# Effects of Artificial Intelligence on Human Resources Management
# A study of IT Sector in Pakistan

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**Abstract**

*As the world is moving towards technology, many organization have already automated their processes while other are striving hard for undergoing the technological process for their functions and practices. Artificial Intelligence being one of the most advance element of the human resources management of corporations is facing major transformations and implications. In Pakistan, the concept of artificial intelligence is evolving with time. Hence, this study aims towards highlighting the importance of artificial intelligence along with the effects which play an important role in transformational process of human resources and how it effects the recruitment. This study has been conducted in the IT sector of Pakistan and it is based on quantitative method of research done with the assistance of research questionnaire.*


*Keywords: Artificial Intelligence, Human Resources Management, Recruitment.*

# 1. Introduction

## 1.1. Artificial Intelligence

The rise of Artificial Inteligence in recent years has attracted numerous controversial remarks. For example, CEO of IBM, Ginni Rometty, argues that AI technologies are "technologies to augment human intelligence. By and large we see a world where this is a partnership between man and machine and this is in fact going to make us better and allow us to do what the human condition is best able to do".

Stephen Hawking, on the other hand, remarked that "the development of full artificial intelligence could spell the end of the human race" (Cellan-Jones, 2014), and Bill Gates has also said that humans should be worried about the threat posed by Artificial Intelligence (Rawlinson, 2015).

Digital age and knowledge economy have shaped heavy changes in the corporate world. (Chen & Li, 2015). Organizations are now facing tough competitions in the dynamic, uncertain, transforming and complex environment (Sanz-Valle & Jiménez-Jiménez, 2005).

## 1.2. Human Resources Management

Human resource management encompasses those activities designed to provide for and coordinate the human resources of an organization Human resource functions refer to those tasks and duties performed in organizations to provide for and coordinate human resources" (Byars and Rue ).

Human resource management is believed to be strongly embedded in the business strategies to effectively support the innovations (Kozlowski,1987). Another emerging field that start producing research interest in Human resource management is flexible human resource management, because it enables the firms to stretch and adapt to changing, uncertain and diverse requirements in both internal and external environment (Wright & Boswell 2002; Kumara & Pradhan, 2014).

## 1.3. Background

In the year 1920 during a science fiction play named RossumoviUniverzálníRoboti which means-Rossum's Universal Robots, also better known as R.U.R. by Czech writer Karel Capek the term ROBOT was firstly used. The term artificial intelligence was first introduced by John McCarthy in 1956 in his first academic conference on the subject. But this journey of knowing this area in more depth had started much before than that.

(Richa Verma, 2018)

## 1.4. Problem Statement

Time is flying increasing the pace of life and its processes. Modern age is the age of internet and technology. This has resulted in shifting of whole paradigm of working environment of businesses and converting it into a completely different form. Companies who wish to strive in the modern culture of business are steadily incorporating artificial intelligence in their organizations. Whereas those which didn't were seen to be vanishing from the industry. Rapid and phenomenal developments have been occurring in the business field making things different from how they were before.

With time human resources have also evolved and so have the all functions of HR involved in artificial Intelligence. Rapid changes which can be witnessed in the business functions at the same time integration of technology has also provided them with numerous techniques of improving making them robust and efficient.

Pakistan is in the developing state so technological advancements hit here later than other parts of the world. Considering this fact, this study is being carried out in order to highlight the effects of artificial intelligence which can effected human resource management and its function.

## 1.5. Aim of the Research

The purpose of carrying out this research is to identify the upcoming opportunities for the artificial intelligence in Pakistan. Corporate performance is the focus of this research in order to examine the effects which are imposed on it by artificial intelligence and other factors including, technology, growth in deep neutral networks and historical data base.

Earlier researches on artificial intelligence have been carried out in other countries and not in Pakistan. So, this research would help the businesses to identify the significance of artificial intelligence. How AI would help human resources to become more efficient. Technological integration in Human resources processes will also assist organization in increasing its corporate strength and increasing the share of value along the human resource.

## 1.6 Hypothesis

**H1:** There is a significant impact of artificial intelligence on human resources.

**H2:** There is no significant impact of artificial intelligence on human resources.

**H3:** There is a positive impact of artificial intelligence on human resources.

**H4:** There is a negative impact of artificial intelligence on human resources.

## 1.7 Literature Review

In this paper, as the progress of AI technology enables researchers to create advanced machines, it is possible for AI to undertake more complex tasks that require cognitive capabilities such as making tacit judgments, sensing emotion and driving processes which previously seemed impossible. (Mahroof,2019)

Artificial intelligence will replace drivers by mid2030's,it uses certain algorithms for driving a car and prevention of risks and accidents, although driverless cars are existing but it will emerge and transform within few decades by 30%. (Drivers,Vishal Maria, 2019)

In the paper titled AI in HRM it was stated that AI will help us to make our job easy and reduce the work load of HR manager but it does not replace the work of human resource manager. Machine learning have a new wave in business it mainly tells that by the year 2020 every organization will use AI always HR departments will face new problems and challenges .that means the problem starts from selecting right candidate and retention of the right candidate so AI will make challenges faster.hr professionals slowly depend on the technologies like AI to move up their work. AI mainly used in recruitment process like it mainly rejects the resumes which are unqualified it makes tasks easy.AI will make use of performance management like system continuously take feedback from the employees .employee retention is more important in the organizations because according to the requirements of employees the HR manager should implement new policies and procedures so that employees will have interest to work in the organization. Through machine learning we have many results and definitely it has its impact in today`s world. (Ruby merlin,Jayam.R 2018).

In the paper title AI is coming –and HR is not prepared .AI is emerging and HR managers should be prepared of how to use this technology all the future work will be done by AI so company's like IBM, PWC and deloite they are done surveys on impact of AI on HR last 18 months and it is cleared that companies want to implement AI but they doesn't not consists employees with proper leadership to make it happen. IBM predict that 120 million workers in the world's 10 largest economics need to give training to workers regarding AI and if the companies didn't start training definitely they lose competitive edge regarding to development even if company want to establish AI but employees don't show interest to pull it off. 80% of employees in US and UK believe that having AI skills will be useful to them to get benefits to their company and 42% said that they are not that they are not believing that their HR departments can execute it. HRD plays an important role in every organization so it needs technologies like AI to be more competitive in the areas changing business environment and this starts with change in culture where details used to take decisions so that managers and the employees of HR need to know about AI.(Sarah Fisher gale 2019)

(Acikgoz,2019) In this paper there are two views to the recruitment process: either the organizational view or from the job-seekers view. However, there is a lack of models which refers one view to the other. Therefore, when investigating the recruitment process it is important to keep in mind from what view it is taken. Among these different suggested models of the recruitment process, it is possible to see some common steps emerge.

In the paper title can AI change the way in which companies recruit, train, develop, and manage HR in work place already AI have significance in HR management but there is a necessity to enhance this technology in each and every organization it makes the work of HR manager or superiors easy for instance under armourit is an American company which manufactures footware. So it receives nearly30,000 resumes so in order to shortlist and select the candidates it will be very difficult for the superiors so they used this AI enabled technology called as hirevue to make the task easier by using this technology. Managers in the organization can conduct interviews to applicants with the help of some pre-recorded questions so that candidates will attend interviews and there will be algorithms which are already coded to the system suit see how to select the candidates, on what bases they have to select

according to the requirements of an organization this AI technology can be used to reduce employees turnover in the companies and definitely it will be the key era for managers.(Faiyazmd.iqbal,2018)

In this paper, however, being able to hire the most competent and best employees on the market is becoming increasingly hard amongst the competition on the job market (Taylor & Collins, 2000; O'Donovan, 2019).

A conceptual study" (2018).The major objective of this paper is to study how Artificial Intelligence influences the recruitment strategy. The study also throws light on the techniques used by companies in AI while recruiting. This study is entirely done based upon secondary sources of information like conceptual papers, various peer reviewed journal articles, books and websites are used to further explore the concept. Secondary sources such as Websites, Journals, Reports, Publication of professionals and books are referred for drafting the entire paper. In conclusion the role of AI – it's the combination of humans and AI that leads to data maintenance, save the cost and time to the organizations with more accuracy and access in total recruitment process.(Geetha R & BhanvSree Reddy D),"Recruitment through artificial intelligence.

The recruitment process does not have a determined model for how it should be conducted, rather it is described and theorized slightly different by many researchers(Acikgoz,2019)

In the paper titled the impact of AI on HR function clearly shows that in near coming future AI is going to bring a drastic change in the way of implementing HR practices with the implementation of AI in an organization .It is true that several jobs may be affected but in reality it raises the productivity of an organization although some of the western companies are successful in integrating AI with some HR practices and became productive and others are still counting on the cost aspects and out of all the HR practices recruitment is the best function in integrating with AI from sourcing ,screening the qualified applicants and finally it is the duty of the governments and the respective organizations to reshape ,re skill and upgrading their work force to compete with these intelligent machines.(Peter,2018)

## 2. Conceptual framework

## 2.1 Definitions of the terms

### i. Artificial Intelligence:

**Artificial intelligence (AI)**, sometimes called machine intelligence, is intelligence demonstrated by machines, in contrast to the natural intelligence displayed by humans. Leading AI textbooks define the field as the study of "intelligent agents" any device that perceives its environment and takes actions.

### ii. Human Resource Management:

**Human resource management** is the strategic approach to the effective management of people in a company or organization such that they help their business gain a competitive advantage.

### iii.      Recruitment

**Recruitment** refers to the overall process of attracting, shortlisting, selecting and appointing suitable candidates for jobs (either permanent or temporary) within an organization.

### iv.      Data Mining:

Data mining is the process of discovering patterns in large data sets involving methods at the intersection of machine learning, statistics, and database systems.

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## 2.2 Conceptual Model
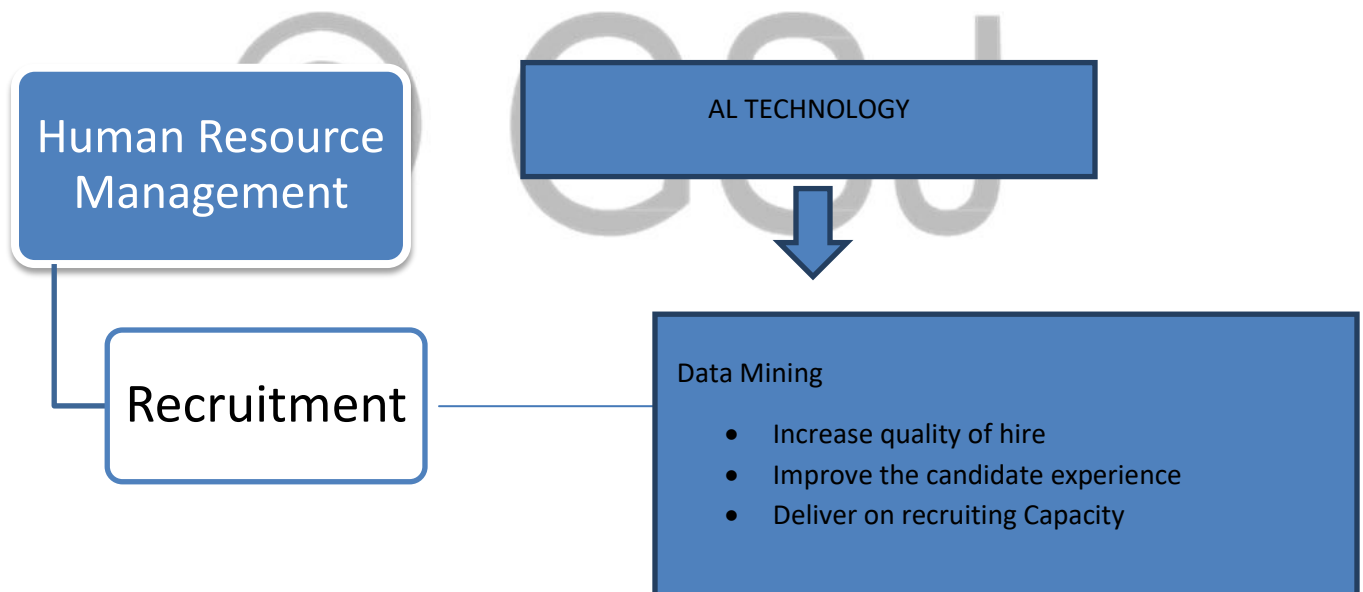
## 3. Research Methodology

### 3.1 Introduction:

In this chapter, we focus on elaboration of the methodology adapted for the purpose of conducting this research in order to find out the factors and their effects on the performance of the organizations. This study has been investigated with the assistance of different techniques including questionnaires, data analysis, and different discussions. This research sheds light on elucidating as well as interpretative reason. It stresses the importance of artificial intelligence and its effects on the organizations. For the purpose of this study, IT sector has been chosen. Applying essential research, information was collected to confirm the legitimacy and the extent of this research in Pakistan.

### 3.2 Research instrument

Questionnaire:

The tool used for the purpose of gathering the data for this thesis is questionnaire which is based on questions divided into each category of independent and dependent variables. Each of these questions included in the instrument of research has been adapted from different sources and is based on the LIKERT'S Scale for measuring the reactions collected in this research.

### 3.3 Face content & validity

The content of the questionnaire had to be necessarily validated by a PhD professor so for this purpose a highly professional PhD professor from a renowned institute of Karachi, Pakistan was contacted. After thorough reading and examination of the questionnaire it was validated by him.

### 3.4 Research design

As stated earlier, the purpose of this research is to find out the effects of four independent variables, which assists artificial intelligence' function. The most commonly used technique to find out the relationship between the dependent and independent variables is the statistical analysis of correlation between them. So, in order to fulfill the need of the research of finding out the relationship, which might exist between the given dependent and independent variables, correlation analysis was conducted using SPSS. The results helped us to examine the relationship of the variables with one another which could be either positive or negative.

### 3.5 Types of data

The data taken for this research is of two types, explicitly, qualitative and quantitative data. This study leans towards the measurement of performance of corporations which is why the data included in this research is quantitative data. Moreover, the variables taken to be investigated for the purpose of confirming that artificial intelligence helps in strengthening the performance also intends to measure and confirm the relationship between the variables and it depends on numerical.

On the other hand, the research is also based upon facts and arguments based on the non-numerical data which is gathered through different articles.

### 3.6 Sample size

Since the purpose of this research is to find out the importance of artificial intelligence in human resources management and its significance on t he performance specifically in the IT sector of Pakistan, so for its commencement sample size of Two Hundred respondents have been taken.

The respondents chosen for filling the research questionnaire were selected from the top ranking IT companies of Pakistan because of the fact that these companies, some of them being multi-national, would have the understanding of the modern challenges related to technology and the complexities of the recruitment.

### 3.7 Study findings

This section explains the findings of the research which was conducted for the purpose of finding out the relation that might exist between one dependent and independent variables. For this purpose, different statistical tests were performed on the collected data.

### 3.8 Ethical considerations

The research was conducted also by fulfilling the ethical and moral responsibilities as a researcher. As per the ethical duties, the information and data gathered from the respondents through the questionnaires are to be kept confidential and to be used only for the sake of this research. Moreover, the process of data gathering for this research was only carried forward after the permission from the higher management of the related IT companies was taken.

## 4. Results and Discussion

### 4.1 Analysis of the data

This study was based upon the study of the relationship between the given independent and dependent variables. For this purpose, the survey was conducted and results were gathered. These results show the existing relationship between the mentioned variables.

The results show that three of the given independent variables namely, **Artificial intelligence**have a significant relationship with the dependent variable which is **Human resources management.**

### 4.2 Respondents' profile

200 respondents were the part of study after their consent. The number of male study subjects were greater than female i.e. male was 82.5% whereas female was 17.5%.

**Gender**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Male | 165 | 82.5 | 82.5 | 82.5 |
| | Female | 35 | 17.5 | 17.5 | 100.0 |
| | Total | 200 | 100.0 | 100.0 | |

Distribution of study subjects with respect to gender.
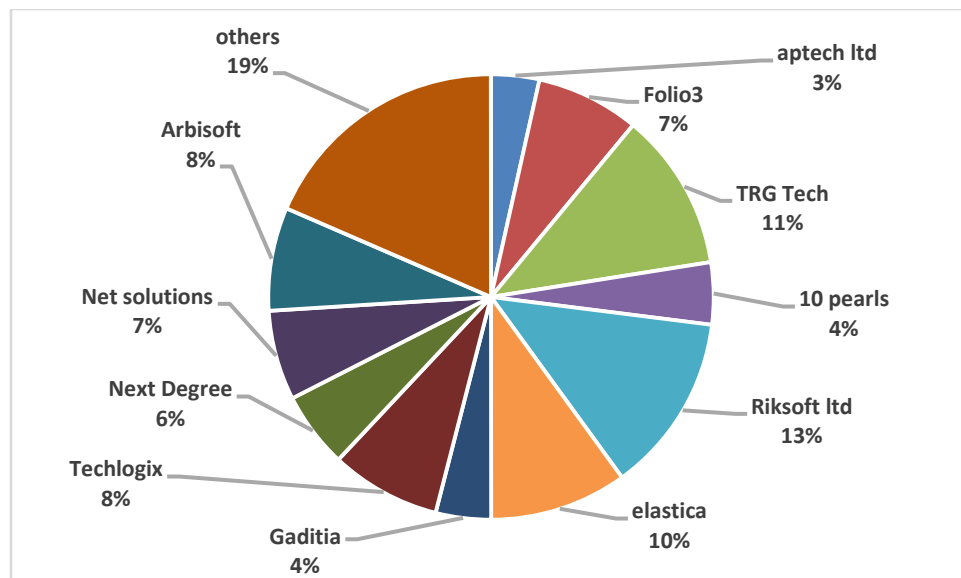
## 4.3 Descriptive Statistics

**Statistics**

| | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Q11 | Q12 | Q13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| N  Valid | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 |
| Mean | 1.0550 | 2.0050 | 1.0650 | 1.0950 | 2.0150 | 2.0350 | 2.0150 | 1.9900 | 1.1500 | 1.9900 | 2.0150 | 1.9800 | 2.0600 |
| Median | 1.0000 | 2.0000 | 1.0000 | 1.0000 | 2.0000 | 2.0000 | 2.0000 | 2.0000 | 1.0000 | 2.0000 | 2.0000 | 2.0000 | 2.0000 |
| Mode | 1.00 | 2.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | 2.00 | 1.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Std. Deviation | .22855 | .43117 | .24714 | .29395 | .50602 | .48472 | .49599 | .54901 | .35797 | .48068 | .54429 | .49072 | .63118 |
| Variance | .052 | .186 | .061 | .086 | .256 | .235 | .246 | .301 | .128 | .231 | .296 | .241 | .398 |
| Range | 1.00 | 3.00 | 1.00 | 1.00 | 3.00 | 3.00 | 3.00 | 3.00 | 1.00 | 3.00 | 3.00 | 3.00 | 3.00 |
| Minimum | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Maximum | 2.00 | 4.00 | 2.00 | 2.00 | 4.00 | 4.00 | 4.00 | 4.00 | 2.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| Sum | 211.00 | 401.00 | 213.00 | 219.00 | 403.00 | 407.00 | 403.00 | 398.00 | 230.00 | 398.00 | 403.00 | 396.00 | 412.00 |

## 4.4 Regression

### Variables Entered/Removed[a]

**Variables Entered/Removed[a,b]**

| Model | Variables Entered | Variables Removed | Method |
|---|---|---|---|
| 1 | Q1[c] | . | Enter |

a. Dependent Variable: Q5

b. Models are based only on cases for which Q10 =

Strongly Agree

c. All requested variables entered.

**Model Summary**

| Model | R<br>Q10 = Strongly Agree<br>(Selected) | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .111[a] | .012 | -.037 | .56061 |

a. Predictors: (Constant), Q1

$R^2$ value named as coefficient of determination, which is the proportion of variation accounted for by the regression model above and beyond the mean model. $R^2$ value for our model is 0.12 that our independent variable explains 12% of the variability of our dependent variable.

## 4.5 ANOVA Analysis

A multiple regression was generated to predict the statusof from independent variable Artificial intelligence. The $F$-ratio test shows that above mentioned independent variables significantly

**ANOVA**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | .078 | 1 | .078 | .248 | .624[c] |
| | Residual | 6.286 | 20 | .314 | | |
| | Total | 6.364 | 21 | | | |

a. Dependent Variable: Q5

b. Selecting only cases for which Q10 =  Strongly Agree

c. Predictors: (Constant), Q1

## 4.6 Correlation Analysis:

**Coefficients**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 1.429 | .612 | | 2.335 | .030 |
| | Q1 | .286 | .574 | .111 | .498 | .624 |

a. Dependent Variable: Q5

b. Selecting only cases for which Q10 =  Strongly Agree

## 5. Conclusion

The purpose of this research was to find out the relationship of a few factors (independent variable) namely, artificial intelligence system with performance in regard to human resources management. Since the end goal of the management is related to recruitment fulfilling organization demands on time and providing them with highest technology services which will also improve company's position in the industry, this is why the decision regarding artificial advancement in HR functions is really crucial for the success of the companies.

To conduct this research the data of 200 questionnaires was analyzed which confirmed that the artificial intelligence have significant impact on human resource.

To elaborate it a bit further, Artificial intelligence is the result of the modern world of complexities and new technological advancements which have allowed new entrant to enter new markets anytime. The biggest challenge of artificial intelligence is that it has made everything quick. Recruiters want to be catered quickly for this purpose, companies ought to have highly responsive HR system so that the hiring is on time. For this purpose, companies can adapt artificial intelligence into the recruitment which allows human resources to be responsive and agile.

Technology is the main focus of the whole world today.Companies who wish to survive in the modern industry must make their recruitment processes digitized by incorporating the modern

technology so that not only the processes can be made faster but also their performance can be made better.

## 5.1 Limitations

Since this research was meant to be conducted in IT sector of Pakistan only so it cannot be generalized to other industries of Pakistan.

Another limitation to this study is the small sample size. The questionnaires were filled by only 200 respondents for the purpose of gathering data.

## 5.2 Future recommendations

It is suggested that in future, if this research is conducted again, this study should be done on a broader scale. Since, it is an evolving concept in Pakistan. It must be widely highlighted in different industries of Pakistan in order to enlighten the companies about its benefits.

Recruitment is the back bone of Human resources so, by making this function automated, companies can successfully have competitive advantage over the competitors in the markets thereby, increasing the technology and artificial intelligence.

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