QUBAHAN ACADEMIC JOURNAL
VOL. 4, NO. 3, August 2024
https://doi.org/10.48161/qaj.v4n3a701

The Role of Knowledge Management and Dynamic Capabilities on Sustainable Competitive Advantage in Indonesian Private Higher Education

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ABSTRACT: This study investigates the impact of knowledge management on dynamic capabilities and sustainable competitive advantage in Private Higher Education Institutions (PHEIs) in Indonesia. Drawing on the knowledge-based view and dynamic capabilities framework, the study employs a structural equation modeling approach to analyze data collected from 92 leaders of 10 PHEIs in Jakarta, Indonesia. The findings reveal that knowledge management has a significant positive effect on both dynamic capabilities and sustainable competitive advantage, with dynamic capabilities partially mediating the relationship between knowledge management and sustainable competitive advantage. The study contributes to the literature by providing empirical evidence on the interplay between knowledge management, dynamic capabilities, and sustainable competitive advantage in the context of PHEIs in Indonesia. The findings of this research suggest that the establishment of a framework and the facilitation of knowledge integration among learning, research, and community service are crucial for effective knowledge management governance among students, universities, and society. The study also highlights the need for future research to validate the findings in different contexts and explore the boundary conditions of the relationships examined.

Keywords: Dynamic Capabilities, Knowledge Management, Private Higher Education Institution, Sustainable Competitive Advantage.

I. INTRODUCTION

Higher education is an institution that possesses the capacity to generate a substantial amount of information, serving the purposes of institutional progress as well as promoting corporate interests [1]. According to [2], it is imperative for higher education institutions to develop a proficient management plan. The expeditious advancement of an institution is contingent upon the effective management of knowledge, thereby surpassing the performance of other institutions. In the realm of knowledge management, higher education encompasses three fundamental components known as the Tri Dharma of Higher Education: education, research, and community service. These components are intricately linked to the transmission of knowledge (science) through teaching, the generation and updating of knowledge through research, and the dissemination of knowledge (science) through community service. The significance of knowledge-related resources as strategic assets and their contribution to superior organizational performance and sustainable competitive advantage in dynamic and challenging environments has been widely acknowledged in the context of the Knowledge-Based View (KBV) of the firm [3-5]. PHEIs institutions are susceptible to several significant transformations in the realms of politics, society, and economics within the contemporary dynamic global context. Furthermore, in recent decades, knowledge management has emerged as a prominent research methodology and has garnered significant attention from researchers worldwide. It has become recognized as a compelling approach within the field of management science [6]. Research universities, being institutions that

prioritize knowledge acquisition and knowledge generation, development, preservation, and dissemination through publications, hold significant significance in the economic progress and advancement of a nation by fostering the generation of novel ideas [7-9]. Effective knowledge management can enhance the operations and services of higher education institutions, including teaching, learning, research, curriculum creation, administration, and strategic planning [9].

The evaluation of Indonesian higher education institutions is determined by four primary factors: the excellence of human resources and students (input), the management of these establishments (process), the current performance accomplishments attained by these institutions (output), and the long-term performance achievements of all of these institutions (outcomes). According to the Private Higher Education Accreditation Profile (PHEIs) obtained from the Higher Education Database of the Directorate General of Higher Education, Ministry of Education and Culture, Research and Technology of the Republic of Indonesia [10], there are a total of 182 non-vocational PHEIs within Region 3 Higher Education Service Institutions. There are a total of 16 PHEIs (8.79%) that have been accredited with an Excellence ranking or rank A. There are 64 PHEIs (35.16%) that have been certified with a very good ranking (rank B), and 50 PHEIs (27.47%) that have been accredited with a good ranking (rank C). According to the data provided by Lldikti3.kemdikbud.go.id (2023), the current count of accredited PHEIs is at 130, with an additional 52 private higher education institutions (28.57%) now pursuing the higher education accreditation process. Only 8.79% of PHEIs hold excellence accreditation. This fact alone necessitates further investigation into the analysis: what specific factors contribute to the competitive advantage of these superior PHEIs? The objective of this research is to further investigate the factors that contribute to SCA.

Furthermore, by looking at bibliometrics about the direction of management education in Indonesia, we can get a better idea of how research in the field is changing. This. Many researchers have worked together on projects and used the same sources and networks to find information [11-13]. Bibliometric data describe these things. With a thorough study of contributions from many people and organizations, this can help find the best study centers and learn more about how to improve collaboration, development, knowledge management, and education in Indonesia right now. Some years Last but not least, bibliometric analyses are also showing interesting patterns in topics that are unique to study management education. The more focused the study is, the more it focuses on modern problems like using technology in management education and adapting to new curriculum as a source for development strategies. Education for power men. On top of that, bibliometrics show shift paradigm study that shows the problems, chances, and new issues that the Indonesian education system is facing. Globalization has improved higher education, yet inequality has grown. Explain higher education internationalization's definition, reasoning, program, organization, results, and influence. Start by acknowledging its complexity and historical and geographic context. Misuse of the term can convert internationalization in higher education into a problem rather than a solution, making it easy to blame foreign influences and players. Academics and politicians must define, use, and describe them [14]. Our research seeks to discover and demonstrate PHEI's competitive advantage elements to aid its global education transformation.

Furthermore, by looking at bibliometrics regarding the direction of management education in Indonesia, we can get a better picture of changes in research in the field. Many researchers have collaborated on projects and used the same sources and networks to search for information information [11-13]. Bibliometric data paints a comprehensive picture of the contributions of many people and organizations, which can help you find the best study centers and learn more about how to improve collaboration, development, knowledge management and education in Indonesia today. Bibliometric analysis also shows interesting patterns in topics that are unique to the study of management education. The more focused the study, the more focused it is on current problems such as knowledge management, dynamic capabilities as adaptation to new learning as a source of sustainable competitive strategy [15]. Our research will demonstrate the importance of Knowledge Management (KM) and DC (Dynamic Capabilities) in enhancing Sustainable Competitive Advantage (SCA) at PHEIs, encompassing knowledge sharing, acquisition, dissemination, and utilization. PHEI has the ability to identify needs and implement effective business processes for Tri Dharma. Tri Dharma HEI uses KM, which includes education, research, and stakeholder engagement, to provide services and maintain a strong foundation. Furthermore, DC plays a crucial role in enhancing SCA, particularly within the framework of Tri Dharma HEI. We strive to enhance knowledge acquisition, disseminate information, and integrate diverse knowledge sources for efficient knowledge delivery. This leads to innovation, productivity, and professional skills in management. KM also

contributes to organizational effectiveness through the development of human resources and the organization's responsibility to adapt to changes and technological needs.

Based on the analysis of issues and empirical studies in the pertinent literature, the researchers identified the subsequent areas of inquiry that require more investigation for research objectives: At first, the researchers identified deficiencies in the dimensions and indicators that were present in prior studies on sustainable competitive advantage as an endogenous variable, specifically within the context of higher education. Second, the researcher conducts an in-depth analysis and constructs a theoretical framework that addresses a research void pertaining to the notion put forth by [16-19] in the field of Knowledge Management in Dynamic Capabilities. These concepts have received limited attention in prior scholarly investigations and appear to hold significance and merit further exploration within the context of investigating crucial facets of higher education in the pursuit of Sustainable Competitive Advantage. Third, this study aims to enhance the scope of knowledge management and dynamic capabilities studies in order to attain sustainable competitive advantage. Additionally, it seeks to examine the framework of a novel conceptual model of sustainable competitive advantage within the context of higher education. In the subsequent section, we shall delve into the contextual dimensions and indicators pertaining to knowledge management, dynamic capabilities, and sustainable competitive advantage within the Tri Dharma facets of higher education, containing learning education, research, and community service. Therefore, the research question is:

1. Does knowledge management enhance dynamic capabilities and sustainable competitive advantage?
2. Do dynamic capabilities play a significant role as a mediator between knowledge management and sustainable competitive advantage?

II. LITERATURE REVIEW

1. SUSTAINABLE COMPETITIVE ADVANTAGE IN HIGHER EDUCATION

In accordance with the Resource-Based View (RBV) of organizations, the attainment of a competitive advantage is contingent upon the presence of distinct and immovable resources within the business. The resource-based approach distinguishes itself from standard strategic management frameworks by this concept. Theoretical structure of the company's Resource-Based View (RBV) is established by comprehending the sources of SCA [20-23]. According to [24], the theoretical framework encompasses four primary components that are essential for attaining SCA. The initial fundamental component of a firm's RBV should commence with two assumptions: the firm's resources can be fixed and diverse, while assuming that certain resources are costly to replicate or inadequate [23]. Universities have the potential to acquire several accolades and attain acknowledgment on both regional and global scales. The term "competitive advantage" in the context of higher education in Indonesia pertains to the evaluation of competitiveness conducted by the Indonesian Ministry of Education and Culture-Ristek. This evaluation is based on four primary dimensions, as outlined in the LLDikti 3 report [25]: the factors under consideration include the quality of human resources and students as input, the management of higher education institutions as a process, the short-term performance successes attained by universities as output, and the long-term performance achievements of higher education as an outcome. Moreover, Higher education's competitiveness can be further evaluated through accreditation assessments conducted by independent scientific associations such as ABET, AACSB, ASIN, JABEE, Royal Society, Asian University Network (AUN-QA), and others. These assessments are carried out by the National Accreditation Board for Higher Education and international accreditation institutions. Excellent educational institutions, exploration, and development drive national growth and human satisfaction. Additionally, universities worldwide strive to be centers of excellence where information is obtained and disseminated through excellent teaching and learning, exploration and development, and partnerships [6].

2. DYNAMIC CAPABILITIES

In accordance with the dynamic capabilities view, an organization's ability to intentionally generate, enhance, and adapt its resource base through a series of organizational routines is crucial for achieving superior and sustainable performance [26-28]. According to [29], the exploitation of dynamic skills can provide HEIs with the ability to expand and serve as a precursor for institutional diversification. Consequently, the adoption

of dynamic capabilities can lead to strategic advantage and long-term success. In their study, [30] assess dynamic skills by considering various sub-dimensions, including comprehension, struggle, and reconfiguration [31]. Additionally, they examine integration, coordination, and learning [16, 32]. These sub dimensions were determined to be applicable within the context of higher education. Consequently, organizations in this industry must closely observe shifts in the education sector, utilize information to identify fresh prospects for providing educational services, adapt processes to cater to target markets, understand the current audience and emerging innovations, evaluate endeavors to create new programs and services, implement novel educational and administrative approaches, update business procedures, foster rapid and effective communication, devise long-term strategies to drive change, integrate activities and tasks, allocate resources, standardize processes and techniques, oversee administrative activities, cultivate new skills, and acquire and explore a novel educational and technical knowledge. Reconfiguring capacity involves implementing new services or administrative processes to provide a service [33]. In a volatile environment, universities must consider competition and managerial approaches. This context requires leadership and strategy to preserve evolutionary adaptation through competitive advantage and long-term success. Campus ecosystem management strategies promote regional, national, and worldwide economic development, benefiting the economy and the university—students, lecturers, and staff [34]. Leadership is crucial to university DC development.

3. KNOWLEDGE MANAGEMENT

In higher education institutions, sustainable competitive advantage is predominately founded upon knowledge. [35] distinguish two primary categories of knowledge: explicit and tacit. [36] provides an additional definition of knowledge management as an integrated systems approach that facilitates and oversees participation in all information assets of an organization, such as databases, documents, policies, and procedures, in addition to the practical expertise contributed by employees. Furthermore, it encompasses the implementation of a collection of knowledge management procedures—storage, evaluation, dissemination, improvement, and generation—with the objective of generating value and fulfilling the organization's tactical and strategic needs. Knowledge management capabilities in higher education contain the competencies of faculty and administration to procure, modify, implement, and safeguard knowledge [37]. Additionally, it promotes the utilization and dissemination of data and information by pertinent stakeholders to facilitate informed decision-making [38]. Academic and administrative processes generate knowledge in higher education, which strives to develop knowledge management policies that enhance knowledge dissemination, decision-making effectiveness, and critical thinking within institutions [39]. HEIs are knowledge-based enterprises that require leadership capable of ensuring effective knowledge asset management, resulting in greater innovation and organizational performance [40].

III. HYPOTHESES DEVELOPMENT

1. THE EFFECT OF KNOWLEDGE MANAGEMENT ON DYNAMIC CAPABILITIES

The implementation and management of knowledge management can lead to the generation of higher dynamic capability. [17] conducted a study on the incorporation of dynamic capability and knowledge management. Their findings indicate that in order to get a suitable level of dynamic capabilities, firms require organizational agility [41]. Organizations are experiencing a growing trend in dynamic capabilities, particularly in their capacity to transform into learning organizations. Consequently, universities should dedicate significant efforts towards the intensive development of their dynamic capabilities. Dynamic Capabilities will improve the company's business activities by effectively managing knowledge resources. Dynamic capabilities improve with the implementation and management of knowledge [17, 42]. Existing literature indicates that the knowledge management has a notable and favorable impact on dynamic capabilities [43-48]. Drawing upon theoretical frameworks, empirical evidence, and pertinent scholarly investigations, the subsequent hypothesis is posited:

H1: Knowledge Management has a positive and significant effect on Dynamic Capabilities.

2. THE EFFECT OF KNOWLEDGE MANAGEMENT ON SUSTAINABLE COMPETITIVE ADVANTAGE

Knowledge management enhances the proficiency of employees in organizations to effectively utilize knowledge. This, in turn, enhances the organization's capacity to generate novel knowledge, leading to improved performance, streamlined operations, cost reduction, and creativity. Ultimately, this fosters sustainable competitiveness for universities [49-51]. According to the resource-based perspective paradigm, innovation performance is derived from the extraction and dissemination of embedded information to customers. Study in [51] found that a knowledge-based view (KBV), which emphasizes excellence in a competitive academic environment, can leverage the perspectives of knowledge acquisition, dissemination, and utilization to establish a sustainable competitive advantage. Other expert opinions also suggest that the development of management methods, leadership, profitability criteria, and innovation is important in higher education [52]. Higher education institutions can ideally apply educational leadership models, like the LIVES model (leader, individuals, educational community, value and knowledge, and society), to manage knowledge effectively [53]. Prior studies indicate a strong and statistically significant relationship between knowledge management and the attainment of sustained competitive advantage within the context of higher education [6, 54-61]. The gap among researchers lies in the utilization of distinct dimensions as research tools and model constellations, which have yet to be implemented within the realm of higher education. Relying upon theoretical frameworks, empirical evidence, and pertinent scholarly investigations, the present study posits the subsequent hypothesis:

H2: Knowledge Management has a positive and significant effect on Sustainable Competitive Advantage.

3. THE EFFECT OF DYNAMIC CAPABILITIES ON SUSTAINABLE COMPETITIVE ADVANTAGE

According to [31], dynamic capabilities offer a novel and potentially comprehensive framework for understanding emerging sources of competitive advantage. This is attributed to the incorporation of individual expertise within the organization [62], as well as the influence of culture, orientation, and leadership [16]. Additionally, it involves the reevaluation and restructuring of corporate strategy to effectively address identified needs [63]. In addition, [34] and [64] introduced the dynamic capabilities framework as a means to provide guidance for universities in effectively managing their innovation ecosystems. This framework aims to assess the university's involvement across the whole lifetime of the innovation ecosystem. Positive relationships were observed between innovation competitiveness and sustainable growth [65]. Existing literature indicates a positive and statistically significant relationship between dynamic capabilities and sustainable competitive advantage in various domains, including higher education [54, 66] the ICT sector [45, 67] the banking sector [68], and the Systematic Literature Review (SLR) conducted by [18]. Drawing upon theoretical frameworks, empirical evidence, and pertinent scholarly investigations, the present study posits the subsequent hypothesis:

H3: Dynamic Capabilities has a positive and significant effect on Sustainable Competitive Advantage.

4. THE MEDIATION EFFECT OF DYNAMIC CAPABILITIES ON KNOWLEDGE MANAGEMENT AND SUSTAINABLE COMPETITIVE ADVANTAGE

In accordance with [69], the presence of robust dynamic capabilities is crucial for companies in order to foster the organizational agility required to navigate uncertain environments. These capabilities play a pivotal role in determining a company's capacity to innovate, adapt, and generate change that ultimately benefits consumer markets rather than competitors. Knowledge management plays a crucial role in enhancing an organization's competitive capabilities [70] and facilitating the attainment of organizational objectives and potential value generation [71]. This is also assessed as a metric for evaluating organizational performance [17, 72]. Hence, the practice of formalizing knowledge persistently enhances organizational operations. Therefore, the implementation of knowledge management strategies enhances an organization's competitive advantage and plays a significant role in attaining organizational objectives, thereby serving as an indicator of organizational effectiveness [72, 73]. The distinction among researchers lies in the dimensions employed and the subject of investigation, as supported by theoretical frameworks, empirical evidence, and pertinent scholarly works [6, 70, 74-76]. The subsequent research hypothesis is:

H4: Knowledge Management has a positive and significant effect on Sustainable Competitive Advantage, mediated by Dynamic Capabilities

The research, based on the aforementioned explanation of relevant research, has built a model as follows in Figure 1 below:

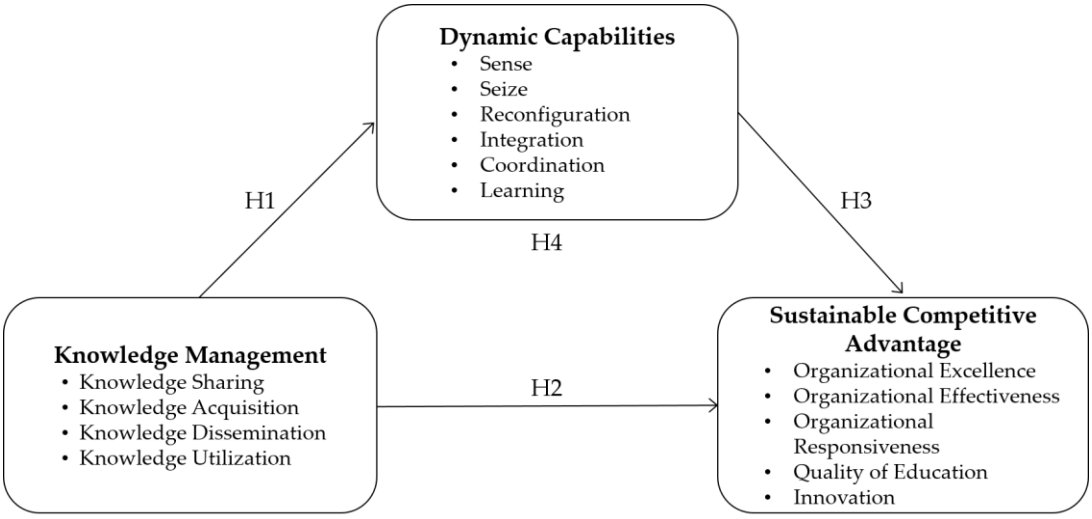

FIGURE 1. Research framework

IV. MATERIAL AND METHOD

1. *RESEARCH DESIGN*

This type of research design is causal, and this research is included in basic research with a quantitative approach method. The type of data used is primary data originating from filling out a research instrument questionnaire that uses a survey by filling out the questionnaire online via a Microsoft online form. The utilization of a methodology for quantifying constructs of a higher order becomes necessary. Therefore, in order to evaluate the influence of dimensions on latent variables, this measurement model utilizes type I second-order analysis, which is a reflective measurement model. Specifically, the model includes explicit indicators to measure the level of conceptual understanding (LOC), while the level of conceptual understanding (HOC) is reflected in the indicator [77].

2. *POPULATION AND SAMPLE*

This research was conducted on the leaders of private universities in Jakarta Region III Higher Education Service Institutions. We collected data from April to December 2023. The population under study comprises the leaders of higher education institutions that have been accredited as A or Excellent institutions for universities in the Jakarta Region III Higher Education Service Institutions in Indonesia. This population consists of a total of 10 PHEIs, who play a role as the units of analysis for this research which include the Rector/Deputy Chancellor, Faculty Dean, Head of Research and Community Service Institute, and Head of Institution Quality Assurance. The sample selection adheres to the requirements of private higher education institutions that have obtained outstanding accreditation, with the goal of ensuring uniformity within the company. The sampling technique for this research is probability sampling, with a proportionately sampling approach [78]. The university's unit leader serves as a representative for the unit within the organization, facilitating the execution of the management evaluation process. According to the [79] table, we selected a sample size of 92 respondents from a total population of 127 individuals. To ensure an appropriate sample size from a population of 127 leaders at PHEI, a sample size of 92 respondents was obtained, as shown in Table 1.

Table 1. Respondent characteristic

University	Rectorate	Dean / VD/HP	Head R&CD/ Head of Division	Head of QA	Total
Universitas Gunadarma	2	5	1	1	9
Universitas Katolik Indonesia Atma Jaya	-	7	2	1	10
Universitas Kristen Indonesia	1	4	1	-	6
Universitas Muhammadiyah Prof. DR. HAMKA	2	6	2	1	11
Universitas Mercu Buana	2	4	1	1	8
Universitas Nasional	1	4	3	-	8
Universitas Pancasila	3	6	1	1	11
Universitas Tarumanagara	1	9	1	1	12
Universitas Trisakti	1	7	-	1	9
Universitas XYZ	3	4	1	-	8
Total	16	56	13	7	92

Note: VD = Vice Dean, HP = Head of Program, R&CD = Research and Community Development, QA = Quality Assurance

2.1 Instrument Development

The construction of the statement instruments in Table 2 are operationalized with a multi-item scale based on previously validated measures, and each scale item uses a 5-point Likert scale (1 ='strongly disagree' to 5 ='strongly agree'). The total measurements in this research are 48 indicators.

Table 2. Measurement of variable

Variable	Dimension and Indicator	Items	Source
Sustainable Competitive Advantage	Organizational Excellence	4	[80]
	1. Employee interaction		
	2. Employee qualifications		
	3. Openness to change		
	4. Vision and mission accomplishment		
	Organizational Effectiveness	4	
	1. Effective in service		
	2. Professionalism		
	3. University Growth		
	4. Employee productivity		
	Organizational Responsiveness	3	
	1. Response to technological change		
	2. Stakeholder response		
	3. Market response		
	Quality of Education	3	[81]
	1. Curriculum		
	2. Learning educational media		
	3. Educational services		
	Innovation	3	
	1. Innovation facilities		
	2. Future ideas		
	3. Innovation capability		
Dynamic Capabilities	Sense	3	[28, 82-84]
	1. Monitor changes		

	2. Monitor new opportunities		
	3. Monitor target market		
	Seize	3	
	1. Identify needs		
	2. Identify the application of the method		
	3. Updating business processes		
	Reconfiguration	3	
	1. Effective communication		
	2. Strategy formulation		
	3. System modification		
	Integration	3	
	1. Communication on decisions		
	2. Holistic comprehension		
	3. Action integration		
	Coordination	3	
	1. Allocate resources		
	2. Service implementation		
	3. Standard management		
	Learning	2	
	1. Development of implementation of Tri Dharma PT		
	2. Continuous improvement method		
Knowledge Management	Knowledge Sharing	3	[85, 86]
	1. Effectiveness of knowledge sharing		
	2. Information system development		
	3. Promotion of knowledge sharing		
	Knowledge Acquisition	3	[51, 85]
	1. Knowledge exchange process		
	2. Management of knowledge sources		
	3. Learning qualifications		
	Knowledge Dissemination	5	[51, 87]
	1. Conference activities		
	2. Database management, repositories, publications		
	3. Mentoring activities		
	4. Virtual learning management		
	5. Informative report		
	Knowledge Utilization	3	[85, 88]
	1. Knowledge evaluation methods		
	2. Knowledge for appropriate needs		
	3. Knowledge integration		

3. STATISTICAL METHOD

The hypotheses in the conceptual model are tested in this quantitative research using the variance-based structural equation modeling (SEM) method. The Partial Least Squares (PLS) strategy is employed to interpret and analyze data, utilizing the SmartPLS version 4.0 application for hypothesis testing. Descriptive statistical analysis and inferential statistics are employed in data processing and analysis, utilizing the multivariate analysis approach. The utilization of Higher Order Construct Modeling (HCM) for the estimation of intricate models. The researcher scrutinizes the research model and assesses the hypothesis using two measurement models, as suggested by [89]. Researchers start with an outer model analysis, utilizing the following four criteria to evaluate data validity and dependability: The indicator is valid if the convergent validity value surpasses

0.70 [90] or the loading factor exceeds 0.50 [91, 92]. The Average Variance Extracted (AVE) values reduce the difference between the model measurement error variance and the construct indicator variation that the latent variable captures. Then, analyze reliability using the expected composite reliability (CR) value. A CR value greater than 0.70 indicates a valid latent variable indicator. Finally, Cronbach's alpha above 0.60 demonstrates a latent variable indicator. Second, we use three parameters for the inner model analysis and evaluation: we use the route coefficient value to estimate the partial influence between 0 and 1. Path coefficients, ranging from 0 to 1, measure positive and negative partial effects. This value helps establish the hypothesis-model structural equation. Next, we calculate R2, which measures model quality. It also shows the exogenous latent variable's extent as a coefficient of determination. Finally, the f-square measure of partial impact illustrates the extent to which the exogenous predictor latent variable influences the endogenous variable in structural order. As this value approaches 1, the influence increases. How well the measurement model explains how constructs are measured affects structural relationships. For a one-sided test of 1.65, significance testing employs the crucial t value and 5% p value. The hypothesis is significant if the p value is less than 0.05 and the crucial t value is more than 1.65 [78].

V. DATA ANALYSIS

1. *RESPONDENTS EXAMINATION*

An examination of the demographic information obtained from a sample size of 92 participants from 10 PHEIs (Universitas Gunadarma, Universitas Katolik Indonesia Atma Jaya, Universitas Kristen Indonesia, Universitas Muhammadiyah Prof. Dr. HAMKA, Universitas Mercu Buana, Universitas Nasional, Universitas Pancasila, Universitas Tarumanagara, Universitas Trisakti, Universitas XYZ). Job role as follows: Rector/Deputy Chancellor: 18 individuals (19%); Faculty Dean: 55 respondents (60%); Head of Research and Community Service: 9 respondents (10%); and Head of Institution Quality Assurance: 10 respondents (11%). The gender distribution is as follows: 51 males (55.4%) and 41 females (44.6%). Among the functional jobs, 6 individuals (6.5%) hold the expert assistant position, 33 experts (35.9%), 34 associate professors (37%), and 19 professors (20%). The majority of respondents are associate professors. In addition, 2 respondents (2.2%) have employment for a duration of less than 5 years, 18 respondents (19.6%) have employment for 5–10 years, 23 respondents (25%) have employment for 11–20 years, 22 respondents (23.9%) have employment for 21–30 years, 26 respondents (28.3%) have employment for 31–40 years, and 1 respondent (1.1%) has employment for more than 40 years

2. *QUANTITATIVE DATA ANALYSIS*

The data was processed using SMART PLS 4.0, then the data was analyzed using the outer model analysis measurement model, namely Factor Loading, Cronbach Alpha and Composite Reliability > 0.6, Average Variance Extracted (AVE) > 0.5. All data in table 3 shows acceptable results [93].

Table 3. Indicator Factor Loading, Cronbach Alpha, Composite Reliability, AVE

No	Variable	Factor loading	Cronbach alpha		Composite Reliability		AVE	
	Sustainable Competitive Advantage							
1	Organizational Excellence							
	SCA_OExc1	0.658						
	SCA_OExc2	0.807	0.815		0.878		0.645	
	SCA_OExc3	0.609		0.948		0.953		0.547
	SCA_OExc4	0.784						
2	Organizational Effectiveness							
	SCA_OEf1	0.700	0.797		0.868		0.622	
	SCA_OEf2	0.715						
	SCA_OEf3	0.686						

	SCA_OEf4	0.677						
3	Organizational Responsiveness							
	SCA_OR1	0.755	0.860		0.915		0.781	
	SCA_OR2	0.789						
	SCA_OR3	0.807						
4	Quality of Education							
	SCA_QE1	0.763	0.840		0.904		0.758	
	SCA_QE2	0.784						
	SCA_QE3	0.820						
5	Innovation							
	SCA_In1	0.718	0.881		0.927		0.809	
	SCA_In2	0.788						
	SCA_In3	0.739						
	Knowledge Management							
1	Knowledge Sharing							
	KM_KS1	0.718	0.836		0.902		0.754	
	KM_KS2	0.787						
	KM_KS3	0.766						
2	Knowledge Acquisition							
	KM_KA1	0.805	0.842		0.904		0.759	
	KM_KA2	0.740						
	KM_KA3	0.773						
3	Knowledge Dissemination			0.930		0.953		0.556
	KM_KD1	0.677						
	KM_KD2	0.745	0.850		0.893		0.627	
	KM_KD3	0.707						
	KM_KD4	0.725						
	KM_KD5	0.775						
4	Knowledge Utilization							
	KM_KU1	0.787	0.836		0.901		0.753	
	KM_KU2	0.698						
	KM_KU3	0.723						
	Dynamic Capabilities							
1	Sense							
	DC_Sn1	0.630	0.829		0.898		0.746	
	DC_Sn2	0.691						
	DC_Sn3	0.787						
2	Seize							
	DC_Si1	0.815	0.860		0.914		0.781	
	DC_Si2	0.750		0.957		0.961		0.594
	DC_Si3	0.819						
3	Reconfiguration							
	DC_Rec1	0.774	0.814		0.889		0.728	
	DC_Rec2	0.630						
	DC_Rec3	0.815						
4	Integration							
	DC_Int1	0.690	0.899		0.937		0.832	
	DC_Int2	0.780						

	DC_Int3	0.818			
5	Coordination				
	DC_Co1	0.821	0.853	0.911	0.774
	DC_Co2	0.819			
	DC_Co3	0.830			
6	Learning				
	DC_L1	0.790	0.883	0.945	0.895
	DC_L2	0.804			

Following this, latent variables are assessed, which are manifested via dimensions and indicators (also known as constructs of a higher order); thus, a technique for measuring constructs of a higher order is required. Hence, to assess the impact of dimensions on latent variables, this measurement model employs type I second-order analysis (reflective measurement model), specifically the type in which LOC reflects HOC but LOC is measured using explicit indicators (reflective model measurement) [77]. The evaluation of latent variables is conducted, wherein they are expressed through dimensions and indicators, commonly referred to as constructs of a higher order. The table 4 below display the dimensional measures of latent variables.

Table 4. Measurement of Dimensional Contribution to Latent Variables

No	Variable	Path coefficient	T-value	f2	Mean	Rank
	Sustainable Competitive Advantage					
1	Organizational Excellence	0.875	28.743	3.251	4.628	4
2	Organizational Effectiveness	0.881	30.547	3.472	4.508	3
3	Organizational Responsiveness	0.887	36.354	3.685	4.446	2
4	Quality of Education	0.907	44.661	4.647	4.587	1
5	Innovation	0.833	21.977	2.273	4.464	5
	Knowledge Management					
1	Knowledge Sharing	0.873	26.118	3.207	4.529	3
2	Knowledge Acquisition	0.887	38.002	3.694	4.533	2
3	Knowledge Dissemination	0.917	46.035	5.306	4.556	1
4	Knowledge Utilization	0.851	22.963	2.630	4.380	4
	Dynamic Capabilities					
1	Sense	0.818	18.086	2.022	4.518	6
2	Seize	0.901	40.468	4.328	4.486	2
3	Reconfiguration	0.875	28.441	3.270	4.551	3
4	Integration	0.839	24.370	2.357	4.496	5
5	Coordination	0.937	63.225	7.148	4.439	1
6	Learning	0.843	24.738	2.454	4.631	4

From the results of data processing, the influence of dimensions on the latent variable can be explained as follows:

- These two dimensions are the ones with the highest contribution to Sustainable Competitive Advantage. The first dimension is Quality of Education, with a 90.7% path coefficient, a t-value of 44.661, and a f2 of 4.647. The second dimension is Organizational Responsiveness, with an 88.7% path coefficient, a t-value of 36.354, and a f2 of 3.685.
- These two dimensions are the ones with the highest contribution to Knowledge Management. Knowledge Dissemination dimension has an 91.7% path coefficient, a t-value of 46.035, and a f2 value of 4.556. Knowledge Acquisition has an 88.7% path coefficient; the t-value is 38.002; and the f2 is 4.533.

- These two dimensions are the ones with the highest contribution to Dynamic Capabilities. Coordination dimension is the 93,7% path coefficient, the t-value is 63.225, and the f2 is 7.148. Seize is a 90.1% path coefficient, the t-value is 40.468, and f2 is 4.486.

According to [94], a higher R2 value is considered more favorable for structural model analysis since it signifies the extent to which the exogenous variable accounts for the variance observed in the endogenous variable. The study findings indicate that the R2 coefficient for dynamic capabilities is 0.716, suggesting that Knowledge Management explains 71.6% of the variability in dynamic capabilities. Furthermore, the R2 value for Sustainable Competitive Advantage is 0.788, reflecting that Knowledge Management and Dynamic Capabilities together explain 71.6% of the variation in sustainable competitive advantage (table 5). In addition, in terms of partial impact, specifically effect size (f2), [95] states that the estimated value of f2 is 0.2 (little), 0.2-0.8 (mid), and > 0.8 (strong).

As stated in the research hypothesis, and the results can be seen in the explanation, table 5, and figure 2 below.

- Hypothesis 1 is accepted based on the statistical analysis, which indicates that 84.6% of knowledge management has a positive and significant impact on dynamic capabilities. This conclusion is supported by the t-value of 26.189, p-value of 0.000, and path coefficient value of 0.846.
- Hypothesis 2 is accepted based on the statistical analysis, which indicates that 61.5% of knowledge management has a positive and significant impact on sustainable competitive advantage. This conclusion is supported by the t-value of 6.581, p-value of 0.000, and path coefficient value of 0.615.
- Hypothesis 3 is accepted based on the statistical analysis, which indicates that 30.4% of dynamic skills have a positive impact on sustained competitive advantage. This conclusion is supported by the t-value of 3.176, p-value of 0.001, and path coefficient value of 0.304.
- The fourth hypothesis demonstrates statistical significance with a t-value of 3.035, a p-value of 0.001, and a path coefficient value of 0.258. These results indicate that only 25.8% of knowledge management has a positive impact on sustainable competitive advantage through dynamic capabilities. Consequently, hypothesis 4 is acceptable.

Table 5. Results of structural model path coefficient (direct and indirect relationship)

Hypotheses	Relationship	β	t-value	p-value	Decision
H1	KM → DC	0.846	26.189	0.000	accepted
H2	KM → SCA	0.615	6.581	0.000	accepted
H3	DC → SCA	0.304	3.176	0.001	accepted
H4	KM – DC → SCA	0.258	3.035	0.001	accepted
DC	R2 = 0.716	KM→DC	f2 = 2.517		
SCA	R2 = 0.788	KM→SCA	f2 = 0.506		
		DC→SCA	f2 = 0.124		

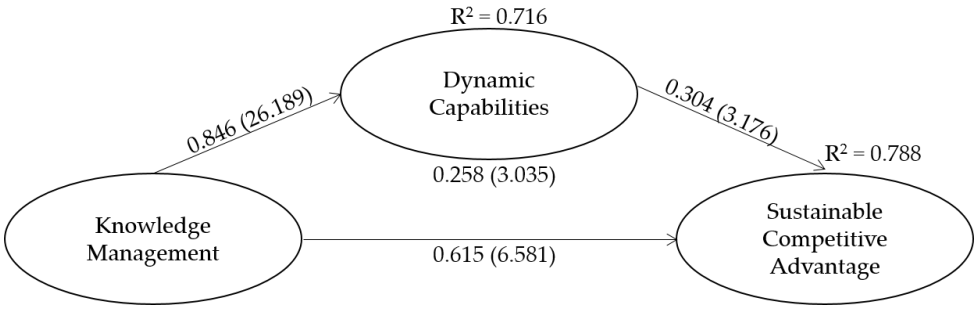

FIGURE 2. Result of hypotheses

Table 5 and Figure 2 reveal that the influence of KM on DC yields the highest result, with a t-value of 26.189 and a path coefficient value of 0.846 (84.6%). In second place is the influence of KM on SCA, with statistical results shown in the t-value of 6.581 and the path coefficient value of 0.615 (61.5%). In third place is the influence of DC on SCA, with statistical results shown in the t-value of 3.176 and the path coefficient value of 0.304 (30.4%). The fourth place goes to the effect of DC mediation on the connection between KM and SCA, which can be seen in the t-value of 3.035 and the path coefficient value of 0.258 (25.8%). Therefore, we can conclude that DC partially mediates the direct or indirect relationship between KM and SCA, leading to improved and more comprehensive results in this research model, supported by valid and reliable statistical values.

VI. DISCUSSION

1. ANALYSIS THE EFFECT OF KNOWLEDGE MANAGEMENT ON DYNAMIC CAPABILITIES

The first hypothesis's findings indicate that knowledge management has the capacity to enhance dynamic capabilities. The influence of various factors on the dimension of knowledge sharing is significant. This dimension pertains to the efficacy of knowledge sharing and information dissemination to both internal and external stakeholders. The dissemination of information serves as valuable information for monitoring changes and staying updated with the latest information. Consequently, lecturers and educational staff are able to identify needs and employ suitable methods to update business processes. The allocation of resources for each activity and the execution of standard services and management for successful methods and the development of Tri Dharma Higher Education implementation can be achieved by knowledge acquisition through learning, research, and community service. In this scenario, the primary responsibility of top management is to adapt short- and long-term policies and decisions by making adjustments to administrative and operational systems (reconfiguration). These modifications are then communicated through appropriate channels to foster the development of dynamic capabilities. This is achieved through a comprehensive comprehension of the organization and the implementation of an informative reporting system. In higher education, the dissemination of knowledge to stakeholders is a fundamental practice. This involves effectively managing the exchange and sharing of knowledge and ideas among stakeholders, with the aim of achieving high-quality knowledge derived from accessible knowledge resources. This knowledge is then utilized in a manner that is both appropriate and sustainable. The reason for this is the capacity of higher education to effectively allocate service resources and adhere to the Tri Dharma of Higher Education. This is achieved through the implementation of management process standards, as well as the utilization of adequate information systems for monitoring and evaluation.

Consequently, PHEI is able to impart knowledge, skills, abilities, and new development competencies in accordance with the Tri Dharma of Higher Education. Dynamic capabilities can enhance the company's commercial activities through effective management of knowledge resources. Effective implementation and management of knowledge management directly correlate with enhanced dynamic capabilities [17]. In addition, higher education plays a role in a society that necessitates ongoing supervision of various parties involved, including students and their families, private and public institutions, and governments. As a result, they have the ability to generate adaptive knowledge and produce generative knowledge, thereby significantly enhancing their dynamic capabilities [96]. The researchers consider this research to be relevant to the proposition model put forth by [19]. This model combines Strategic Human Resource Management (SHRM) and the Dynamic Capabilities Framework (DCF) to enhance comprehension of the relationship between HRM and performance. It also aims to stimulate additional research on the underlying mechanisms involved. A three-pronged approach to DC HRM, which includes knowledge-building, social integration, and reconfiguration-enhancing capabilities, enables organizations in a fast-paced and dynamic environment to effectively utilize the synergies between HRM resources and capabilities. This ultimately enhances strategic agility in the face of change and disruption. [97] emphasize the significance of organizational capabilities in establishing strategic flexibility through the ability to adjust to the external environment, including emerging technologies, consumer demands, and market volatility. The optimal utilization of internal capabilities, such as financial, resource, and value capabilities, as well as external capabilities, including technological changes, knowledge, and market opportunities, is crucial for higher education institutions to achieve sustainable performance [98]. The present research aligns with previous studies that

have indicated a positive and statistically significant relationship between knowledge management and dynamic capabilities [44-48].

2. *ANALYSIS THE EFFECT OF KNOWLEDGE MANAGEMENT ON SUSTAINABLE COMPETITIVE ADVANTAGE*

The second hypothesis's findings indicate that knowledge management has the capacity to enhance sustainable competitive advantage. Knowledge management plays a crucial role in enhancing sustainable competitive advantage. It involves optimizing knowledge sharing through mechanisms such as filtering, creating cross-lists (matrix), and utilizing various sources of knowledge to disseminate informative knowledge reports to relevant parties. This enables higher education organizations to acquire knowledge that fosters openness to change, enables innovation, productivity, capabilities, and management professionalism. Ultimately, this assists in achieving the strong vision, mission, and goals of higher education. The impact of knowledge management on organizational excellence is seen in the establishment of effective communication channels among employees, namely lecturers and education staff. This is attributed to the possession of competency qualifications and a willingness to embrace change, which ultimately contributes to the enhancement of higher education performance. The component of sustainable competitive advantage assigns the highest score to the quality education dimension, which pertains to Higher Education institutions that possess a curriculum of high quality that aligns with both national and international standards for service and learning. This achievement can be attributed to the effective governance of knowledge management. Moreover, knowledge management enhances organizational performance, including substantial university expansion and efficacy in executing the Tri Dharma of Higher Education through the cultivation of staff professionalism. However, this must be accompanied with employee productivity. The determinant factors of knowledge management explore the influence of organizational responsiveness on technological advancements, market dynamics, and stakeholder concerns.

Knowledge is a valuable resource that necessitates effective management in order to enhance an organization's competitive performance. Consequently, in order to achieve success, firms must leverage their knowledge assets through innovative approaches [99]. Employee participation and contact with people, resources, and technology lead to the acquisition of knowledge. According to [100] knowledge utilization pertains to the distribution of knowledge generated by scholars and researchers within the institution to stakeholders or external collaborators, with the intention of applying, utilizing, and contributing to society. Based on expert references and research instruments utilized in this study, the researcher suggests that the knowledge management process demonstrates the significance of acquiring and utilizing knowledge in higher education. This is beneficial for lecturers and educational staff in managing knowledge assets within organizations, as well as for students who cultivate critical, creative, and analytical thinking abilities, ultimately leading to the reputation of HEIs. Information technology's vital role in higher education student management, boosting information development and improving student management practice [101]. Moreover, [102] claim using a knowledge-based view (KBV) to achieve a resource-based view (RBV), particularly excellence, provides a competitive edge University competition. To attain the educational ideal of the LIVES model [53], it is necessary to acquire the skills of appreciating, comprehending, and enhancing both personal and shared experiences.

[52] argue that the significance of higher education lies in the advancement of management techniques, leadership, profitability standards, and innovation. Additionally, the implementation of knowledge management practices plays a significant role in enhancing an organization's capacity to generate novel knowledge, leading to enhanced performance, operational efficiency, and creativity. This, in turn, fosters sustainable competitiveness within the context of universities [50, 51]. The most prevalent themes that arise from exploring Challenge-Based Learning (CBL) research definitions are dimensions, which contribute to the study of knowledge management in the form of CBL. CBL is an integration of problem-based learning and project-based learning approaches that encompass global themes, real-world challenges, collaboration, technology, flexibility, multidiscipline and discipline specificity, definition of challenges, creativity, and innovation [103-105]. Hence, the facets of knowledge management and variables related to sustainable competitive advantage can effectively address the CBL gap. The research findings are corroborated by pertinent

studies that assert that knowledge management exerts a substantial influence on sustainable competitive advantage in higher education [6, 54-56, 58, 59, 106].

3. ANALYSIS THE EFFECT OF DYNAMIC CAPABILITIES ON SUSTAINABLE COMPETITIVE ADVANTAGE

The findings pertaining to the third hypothesis within the research model indicate that dynamic capabilities exert a significant influence on the attainment of sustainable competitive advantage. The formation of dynamic capabilities in HEIs is derived from their ability to monitor the environment, seize identified opportunities, and reconfigure resources. This enables HEIs to adapt, integrate, coordinate, and renew resources in response to the ever-changing internal and external environmental conditions. These capabilities are crucial for the advancement of the Tri Dharma of Higher Education and the governance of higher education. The primary factor influencing dynamic capabilities is coordination, which holds significant importance. Higher education institutions must possess the capacity to allocate resources effectively for each activity that promotes the successful execution of coordination in the Higher Education Tri Dharma. Additionally, they should enhance standard management through the utilization of appropriate information systems to ensure sustainability. The competitive advantage in the organizational excellence dimension lies in the effective collaboration among employees, including lecturers and education staff, who possess the necessary expertise and skills. They demonstrate mutual respect for each other's willingness to embrace change, with the ultimate aim of realizing the organization's vision, mission, and goals. The challenge lies in the reconfiguration of strategies through innovation, the modification of changes and needs through the renewal of business processes (seize and reconfiguration), and the integration of these strategies through a holistic understanding. This integration should be accompanied by the formulation of long-term strategies as policies and decisions, which should be coordinated from standard resources and management. Furthermore, these strategies should be integrated with every program action on competency development, utilizing efficient and effective methods in the implementation of the Tri Dharma of Higher Education (reconfiguration, integration, coordination, and learning). Therefore, in order to achieve sustainable competitive advantage in higher education, it is crucial to consistently excel in both individual and organizational performance. This entails attaining organizational excellence, effectiveness, responsiveness, educational quality, and the ability to innovate in order to seize potential opportunities. This demonstrates the organization's capacity to adapt to its external surroundings in a manner that yields organizational performance and the successful execution of the Tri Dharma of Higher Education.

Based on the findings of [107], dynamic capabilities pertain to the degree to which an organization promptly and effectively responds to alterations in its external environment. To enhance the dynamic capacities of project-centered course teams in fostering student innovation, we will utilize the framework outlined by [108]. The mechanisms aimed at fostering student innovation encompass several key aspects. Firstly, it involves facilitating access to resources and guidance. Secondly, it entails promoting experimentation and risk-taking, particularly in project-centered courses. Thirdly, it involves cultivating skills in design thinking and agility. Lastly, it involves fostering a mindset of continuous improvement. According to [109], adopting a directed and continuous dynamic capabilities change approach from an evolutionary standpoint promotes learning and reduces organizational inertia. This is because the mechanisms that respond to environmental changes are constantly in motion, ensuring that the entire model operates in synergy with environmental forces. The results of this study validate prior research conducted by [45, 54, 66-68] which have established a positive and statistically significant relationship between dynamic capabilities and sustainable competitive advantage in higher education, the ICT sector, and the banking sector, respectively.

4. ANALYSIS THE EFFECT OF KNOWLEDGE MANAGEMENT ON SUSTAINABLE COMPETITIVE ADVANTAGE MEDIATED BY DYNAMIC CAPABILITIES

The fourth hypothesis's research findings have been confirmed, indicating that dynamic capabilities might act as a mediator in the connection between knowledge management and sustainable competitive advantage. To obtain sustainable competitive advantage in higher education, it is crucial to prioritize knowledge management and enhance it with dynamic capabilities. The relationship between dynamic capabilities and sustainable competitive advantage is partially mediated, as both direct and indirect influences have a positive

and significant impact. However, the coefficient value of the direct influence of knowledge management on sustainable competitive advantage is higher than the coefficient value through the mediation of dynamic capabilities. HEIs in knowledge management involves the use of strategic and systematic approaches to create, capaci, apply, lm, develop, and utilize knowledge. It also focuses on developing skills in implementing the Tri Dharma, higher education, and strategic knowledge management governance. This includes aligning with the vision, mission, goals, and policies of higher education and government, as well as supporting environmental changes that influence decision-making in higher education knowledge management governance. The ultimate goal is to enhance organizational performance. The research results focus primarily on the aspect of knowledge usefulness, specifically the process of filtering, creating a cross-list (matrix), and integrating different sources and types of knowledge. Additionally, the study examines the methods used to analyze and critically evaluate knowledge in order to identify patterns that are beneficial for achieving the lowest average answer value. Hence, it is imperative to enhance dynamic capabilities in the areas of perception, capture, adaptation, integration, coordination, and knowledge acquisition to ascertain strategic trajectory and attain enduring competitive advantage.

These capabilities are intricately linked to the involvement of key individuals in the knowledge development process within an organization, which serves as a means for ongoing enhancement. This is due to the fact that knowledge management enhances an organization's competitive capacity [70], thereby facilitating the attainment of organizational objectives or outcomes and the potential for value creation [71]. Additionally, it serves as an indicator of organizational performance [72]. Research indicates that the various stages of knowledge management, such as acquiring, creating, disseminating, and utilizing knowledge, as well as the practices involved, such as monitoring, leadership, communication, protection, and knowledge work, have an impact on an organization's competitive advantage [6]. Knowledge management plays a crucial role in enhancing an organization's competitive capacities and facilitating the attainment of organizational objectives, serving as a key indicator of organizational performance [72, 73]. According to [18], the implementation of CII that enhances learning mechanisms and knowledge management can lead to the advancement of dynamic capabilities. This is achieved by leveraging knowledge to facilitate organizational adaptation actions in response to environmental changes, thereby addressing the challenge of achieving sustainable competitive advantage. The results of this study validate prior research, indicating that knowledge management has a favorable and substantial impact on sustainable competitive advantage, which is mediated by dynamic capabilities [6, 70, 74, 76]. This study serves to enhance the qualitative research conducted by [17] on the topic of integrating knowledge management and dynamic capabilities within agile companies.

VII. CONSLUSION

Knowledge management plays a crucial role in enhancing dynamic skills. The effective implementation of the Higher Education Tri Dharma necessitates the adoption of a knowledge-based view (KBV) that encompasses knowledge sharing, knowledge acquisition, knowledge dissemination, and knowledge utilization. This approach enables stakeholders to identify their needs and employ suitable methods for business processes. To apply service and management quality standards for the Tri Dharma of Higher Education, we may synchronize knowledge acquisition, encompassing education, research, and stakeholder engagement. According to the research findings, knowledge management plays a crucial role in enhancing the sustainable competitive advantage of PHEIs. This is attributed to its ability to optimize the interchange of knowledge, facilitate information dissemination, and integrate diverse knowledge sources for effective knowledge dissemination. This methodology promotes the development of new ideas, efficiency, and expertise in the field of management. Knowledge management plays a significant role in enhancing organizational effectiveness, as exemplified by the success of the Tri Dharma of Higher Education. This success is primarily driven by the high quality of education and the effective administration of knowledge management infrastructure resources, which fosters innovation. Organizations can attain a competitive edge and achieve success by employing inventive tactics and approaches to harness their knowledge resources. However, it is crucial to focus on the dimensions of knowledge consumption, innovation, integration, and other factors that contribute to the ongoing enhancement and continual improvement of higher education.

The study examines the mediating role of dynamic capabilities in the association between knowledge management and sustainable competitive advantage. The findings indicate that both direct and indirect

influence through dynamic capabilities have a substantial impact on sustainable competitive advantage. This suggests that dynamic capabilities partially mediate the relationship between knowledge management and sustainable competitive advantage. Therefore, the findings of [18] support the proposition model's constellation, which posits that the notion of continuous improvement, specifically knowledge management, constitutes a type of continuous improvement initiative (CII) that yields enduring strategic advantages for the organization, including environmental adaptation and the attainment of sustainable competitive advantage. Moreover, the present study serves as a tangible manifestation of the theoretical framework put forward by [16, 17, 19]. In contrast, [45] found that although the innovation component is crucial for the long-term viability of a company, it does not have a direct positive relationship with competitive performance in the ICT sector. Among the several research aspects considered in this study, there is a lack of attention given to the influence of these dimensions on the latent variables, which aligns with the findings of this research. This research demonstrates its timeliness and aims to provide a complete analysis of research on HEIs and other sectors that require measurement and evaluation of SCA. It is expected to contribute by incorporating more aspects to enrich future research in this area.

VIII. IMPLICATION

In this research, the operationalization of sensing refers to the university's capacity to track and recognize changes in the external environment, leading to the creation of innovative services. In this scenario, it's critical to reconfigure at the Tri Dharma HEIs level, fostering integration with stakeholders to expedite adaptation and continuous improvement. In this case, the researcher thinks that improving the [110] model, which talks about how dynamic capabilities work in PHEIs, needs a complete method for combining tasks in every work area. This involves allocating resources appropriately for each activity, implementing quality standard management techniques across units, and employing effective methods and information system control mechanisms to ensure the successful implementation of Tri Dharma HEIs (coordination and learning). Researchers believe that creating space and communication to integrate policies with holistic understanding should be part of PHEI's strategic programs and actions at the Tri Dharma HEI level.

The development of AI applications for knowledge sharing and access to Tri Dharma HEIs' information enhances the effectiveness of knowledge sharing. Students, employees, and partners can acquire knowledge using a problem-based identification strategy by constructing an ecosystem and implementing Tri Dharma HEIs' information flow. Knowledge Dissemination through an Output-Based Strategy: For students, this means creating a database containing the outcomes of Tri Dharma HEIs conducted by both students and lecturers. This database includes student final assignments, research, and lecturer publications related to study programs, objects, subjects, topics, and results. Meanwhile, for management PHEIs, this means establishing a knowledge reporting framework and system across all units to track issues, evaluate progress, and set goals for relevant parties (reports). Knowledge utilization through an outcome-based strategy has implications for students. This is an application for a list of research results and publications by lecturers and students, which they can use as a reference based on science fields, topics, objects, and research subjects. This approach promotes renewal and scientific development. In the meantime, PHEI Management is crafting a framework for information and knowledge at Tri Dharma HEIs, ensuring its effective integration into the structure to address pertinent and efficient stakeholder needs.

Knowledge utilization begins with a knowledge-based approach that can offer solutions to problem-based issues. This approach is then passed on to students through the acquisition of knowledge, facilitated by skilled and knowledgeable teaching personnel in their respective professions. Ultimately, this process evolves into a project-based approach. The outcomes of the project-based solutions and collaborative actions are determined by the identified difficulties. The establishment of a framework and the facilitation of knowledge integration among learning, research, and community service are crucial for effective knowledge management governance among students, specifically in the context of PHEIs. Internally, it is necessary to employ integrative methods and mechanisms, involving stakeholders, to address management issues within the structural management units at PHEIs. This will serve as the foundation for evaluating and implementing appropriate policy updates, ultimately enhancing the implementation of Tri Dharma Higher Education to meet accreditation criteria and promote successful national and international recognition. The exploitation of knowledge refers to the output and outcome derived by PHEIS from the management of knowledge resources. The incorporation of a complete

framework aimed at achieving long-term competitive advantage inside higher education institutions (PHEIs) and the facilitation of integration among study, research, and community service are integral elements. Effective management of dynamic capacity and knowledge management plays a crucial role in facilitating the attainment of a sustained competitive advantage. This can be achieved through the processes of education, research, and community service, as evidenced by the number of activities and the value of benefits for society, government, and industry (pentahelix hierarchies: community, academic, business, and government). This means that the knowledge cycle wheel becomes valuable and has a tangible impact in a system of interaction and pentahelix hierarchies.

IX. LIMITATION & FUTURE RESEARCH

The first limitation of this research is that it only generalizes the results to the leadership sample level, which includes 10 private universities. Future research could potentially extend to PHEI regions other than Indonesia. Second, this research only discusses two determinant variables (KM and DC) that have an impact on SCA PHEI. Third, the research is focused solely on the education sector, specifically private universities. Future research could propose education sectors at different levels, such as private high schools or state universities, as well as industrial sectors beyond education. We hope that further research can focus on determinant aspects that influence sustainable competitive advantage, given the limitations of the current study. In order to generalize the results, it would be beneficial to expand the research population to include both public and private universities, as well as broaden the scope to include other sectors. The following are some suggestions for determining topics that significantly influence sustainable competitive advantage: We recommend market orientation, organizational learning capabilities, intellectual capital, industry collaboration, strategic leadership, a balance scorecard, reputation and legitimacy, and strategic human resource management.

Funding statement

This research was supported by authors.

Author contribution

All authors made an equal contribution to the development and planning of the study.

Data Availability Statement

Data are available from the authors upon request.

Conflict of Interest

No potential conflict of interest was reported by the author(s).

Acknowledgements

We are grateful for the support provided by the Postgraduate Program of Universitas Negeri Jakarta, Universitas Esa Unggul and all respondents.

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