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Knowledge Management Capabilities on the Performance of Startup Companies: Evidence from Startups in Kerala

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Abstract:-

➢ ***Purpose:***
The purpose of the study is to point out the importance of knowledge management in startup companies. For this, four knowledge management processes—knowledge acquisition, conversion, application, and protection—that may have an impact on startup companies' performance are closely examined.

➢ ***Design, Methodology, and Approach:***
The empirical research was conducted by participating 250 startup companies that are registered in the Kerala startup mission from 2015 to 2020, and structural equation modeling (SEM) was applied to determine the relationship between the knowledge management process and startup performance.

➢ ***Findings:***
The study supports the resource-based view theory by stating that knowledge management is essential for newly established ventures. It has been found that both knowledge conversion and protection play significant roles in the performance of startup companies. While acquisition and application are insignificant.

➢ ***Social Implication:***
This study has several implications, one of which is that institutions and government bodies should focus on implementing knowledge management strategies.

➢ ***Research Limitation:***
The study has some drawbacks, including the fact that it only included 250 startup companies from Kerala and had a limited sample size. Therefore, generalizations in a global setting are challenging. Second, other intangible assets that fall beyond the scope of the study also have an impact on how well startup businesses perform.

➢ ***Originality or Value:***
The study gives startup founders insight into how knowledge management is important at each stage of their firm's life cycle and affects their ability to raise startup funding.

➢ ***Paper Type:*** **Research Paper**

Keywords:- *Knowledge Management, Startup Companies, Structural Equation Modeling, Performance.*

I. INTRODUCTION

The concept of knowledge management plays a prominent role in the performance analysis literature (Desouza & Awazu, 2006; Oliva & Kotabe, 2019). As startup companies are new ventures, they are required to maintain a sufficient amount of intangible assets in the form of intellectual capital (Anwar et al., 2018a), marketing strategies, and knowledge management practices (Kianto et al., 2014). In addition to that, entrepreneurship literature supports the idea that knowledge management has a momentous role in the economic, social, environmental, and technological performance of startup companies (Viswanathan& Arunima KK. 2020). Besides, startups at their seed stage are required to maintain networking with various stakeholders in the startup community. In such a way, knowledge acquired from different communities is effectively managed to ensure a scalable business model (Salamzadeh& Kirby, 2017).

Knowledge management emerged during the 1990s, and there is no universally accepted definition for knowledge management. According to Yang (2011), knowledge management is the effective utilization of knowledge resources for exploiting new opportunities and enhancing competitive advantages. It is, therefore, appropriate to adopt the structural process of knowledge management such as acquisition, conversion, transfer, and storage (Oliva & Kotabe, 2019), and it has wide application in different sectors for assessing the performance of the organization, such as the service industry (Valacherry & Pakkeerappa, 2020), manufacturing industry (Tan & Wong, 2015), etc. Startups are frequently viewed as tools for value generation and innovation. Similarly, the expansion of these businesses boosts the entire economy by increasing GDP, creating jobs, and fostering overall societal advancement (Salamzadeh & Kirby, 2017). Regardless of the situation, entrepreneurs seek out challenges in the early phases of their operations to boost competitiveness. They may have failed in their early phases as a result of a variety of difficulties, including a failure to establish Minimum Viable Products (MVP), value generation, and the deployment of adequate human resources

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(Salamazadeh and Hiroko, 2015). According to Salamazadeh & Kirby (2017), every startup goes through seven stages in its life cycle. The process starts with the development of an original idea that could attract funding from investors. Then comes the second stage of the startup, with the preparation and shaping of entrepreneurial mindsets. After that, they must establish effective networking with a wide range of stakeholders before they can enter the market and add value to their offerings (Lee et al., 2001). Finally, once the company has reached its growth goal, it can move forward with IPO or merger and acquisition strategies. So, each stage of their life cycle requires effective knowledge management for developing a unique business model.

The Kerala startup ecosystem was established to encourage the younger generation to build their own companies rather than seek out traditional jobs. Additionally, Kerala startups have a unique way of bringing together businesses, startups, investors, and research and development teams. The Kerala Startup Mission has had a significant impact on the growth of the entrepreneurial culture in the state. According to reports, it has 40 business incubation centers and more than 3900 registered startups. In 2021, one startup from Kerala entered the unicorn list, which is the 100th from India.

Various theories explain the functions of entrepreneurship activities, and among them, the resource-based view theory (RBVT) asserts that every firm has a sufficient number of specific resources. So effective utilization of all these resources, such as intellectual capital, entrepreneurial strategies, and knowledge management, is essential for the performance of newly established ventures (Anwar et al., 2018). There is also a gap between resource-based theories on the performance of newly established ventures and many entrepreneurship literature studies on concentrated knowledge management in established ventures (Valacherry & Pakkeerappa, 2020). Therefore, the study seeks to test the effect of knowledge management capabilities on the performance of startup companies. Previous literature explains that there are different processes of knowledge management, and the present study takes the KM process into four dimensions, such as acquisition, conversion, application, and storage of knowledge. Meanwhile, the present study provides a better insight into the KM culture in the Kerala startup ecosystem. This study was divided into various sections. The first section includes a review of the literature on key organizational and knowledge management process dimensions. Then details about the methodology and validity and reliability measurements are presented. After that, data analysis using structural equation modeling is developed. Finally, a conclusion and implications are presented.

II. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Several academicians studied the different tangible and intangible assets that impact the performance of startup companies (Anwar et al., 2018), and little attention was given to understanding the impact of startup performance based on various know-how and intangible assets used by the organization. So, the present study concentrated on taking knowledge management capabilities as the measure for evaluating startup performance (Oliva & Kotabe, 2019). Knowledge management capabilities are meant to intentionally create knowledge within the organization (Chiu & Chen, 2016). According to Gold et al. (2001), knowledge management involves four phases: knowledge acquisition, conversion, application, and protection. Based on that, the following hypotheses were formulated:

A. Knowledge Acquisition

Knowledge acquisition is a fundamental element of the knowledge management process. It is the procedure for gathering information from both internal and external sources. External knowledge comes from customers and suppliers, whereas internal knowledge is created within the organizational repository (Tan & Wong, 2015). In other words, it is the capacity to absorb from a variety of sources, which ultimately results in innovation (Chiu & Chen, 2016). There are numerous names for acquiring knowledge, including creation, generation, seeking, and others, and they are all interchangeable in context (Gold et al., 2001). Similarly, knowledge that is collected from various sources and added to the existing literature is also referred to as acquisition (Inkpen et al., 2016). Effective knowledge Acquisition requires sufficient experience in making decisions about where to acquire knowledge, what sources are available, etc. (Valacherry & Pakkeerappa, 2020). The result of this process is how it can convert personal knowledge into organizational knowledge. So, they may adopt collaboration with people and organizations to ensure effective KM (Garcia-Perez-de-Lema et al., 2020; Mention, 2016). Similarly, startups that are incubated in business incubators can experience failures and successes in the same ecosystem, and internal knowledge is created with them (Viswanathan & Arunima K., 2020).

B. Knowledge Conversion

Every founder is required, as part of the knowledge conversion process, to efficiently manage and use the adequate knowledge gathered from various sources (Gold et al., 2001). In other words, this is how tacit information is transformed into explicit knowledge (Chiu & Chen, 2016). Similar to this, it can be used to eliminate redundant information and outdated knowledge while integrating knowledge from many sources (Gold et al., 2001).

C. Knowledge Protection

There should be proper care given when dealing with knowledge, and knowledge protection may be formal or informal according to the size of the organization (Bolisani et al., 2013), and every firm cannot use intellectual property rights such as trademarks, patents, and copyrights. Firms still adopt some of their codes of conduct to generate knowledge protection practices (Gold et al., 2001). Even with these protection measures, there is also risk associated with the knowledge protection measures, and firms nowadays use encryption to make their communication channels safer (Thalmann & Sarigianni, 2016).

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D. Knowledge Application

The application of knowledge is the focal point of knowledge management. An organization can hasten the creation of new products by implementing KM. Numerous authors have discovered that innovation is the result of knowledge application, which enables them to make wise decisions and solve problems (Ode & Ayavoo, 2019). Similar findings were made by Valacherry and Pakkeerappa (2020) in their studies, which indicated that management support and project knowledge application add value to the software industry. As a result, it is possible to conclude that knowledge application significantly affects the performance of startup companies.

E. Startup Performance

A startup is a new venture that contributes to economic growth and employment generation. Many factors affect the performance of startup companies. As these are new to the market and environment, they find difficulty acquiring more tangible resources because of their limited operations (Tanha et al., 2011). In such a way, they should concentrate on intangible assets rather than tangible assets. That intangible resource may be taken in the form of intellectual capital, entrepreneurial orientation, marketing strategies, and knowledge management (Anwar et al., 2018a). Many others in the entrepreneurship literature suggest that intellectual capital positively contributes to the performance of startup companies. Intellectual capital consists of knowledge and abilities possessed by the human being, their ability to maintain relationships with outsiders, the infrastructure used by them, etc. So the incorporation of all these contributes to the performance of startup companies (Peng & Pike, 2014). On the other side, a lot of business incubation facilities support start-up businesses. They help by offering funding, incubator space, and technical support. New ventures achieved their financial goals thanks to their assistance and business networks. Similar to how businesses adopt different tactics, entrepreneurs do so as well. These strategies might take the form of creativity, taking calculated risks, or being proactive. Numerous researchers from both developed and developing countries have undertaken studies that show how a focus on entrepreneurship enhances startup performance. (Kemp, 2013; Management et al., 2015; Sedita et al., 2018; Zreen et al., 2019).

Therefore, it is clear from all of the above that a variety of factors influence how well newly founded businesses perform. Knowledge management is an intangible resource component that affects the performance of startup companies. (Centobelli et al., 2017) conducted a systematic literature review regarding how knowledge management affects the performance of startup companies and found that it contributes to technological, financial, and human performance. Based on these, the following hypotheses were formulated:

- H1: Knowledge acquisition positively contributes to startup performance.
- H2: Knowledge conversion positively contributes to startup performance.
- H3: Knowledge protection positively contributes to startup performance.
- H4: Knowledge applications positively contribute to startup performance.

III. METHODOLOGY

The research used a structural equation modeling (SEM)-based empirical investigation, and the sampling method used was stratified cluster sampling, which involved grouping all startups in Kerala according to their geographic location. Startup founders who have registered for the Kerala Startup Mission between 2015 and 2020 are the respondents used in the study. To make a performance analysis, all startups in the ideation stage are also removed (Hormiga et al., 2011). Startups are chosen based on the definitions offered by the Indian government and DPIIT. Therefore, all startups with ages under ten years, yearly revenues under one hundred crores, and registration as a private limited company, partnership firm, or limited liability partnership comprise the study's population.

A thorough questionnaire was conducted for data gathering online, and all the founders were personally interviewed. 16 of the 286 people who were contacted were removed from the list because they didn't respond to the questionnaire, and the remaining people didn't take part. 250 startup founders ultimately responded to the valid survey. Two parts of the questionnaire provide the founders' demographic information as well as the many constructs needed for the investigation. KM processes on variables are taken from Tan & Wong (2015), and performance measures are from Anwar et al. (2018). All the scaled items range from a 5-point Likert scale to strongly agree to strongly disagree. Hypothesis testing was done using Amos 23.

IV. RESULT

This section is divided into four categories: first, it evaluates the demographic profile of founders; then, reliability and validity are measured; model fit measures are identified; and final path estimates are presented. The detailed explanations of each section are explained below:

A. Respondent Profile

The founder's profile is shown in Table 1. It is evident that the majority of company founders are male (84%) and have advanced degrees (14% have PhDs and 62% have postgraduate degrees, respectively). Similar to this, 94% of founders use external sources of finance to scale their businesses, while the remaining 20% use their own sources of funding. As a result, companies will be able to draw in more venture capitalists and angel investors between 2014 and 2020. Additionally, startup founders are attending various founders' meets and conclaves (90% and 10%, respectively). So, these are considered the signals for ensuring effective knowledge management and attracting investment for the various stages.

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Table 1: Demographic Profile of Founders

Variable	Categories	Frequency	Percentage
Gender	Male	210	84
	Female	40	16
Educational Qualification	Plus, Two	25	10
	Degree	35	14
	Post Graduate	155	62
	Doctorate	35	14
Major source of funding	Our savings	15	6
	Friends and Family	20	8
	Angel or venture capital	215	86
Attending startups meet or conclaves	Yes	225	90
	No	25	10

B. Validity and Reliability Measurement

After analyzing the respondent's profile, the relationship between dependent and independent variables can be analyzed using structural equation modeling. Structural equation modeling consists of two parts: the first part consists of confirmatory factor analysis, and the second part is regarding prediction (Li & Li, 012). While using structural equation modeling in AMOS, it requires a sample size of at least 200 (Iacobucci, 2010). So, it satisfied those particular conditions.

The measurement model starts with reliability analysis, and reliability refers to the ability of an instrument to measure a construct. Reliability can be measured by using Cronbach alpha, and it should be above 0.7 (Peterson, 2013). In this case, the entire construct met a reliability value above 0.7. (Table2)

Table 2 also shows the convergent validity. Factor loading, composite reliability, and average variance extracted (AVE) were applied to measure convergent validity. Factor loadings for all the constructs range from 0.743 to 0.904 (threshold limit > 0.7). Likewise, composite reliability should be above 0.7, and average variance extracted should be above 0.5 (Alarcón & Sánchez, 2015). Therefore, every construct satisfied the CR and AVE requirements, which are above 0.7 and 0.5, respectively.

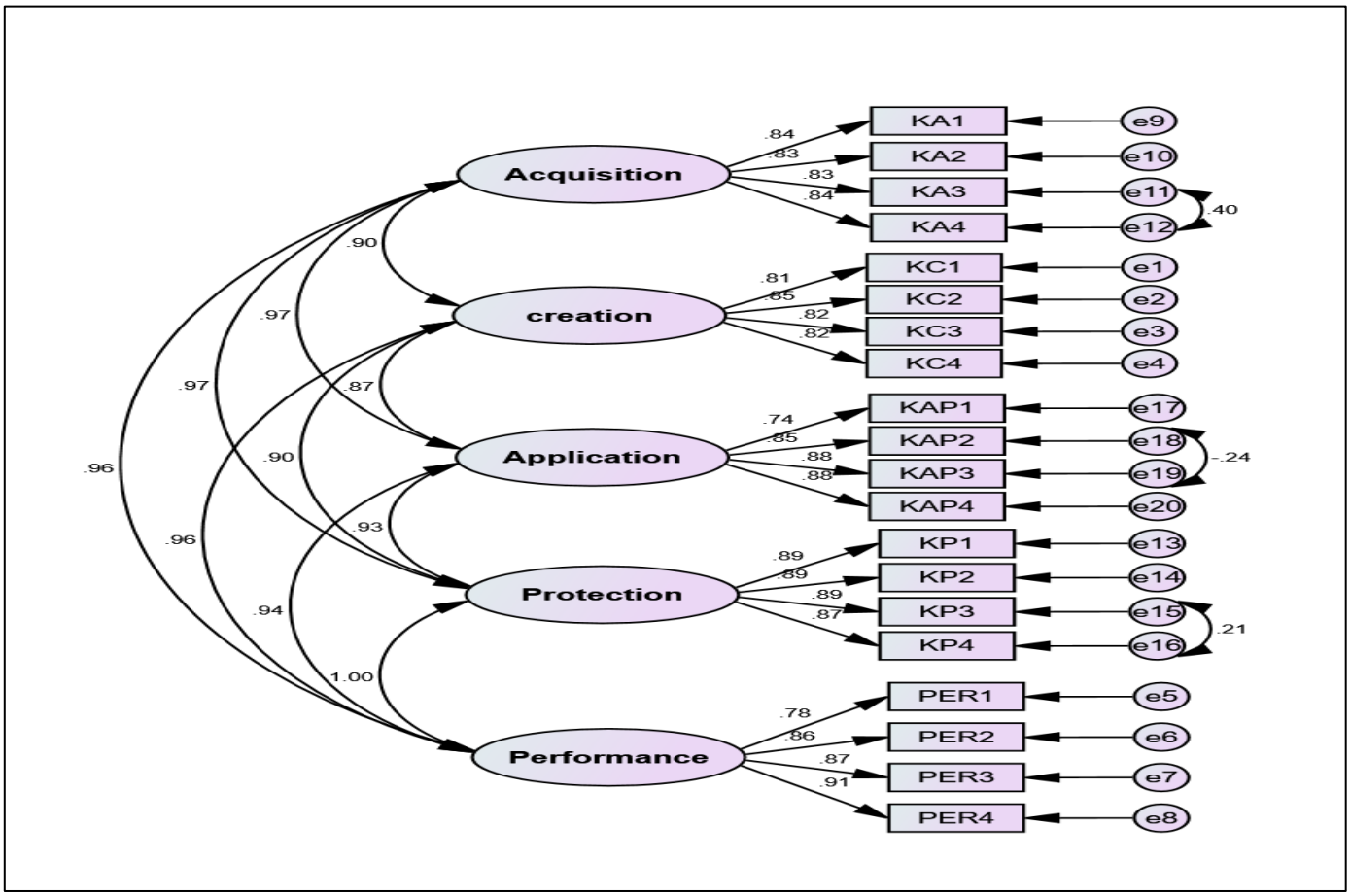

Fig 1: Confirmatory Factor Analysis

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Table 3 shows the model fit analysis done by using AMOS software. It is found that the model is well fit with CMIN/DF, which is 1.771, GFI = 0.905, RFI = 0.938, NFI = 0.949, CFI = 0.977, and RMSEA = 0.056. For a better model fit, the CMIN/DF should be less than 3, and GFI, NFI, and CFI must be more than 0.9. Likewise, the root mean square value should be below 0.08 (Hooper et al., 2008).

The standardized estimates are given in Figure 2. As seen in Figure 2, we formulated four paths and four corresponding hypotheses. From this, two of them are accepted, and the remaining two are rejected.

Table 4 confirms the hypothesis by using structural equation modeling, and it is found that knowledge management plays a significant role in the performance of startup companies. It has been found that knowledge conversion positively contributes to startup performance (beta: 0.385), which indicates that 38.5% of the startup performance is predicted by the knowledge conversion process used by the companies, and the remaining 61.5% is predicted by some other variable that is not included in the study. The study supports the findings of Gold et al. (2001), and it confirms that the knowledge conversion process brings uniqueness to ventures in terms of eliminating unwanted information. Likewise, knowledge protection measures adopted by startup companies significantly contribute to startup performance (beta: 0.731), which shows that 73.1% of startup performance is contributed by knowledge protection techniques adopted by them by using both formal and informal measures (Bolisani et al., 2013).

Table 2: Reliability and Validity Concerns

Variable	P value	Estimate	Construct	CR	AVE	alpha
KA1	***	0.842	Acquisition	0.903	0.699	0.911
KA2	***	0.827				
KA3	***	0.832				
KA4	***	0.842				
KC1	***	0.807	Conversion	0.895	0.68	0.894
KC2	***	0.855				
KC3	***	0.815				
KC4	***	0.822				
KAP1	***	0.743	Application	0.907	0.709	0.901
KAP2	***	0.853				
KAP3	***	0.881				
KAP4	***	0.883				
KP1	***	0.89	Protection	0.936	0.784	0.938
KP2	***	0.891				
KP3	***	0.894				
KP4	***	0.866				
P1	***	0.782	Performance	0.916	0.733	0.915
P2	***	0.857				
P3	***	0.871				
P4	***	0.909				

C. Model Specification and Estimation

Table 3: Model Fit Measures

Index	Range	Standard	Outcome	Conclusion
CMIN/DF	Less than 3	<3	1.771	Model is a good fit
GFI	0-1	0.9	.905	The model is good fit
RFI	0-1	0.9	.938	The model is a good fit
NFI	0-1	0.9	.949	The model is a good fit
CFI	0-1	0.9	.977	The model is a good fit
RMSEA	Less than 0.08	<0.08	.056	The model is a good fit

Source: Kline (2005)

V. DISCUSSION

In the globalized era, the world is considered a single marketplace in which people around the globe are competing together. So, innovation and uniqueness contribute to growth in entrepreneurship culture, and every firm is looking for solutions to the problems faced by society. In such a manner, the entire actions of the founders are necessary to contribute to the performance of new ventures (Chen & Chang, 2013). In a similar vein, startup businesses are unfamiliar with both the market and their surroundings. Therefore, to contribute sufficiently, they must have abundant intangible resources and assets. (Alvarez & Busenitz, 2001) Knowledge

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management is one of the intangible resources adopted by startup companies.

Furthermore, it was shown that KM is widely used in entrepreneurship literature. Through critical evaluation, Centobelli et al. (2017) discovered that KM studies on startups are primarily done based on factors influencing KM implementation, the tools adopted by them, and how they will impact economic, social, and technological performance. They did this by taking 947 papers published in Scopus and Web of Science sources.

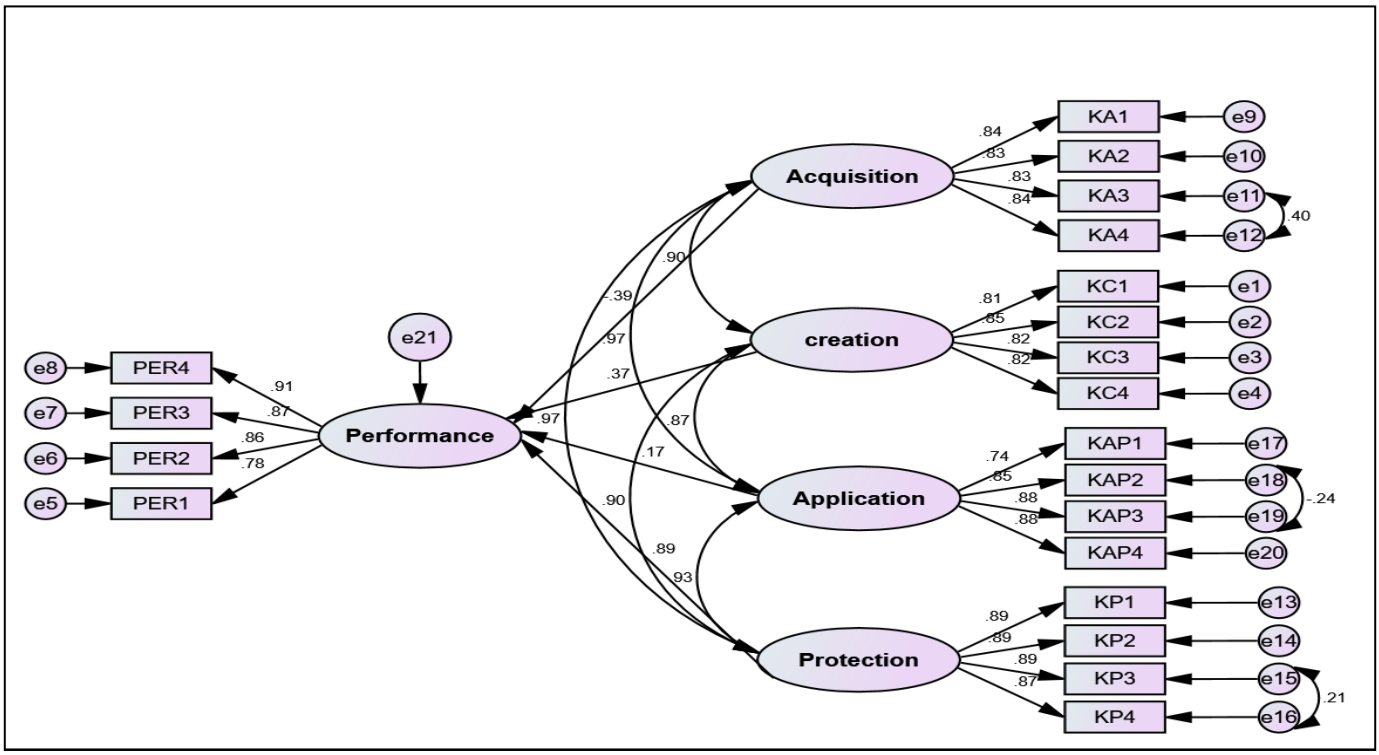

Fig 2: SEM Model Showing Knowledge Management Capabilities on Startup Performance

In the case of small-scale businesses, the majority of funding for small and medium-sized businesses comes from outside sources, and all lending institutions, including investors and suppliers, base their investments on their ability to manage knowledge (Desouza & Awazu, 2006). As far as startups are concerned, there are three stages of the life cycle: the bootstrapping stage, the seed stage, and the creation stage. Even though KM is needed in every organization, it plays a significant role in the seed stage because it will determine the success or failure of their product (Viswanathan & Arunima K, 2020). Even though this is the case, there are several obstacles to integrating knowledge management solutions, such as a shortage of resources and the need for results quickly (Oliva & Kotabe, 2019). According to Gold et al. (2016), every business organization is looking for profit maximization in the short run and growth orientation in the long run. Thus, it has been demonstrated that knowledge management may be used as a weapon to compete with others by introducing unique operational methods that others cannot copy. Numerous studies have found that the infrastructure and process of knowledge management both play a role in the effective implementation of strategies and the making of sound decisions (Abualoush et al., 2018; Bolisani et al., 2013; Gold et al., 2001; Ng et al., 2014; Oliva & Kotabe, 2019; Thalmann & Sarigianni, 2016).

Table 4: Structural Model Result

Hypothesis	Coefficient Beta	SE	P value	Result
Performance <--- Acquisition	-3.73	.440	0.396	Not supported
Performance <--- Conversion	0.385	.088	***	Supported
Performance <--- Application	0.188	.271	0.488	Not supported
Performance <--- Protection	0.731	.227	***	Supported

Nowadays, the Kerala startup ecosystem reaches the top position in terms of the quality and quantity of funding received by each founder as well as their ability to scale their product. Investors make decisions based on a company's ability to promote its goods in a novel way through pitching activities. Kerala Startup Mission also runs several initiatives and events to bring together the government, researchers, investors, and startup founders on a single platform (Kerala Startup Mission, 2019; Thomas & K.I., 2020). Thus, in their many funding stages, these are seen as the tools for gathering, converting, protecting, and using knowledge. Therefore, the research has broad implications for startups in Kerala.

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VI. CONCLUSION, LIMITATION, AND SCOPE FOR FURTHER RESEARCH

Previous research suggests that knowledge management capabilities are important from an organizational point of view. The study added to the entrepreneurship literature by incorporating knowledge management into the newly established ventures. It is found that all through the life cycle of startups, effective knowledge management is required to bring innovation as well as scale up their business. Some of the startups from Kerala drop out of their businesses within their initial periods. It occurs for several reasons, including difficulty in making decisions on where to get funding, how to scale their product, etc. The results of the present study can assist startups in identifying the elements that can improve the success of new businesses. According to the report, knowledge management investments made appropriately improve performance. Similarly, newly formed businesses should place more emphasis on the knowledge conversion and protection processes, which have an impact on value generation. Additionally, managers need to put more effort into networking with others. Additionally, startups must invest more resources in this. The research has several limitations. First, this research examined startup companies located in Kerala, so there will be differences in the interpretation of the results for companies outside Kerala. Second, many intangible resources contribute to the performance of startup companies that are outside the purview of the study. Finally, knowledge management has other dimensions such as culture, infrastructure, etc. that are not included. Further research suggests the inclusion of the influence of another factor that may mediate or moderate the relationship between knowledge management and additionally, it is appropriate to apply the same research to other fields, such as the function of KM in universities and educational institutions to improve value-oriented educational systems.

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