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# Entrepreneurial Orientation and Human Resource Management: The Mediating Role of Artificial Intelligence

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**Abstract-** The aim of study is to check the impact of entrepreneurial orientation on human resource function by using new technology such as artificial intelligence. How it to get competitive advantage and resolve the human resource issue by using artificial intelligence. The data were collected from 292 Human Resource Section individuals. The finding shows that entrepreneurial orientation has significant impact on the human resource management. The implementation of artificial intelligence has positive partial contribution on the human resource management. This study is conducted in Lahore, Pakistan. if this study is broadening then its outcome finds that has positive impact on the adoption of artificial intelligence technology in organization.

**Keywords: entrepreneurial orientation; artificial intelligence; human resource management**

## I. INTRODUCTION

World association is continuously adopting new technology up to get competitive advantages (Ilyas et al., 2021; Johansson & Herranen, 2019; Rehman et al., 2021). Artificial intelligence technological are provided more opportunity to human's activities (Erixon, 2018). The artificial intelligence in human resource management has positive impact on it (Rehman et al., 2021; Tambe et al., 2019). The human resource process can optimized with the help of artificial intelligence technologies (Parry & Battista, 2019). The human limitations, such as preconceptions, biases and a lot of time restraints in effective a recruitment process but the latest technology are allowing more flexibility and reliability than before (Marler & Fisher, 2013). Entrepreneurial orientation are links with artificial intelligence to get competitive advantage in digitalization and internationalization (Ransbotham et al., 2017). This technology will be gainful within fifty years and take all human relative jobs after120 years (Grace et al., 2018). Executives has invested in artificial intelligence in next three years (Jarrahi, 2018).

The artificial intelligence has valuable progresses in our business activities and also provides the opportunity for internationalization (Dwivedi et al., 2019). In HRPA survey 84% of Human Resource organization Suggested that Artificial Intelligence was very useful instrument within recruitment (Mishra et al., 2016) The correlation between entrepreneurial orientation and implementation of artificial intelligence in human resource management that ensure the advantages of an artificial intelligence system can improve human resource process and this build efficient data management system (Baldegger et al., 2020). The previous study needs more theoretical implication. In this present study, we proposed the mediating role of artificial intelligence between entrepreneurial orientation and human resource management. This is helpful for economic and social empowerment for entrepreneur's and its changes help in organization human resource function. The data is collected from 292 respondents from Lahore, Pakistan firms.

## II. LITERATURE REVIEW

### Entrepreneurship Orientation

It is defined as "an business strategic assertiveness towards entrepreneurship" (Brundage et al., 2018). It is practices in continuously improvement in the activities for efficient decision making, the idea to get competitive advantage (Rana et al., 2021; Martens et al., 2018). This is consists of innovativeness, risk taking and pro-activeness (Ashfaq et al., 2021; Anderson et al., 2015). This perspective characterized of products to meet the expectation of future demand (Kiyabo & Isaga, 2020). The innovativeness is a firm's tendency to support new ideas, novelty and creative process that gives result in form of new products,

services and technological procedures. The risk taking in which the firms are willing to experience heavy debt for high returns. The pro-activeness is pursued in innovative opportunities by highly participating in emerging markets (Montiel-Campos, 2018; Ashfaq et al., 2021). Entrepreneur's orientations are highly considered progressive growth agents for any country because it's helps to take changes in economical, technological and organizational level (Hijjawi, 2020). Entrepreneurial orientation has widely recognized in firm performance (Wales et al., 2019). It has positively influenced on the firm performance and in country progresses (Koe, 2016).

**Artificial Intelligence**

Artificial intelligence is find in various disciplines like philosophy, economics, mathematics, psychology, neuroscience and computer engineering (Russell, 2017). Artificial intelligence can be defined as "a computerize system ability to correctly interpret from external data, learn from data to achieve goals and tasks with flexible adaptation" (Haenlein & Kaplan, 2019).The attribute the rapidly evolving nature of artificial intelligence including acting likely humanly and rationally thinking and it proposed six elements of artificial intelligence like autonomy, reactivity, ability to learn, ability to cooperate, personality and human like interaction (Milli et al., 2017).The artificial intelligence includes first generation, second generation and third generation (Haenlein et al., 2019). The super intelligence is anticipated to be capable and skillful to scientific creativity and social skills (Wirth, 2018). Artificial intelligence is highly used in human resource and customer service (Prentice et al., 2020).

**Human Resource Management**

Human resource management is able to gain, train and develop a human workforce that helps the company in achieves its goals according their vision, mission and objectives (Abid et al., 2021; Achkar, 2019; Nawaz, & Bhatti, 2018; Zafar et al., 2021; Rehmat et al., 2020). It is process of acquiring, retaining, maintaining new skills, capabilities and competences in a firm's (Hassan et al., 2020; Morrison et al., 2019). Human resource management practices consist of recruiting new employees (Nawaz et. al., 2017; Nisar et al., 2020), developing and managing those employees to get efficient performance (Abid et al., 2020; Erum et al., 2020; Hoque et al., 2018; Nawaz et al., 2020; Rehmat et al., 2021; Torres et al., 2020). The human resource also covers performance management and training development (Al-Damoe et al., 2015; Nawaz et al., 2018).

**The relationship between Entrepreneurial Orientation and Human Resource Management**

These cover contingency theory to produce better understanding to the institute through providing theoretically supervision in the policymaking to align entrepreneurial orientation with their technological abilities in the firms (Sanyal et al., 2020). Human resources increases with entrepreneurial orientation (Marler & Fisher, 2013). Entrepreneurial orientation are pursue new business opportunities with human resource has significant outcome (Niemand et al., 2017), This approach has direct effects of entrepreneurial orientation on human performance (Alayo et al., 2019). The entrepreneurial orientation is highly influence related to product innovation among implementing of human resource management (Tang et al., 2015). We concluding that entrepreneurial approaches superior performance with human resource management (Zehir et al., 2015).

H1: There is a positive relation with entrepreneurial orientation and human resource management.

**The relationship between Artificial Intelligence and Human Resource Management**

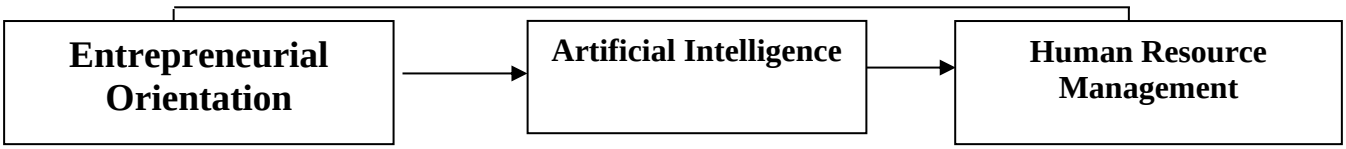
Globalization, social trends and modern technologies like Artificial Intelligence on Human Resources, engineering, customer service, financial services (Bughin, 2020). Human intelligence is ability to perceive, analyze and learn from earlier experience and solve very complex problems autonomously (Tsai et al., 2015). Still, the question is the smart systems is replace humans intelligence, After the vast progression in big data, high speed computers, intelligent software and robots are now able to perform very critical complex tasks beyond like human capability (Hmoud & Laszlo, 2019). Artificial intelligence is used in recruitment is the Knowledge search based engine(Strohmeier & Piazza, 2015).

Artificial intelligence plays vital role in optimizing the recruitment system, its decrease the burden of repetitive tasks such screening applicants, reducing the hiring cost and improving the quality of it. Artificial intelligence will add more improvement to the hiring process, eliminate human biases and improve job seeker perceptions about the employers. So no doubt that artificial intelligence taking part in recruitment and selection will increase very rapidly (Huang & Rust, 2018). Artificial intelligence play important role in various functions in human resource department where the robotics firms can handle recruitment, hiring, analyzing, data collection, decreases workload at workstation and its increase efficiency (Yawalkar, 2019). Artificial Intelligence will be evidence based, affordable, reduce costs, creativity, critical thinking, time saving and have very positive impact on the in human resource activities and its increases the efficiency of human resources function (Meskó et al., 2018). We divided four techniques for human resource tasks the first is complication of human resource phenomena, second is

limitations of small data sets, third is accountability questions relative with fairness and legal constraints and fourth is adverse employee responses to management decisions through data based systems. we concludes that these economically efficient and socially appropriate for using data science in the management of employees in it (Stone et al., 2018). Artificial intelligence is positioning in human resource management the organizations can improve efficiency in recruitment and selection and with subjective criteria such as nepotism and favoritism are less in recruitment and selection of employees and it's have positive impact on the development and productive application of employees (Kshetri, 2021). Human resource functions like recruitment, training, selection, talent and retention management provides positive intersection of Artificial intelligence and Human resource management now and increase in future at human resource workforce (Maduravoyal, 2018).
H2: There is a positive relation with entrepreneurial orientation and artificial intelligence.

**The Relationship between Entrepreneurial Orientation and Artificial Intelligence**
Entrepreneurial orientation and adoption of Artificial Intelligence is in the operational performance provides the competitive advantage in better understand of behavior's (Sahi et al., 2019). The entrepreneurial orientation with artificial intelligence technology are increases the performance, decision and the process in business strategies (Shaher & Ali, 2020). Artificial intelligence are enabled the organization to gaining significant competitive advantage (Dubey et al., 2020).
Entrepreneurial orientation includes like innovation, exploring new opportunities with artificial intelligence help to use resources very effectively (Krishna & Rohit, 2018). Artificial intelligence are currently enabled the high cost of innovation but it's provides higher than normal profit (Arunachalam et al., 2018). The entrepreneurship skills and the application artificial intelligence very efficient in management research (Sabahi & Parast, 2020). Artificial intelligence has been receiving raises attention with its applicable is useful in entrepreneurship (Obschonka & Audretsch, 2019). Artificial intelligence is enhances the performance with the help of entrepreneurial orientation (Maroufkhani et al., 2020). The firm operational performance with artificial intelligence is beneficial (Bogachov et al., 2020). This technology is helps in improvement in automate decision making in firms (Agrawal et al., 2019).
H3: There is a positive relation with Artificial Intelligence and human resource management

**Figure 1: Research Conceptual Framework**




## III. RESEARCH METHOD

This study is based on primary source of data in form of questionnaires. Entrepreneurial orientation scale developed by (Lee & Lim, 2009) with reliability of 0.887. Artificial intelligence scale developed by (Schepman & Rodway, 2020) with reliability of 0.895. Human resource management scale adoption by (Coelho et al., 2012) with reliability of 0.880. The random samplings are used for the data collection from human resource individuals. The data based on two hundred ninety-two respondents from Lahore, Pakistan firms.
Table 1: Demographic characteristics are including respondent's gender, age, management level, qualification, and job experience and industry types. The 292 respondent has 67.5 % Male and 32.5% Female. Furthermore, the largest age group 39% at the (31 to 40) years. Almost 59% of the participants are middle level in firms. The 32% employees have 14-year education. The 40% have less than 5 year working experience and 60% data collected from private organization.
The descriptive analysis includes the means and standard deviations values. Entrepreneurial orientation means value is 3.241 and standard deviation value is 0.399. Artificial intelligence mean value is 3.970 and standard deviation value is 0.461. Human resource management means value is 2.196 and standard deviation is 0.275 in short, all values shows the data were reasonably homogeneous and shows reliability.

**Table 1: Demographic Characteristics**

| Characteristics | Frequency | Percentage | Cumulative Percent |
|---|---|---|---|
| **Gender** | | | |
| ▪ Male | 197 | 67.5 | 67.5 |
| ▪ Female | 95 | 32.5 | 100 |
| Total: | 292 | 100.0 | |
| **Age** | | | |
| ▪ Less than 30 Years. | 109 | 37 | 37.3 |
| ▪ 31 – 40Years. | 114 | 39 | 76.4 |
| ▪ 41 – 50 Years. | 49 | 16.8 | 93.2 |
| ▪ 51- 60 year. | 16 | 5.5 | 98.6 |
| ▪ Above 60 year | 4 | 1.4 | 100 |
| Total: | 292 | 100.0 | |
| **Management Level** | | | |
| ▪ Top | 75 | 25.7 | 25.7 |
| ▪ Middle | 174 | 59.6 | 85.3 |
| ▪ Lower | 43 | 14.7 | 100 |
| Total: | 292 | 100.0 | |
| **Qualification** | | | |
| ▪ Less than 14 | 92 | 31.5 | 31.5 |
| ▪ 14 year | 71 | 24.3 | 55.8 |
| ▪ 16 year | 81 | 27.7 | 83.6 |
| ▪ Above 16 year | 41 | 16.4 | 100 |
| Total: | 292 | 100 | |
| **Job Experience** | | | |
| ▪ Less than 1 year | 73 | 25 | 25 |
| ▪ 1 to 5 year | 118 | 40.4 | 65.4 |
| ▪ Above 5 year | 101 | 34.6 | 100 |
| Total: | 292 | 100 | |
| **Type of Industry** | | | |
| ▪ Public | 62 | 21 | 21.2 |
| ▪ Private | 173 | 59.2 | 80.5 |
| ▪ International | 57 | 19.5 | 100 |
| Total: | 292 | 100 | |

Table 2: The correlation analysis of entrepreneurial orientation and human resource management also high positive correlation between them its value is ($r = 0.79$, $p < 0.01$) the hypothesis (H1) is accepted. There is also a highly positive relationship between artificial intelligence and human resource management with value of ($r = 0.84$, $p < 0.01$). The hypothesis (H2) is also accepted. Entrepreneurial orientation are shows highly positively correlation with artificial intelligence with Pearson value ($r = 0.82$, $p < 0.01$) this show that hypothesis (H3) is accepted.

**Table 2: Correlation**

| | Entrepreneurial Orientation | Artificial Intelligence | Human Resource Management |
|---|---|---|---|
| Entrepreneurial Orientation | | | |
| Pearson Correlation | 1 | 0.824** | 0.794** |
| Sig. (2-tailed) | - | .000 | .000 |
| N | 292 | 292 | 292 |

| | | | |
|---|---|---|---|
| Artificial Intelligence | | | |
| Pearson Correlation | 0.824** | 1 | 0.841** |
| Sig. (2-tailed) | 0.000 | - | 0.000 |
| N | 292 | 292 | 292 |
| Human Resource Management | | | |
| Pearson Correlation | 0.794** | 0.841** | 1 |
| Sig. (2-tailed) | 0.000 | 0.000 | - |
| | 292 | 292 | 292 |

N=292, *p<0.05, **p<0.01

Table 3: In regression analysis, the total effect between entrepreneurial orientation and human resource management is β=0.537, p=0.00 that has significant positive results. The mediation artificial intelligence β=0.214, p=0.00 it's explain the partially positive relationship between entrepreneurial orientation and human resource management.

**Table 3: Regression Analysis**

| Variables | $R^2$ | β- value | P-value | F-sign |
|---|---|---|---|---|
| **Human Resource Management (Dependent)** | 0.631 | 0.537* | 0.00 | 0.00 |
| **Artificial Intelligence (Mediator)** | 0.680 | 0.214* | 0.00 | 0.00 |
| **Entrepreneurial Orientation (Independent)** | 0.739 | 0.340* | 0.00 | 0.00 |

*p<0.05, **p<0.01

## IV. Discussion

The previous studies show that the companies are increasingly considering the artificial intelligence that create new sources of business value to see the impressive results (Ransbotham et al., 2018). An entrepreneurial approach involves innovation, risk taking and proactive behavior that engage to take risk to enter new markets. without adoption, it has not get much efficient results (Amankwah-Amoah et al., 2018). Innovativeness has positive outcome on human performance in developing competitive advantage with new technologies help to improve business performance (Tajeddini & Trueman, 2014). Talent turnover is regular process the new hiring is very time consuming for this management requires more innovative technologies for business survival (Oberholzer & Gruner, 2019).The study tests mediating relationship of artificial intelligence between Human Resource management and entrepreneurial orientation. The results suggest that entrepreneurial orientation with implementation of artificial intelligence in human resource management have very positive result. The all three hypotheses are accepted positive. Data management provides opportunity door for Human Resource management, the company's builds an efficient data management system forward to a brighter future with artificial technology.

**Theoretical contribution**

The previous studies, result show that there is a correlation between entrepreneurial orientation and implementation of artificial intelligence on the human resource management (Baldegger et al., 2020) but this study shows that artificial intelligence has partially positive mediating role between entrepreneurial orientation and artificial intelligence. This study contributed to contingency theories.

**Practical Contribution**

Many studies show that artificial intelligence will perform many activities in the few years in medical, engineering, business fields and task performance (Grace et al., 2018). The rapid increase of artificial intelligence around the world suggests it's become an integrated part of our life (Jarrahi, 2018). This study shows that adoption of artificial intelligence in the Human Resource Management process has strong practical outcome in handling of human related task and reduces the work load from employees (Vardarlier & Zafer, 2020). Human resource is needs to delivering successful business with new technology to enhance employees performance in a new world (Malik et al., 2020).

**Limitations and Future Research Directions**

While doing this study, it is recognized that it makes a lot of findings but it has some limitations as well. The studies have based on thirty one questions. The sample size is only based on 292 respondents. This paper doesn't cover the profitability aspect on introducing of artificial intelligence in human resource management. The study is expended by putting new variable in discussion. The resources and time of studies are also limited but this study useful for the organizations. Now the companies do not use this technology but they will be using in the future.

## V. CONCLUSION

Now the global markets, efficient talented workers are required to progress their organization. For this, the organization requires more efficient and innovative technologies. This study purpose is to identify the role of entrepreneurial orientation on the human resource management with the mediating role of implementation of artificial intelligence. The previous study shows that it has significant positive result in practical and theoretical aspect. Now this study show that entrepreneurial orientation approaches have very strong relation with human resource management and its mediation of artificial intelligence have positive partial contribution between human resource management. Its impact on implementation artificial intelligence on human resource management gives efficient result for a brighter future.

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