

## Examining the role of artificial intelligence in determining sustainable competitive advantage: Evidence from the pharmaceutical sector of Karachi Pakistan

Muhammad Sameer Hussain<sup>a\*</sup>, Muhammad Masood Mir<sup>b</sup>, Syeda Farina Musharaf<sup>c</sup> and Shamroze Sajid<sup>d</sup>

<sup>a</sup>Exito Pvt Ltd, Pakistan

<sup>b</sup>Institute of Business Management, Pakistan

<sup>c</sup>Federal Urdu University, Pakistan

<sup>d</sup>OrderCall, Pakistan

### CHRONICLE

#### Article history:

Received: October 2, 2022

Received in revised format: October 18, 2022

Accepted: November 4, 2022

Available online:

November 4, 2022

#### Keywords:

Artificial intelligence

Talent Management

Recruitment and Selection

Succession Planning

Training and Development

Leadership

Competitive Advantage

Paper type-Research Paper

### ABSTRACT

As in today's era firms are looking to sustain while facing multiple challenges. Ultimately talented employees are the backbone of any firm that provides a sustainable competitive position at a global level. The major aspect is to make appropriate strategies to stay effective and efficient. Firms are focused on their strategies of recruitment and selection, training, and leadership capabilities to build up. A sample is collected from top-level management of the pharmaceutical sector sample data is of 320 Professionals from the different pharmaceutical sector of Karachi Pakistan. For Data collection Survey method is adopted with a close-ended Questionnaire. The study reveals the impact of artificial intelligence on competitive advantage. This research finds out certain strategies to be aligned with the mediation of Artificial intelligence to gain sustainable competitive advantage and serial mediation of the talent management process among the pharmaceutical sector of Karachi Pakistan. Talent management and Artificial Intelligence serial mediation aligned with HR practices to gain competitive advantage. As the study indicates that recruitment and selection are positively aligned with Artificial intelligence and serial mediation of talent management, further aspects of talent development and talent retention are directly linked with a competitive advantage as suitable components. This research merely focused on the pharmaceutical sector of Karachi Pakistan and the results generalized on the professionals of this particular sector, while new aspects of HR practices could be linked up with Artificial intelligence that will help to boost and find better insight into other industries.

© 2023 by the authors; licensee Growing Science, Canada.

## 1. Introduction

In today's era firms never back down to grab a single opportunity to make out the business better and broader as AI helps to identify those factors through which talent leave, it also anticipates in the acquisition of the talent by establishing the individual in a specific right dimension so it could perform better, as modern techniques are adopted to figure out the need of the organization, it also focuses on developing talent for the right position according to the attributes and abilities that is suitable for the organization (Uren & Jakson, 2012). The identification of talent that is pursued by succession planning to align development and retention process, apart from that some modern facets also support training and development, leadership that is essential credentials help to retain and develop talent (Jyoti & Rani, 2014). It is also predefined that sustainability could indulge by providing training programs that can lead to rapid transfer of knowledge, as it will enhance the proficiency of the skills set that is required on the job (Galaios, 2014). It is also elaborated that pharmaceutical innovations are aligned with Artificial intelligence to enhance their activities as it is rich in data and information handling where AI could play a vital role in enhancing their production line that could be effective in terms of competitive advantage (Khedkar & Mitra, 2017).

\* Corresponding author.

E-mail address: [m.sameer.hussain@outlook.com](mailto:m.sameer.hussain@outlook.com) (M. S. Hussain)

ISSN 2816-8151 (Online) - ISSN 2816-8143 (Print)

© 2023 by the authors; licensee Growing Science, Canada

doi: 10.5267/j.jfs.2022.11.003

Similar to that it is also determined that Stahl, Bjorkman, Farndale, Morris, Paauwe and Stiles's (2007) findings reveal that giant firms in the pharmaceutical sector conclude to develop talent strategies and for that certain practices training and development, leadership, effective recruitment of talent are essential for competitive advantage. Apart from that Human resources is a feature that essentially makes the production of results be completed and for that training is necessary to make sure that adequate personnel is available and technically capable enough to perform (Asare, 2008; Mullins, 2007). Moreover, research has explored the aspect of the talent management process with sustainable competitive advantage similar to that in certain aspects are essential to attract, develop and retain talent (Rabbi, et al., 2015). While apart from that different trends create linkage with artificial intelligence to gain sustainable competitive advantage (Lmbrie et al., 2020). While it is also stated in recent research that HR strategies are associated with Artificial intelligence as an effective recruitment and succession planning leads to effective development and retention of employees as existing practices bring an innovative change in the organization (Keserwani, 2020). Furthermore, it is examined that leadership development is an essential way that is opted to retain and develop talent and it could be achieved by proper nurturing of the talent by mentoring this will eventually lead to a sustainable competitive run for a longer span (Ashif, 2019). As this research will be focusing on key components related to HR such as recruitment and selection, Succession planning, training and development and Leadership to be implemented with the schema of Artificial intelligence that requires new skill set and capabilities as data from the Artificial intelligence integrated overall professionals to evidence the critical insights of the business would run with the pace as per market, similarly data would help to cage the impactful changes in these direction that would help HR to build strategies that have analytic approach and asses overall competitively.

## 2. Literature Review

Sánchez et al. (2019) investigate that firms are in a hectic situation due to the rapid change of environment and globalization have indulged that strategies should be changed as required to cope up with the uncertainties to gain competitive advantage. In terms of recruitment and selection, he further emphasizes that the E-recruitment process should be used as it becomes compatible although it's a tough task to get the best result out of that at the initial stage. In terms of evolving the aspect of Artificial intelligence, it indulges in the branches of recruitment to attract the suitable talent that can produce productivity, as firms have opted for the approach of talent acquisition system that enables the function from a broader perspective (Rajesh, et al., 2018). Similar to that Ai also enhances the decision support system by choosing the appropriate talent with required attributes, in the context of the most effective expert systems that are aligned with HRIS (human resource information system) that increase learning capabilities among the firm (Hmoud & Laszlo, 2019). Moreover, it elaborates that implication of AI in recruitment and selection would help in an engaging best suitable candidate, rather than invest time in screening the resume, although it's a quick process certain factors have to be considered such as culture as AI have found some difficulties previously (Upadhyay & Khandelwa, 2018). It is determined that succession planning is aligned to develop the potential and motivate them to do better in terms of succession; firms believe that recruited employees are developed and can fully fill the competent roles (Javed & Jaffar, 2019). It is also emphasized that at the time of indulging the employee's biased decision may affect negatively the mechanism of succession planning As AI algorithms will provide the results related to the consistency of the individual it will help to evaluate the internal candidates for specific roles (Chakraborty, 2017). Moreover, it is elaborated that firms especially emphasize on the key position for the future need and for that special recruitment from internal pools generated, while some considerations are being taken such as having insight knowledge of the firm and would be maintaining a change that is to be opted (Wolor et al., 2020). Similarly executing a succession planning strategy is an important characteristic because it defines that firms value their people, however, firms define policies that set a long-term strategic focus for individual performance (Maphisa et al., 2017). According to Yawson (2019), succession planning makes certain of moving a smooth workflow from top to bottom, as in today's era a shift is emphasized in the workforce in the way of baby boomers that are obsoleting, and millennials are taking place with new advancement in technology. Lamson and Redwitz (2018) elaborate that technical training has gained a lot of sights but moreover to that variety in skills, diversity of global mindset and emotional intelligence are the key aspects look for the future as Artificial intelligence linking with training leads to enhancement of the streamlined content for the firms and they can cope up with technological advancement that is rapidly growing. As it is examined that different streamlines required innovative solutions while maintaining quality to sustain in the competitive era, concerning that AI has promoted the aspect of cloud computing cognitive and virtual system as firms want to stay at the topmost in changing technologies trends by developing new appropriate strategies and methodologies to improve in the circumstances as it's all about bulk of data that is available and firms can optimize and analyze that (Cioffi et al, 2020; Barnard, 2019). Moreover, it is described that certain practices of human resources (HR) should be aligned such as training, staffing, compensation that can bring innovation and these factors will ensure the competitive advantage (Samarasingh & Medis, 2020). While preference in Artificial intelligence is given to training, to accelerate growth as firms are emphasizing technology, similarly a shift of training applied towards Artificial intelligence that helps to cope with various tools (Dijkkamp, 2019). In addition, it is also indicated that moving to become a successful firm, one does emphasize on the knowledge, abilities of the competent employees and that do occur with different sort of training that is required for career development (Ahmad & Saad, 2019). Apart from that, Strategic Human Resource facets links to organizational effectiveness that could be measured via internal career opportunities and development that could be enriched by the process of training that outcomes are in form of commitment, motivation, and employee performance (Raheem & Khan, 2019). Leadership is quite a well-renowned phenomenon in the management section moreover, AI has increased at the workplace, automatically looping is the shift to a broader perspective as AI has possess a new and unique challenge for business leaders to adopt and to simultaneously invest in training programs to support financial

performance and gain an advantage (Fleming, 2020). Even though it's resolute that leader's position is overwhelmed by the expectation and preserve multidimensional role, while leadership a significant predictor to cage the development among subordinates as it could be integrated by proper Hr aspects, similar to that it also intervenes to maximize the talent efficiency (Khalid, 2019). Besides that, it is also defined that revolution in machine learning took over the characteristics of leaders by doing their work and introducing new ways to lead because currently machines are involved more in intellectual tasks and for that proficient leaders are required to systematically view that (Björkman & Johansson, 2018). While it is found out that this mechanism has transformed business could get a sustainable position by how they cope up with Artificial intelligence that is the key determinant because globalization has corresponded with AI simultaneously to link with Talent Management approach (Rogers, 2020).

## 2. Methods

### 2.1 Participants

This research collected the data from the top-level management HR professionals of the pharmaceutical sector of Karachi Pakistan. A questionnaire of around 450 was distributed among which 370 were filled. Some of them via google form that is helpful for the researcher and time saving and others physically (Russell, 2010). while remaining were returned, while obsoleting normality, outliers, and data clearing issues sample size of 320 remains of Hr managers and Talent Acquisitions specialist on which test is analyzed which is similar with the findings of (Pillai & Sivathanu, 2020). the responses as we can see out of 320 respondents 74.06% were male and the remaining 25.40 % were female selected randomly, similarly to that majority of them were Masters qualified as results shows that 46.80 % were them while remaining highest were M.Phil in their respective fields and just 6.87 % were intact with the Ph.D. program, Apart from that if we consider their respective Positions mainstream lies in Officers ranking with topmost 40.90 % were them, the second-best percentage is of Assistant Managers with 19.06 % and 16.80 % were Senior Managers among respondents. Whereas in terms of experience 33.12 % of them are having experience Between 3 to 5 Years in their particular field.

### 2.2 Data Collection Procedure

Method to be adopted for this study is survey-based, as finding a suitable sample from large size population survey based is the appropriate method to be adopted (Saunders, et al., 2009) as mostly such type of quantitative type studies fall in this category as suggested by Swetnam (2005) as survey base study consists with the findings of (Oksanen, 2018). The technique of Probability sampling is used as the researcher identifies the target population and the Frame of the sample is known, while it also indicates about choosing sampling frame where it relies on in-person contact with respondents and the entire population is spread that ultimately cover to chose the probability sampling among which systematic random sampling is used (Saunders, et al., 2009). However, this research will be focusing on descriptive research design to accurately analyze a clear view of evaluating data with critical variables (Saunders, et al., 2009; Bhalgat, 2019). While for data collection process of 5 points adaptive likert scale is used to observe the responses because it provides the in-depth analysis to find the preferences that are related to the respondents in the structured close-ended questionnaire, Moreover in this research will also indicate to find the association among constructs due to that researcher emphasize on checking results on that particular scale as discussed by (Saunders, et al., 2009). Similar studies along with a 5 points adaptive scale have also been utilized to examine the response (Adesola, 2017; Chee, 2017).

## 3. Results

For checking the reliability and validity of the triangular stimulation technique with Cronbach's alpha, discriminant validity, and Heterotrait- Mono trait is used to check the accuracy of the data with Fornell-Larcker Criterion (Hair *et al.*, 2010). To analyzed Conceptual model and interpret the data most prevalently in social science PLS-SEM (Partial least Square structural Equation Model) & Bootstrapping with SMART PLS 3.0 is particularly used to cater to large and normal sample size data that is applied in the primary method of research while to check the several independent and dependent with mediation effect (Joseph et al., 2017). Similar findings of the mediation effect are aligned with the studies of (Pillai & Sivathanu, 2020). Table 1 interprets the reliability and validity that has been checked out by triangular simulation via Sem technique among the responses of the questionnaire, it could be seen that the values of Cronbach's alpha that represent the reliability are well above 0.7 that indicates that data is reliable and asses consistency to measure the construct as suggested by Fornell and Larcker (1981). Similar to that Rho\_A also finds the internal consistency for each construct, as it also finds the mean value in return among Cronbach's alpha and composite reliability (Bittencourt, et al., 2020). While internal consistency also been measured by using composite reliability as it evaluates it via different outer loadings, values specifically lie in between 0.70 and 0.90 repute as acceptable because while assessing the consistently the accurate reliability may fall in between Cronbach's alpha signify the lower and composite reliability signifies the upper bound hence the values of the above table lies among the giving criteria which also consistent with the elaboration of Hair et al. (2017). Although AVE average variance extracted demonstrate content validity that explains the variance that is denoted by the latent construct although AVE's square root should be higher rather than other correlated construct's values it is said to be so because convergent validity determines measure that is associated positively which is also suggested by (Fornell & Larcker, 1981; Hair, Hult, Ringle, & Sarstedt, 2017). Furthermore, the AVE values are also well above the threshold value of 0.50 recommended by Hair et al. (2010).

**Table 1**  
Construct Reliability and Validity

	Cronbach's Alpha	rho A	Composite Reliability	Average Variance Extracted (AVE)
Artificial Intelligence	0.800	0.804	0.870	0.626
Competitive Advantage	0.830	0.859	0.880	0.599
Leadership	0.789	0.794	0.863	0.613
Recruitment and Selection	0.748	0.753	0.858	0.669
Succession Planning	0.762	0.767	0.849	0.585
Talent Attraction	0.832	0.837	0.899	0.748
Talent Development	0.827	0.832	0.896	0.743
Talent Retention	0.779	0.792	0.858	0.602
Training and Development	0.727	0.739	0.847	0.649

**Table 2**  
Fornell -Larcker Criterion (Discriminant Validity)

	Artificial Intelligence	Competitive Advantage	Leadership	Recruitment & Selection	Succession Planning	Talent Attraction	Talent Development	Talent Retention	Training & Development
Artificial Intelligence	0.791								
Competitive Advantage	-0.024	0.774							
Leadership	0.472	-0.067	0.783						
Recruitment & Selection	-0.281	0.110	-0.134	0.818					
Succession Planning	0.494	-0.042	0.309	-0.385	0.765				
Talent Attraction	0.426	-0.090	0.338	-0.189	0.299	0.865			
Talent Retention	-0.018	0.749	-0.097	0.097	-0.037	-0.032	0.862		
Talent Development	0.027	0.483	-0.021	0.053	0.025	0.013	0.482	0.776	
Training & Development	0.460	-0.063	0.406	-0.176	0.485	0.226	-0.062	-0.030	0.806

Above Table 2 interprets discriminant validity with the relevancy of Fornell larcker criterion which elaborates about the validity of the data, and also describes the extent to which variables and constructs vary from each other the construct and via empirical standards(Hair et al., 2017). Discriminant validity examines the extent to which a distinct is truly different from other constructs in terms of how it correlates and also the distinction among the measured variables as it could be seen that Artificial intelligence comprise of the value 0.791 which is highest in its own latent and also compared row-wise with other variables and similar with all variables which shows that all the diagonal values are not less than any other of diagonal values among others hence the discriminant validity is maintained.

**Table 3**  
Hetrotrait -Monotrait (HTMT)

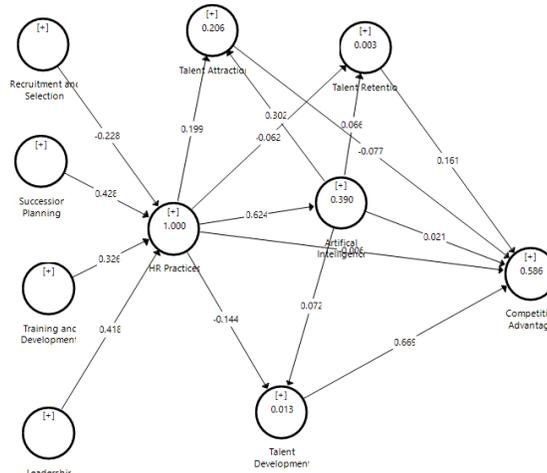
	Artificial Intelligence	Competitive Advantage	Leadership	Recruitment & Selection	Succession Planning	Talent Attraction	Talent Development	Talent Retention	Training & Development
Artificial Intelligence									
Competitive Advantage	0.081								
Leadership	0.588	0.093							
Recruitment and Selection	0.368	0.150	0.171						
Succession Planning	0.631	0.092	0.399	0.508					
Talent Attraction	0.516	0.120	0.413	0.235	0.371				
Talent Development	0.076	0.884	0.138	0.121	0.106	0.086			
Talent Retention	0.086	0.584	0.107	0.082	0.112	0.105	0.591		
Training and Development	0.601	0.107	0.522	0.241	0.651	0.288	0.096	0.153	

Table 3 shares about the remedy of Hetro trait and mono trait lies among correlations, as it is a mean of all the construct whether between trait correlations approach to the within traits while hetro is a mean of all correlations of displays across construct measuring different construct while mono trait evaluates the geometric mean or the average correlations among the indicators of the same construct, it an approach that evaluates true correspondence of the constructs. While it is suggested that it should not exceed the threshold value of 0.8 otherwise the discriminant validity could not be measure (Hamid, et al., 2017). Similarly the above tables indicates the values of (0.081, 0.093, 0.171, 0.508, 0.371, 0.086, 0.591, 0.153) specifies that the values are well below the threshold value so discriminant validity is retained. Table 4 infers about the R square which shows the coefficient correlation in percentage type of variation among mediation and dependent variables explained by Hr practices such as Recruitment and Selection, Succession Planning, Training & Development and Leadership. As we can see Artificial intelligence demonstrates 39 % variation explained by the independent variables. Similar goes with Competitive advantage that elaborates the highest percentage variation in it that is 58.6 % explicated by independent variables considering that in the dependent variable most of the variation has to occur due to these independent variables.

Although the Serial mediators' Talent attraction shows the higher variation of 20.6 % as compared to Talent Development 0.013% and Talent Retention 0.003% are the least that have some sort of significant impact as processing as mediators and lowest explained by the independent variables.

**Table 4**  
The results of R-Square values

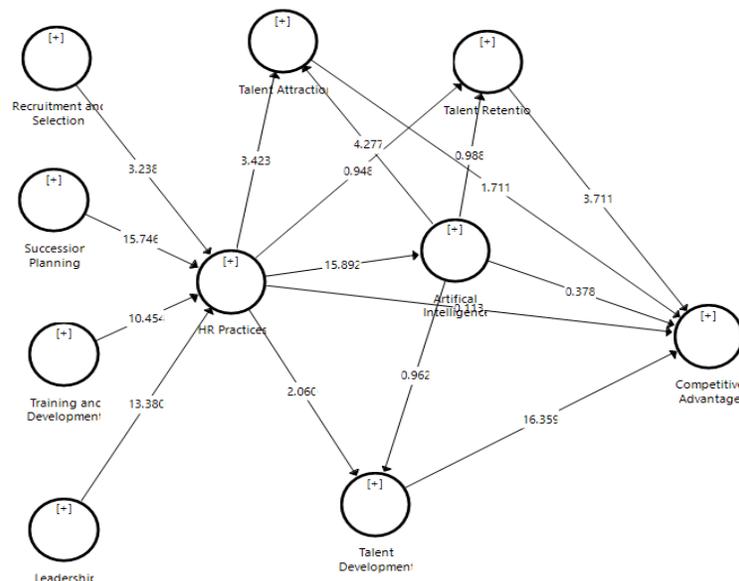
	R Square	R Square Adjusted
Artificial Intelligence	0.390	0.388
Competitive Advantage	0.586	0.580
Talent Attraction	0.206	0.201
Talent Development	0.013	0.007
Talent Retention	0.003	0.003



**Fig. 1.** The results of structural equation model

**Table 5**  
The results of Bootstrapping

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Artificial Intelligence → Competitive Advantage	-0.032	-0.032	0.051	0.632	0.528
Artificial Intelligence → Talent Attraction	0.480	0.482	0.053	9.047	0.000
Artificial Intelligence → Talent Development	-0.027	-0.027	0.060	0.459	0.646
Artificial Intelligence → Talent Retention	0.077	0.080	0.056	1.378	0.169
Leadership → Artificial Intelligence	0.287	0.292	0.057	5.063	0.000
Leadership → Competitive Advantage	-0.009	-0.009	0.015	0.603	0.547
Leadership → Talent Attraction	0.138	0.141	0.033	4.227	0.000
Leadership → Talent Development	-0.008	-0.008	0.018	1.230	0.662
Leadership → Talent Retention	0.022	0.024	0.018	1.230	0.219
Recruitment and Selection → Artificial Intelligence	-0.104	-0.112	0.039	2.695	0.007
Recruitment and Selection → Competitive Advantage	0.003	0.004	0.006	0.551	0.582
Recruitment and Selection → Talent Attraction	-0.050	-0.054	0.020	2.543	0.011
Recruitment and Selection → Talent Development	0.003	0.003	0.007	0.407	0.684
Recruitment and Selection → Talent Retention	-0.008	-0.009	0.007	1.087	0.277
Succession Planning → Artificial Intelligence	0.321	0.323	0.062	5.148	0.000
Succession Planning → Competitive Advantage	-0.010	-0.011	0.017	0.604	0.546
Succession Planning → Talent Attraction	0.154	0.156	0.036	4.251	0.000
Succession Planning → Talent Development	-0.009	-0.009	0.020	0.442	0.658
Succession Planning → Talent Retention	0.025	0.026	0.019	1.286	0.199
Talent Attraction → Competitive Advantage	-0.050	-0.053	0.039	1.272	0.204
Talent Development → Competitive Advantage	0.684	0.680	0.045	15.194	0.000
Talent Retention → Competitive Advantage	0.138	0.142	0.049	2.786	0.006
Training and Development → Artificial Intelligence	0.156	0.152	0.066	2.373	0.018
Training and Development → Competitive Advantage	-0.005	-0.005	0.008	0.611	0.541
Training and Development → Talent Attraction	0.075	0.073	0.033	2.279	0.023
Training and Development → Talent Development	-0.004	-0.004	0.010	0.448	0.654
Training and Development → Talent Retention	0.012	0.012	0.010	1.201	0.230



**Fig. 2. The results of bootstrapping**

Table 5 infers about the results related to Bootstrapping that tells about the significance of testing and estimates all subsamples as it also indicates the values of latent variables as discussed by Wold (1985). As it compares the level significance with Two-tailed test would yield a T value  $> 1.96$  and P values  $< 0.05$  to show the statistical significance (Fisher, 1930). Furthermore, the above tables and Figure 2 elaborates on the results of mediation and the above pictures indicate the second-order model of HR practices linking with Artificial intelligence and consisting of Multiple serial mediation with talent management to gain the Sustainable competitive advantage this sort of Second-order or Hierarchical component model involves the testing higher-order structure that contains two layers in SEM pls as it allows to utilized and represent the construct on a different level as it reduces the parsimony so it would be easy to grasp complex models (Hair *et al.*, 2017). Furthermore, the above table interprets the mediation effect as we can see (i.e., mediator Artificial intelligence has got insignificant impact with dependent variable Competitive advantage ( T Value 0.632 and P-value 0.528) as the T value  $\leq \pm 1.96$  and P values are greater than  $\geq 0.05$  threshold value which suggests that it is insignificant impact with the dependent variable. Similar to that Artificial intelligence also consist of serial mediation such as (Talent Attraction, Talent Development, and Talent Retention) as Artificial intelligence is consistent and significant with a serial mediator of Talent Attraction ( i.e., T values 9.047 and P-value is 0.000) which elaborates that it is well situated towards that threshold values as Artificial intelligence is significant via Serial Mediator talent attraction but insignificant with direct effect towards competitive advantage. More likely similar analysis find out with two remaining serial mediators of talent development and talent retention as artificial intelligence shows the value of ( T value 0.459, 1.378 and P values 0.646, 1.69) which are  $\leq$  the threshold value of  $\pm 1.96$  and  $\geq$  than P values of 0.05 both of them creating an insignificant impact with artificial intelligence, as serial mediation creates a significant impact and shows direct effect via talent attraction but not consistent with a dependent variable competitive advantage, but via talent development and talent retention shows insignificant at overall level with Artificial intelligence but directly talent development and talent retention create an effect on competitive advantage.

While in terms of Leadership with a competitive advantage is insignificant as the values show (T value 0.603 and P-value 0.547) are not upto the threshold values apart from that leadership is significant through a mediator and serial mediation with Artificial intelligence and Talent Attraction showing T values of (5.063, 4.227)  $\geq \pm 1.96$  and P values ( 0.000)  $\leq 0.05$  consist of full mediation effect as indirect impact of Independent variable with mediator and serial mediator is significant while the direct impact of Talent attraction and Competitive advantage is also insignificant with T and P values (1.272, 0.204) are not consistent with the threshold values. Apart from that leadership with artificial intelligence and with talent development shows the critical T values of (5.063, 0.438) and P values ( 0.000, 0.632) where it can be seen that Leadership is significant with the direct impact of artificial intelligence but the indirect impact via Talent development is insignificant which means that all the direct impact of leadership with a competitive advantage, talent development and artificial intelligence with talent development shows the competitive partial mediation talent development is significant with a competitive advantage with values of ( T values  $\geq 15.194$ ,  $\leq$  P values 0.05) as competitive partial mediation tells where direct and indirect effects are elaborated in a different direction which indicates that there is the certain impact of X on Y and certain mediates via M (Carrion, et al., 2017). As we can see that Leadership is directly significant with Artificial and talent development but indirectly is insignificant no mediation occurs. The same situation that occurs with Leadership with the mediation of artificial intelligence is significant while leading with talent retention also shows the T and P values (1.230, 0.219) are not up to the threshold values similar sort of competitive partial mediation exist via mediation and serial mediation. But the direct impact of Talent retention towards competitive advantage is significant with T and P values of ( T  $\geq 2.786$   $\leq 0.006$ ).

While in terms of Recruitment and selection with competitive advantage is insignificant as the values shows (T value and P value 0.551, 0.582) are not upto the threshold values apart from that Recruitment and selection is significant through mediator and full mediation with Artificial intelligence and Talent Attraction showing T values of (2.695, 2.543)  $\geq \pm 1.96$  and P values (0.000)  $\leq 0.05$  consist of full mediation effect as indirect impact of Independent variable with mediator and serial mediator is significant while the direct impact of Talent attraction and Competitive advantage is insignificant with T and P values (1.272, 0.204) are not consistent with the threshold values. But as discussed above that Artificial intelligence is significant with serial mediator of talent attraction with T value (9.047, and P values  $< 0.000$ ). Apart from that recruitment and selection with artificial intelligence and with talent development shows the critical T values of (2.695, 0.407) and P values (0.000, 0.684) where it can be seen that Recruitment and selection is significant with direct impact of artificial intelligence but indirect impact of via Talent development is insignificant which means that all the direct impact of Recruitment and selection with competitive advantage, talent development and artificial intelligence with talent development shows the competitive partial mediation talent development is significant with competitive advantage with values of (T values  $\geq 15.194$ ,  $\leq$  P values 0.05) as competitive partial mediation tells where direct and indirect effects are elaborated in a different direction which indicates that there is certain impact of X on Y and certain mediates via M (Carrion et al., 2017). As we can see that Recruitment and Selection are directly significant via Artificial and talent development is aligned directly with competitive advantage but indirectly is insignificant no mediation occurs. The same situation occurs with the mediation of artificial intelligence is significant, while Recruitment and Selection with talent retention also show the T and P values (1.087, 0.227) are not up to the threshold values similar sort of Competitive partial mediation exist via mediation and serial mediation. But the direct impact of Talent retention towards competitive advantage is significant with T and P values of (T  $\geq 2.786 \leq 0.005$ ).

While in terms of Succession Planning with competitive advantage is insignificant as the values shows (T value and P value 0.604, 0.546) are not acceptable as they are not up to the threshold values apart from that Succession Planning is significant through mediator and full mediation with Artificial intelligence and Talent Attraction showing T values of (5.148, 4.251)  $\geq \pm 1.96$  and P values (0.000)  $\leq 0.05$  consist of full mediation effect as indirect impact of Independent variable with mediator and serial mediator is significant while the direct impact of Talent attraction and Competitive advantage is insignificant with T and P values (1.272, 0.204) are not consistent with the threshold values. But as discussed above that Artificial intelligence is significant with serial mediator of talent attraction with T value (9.047, and P values  $< 0.000$ ) Furthermore Succession planning with artificial intelligence and with talent development shows the critical T values of (4.251, 0.442) and P values (0.000, 0.658) it could further explained that Succession planning is significant with direct impact of artificial intelligence but indirect impact of via Talent development is insignificant which means that all the direct impact of Succession Planning with competitive advantage, talent development and artificial intelligence shows the competitive partial mediation talent development is significant with competitive advantage with values of (T values  $\geq 15.194$ ,  $\leq$  P values 0.05) as competitive partial mediation ensures where direct and indirect effects are elaborated in a different direction which indicates that there is certain impact of X on Y and certain mediates via M (Carrion, et al., 2017). Moreover, Succession planning is directly significant via Artificial and talent development is signed directly with competitive advantage but indirectly is insignificant no mediation occurs. The same situation occurs with the mediation of artificial intelligence is significant, Succession planning association with talent retention also shows the T and P values (1.286, 0.199) are not consistent with the threshold values similar sort of Competitive partial mediation exist via mediation and serial mediation. Eventually, the direct impact of Talent retention towards competitive advantage is significant with T and P values of (T  $\geq 2.786 \leq 0.005$ ) which shows that direct impact occurs but no sort of mediation exists.

Although Training and development with competitive advantage is also inconsequential as the values shows (T value and P value 0.611, 0.541) are not adequate as they aren't upto the threshold values apart from that, Training and Development is linked via mediator and full mediation with Artificial intelligence and Talent Attraction showing T values of (2.373, 2.279)  $\geq \pm 1.96$  and P values (0.000)  $\leq 0.05$  consist of full mediation effect as indirect impact of Independent variable with mediator and serial mediator is substantial while the direct impact of Talent attraction and Competitive advantage is insignificant with T and P values (1.272, 0.204) are not consistent with the threshold values. But as deliberated above that Artificial intelligence is significant with serial mediator of talent attraction with T value (9.047, and P values  $< 0.000$ ) Besides that Training and Development with artificial intelligence and with talent development shows the critical T values of (2.373, 0.448) and P values (0.018, 0.654) it could further explicated that Training and Development is significant with direct impact of artificial intelligence but indirect impact of via Talent development is insignificant which means that all the direct impact of training and development with competitive advantage, talent development and artificial intelligence shows the competitive partial mediation talent development is significant with competitive advantage with values of (T values  $\geq 15.194$ ,  $\leq$  P values 0.05) as competitive partial mediation ensures where influences direct and indirect are elaborated in a different direction which indicates that there is certain impact of X on Y and certain mediates via M (Carrion, et al., 2017). Moreover, Training and Development are directly significant via Artificial and talent development is signed directly with competitive advantage but indirectly is insignificant no mediation occurs. A similar condition occurs with the mediation of artificial intelligence is significant, Training and Development association with talent retention also shows the T and P values (1.201, 0.230) are not consistent with the threshold values similar sort of Competitive partial mediation exist via mediation and serial mediation. Eventually, the direct impact of Talent retention towards competitive advantage is significant with T and P values of (T  $\geq 2.786 \leq 0.005$ ) which shows that direct effect occurs but no category of mediation exists.

#### 4. Discussion

This study perhaps finds out the direct and indirect relationship among variables towards dependent variable via a mediator and serial mediation as from above results and analysis as it is consistent that HR has to provide strategic importance towards this process of attracting, retaining and developing talent that could deal an extensive growth of competitive advantage (Kapoor, 2009). Similar Sort of studies have also been conducted by Ibrahim, (2018) which elaborates that competitive position could be reached through internal advantages, specifically aligned with knowledge and resource are the key components, as it could not be relieved with any other option. While in terms of talent retention which is necessary maintain so the probable talent would retain at longer span, as it is also an experiment from the perspective of the organization to make talent committed on long term there are various factors including such as compensation, training, and development that find consistency within the matters of firm internally (Al Aina & Atan, 2020). Talent development is the support that it considers of the change that has been executed within the context of organizational values, as a business continuously performs different activities in terms of strategies, new development techniques (Ahmed, 2016). Furthermore above also elaborate that Recruitment and selection are significant with artificial intelligence previous studies indicate that firms have the biggest ask to drive a proper way for recruitment strategy and that has to be implemented for maintaining a strong portfolio, as business-driven techniques impose and create new strategies and capabilities (Chanda, 2019; Sánchez, Navarro, & Losada, 2019).

While linkage has also been found as talent retention in Human resource management has got significance with new upcoming trends via this and it will cause changes in business dynamics, because HRM trends are considerable with employment procedures, development and evaluation of it (jatobá, et al., 2019). Similar sorts of studies show talent development is essential to gain advantage as Artificial intelligence tends to help an individual grow with skills set, and with maintaining its strength to cope up with future trends this entire process is a monitor with the matching of Smart techniques of Artificial intelligence (Barboza, 2019). Although from the above results it could be seen as well that succession planning is not directly linked up with competitive advantage but via meditation and indirect impact is significant it mostly occurs this sort of segment is particularly assigned to top-level management (Ahsan, 2018). These sorts of similar studies have been supported by the findings that culture within the firm goes hand in hand with succession planning, (Loomes, et al., 2019). Existing findings also support succession planning with talent management strategies are fasten growing streams, incorporating it accurately will have a significant impact on organization performance as scarcity of talent has become furiously challengeable nowadays strategies are built upon it with participant tends to find proper development resources that will effectively contribute to succession planning (Tomcikova & Cocolova, 2020). As training makes employees more competent to create advantage and will add advantage to the organizational success, providing training will also ensure long term employment (Amadi, 2014). Later on, artificial intelligence is significantly and positively associated with training that mostly algorithms rely on training as they are created from the set of data, where innovation related to advanced technology takes place they can prosper well with training and learn the data set and applications that are used (Cockburn, et al., 2018). A related sort of analysis could be found with previous studies that state artificial intelligence has changed the sort of learning by a new modern mechanism that will eventually prosper at a high level within the context of the firm (Ilkka, 2018).

Later on, the last variable Leadership which is also insignificant directly towards competitive advantage but indirectly via artificial intelligence and serial mediation of talent management is significant as leadership possesses critical information to the aspects of strategic aspects and it's accomplishments for the firm as leader manually contributes to the pivotal role related to the firm, as a basic concept for them is to adapt the change and implement as it follows, leadership possesses the quality that will boost the competitive advantage for the firms as they are the responsible to induce and teach the values and cultures that will enable the strategy formulation and will up those gaps that are considered as likely to be filled, More Studies also finds that strategic leadership is the aspect to attain advantage by motivating the talent and creating robustness within the supervision of the firm (Mubarak & Yusoff, 2019; Kathiravan et al., 2017).

With the feature of Artificial intelligence or Artificial sort of leadership has changed the dynamics of the business as automation of robotics has taken over the place, (Sun, 2018). While it can also be seen from above that talent do gets attract by the leadership style following the firm and helps in retaining the talent as well talent employees tend to leave more early if they are unsatisfied with the leaders and organizational policies that impactful in this way although in this challenging environment talent retention is considered to be the important feature (Mohammed, 2015). As above results inculcate that indirectly it is valuable for the competitive advantage also with serial meditation of talent management process because it is a central tendency point that has to be measured and get the sustainability at the overall level.

#### 5. Conclusion

On the basis of Study analysis and discussions reveals about the impact of HR practices to be aligned with the artificial intelligence to gain competitive advantage with talent management consist of serial mediation within them, ultimately HR practices align with recruitment and selection that will be transformed with Ai and looked for new endeavors, as new Innovation E recruitment has introduce and make it necessary to implement talent management Strategies, Moreover within the context of Succession planning if firms adopt prominent strategies towards management will impact and gain competitive advantage, merely it should not be focus on just individual basis but looked at overall level where transfer of critical knowledge is transform as firms thrive more to encourage their employees for the accurate progression, Artificial intelligence will particularly automate and assess HR professionals in data history and bringing analytics for key performance as

in Pharmaceutical multinational corporation has expanded the tradition with the aspect of right people at right place they have assess the dynamics via technology whether the appropriate talent could match up with the strategic and cultural insights of the firm as they have utilized brand attraction and reputation that formerly regulates and provides an inspiring mission to the talent.. In this line, the talent management process of attraction, retention, and development is associated to tackle the needs and demands of advanced technology and within that context. Leadership aligns MALS system that imposes quality aspect for the intelligent integrated system as responsible leaders inculcate efficiency throughout the process their vision will guide the planning and formulate the strategies that will be considered to gain the edge accountability towards them will assess and highlight the flaws that are situated in impulsive growth. Furthermore, serial mediation and mediation has a significant impact as nowadays globally talent scarcity is imposed and firms try to retain them

As Artificial intelligence develop the key indicators to develop and retain the talent as talent management is quite an effective approach for the global competitive business environment as HR has revolutionized with help of AI and Talent Management to gain competitive advantage similarly scientifically production and necessities of AI have adopted in talent retention and development techniques so the future of the firms will be safe and sound the hospitality industry is attached to numerous day to day work challenges and highly associated of the attrition rate with the output, so ultimately AI will attract and retain them with development of new capabilities as firms are competing for the same sort of challenges, therefore, standardization should be maintained with consistency. As this study indicates about the dimension of Artificial intelligence in the pharmaceutical sector within the context of HR practices where it is identified modification and adaptation of technology in changing environment

### 5.1 Practical Implications

This research merely focused on matters of both theoretical and technological perspective as it is checked what sort impact artificial intelligence possessed linking with HR practices, because the availability of high attrition rates has occur and similar to that adaptability of changes that are compelling needs for the firms to find the right talent, as AI has indulged it has discovered system more efficient working with automation, makes out the process fast within this particular sector where technological advancement is quite bit high as compared to other sectors it will also improve quality and services, more likely there are certain gaps such as deficiency of skills set as we are particularly in Pakistan has limited scope towards research and have a small bunch of pool in the market. Concerning firms and sectors do rely on AI and another digital sort of transmission that will help the economy and provide cost-efficiency. AI in pharmaceuticals is a crucial aspect to be taken care of.

## References

- Adesola, A. B. (2017). THE IMPACT OF TRAINING AND DEVELOPMENT ON EMPLOYEE PERFORMANCE IN RADISSON BLU ANCHORAGE HOTEL SUBMITTED BY.
- Ahmad, R., & Saad, M. (2020). The impact of Malaysian public sector in the relationship between transformational leadership styles and career development. *International Journal of Public Administration*, 43(3), 203-212.
- Ahmed, H. K. (2016). The impact of talent management on the competitive advantage in the organizations. In *Bein a paper presented at the International Conference, Abu Dhabi*.
- Ahsan, M. (2018). Effective recruitment and selection along with succession planning towards leadership development, employee retention, and talent management in Pakistan. *Journal of entrepreneurship & organization management*, 7, 233.
- Al Aina, R., & Atan, T. (2020). The impact of implementing talent management practices on sustainable organizational performance. *Sustainability*, 12(20), 8372.
- Asare-Bediako, K. (2002). Professional skills in human resource management. *Accra. Kasbed Ltd*.
- Ashif, A. S. M. (2019). Talent management as a source of competitive advantages: a review. *International Journal of Business and Social Research*, 9(4), 28-34.
- Barboza, C. (2019). Artificial Intelligence and HR: The New Wave of Technology. *Journal of advances in Social science and Humanities*, 5(4), 715-720.
- Barnard, D. (2019). *how AI is Transforming Learning and Development*, s.l.: s.n.
- Bhalgat, K. H. (2019). *An exploration of how Artificial Intelligence is impacting Recruitment and Selection process* (Doctoral dissertation, Dublin Business School).
- Bittencourt, E. S., Fontes, C. H. D. O., Rodriguez, J. L. M., Filho, S. Á., & Ferreira, A. M. S. (2020). Modeling the socioeconomic metabolism of end-of-life tires using structural equations: A Brazilian case study. *Sustainability*, 12(5), 2106.
- Johansson, S., & Björkman, I. (2018). What impact will Artificial Intelligence have on the future leadership role?—A study of leaders' expectations.
- Carrion, C. G., Nitzl, C. & Roldan, J. I. (2017). Mediation Analyses in Partial Least Square Structural equation Modeling: Guidelines and empirical examples. *Springer International Publication*.
- Chee, Y. P. (2017). The Role of Talent Management in Employee Retention. *Journal of human resource and sustainability*, 7(2), 93.

- Cioffi, R., Travaglioni, M., Piscitelli, G., Petrillo, A., & De Felice, F. (2020). Artificial intelligence and machine learning applications in smart production: Progress, trends, and directions. *Sustainability*, 12(2), 492.
- Cockburn, I. M., Henderson, R., & Stern, S. (2018). The impact of artificial intelligence on innovation: An exploratory analysis. In *The economics of artificial intelligence: An agenda* (pp. 115-146). University of Chicago Press.
- Dijkkamp, J. (2019). *The recruiter of the future, a qualitative study in AI supported recruitment process* (Master's thesis, University of Twente).
- Fisher, R. A. (1930). *Eugenics and Statistics, Discussing Karl Pearson and R. A. Fisher*. s.l.:s.n.
- Fleming, M. (2020). AI is changing work—And leaders need to adapt. *Harvard Business Review*.
- Fornell, C. & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, 18(1), 39-50.
- Galaïos, G. (2014). MANAGEMENT TRAINING AS A SOURCE OF COMPETITIVE ADVANTAGE IN THE FINANCIAL SERVICES SMEs IN GREECE.
- Hair, J. F., Black, W. C., Babin, B. J. & Anderson, R. E. (2010). *Multivariate Data Analysis*. s.l.:s.n.
- Hair, J. F., Hult, G. T. M., Ringle, C. M. & Sarstedt, M. (2017). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. s.l.:s.n.
- Hamid, M. R. A., Sami, W. & Sidek, M. H. M. (2017). Discriminant Validity Assessment: Use of Fornell & Larcker Criterion Versus HTMT Criterion. *Journal of Physics: Conference Series*.
- Hmoud, B. & Laszlo, V. (2019). Will Artificial intelligence take over the human resources recruitment and selection. *Network Intelligence Studies*, 7(13), 21-30.
- Ibrahim, D. A. U. (2018). TALENT MANAGEMENT AND ITS EFFECTS ON THE COMPETITIVE ADVANTAGE IN ORGANIZATIONS. *International Journal of Recent Advances in Multidisciplinary Research*, 5(11), 4247-4253.
- Ilkka, T. (2018). *The impact of artificial intelligence on learning, teaching, and education*. European Union.
- Javed, B., & Jaffar, M. (2019). Impact of Succession Planning on Employee Retention.
- Joseph, F. H. J., Black, W. C., Babin, B. J. & Anderson, R. E. (2017). *Multivariate Data Analysis*.
- Jyoti, J. & Rani, R. (2014). Exploring talent management practices: antecedents and consequences. *International Journal of Management Concepts and Philosophy*, 8(4), 220-248.
- Kapoor, B. (2009). Impact of Globalization on Human Resource Management Cal State University.
- Kathiravan, M., Saikumar, V., & Sunitha, V. (2017). Optimization Talent Management Process Analytics on Pharmaceutical SMEs Employees. *International Journal of Pharmaceutical Sciences Review and Research*, 46(2), 52-59.
- Keserwani, D. H. (2020). Increasing Artificial Intelligence & Data Analytics Applications and Its Influence on Human Resource Management. *UCG journal*, 19(5), 244-252.
- Khalid, F. (2019). The Choreography of Talent Development in Higher Education. *Higher Education Studies*, 9(1), 40-52.
- Khedkar, P. & Mitra, S. (2017). *Boosting Pharmaceutical Sales and marketing with Artificial intelligence*, s.l.: s.n
- Lamson, M. & Redwitz, A. V. (2018). The Impact of AI on Learning and Development.
- Imbrie, A., Kania, E., & Laskai, L. (2020). The question of comparative advantage in Artificial Intelligence: Enduring strengths and emerging challenges for the United States. *Center for Security and Emerging Technology*.
- Loomes, S., Owens, A., & McCarthy, G. (2019). Patterns of recruitment of academic leaders to Australian universities and implications for the future of higher education. *Journal of Higher Education Policy and Management*, 41(2), 137-152.
- Maphisa, S. B., Zwane, B. K. & Nyide, C. J. (2017). SUCCESSION PLANNING AND STAFF RETENTION CHALLENGES: AN INDUSTRIAL OUTLOOK AND MAJOR RISKS. *Risk governance & control: financial markets & institutions*, 7(3), 17-26.
- Mohammed, A. (2015). The Impact of Talent Management on Employee Engagement, Retention and Value Addition in achieving Organizational Performance. *International Journal Of Core Engineering & Management (IJCEM)*, 1(12), pp. 142-152.
- Mubarak, M. F. & Yusoff, F. W. (2019). Impact of Strategic Leadership on Strategy implementation. *British Journal of Management and Marketing Studies*, 2(1), 32-43.
- Mullins, L. J. (2007). *Management and organizational Behavior*. s.l.:s.n.
- Oksanen, R. (2018). *New technology-based recruitment methods* (Master's thesis).
- Rabbi, F., Ahad, N., Kousar, T. & Ali, T. (2015). TALENT MANAGEMENT AS A SOURCE OF COMPETITIVE ADVANTAGE. *Journal of Asian Business Strategy*, 5(9), 208-214.
- Raheem, A. & Khan, M. A. (2019). Impact of Talent Management on Organizational Effectiveness: Mediation Model of Psychological Contract. *Business & Economic Review*, 11(2), 149-180.
- Rajesh, D. S., Kandaswamy, M. U. & Rakesh, M. A. (2018). The impact of Artificial Intelligence in Talent Acquisition Lifecycle of organizations. *International Journal of Engineering Development and Research*, 6(2), 709-717.
- Rogers, M. (2020). *A Better Way to Develop and Retain Top Talent*, s.l.: Harvard Business Review
- Russell, J. (2010). *Exploring Psychology for AS Level AQA'A': Study and Revision Guide*. Oxford University Press.
- Samarasinghe, K. R., & Medis, A. (2020). Artificial intelligence based strategic human resource management (AISHRM) for industry 4.0. *Global Journal of Management and Business Research*.
- Rodríguez-Sánchez, J. L., Montero-Navarro, A., & Gallego-Losada, R. (2019). The opportunity presented by technological innovation to attract valuable human resources. *Sustainability*, 11(20), 5785.
- Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research methods for business students*. Pearson education.

- Stahl, G. K., Björkman, I., Farndale, E., Morris, S. S., Paauwe, J., Stiles, P., ... & Wright, P. M. (2007). *Global talent management: How leading multinationals build and sustain their talent pipeline* (Vol. 34). Fontainebleau: Insead.
- Sun, Z. (2018). Artificial Leadership: An Artificial Intelligence Approach. *PNG UoT BAIS*, 3(12), 1-7.
- Swetnam, D., & Swetnam, R. (2000). *Writing your dissertation: The bestselling guide to planning, preparing and presenting first-class work*. Hachette UK.
- Tomcikova, L., & Coculova, J. (2020). Leading and education of talented employees as one of the major impacts of globalization on human resources management. In *SHS Web of Conferences* (Vol. 74, p. 04029). EDP Sciences.
- Upadhyay, A. K., & Khandelwal, K. (2018). Applying artificial intelligence: implications for recruitment. *Strategic HR Review*.
- Uren, L., & Jakson, R. (2012). What talent wants. *The journal to talent segmentation*.
- Wold, H. (1985). Partial least squares. S. Kotz and NL Johnson (Eds.), *Encyclopedia of statistical sciences* (vol. 6). Wiley, New York.
- Wiradendi Wolor, C. (2020). Implementation talent management to improve organization's performance in Indonesia to fight industrial revolution 4.0. *International journal of scientific & technology research*.
- Yawson, R. M. (2019, March). Human resource development and executive leadership succession planning in nonprofits. In *Proceedings of the 56th Annual Eastern Academy of Management Conference* (pp. 1-16).



© 2023 by the authors; licensee Growing Science, Canada. This is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC-BY) license (<http://creativecommons.org/licenses/by/4.0/>).