It indicates that AOL plays a partial mediating role in the mechanism of the impact of NE on IP. Namely, in the case of appropriate relationship embedding, communication and coordination between enterprises can promote the transmission of knowledge and opportunities for mutual learning, so as to obtain knowledge and improve innovation performance. the conclusion supports the viewpoints of (Kalmuk and Acar 2015, Hong, Zheng et al. 2019).

Under demand-dominant logic, service has become an indispensable and important factor in the survival and development of small enterprises. In the process of service innovation, a company acts as a living organization, and the improvement of learning ability directly determines innovation performance. Because MSMEs mainly exist in the form of small owners, it is difficult to provide high-quality services based on their own capabilities. In order to meet the needs of big businesses, these companies cooperate with other companies to innovate and try to meet the service needs of bigger players in their respective network. This paper verifies that NE can positively affect service innovation performance by promoting AOL. In fact, due to the complexity and diversity knowledge involved in the innovation process, any organization cannot exhaust all the knowledge needed for innovation, which limitation of resources greatly restrict the innovation ability of enterprise, innovation success rate decreased, it makes the companies lonely to practice service innovation behaviors increasingly rare. As a result, more and more companies begin to cross organizational boundaries, through the advantages on differentiation resources occupy, to establish different levels partnerships with market members, and seek a favorable position in business partnerships, to achieve the addition of innovative knowledge and other resource, and conform the innovation composition forces, promote the upgrading of innovation performance.

Although some meaningful conclusions have been drawn in this research, there are still some limitations. Due to the limitation of research conditions, this research only investigates the influence of NE. Future research could investigate the relationships between relational embedded configuration with external partners in different fields and IP through AOL.

6.2. *Management Implications.*

Nowadays, MSMEs are facing fierce competition and differentiated needs of customers. They need to survive and maintain sustainable development through service innovation. From the research conclusions of this paper, MSMEs can get the following management implications. Firstly, they need to improve the degree of relational embedding with external partners and enhance the quantity and quality of the interaction. It would be beneficial to raise the relationship with partners to the strategic height and pay attention to the quality and long-term maintenance of the relationship with partners. Secondly, MSMEs could give full play to the mediating effect of AOL and cultivate AOL. Specifically, MSMEs could cultivate OLC from two aspects. On one hand, it is vital for a firm to take its relationship with external partners as a strategic resource. A firm could record and track the whole process of acquiring knowledge from partners. Above all, it needs to summarize the successful experience and failure lessons to improve the ability to manage knowledge and resources between firms and finally transform these learning processes and learning ability into a firm's progress. On the other hand, a firm needs to arrange full-time employees to deal with matters of various external partnerships and is committed to the promotion of OLC. In addition to clarifying the responsibilities of employees, firms should give them sufficient training to improve their professional skills in relationship management and organizational learning, so that they can more effectively complete the tasks assigned to them by the firm.

The conclusions of this study can help enterprises to understand how network embedding affects enterprise's innovation performance through ambidextrous organizational learning activities, which can improve the effective cooperation with network members and promote innovation performance of enterprises and the whole network. To analyze the influence of network embedding on technology innovation performance of enterprises from the

perspective of knowledge, we achieve a new research perspective about the relationship between the network embedding and technology innovation performance.

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