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Factors Affecting Performance of Higher Educational Institutions: A Dynamic Capability Perspective

Yousef A AlJemely
Department of Educational, College of Education, Majmaah University, Kingdom of Saudi Arabia

العوامل المؤثرة على أداء مؤسسات التعليم العالي: منظور القدرة الديناميكية

يوسف عبدالرحمن الجميلي
قسم العلوم التربوية، كلية التربية، جامعة المجمعة، المملكة العربية السعودية

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Abstract:

The competition in the educational sector has diverted the attention of private higher educational institutions towards enhancing their performance and gain competitive advantage through the adoption of modern technologies. Therefore, this research aimed to highlight the factors leading to the performance of private higher educational institutions in KSA. The data were gathered from top-level management of PHEIs and analysed with Smart PLS4. The results highlighted that big talent capability and big data analytical capability can help PHEIs develop strategic agility that not only helps achieve competitive advantage but also leads to superior performance. Therefore, competitive advantage significantly mediates the relationship between strategic agility and the performance of PHEIs. Moreover, student retention strengthens the relationship between strategic agility and competitive advantage. The findings of this research can act as a guideline for leaders, administrators or owners of PHEIs in KSA aiming to enhance institutional performance.

Keywords: Big Talent Capability, Big Data Analytical Capability, Strategic Agility, Competitive Advantage, HEIs Performance.

الملخص:

لقد أدت المنافسة في قطاع التعليم إلى تحويل انتباه مؤسسات التعليم العالي الخاصة نحو تعزيز أدائها والحصول على ميزة تنافسية من خلال تبني التكنولوجيا الحديثة. لذلك، هدف هذا البحث إلى تسليط الضوء على العوامل المؤدية إلى أداء مؤسسات التعليم العالي الخاصة في المملكة العربية السعودية. تم جمع البيانات من الإدارة العليا لمؤسسات التعليم العالي الخاصة وتحليلها باستخدام برنامج Smart PLS4. وأبرزت النتائج أن قدرة المواهب الكبيرة والقدرة على تحليل البيانات الضخمة يمكن أن تساعد مؤسسات التعليم العالي الخاصة على تطوير المرونة الاستراتيجية التي لا تساعد فقط في تحقيق الميزة التنافسية بل تؤدي أيضًا إلى أداء متفوق. لذلك، تتوسط الميزة التنافسية بشكل كبير العلاقة بين المرونة الاستراتيجية وأداء مؤسسات التعليم العالي الخاصة. علاوة على ذلك، يعزز الاحتفاظ بالطلاب العلاقة بين المرونة الاستراتيجية والميزة التنافسية. يمكن أن تكون نتائج هذا البحث بمثابة دليل للقادة أو الإداريين أو مالكي مؤسسات التعليم العالي الخاصة في المملكة العربية السعودية بهدف تعزيز الأداء المؤسسي.

الكلمات المفتاحية: قدرة المواهب الكبيرة، قدرة تحليل البيانات الكبيرة، المرونة الاستراتيجية، الميزة التنافسية، أداء مؤسسات التعليم العالي.

1. Introduction:

Background

In the Kingdom of Saudi Arabia (KSA) higher educational sector is considered a centre of excellence for transforming the nation's future. All the public and private sector higher educational institutions can play their role in the economic development of the country (Meshari et al., 2021); thus, researchers should highlight the antecedents of the performance of these institutions. In this era of knowledge, public and non-public education plays an important role in promoting economic solidarity, social cohesion, individual development, sustainable development, and

cultural development (Al-Dali & Al-Rayes, 2009). However, private institutions, are facing many challenges and struggling to survive in the dynamic economic conditions (Casagrande et al., 2020; Al Rahhaleh et al., 2023). Therefore, researchers should identify the steps that institutions should take to enhance their performance (Meniado, 2021; Bhatti et al., 2022; Al Rahhaleh et al., 2023).

Recently, Saudi Arabia launched Vision 2030 aimed to get at least five universities ranked among the top universities of the World (Alshuwaikhat et al., 2016). To fulfil this vision, Saudi universities should understand the metrics followed by international universities and enhance their performance (Al-Kuwaiti et al., 2019) by developing strategic agility based on big data analytics (Khaw & Teoh, 2023). Similarly, Dahdough et al. (2018) highlighted that institutions can develop strategic decisions and agility with the help of big data technologies. In addition, Lyn Chan and Muthuveloo (2021) argued that in this volatile technological era, all educational institutions need strategic agility to cope with challenges and enhance their performance. Agility is essential to improve performance and operational strategies (Ashrafi et al., 2019). Moreover, it can enable institutions to adapt to different technological platforms (Nyoni, 2022). Many prior studies have reported that institutional performance is linked to strategic agility (e.g., Arokodare & Asikhia, 2020; Le et al., 2022; Panda, 2022) but they ignored to highlight the antecedents of strategic agility leading to performance. Hyun et al., (2023) argued that organizational agility is associated with big data analytics or capabilities including big talent capability and big data analytics capability management. Therefore, these capabilities can help private educational institutions in KSA develop strategic agility and enhance performance.

Research Problem and Objectives

Al Kuwaiti et al. (2019) highlighted that there are 34 universities in KSA; among them 25 are public and nine are private higher educational institutions). These universities or higher educational institutions are spread across different regions of the country, and they play pivotal role in societal development. Moreover, the higher educational sector in KSA is playing a strategic role in providing quality education to its citizens. Furthermore, this sector is continuously expanding; both private and public institutions are growing steadily, but the growth of private institutions is still unsatisfactory. Currently, there are 29 public and 38 private universities in the Kingdom (Ministry of Education, 2022). In 2019, a quality assessment of 1000 universities reported that among the top ten Saudi universities, only eight are ranked in the group, but only four universities, including King Fahd University of Petroleum & Minerals (KFUPM), King Abdul-Aziz University, King Saud University, and King Khalid University (KKU) were individually ranked (Al Kuwaiti et al., 2019). All these universities ranked by QS ranking 2019 were from the public sector, indicating that private universities must emphasize their performance to be ranked. Moreover, the public sector universities or higher educational institutions in KSA performing better than private ones (PHEIs). Therefore, it is important for PHEIs in KSA to develop a proactive strategy to enhance their performance.

Big data can assist educational institutions in making strategic decisions because it can forecast future performance and address educational issues hindering performance (Birjali et al., 2018). Big data technology is defined by Chakhari (2015, p. 70) as “a new generation of technologies, architectures, tools, and techniques designed for extracting value from very large volumes of a wide variety of data, allowing a high speed of capture, discovery and/or analysis”. Moreover,

National Institute of Standards and Technology (NIST) (2015) defined big data as "the inability of traditional data architectures to handle efficiently the new datasets. It consists of extensive datasets - primarily in the characteristics of volume, variety, velocity, and/or variability - that require a scalable architecture for efficient storage, manipulation, and analysis". Further, Dahdouh et al. (2018) defined big data in the context of educational institutions as "the data that is produced by learners during the learning process, including the data created while they are taking an online course or training module" (p. 2784).

In a turbulent business environment, strategic agility enables institutions to determine the market trends (Nejatian et al., 2019) as it is a dynamic capability that comprises several meta-capabilities leading to flexibility (Shams et al., 2021). Cetindamar et al. (2021) highlighted that dynamic capabilities are insufficient in accelerating institutional performance, and they need big data capabilities (Davenport, 2014). Many studies have indicated the different antecedents of educational institutions and only a few of them have investigated the influence of big data analytical capabilities on the performance of educational institutions (Ashaari et al., 2021). However, still there is a dearth of investigation on the performance of private educational institutions in KSA linked with strategic agility based on big data analytical capabilities. Therefore, this research has highlighted the role of big talent capability and big data analytics management capability on the strategic agility of private higher educational institutions. Moreover, it has examined the role of strategic agility (i.e., based on big talent capability and big data analytics management capability) on competitive advantage and performance of private higher educational institutions. Furthermore, it has investigated the mediating role of competitive advantage in the relationship between strategic agility and performance of private higher educational institutions, and the moderating role of student retention in the relationship between strategic agility and competitive advantage. In conclusion, the aim of this research is to highlight the factors leading to the performance of private higher educational institutions in KSA.

2. Literature Review

Resource Based View (RBV) generally emphasise static resources and capabilities, but the dynamic capability view postulates about organizational competence of adapting to a dynamic business environment (Teece, 2012) by sensing and seizing upcoming opportunities (Gebauer, 2011). Therefore, strategy agility is the best fit for a dynamic capability framework (Alyahya et al., 2023). Further, Al-Darras et al. (2022) highlighted that in today's business world, organizations can develop dynamic capabilities with the help of big data analytical capabilities.

Big Talent Capability, Big Data Analytical Capability Management and Strategic Agility

In the current era of digitalization and Industry 4.0, big data analytical capabilities are considered important organizational resources (Al-Darras et al., 2022), comprising big talent capability (BTC) and big data analytical capability management (BDACM). This capability can help institutions to sense and seize market opportunities (Mikalef et al., 2020). Garmaki et al. (2016, p. 301) defined it as "the organizational ability to utilize data assets in combination with physical IT assets and human resource to create competitive advantages". Big data analytical capabilities can help organizations estimate future market prospects and demand, create an action plan for reacting to changing market conditions, and shorten production lead times. Thus, these capabilities can help institutions to achieve strategic agility (Alyahya et al., 2023). Furthermore, Khaw and Teoh (2023) argued that big data analytics technology can enable higher educational institutions to develop strategic agility. Therefore, big talent capability can big data analytical capability management help private higher educational institutions in KSA to strategic

agility. Based on this discussion, the following hypotheses are developed:

H1: Big talent capability is positively related to strategic agility.

H2: Big data analytical capability is positively related to strategic agility.

Strategic Agility and Competitive Advantage

In this competitive business environment, organizations need to predict the upcoming challenges and change their strategies accordingly to achieve a competitive advantage over rivals. Therefore, strategic agility can help organizations to gain a competitive advantage (Fakunmoju et al., 2020). Moreover, Battour et al. (2021) highlighted that SMEs can achieve sustainable competitive advantage through strategic agility. Furthermore, many studies reported the relationship between strategic agility and competitive advantage (e.g., Clauss et al., 2021; Seyadi & Elali, 2021; Amini & Rahmani, 2023; Motalo et al., 2023), but still, there is a dearth of literature highlighting the competitive advantage of higher educational institutions in KSA associated with strategic agility. Therefore, the following hypothesis was developed:

H3: Strategic agility is positively related to competitive advantage.

Strategic Agility and Performance of PHEIs

Strategic agility is an organizational ability that enables organizations to modify their actions to maintain competitive advantage (Weber & Tarba, 2014). It is an important factor that helps organizations to determine their success in turbulent environment (Yildiz & Aykanat, 2021). It is evident from the literature that agile institutions can swiftly respond to upcoming opportunities (AlTaweel & Al-Hawary, 2021). Thus, strategic agility can improve performance (Shin et al., 2015; AlTaweel & Al-Hawary, 2021) in higher educational institutions. Therefore, to investigate the influence of strategic agility on the performance of private higher educational institutions and examine the role of competitive advantage on the performance of higher educational institutions, the following hypotheses are developed:

H4: Strategic agility is positively related to the performance of HEIs.

H5: Competitive advantage is positively related to the performance of HEIs.

Competitive Advantage and Performance of PHEIs

Ramdhany et al. (2019) indicated that public sector universities can enhance their performance with a competitive advantage. Similarly, De Haan (2015) reported that competitive advantage can help public-sector universities to enhance their performance. In addition, Rabah (2015) mentioned that higher educational institutions need a competitive advantage to enhance their performance. However, the prior studies mainly focused on public sector higher educational institutions, and there is a paucity of research highlighting competitive advantage in private higher educational institutions. Therefore, to investigate the mediating role of competitive advantage in the relationship between strategic agility and the performance of private higher educational institutions and to determine the moderating role of student retention in the relationship between strategic agility and competitive advantage, the following hypotheses are developed:

H6: Competitive advantage mediates the relationship between strategic agility and the performance of HEIs.

H7: Student retention moderates the relationship between strategic agility and competitive advantage.

Based on the discussion given above the conceptual framework was developed to predict the factors leading to the performance of PHEIs in KSA (See Figure 1).

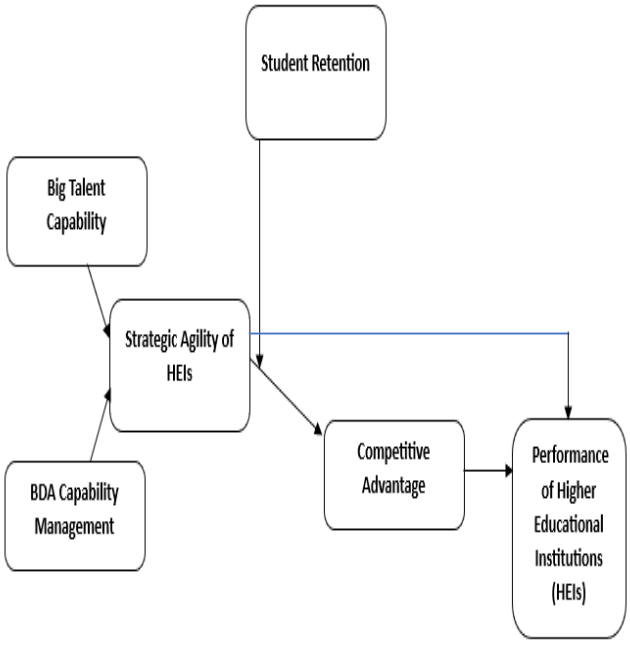

Figure 1. Conceptual Framework

3. METHODOLOGY

Nowadays higher educational institutions in KSA are facing a lot of challenges in their performance and long-term survival. Besides the emerging competition, the biggest challenge is the agility to retain the students, and to overcome this, upgradation of data processing and storing mechanisms is essential with the help of big data because it is the most useful paradigm for data-efficient data processing. Furthermore, it can help educational institutions to improve their data collection, storing, analysing, processing, optimizing and visualization capabilities (Dahdou et al., 2018; Singh et al., 2021). Thus, it can help the higher educational institutions in KSA in developing strategic agility, gaining competitive advantage, and enhancing performance. Therefore, this study aimed to highlight the influence of big data analytical capabilities (i.e., big talent capability and big data analytics management capability) on the strategic agility of high educational institutions. Moreover, it aimed to investigate the mediation of competitive advantage in the relationship between strategic agility and the performance of higher educational institutions. In addition, the moderating role of student retention was analysed in the relationship between strategic agility and competitive advantage.

Research Instrument and Measurements

The development of appropriate scales is the most difficult task; thus, the majority of quantitative studies adopt or adapt scales developed by prior valid studies. Similarly, this research has focused on previous literature highlighting big talent capability, big data analytics management capability, strategic agility, competitive advantage, student retention, and performance of higher educational institutions to find the most relevant scales. The scale of big talent capability (i.e., 9-items based) was adapted from Akter et al., (2020), and big data analytics management capability was examined with a scale developed by Bag et al., (2020). These scales were adapted in the context of private higher educational institutions (PHEIs). Strategic agility is measured with a scale based on 8 items adapted from Queiroz et al. (2018) and Haider and Kayani (2020) in the context of private higher educational institutions (PHEIs) in KSA. Five item-based scale of competitive advantage was adapted from Zhao et al., (2019), and performance of higher educational institutions was measured with five items scale by Chen, Mattioda, and Daugherty (2007). Lastly, a 5-items scale of student retention was adopted from the study of Giannakos et al. (2017) and Cabrera et al. (1992). The face validity was ensured by three institutional experts, two subject experts, and three researchers. They provided different comments about the relevance and the context of each item. Moreover, they indicated some grammatical or general addition to a few items. The comments provided by all of them were incorporated before finalizing the questionnaire. The questionnaire was divided into two sections: the first section inquired about the demographic information of respondents, and the second section was related to questions about variables (i.e., big talent capability, big data

analytics management capability, strategic agility, competitive advantage, student retention and performance of higher educational institutions).

Population and Sample

The main objective of the research was to investigate the effect of big data capabilities on strategic agility and performance of PHEIs, thus, it was aimed to gather from top-level management of private higher educational institutions in KSA. Hence, the purposive sampling technique was used as the purpose was to gather the required information top level management/administration. The information about top-level management of PHEIs was taken from their websites and LinkedIn. The questionnaire was designed online (i.e., via Google Forms), and its link was shared with the top-level management/administration of private higher educational institutions in KSA. The data collection took 11 days from 1st February to 12th February. Every private higher educational institution has its different hierarchal structure, thus, it was difficult to figure out the exact number of top-level management employees. Therefore, the sample size of 385 was considered appropriate for the study because it is applicable particularly when the population is unknown (Krejcie & Morgan, 1970). The demographic information of all the respondents is shown in table 1. It shows that the majority of respondents were males (i.e., 96 %) and had more than 10 years of experience in managerial assignments. There were only 16 (i.e., 4%) female respondents because in PHEIs, the managerial positions are occupied by males.

Table I.

Demographic Information of Respondents

Demographics	Factors	Count	Percentage
Gender	*Male*	369	96 %
	Female	16	4 %
Qualification	*Masters*	91	24 %
	Post Graduation	178	46 %
	PhD	116	30 %
Experience on Administrative Posts	*5 - 10 years*	32	8 %
	11 - 15 years	177	46 %
	16 - 20 years	118	31 %
	Above 21 years	58	15 %

4. Results

This research has employed structural equational modeling (SEM) technique for analyzing the data by using Smart Pls 4 because it only minimizes the intermediacy problems that occur in other modeling techniques but also help in proper investigation of complex models (Wittmann et al., 2009; Asghar et al., 2021). The main reason behind employing PLS-based SEM is its flexibility, appropriateness, and robustness for analyzing small sample sizes to generate high efficiency while estimation of parameters (Okumus et al., 2023). The data analysis was done in two steps, in the first step measurement model was tested to show the psychometric properties of every item. Moreover, the common method bias (CMB) was determined to ensure the quality of data, and it was aimed to get the desired results (i.e., less than 3) according to suggestions of (Kock & Lynn, 2012). In the second step of data analysis, the hypotheses were tested by analyzing the structural model.

The investigation of the measurement model is important to determine the internal consistency of constructs and evaluate average extracted variance

(AVE). The results highlighted that the AVE values of all the constructs were more than 0.5 (i.e., the minimum threshold), and the Cronbach alpha (i.e., composite reliability) of all the constructs was more than 0.7. The threshold values were followed by prior studies (e.g., Hair, 2014; Darsono et al., 2019; Wilujeng 2023). The findings revealed that loadings of all variables are greater than 0.6 except for one factor of big data capability management (i.e., 0.575) and one factor of student retention (i.e., 0.578). Therefore, they were removed from the final measurement model. Moreover, the AVE values shown by the model were more than 0.5 (i.e., Big Talent Capability: 0.529, BDA Capability Management: 0.514, Strategic agility: 0.502, Competitive Advantage: 0.555, Performance of higher educational institutions: 0.544, Student Retention: 0.626). In addition, the VIF values were ensured for checking CBM and ensuring multicollinearity, and results showed that all values are below 3 (Hair et al., 2021). The values of Cronbach's alpha (α), Average Extracted Variance (AVE), VIF, and loadings of all items of big talent capability, big data analytics management capability, strategic agility, competitive advantage, student retention and performance of higher educational institutions are given table 2. Figure 2 shows the measurement model, it highlights the loadings and other psychometric properties. Figure 3 highlights the final measurement model after removing the two items.

Table 2.

AVE, Loadings, and Cronbach's Alpha

Constructs	Items	Loadings	VIF
Big Talent Capability	Our analytics personnel are very capable in terms of programming skills.	0.775	2.770
AVE: 0.529	Our analytics personnel are very capable in terms of managing different projects run by institute	0.765	2.202
Cronbach's Alpha: 0.890	Our analytics personnel are very capable in the areas of data and network management and maintenance.	0.710	1.957
	Our analytics personnel show a superior understanding of technological trends, which are important for educational institutes.	0.673	1.830
	Our analytics personnel are very knowledgeable about the critical factors for the success of our institute.	0.671	2.964
	Our analytics personnel understand our institutional policies and plans at a very high level.	0.770	2.933
	Our analytics personnel are very knowledgeable about the competitive environment in higher education sector.	0.674	2.180
	Our analytics personnel work closely with partners for providing key inputs useful for developing innovative services.	0.750	2.961
	Our analytics personnel work closely with students and teachers to maintain productive relationships with them	0.749	1.929
BDA Capability Management	We continuously examine the innovative services available for the strategic use of BDA.	0.575*	1.838
AVE: 0.514	We enforce adequate plans for the introduction and utilization of BDA.	0.780	2.318
Cronbach's Alpha: 0.810	We perform BDA planning processes in systematic and formalized ways.	0.736	1.633
	We frequently adjust BDA plans to better adapt to changing market conditions.	0.750	2.074
	In our institution, analysts and stakeholders meet frequently to discuss important issues both formally and informally.	0.684	1.643
	In our institution, information is widely shared between	0.755	1.573

	analysts and line people so that those who make decisions or perform jobs have access to all available know-how.		
Strategic Agility	Respond to changes in aggregate demand of market and students	0.652	1.731
AVE: 0.502	Customize a service to suit an individual student.	0.728	2.068
	React to new service for students	0.669	1.920
Cronbach's Alpha: 0.859	Introduce new fee schedules in response to changes in our competitor's fee.	0.756	1.754
	Expand into new cities or regions	0.746	2.067
	Expand or reduce the variety of degree programs	0.798	2.356
	Adopt new technologies to increase the throughput of services.	0.700	1.663
	Make relationship with partner institutions	0.603	1.626
Competitive Advantage	The total assets of the institute have been increasing in the past three years.	0.711	2.154
AVE: 0.799	The profit level of the institute has been rising in the past three years.	0.747	2.153
Cronbach's Alpha: 0.555	The institute's return on investment has been increasing in the past three years.	0.786	1.642
	The institute's student satisfaction has improved significantly in the last three years.	0.682	1.805
	The market share of the institute has increased significantly in last three years.	0.794	2.088
Institutional Performance of HEIs	Student satisfaction	0.768	1.572
	Overall competitive position	0.751	1.626
	Student enrolment	0.707	2.211
AVE: 0.544	Profitability	0.826	2.544
	Repeat enrolments by students	0.618	1.422
Cronbach's Alpha: 0.794			
Student Retention	Students continue to work towards degree from our institute.	0.578*	1.138
AVE: 0.626	Students always want to finish their studies from this institute.	0.825	2.615
Cronbach's Alpha: 0.844	Students prefer to do further courses in institute after completion of their degrees.	0.864	2.643
	Students refer to our university to their close friends and encourage them to continue attending this institute.	0.792	1.978
	Students feel important to be graduated from our institute.	0.860	2.742

*These items were removed for final analysis as loadings were below 0.6.

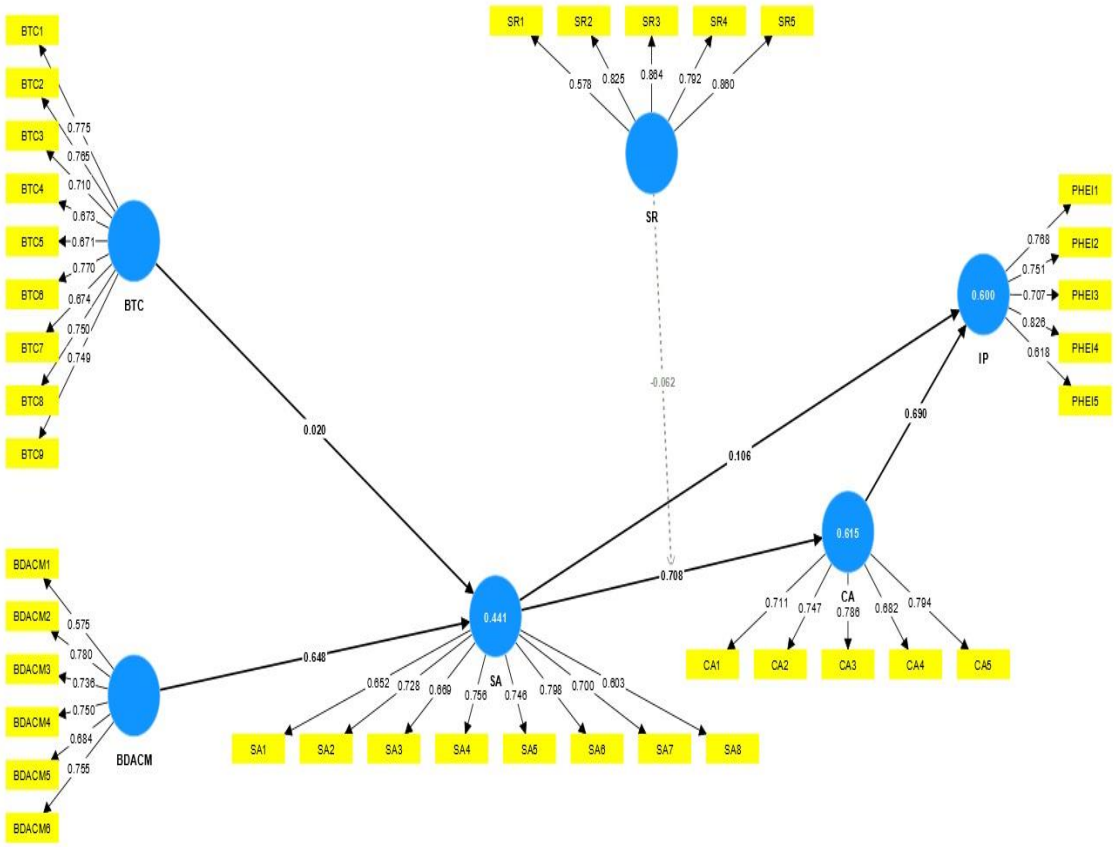

Figure 2: *Measurement Model (without deleting items)*

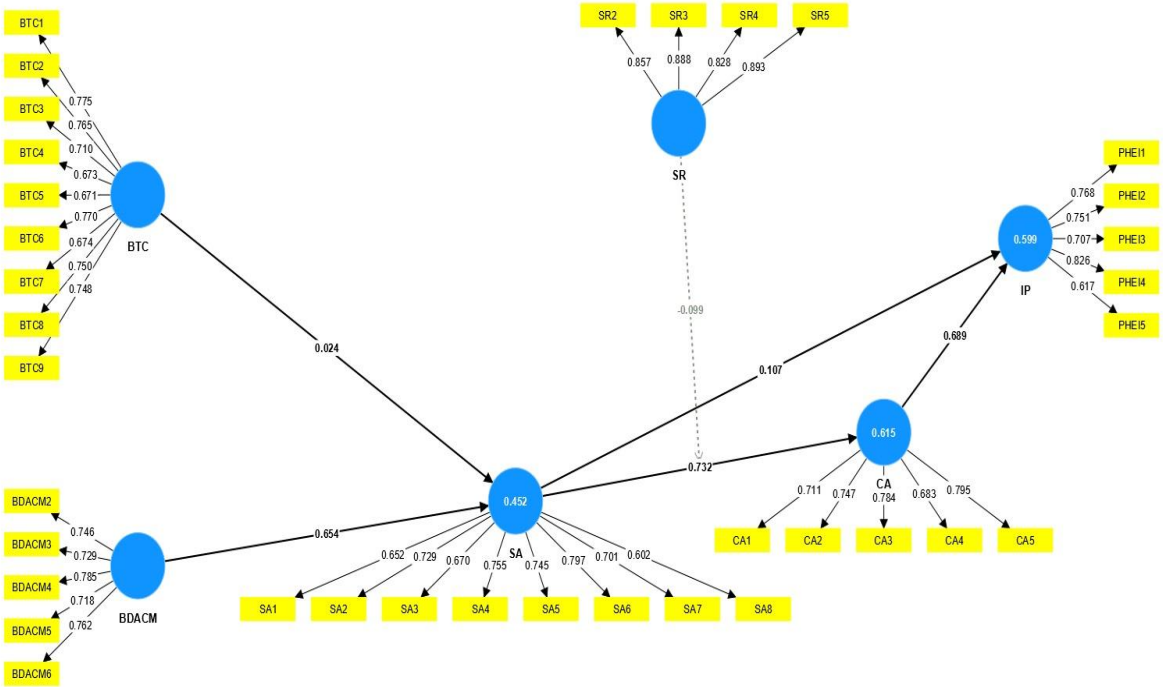

Figure 3: *Final Measurement Model*

Fornell-Larcker criterion was ensured to analyze discriminant validity. Table 3 given below shows the Fornell-Larcker criterion.

Table 3:

Fornell-Larcker criterion (Discriminant Validity)

	BDACM	***BTC***	***CA***	***IP***	***SA***	***SR***
BDACM	0.748					
BTC	0.776	0.727				
CA	0.658	0.558	0.745			
IP	0.671	0.798	0.771	0.737		
SA	0.672	0.531	0.767	0.635	0.709	
SR	0.664	0.786	0.413	0.584	0.395	0.867

**BDACM: Big Data Analytical Capability Management, BTC: Big Talent Capability, SA: Strategic Agility, CA: Competitive Advantage, IP: Performance of higher educational institutions, SR: Student Retention*

In the second step of analysis, structural model was investigated to test the proposed hypotheses. To investigate the structural model bootstrapping with 5000 iterations. The summary of hypotheses is given in table 4.

Table 4.

Results Summary

	Hypothesis	**STD Coefficient (β)**	**Standard Deviation**	**T- Values**	**P-Values**
H1	BTC -> SA	0.024	0.043	0.557	0.578
H2	BDACM -> SA	0.654	0.051	12.871	0.000
H3	SA -> CA	0.732	0.025	29.373	0.000
H4	SA -> IP	0.611	0.031	19.911	0.000
H5	CA -> IP	0.689	0.048	14.466	0.000
Mediating Hypothesis					
	Hypothesis	**STD Coefficient (β)**	**Standard Deviation**	**T- Values**	**P-Values**
H6	SA -> CA -> IP	0.505	0.042	11.991	0.000
Moderating Variable					
	Hypothesis	**STD Coefficient (β)**	**Standard Deviation**	**T- Values**	**P-Values**
H7	SR x SA -> CA	0.099	0.03	3.343	0.000

**BDACM: Big Data Analytical Capability Management, BTC: Big Talent Capability, SA: Strategic Agility, CA: Competitive Advantage, IP: Performance of higher educational institutions, SR: Student Retention*

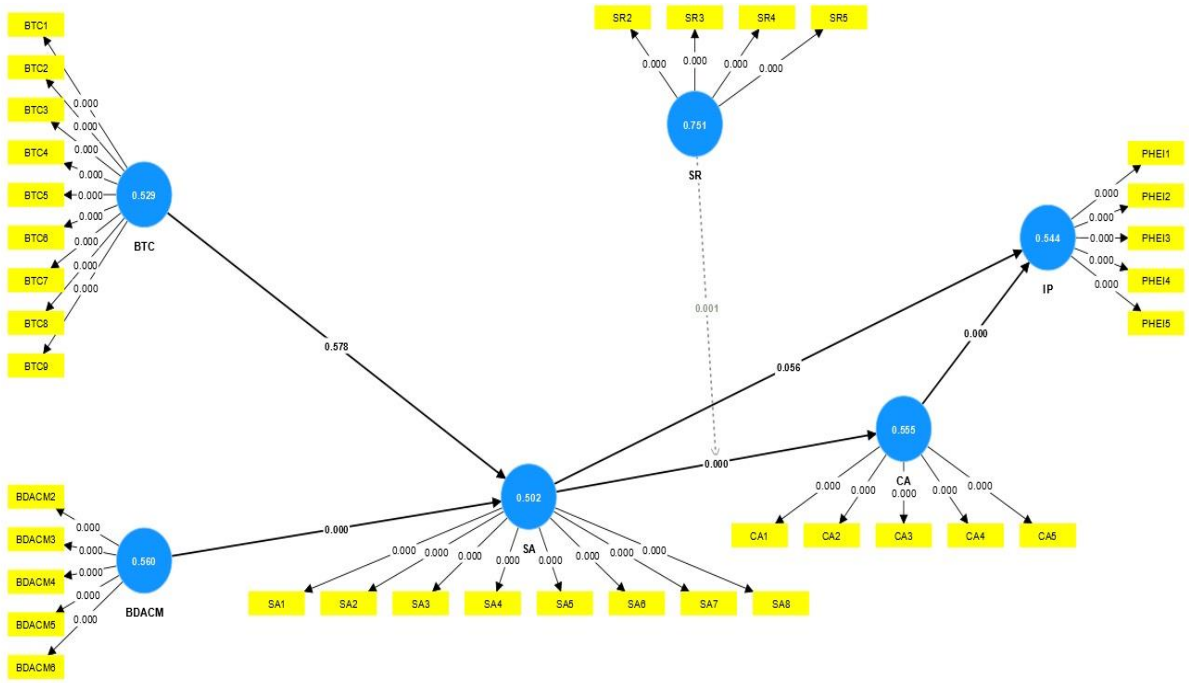

Figure 4: *Structural Model*

Table 4 shows an insignificant relationship between big talent capability and strategic agility (β = 0.024, T= 0.577, P= 0.578). There is a significant relationship between big data analytical capability management and strategic agility (β = 0.645, T= 12.871, P= 0.000). Moreover, strategic agility significantly influences competitive advantage (β = 0.732, T= 29.373, P= 0.000) and performance of higher educational institutions (β = 0.611, T= 19.911, P= 0.000). In addition, there is a significant relationship between competitive advantage and the performance of higher educational institutions (β = 0.689, T= 14.466, P= 0.000).

The results revealed that competitive advantage mediates the relationship between strategic agility and institutional performance (β = 0.505, T= 11.991, P= 0.000). In addition, student retention moderates the relationship between strategic agility and competitive advantage (β = 0.099, T= 3.343, P= 0.000).

5. Discussion

In the current digital era, the competition and need for digital transformations or digital strategies directed the attention of researchers and practitioners towards focusing on the performance of their institutions or organizations and particularly highlighting the factors leading to performance (Al-Thuneibat et al., 2015; Lokuge & Duan, 2023; Bednářová et al., 2023). Moreover, the global financial crisis of 2008 and the COVID-19 pandemic have forced organizations (Umar & Dikko, 2018) and educational institutions (Camilleri, 2021; Babbar & Gupta, 2022) to determine their performance indicators. Moreover, the pandemic significantly transformed the educational system (Almelhes, 2021), and higher educational institutions, particularly private higher educational institutions, strive to enhance their performance. Many studies have highlighted the traditional approaches leading to institutional performance. However, there is a dearth of literature on the latest technological factors that can enhance the performance of PHEIs. Therefore, this research has provided a comprehensive framework highlighting the performance of PHEIs in KSA.

In this competitive era, big data capabilities are considered the most important organizational resources (Al-Darras et al., 2022) that help in achieving strategic agility. Therefore, this research focused on these capabilities and developed two

hypotheses (i.e., H1 and H2) to determine the influence of big talent capability and big data analytical capability on strategic agility. The results supported the second hypothesis and findings reported that private higher educational institutions require big data analytical capability instead of big talent capability to develop strategic agility. These findings are supported by prior studies which highlight that big data capabilities are essential for developing dynamic capabilities (Davenport, 2014) and in higher educational institutions big data analytics technology can support in developing strategic agility. The third hypothesis (i.e., H3) was developed to determine the relationship between strategic agility and competitive advantage. The results supported the hypothesis and the findings highlighted that private higher educational institutions in KSA require strategic agility to gain competitive advantage. The findings align with the research by Fakunmoju et al. (2020), who also found a significant relationship between strategic agility and competitive advantage.

The fourth hypothesis (i.e., H4) was developed to predict the influence of strategic agility on the performance of private higher educational institutions. The results supported the hypothesis and findings reported that the performance of private higher educational institutions in KSA depends on strategic agility. These findings align with the study by Yildiz and Aykanat, (2021), who indicated that strategic agility is an important factor organizations need to remain successful in a dynamic environment. In addition, Rabah (2015) highlighted that higher educational institutions must have a competitive advantage over rivals to enhance their performance. Therefore, private higher educational institutions in KSA must focus on big talent capability and big data analytical capability to develop strategic agility, which helps gain competitive advantage and enhance organizational performance. Thus, H5 was developed to investigate the relationship between competitive advantage and performance of HEIs. Further, H6 was developed to investigate the mediating role of competitive advantage in the relationship between strategic agility and the performance of HEIs. The results supported the hypothesis, and findings highlighted that strategic agility significantly influences the competitive and performance of higher educational institutions in KSA. The seventh hypothesis (i.e., H7) was developed to investigate the moderating role of student retention in the relationship between strategic agility and competitive advantage. The results found that student retention strengthens the relationship between strategic agility and competitive advantage. These findings align with the prior research by Pinchbeck & Heaney (2022), who argued that student retention is an important indicator of the performance of educational institutions.

6. Implications

The study has developed a comprehensive framework for highlighting the factors leading to performance private higher educational institutions in KSA. Therefore, it has provided different theoretical and practical implications. In terms of theoretical implications, this research has expanded the literature on big talent capability, big data analytical capability, strategic agility, competitive advantage, and performance of private higher educational institutions. Moreover, this research is the first to align big data capabilities with strategic agility and performance in the context of higher educational institutions. In the context of practical implications, this research can serve as a guideline for educational leaders, administrators, and owners of private higher educational institutions aiming to enhance institutional performance.

7. Limitations

This research has provided a comprehensive overview of antecedents and outcomes of strategic agility. However, it still has some limitations that further studies can consider. First, the research has

focused on the private higher educational institutions in KSA. The studies in the future can focus on public sector higher educational institutions. Secondly, the research has considered only two big-data elements, including big talent capability and big-data analytical capability. However, studies in the future can expand the model by determining the other elements. Thirdly, the research has only focused on the institutions in KSA, and future studies can emphasize any other country.

8. Recommendations

Public sector higher educational institutions or universities always have a competitive edge over private ones. Therefore, private sector higher education institutions need to develop a competitive advantage to enhance their performance. This research has recommended that private higher education institutions in KSA aiming to enhance their performance must focus on developing a competitive advantage that could be attained by developing strategic agility linked with big data analytical capability management. The competitive advantage explains the relationship between strategic agility and performance of PHEIs. Moreover, the student retention strengthens the relationship between strategic agility and competitive advantage.

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Appendix 1

Questionnaire (Items of Variables)

Big Talent Capability					
Please indicate your response to the following statements about your institute: SD: *Strongly Disagree*, DIS: *Disagree*, NT: *Neutral*, AG: *Agree*, SA: *Strongly Agree*					
	SD	**DIS**	**NT**	**AG**	**SA**
Our analytics personnel are very capable in terms of programming skills.					
Our analytics personnel are very capable in terms of managing different projects run by institute					
Our analytics personnel are very capable in the areas of data and network management and maintenance.					
Our analytics personnel show superior understanding of technological					

trends, which are important for educational institutes. Our analytics personnel are very knowledgeable about the critical factors for the success of our institute. Our analytics personnel understand our institutional policies and plans at a very high level. Our analytics personnel are very knowledgeable about the competitive environment in higher education sector. Our analytics personnel work closely with partners for providing key inputs useful for developing innovative services. Our analytics personnel work closely with students and teachers to maintain productive relationships with them					

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BDA Capability Management

Please indicate your response to the following statements about your institute:
SD: *Strongly Disagree*, DIS: *Disagree*, NT: *Neutral*, AG: *Agree*, SA: *Strongly Agree*

	SD	**DIS**	**NT**	**AG**	**SA**
We continuously examine the innovative services available for the strategic use of BDA. We enforce adequate plans for the introduction and utilization of BDA. We perform BDA planning processes in systematic and formalized ways. We frequently adjust BDA plans to better adapt to changing market conditions. In our institution, analysts and stakeholders meet frequently to discuss important issues both formally and informally. In our institution, information is widely shared between analysts and line people so that those who make decisions or perform jobs have access to all available know-how.					

Strategic Agility of PHEIs

Please indicate your response to the following statements about your institution: *Compared to our three nearest competitors, our institute can easily and quickly*
SD: *Strongly Disagree*, DIS: *Disagree*, NT: *Neutral*, AG: *Agree*, SA: *Strongly Agree*

	SD	**DIS**	**NT**	**AG**	**SA**
Respond to changes in aggregate demand of market and students Customize a service to suit an individual student. React to new service for students Introduce new fee schedules in response to changes in our competitor's fee. Expand into new cities or regions Expand or reduce the variety of degree programs Adopt new technologies to increase the throughput of services. Make relationship with partner institutions					

Competitive Advantage

Please indicate your response to the following statements about your institute:
SD: *Strongly Disagree*, DIS: *Disagree*, NT: *Neutral*, AG: *Agree*, SA: *Strongly Agree*

	SD	**DIS**	**NT**	**AG**	**SA**
The total assets of the institute have been increasing in the past three years.					

The profit level of the institute has been rising in the past three years.					
The institute's return on investment has been increasing in the past three years.					
The institute's student satisfaction has improved significantly in the last three years.					
The market share of the institute has increased significantly in last three years.					

Performance of HEI

Please indicate your response to the following statements about your institute: *Your* institute*'s performance is better as compared to competitors in the following areas*

SD: *Strongly Disagree*, DIS: *Disagree*, NT: *Neutral*, AG: *Agree*, SA: *Strongly Agree*

	SD	**DIS**	**NT**	**AG**	**SA**
student satisfaction					
Overall competitive position					
Student enrolment					
Profitability					
Repeat enrolments by students					

Student Retention

Please indicate your response to the following statements about your institute:

SD: *Strongly Disagree*, DIS: *Disagree*, NT: *Neutral*, AG: *Agree*, SA: *Strongly Agree*

	SD	**DIS**	**NT**	**AG**	**SA**
Students continue to work towards degree from our institute.					
Students always want to finish their studies from this institute.					
Students prefer to do further courses in institute after completion of their degrees.					
Students refer to our university to their close friends and encourage them to continue attending this institute.					
Students feel important to be graduated from our institute.					