

# Application of AI in Human Resource Management and Gen Y's Reaction

Suruchi Pandey, Priyadarshini Khaskel,

**Abstract:** HR is facing the transformation challenge and disruptive impact of AI in its functions. In this study, we shall bring into light certain challenges faced by AI in HR and the technological counter solutions to it that have been reinstated. Many companies like IBM, have reengineered its HR service delivery strategy to render intelligent agents to the services being provided to its managers and associates, answer their queries and suggest decisive aspects of employees roles, careers, rewards, compensation and learning. Also United Health Group is on building a graph database which uses AI to identify improvements in efficiency and quality of services. Such instances create the need to study the reaction of the Gen Y which composes more than the 50% of the working population i.e. population under 25 and around 65% is under the age of 35 and their reaction to the transformation in HR systems to it quotes Forbes study<sup>1,7,27</sup>.

A qualitative study was carried out and Gen Y professionals were interviewed to seek the feedback. The HR themes and functional areas were identified which are perceived as areas where application of AI is possible. A deep-learning model using Neuroph Studio was created to capture the perception of the young working professionals. The study brings out the statistics to a clear majority of the sample to believe that AI must be implemented in the current HR systems. The research is useful to current practitioners of profession of HR. The study implies that AI will enter HR roles and working population is ready for it. The study is good indicator for artificial intelligence developers as areas of application are identified.

**Keywords:** Human Resource Technology, Artificial Intelligence, Gen Y, HRM

## I. INTRODUCTION

Human resource is moving beyond its base functionality. Automation is an emerging theme with many functions becoming completely digitized, eliminating the need for human involvement. A 2018 LinkedIn survey<sup>2</sup> revealed that Artificial Intelligence proved most valuable in the field of candidate sourcing and candidate screening. The biggest advantage of AI is reading applicant material in lesser time span and also free from human bias or error. As companies grow in size, start to take on more employees, their needs become more sophisticated and the main objective of companies is to save resources and time. Therefore they are heading towards robotics, virtual training session and AI. Until recently, the benefits of Artificial Intelligence (AI) in Human Resource Management were to improve efficiency of the HR tasks and help in cost savings by automating the repetitive tasks.

Revised Manuscript Received on November 30, 2019

\* Correspondence Author

Suruchi Pandey\*, Associate Professor, Symbiosis Institute of Management Studies, SIU, Pune, India. Email: suruchi.p@sims.edu

Priyadarshini Khaskel, Student Manager, Symbiosis Institute of Management Studies, SIU, Pune, India.

However now, due to technological advancements, AI has enabled HR teams in the organisations in resolving critical business related issues which have HR as centric solution, propel tremendous performance improvements areas, and contribute to the profitability and larger business results. AI in true sense has led to evolution of HR to mission critical from strategic and administrative.<sup>21</sup>

The concept of connection between workers' wellbeing and their productivity emerged between 1890 and 1920.

The timeline it followed could be summarised in three major phases.<sup>3</sup>

1<sup>st</sup> Generation HR Technology (1900-2000): System of Records

2<sup>nd</sup> Generation HR Technology (2000-2012): Automation

3<sup>rd</sup> Generation HR Technology (2013 and running): Smart HR Technologies

AI has entered in day to day tasks like Alexa, Auto driven Cars, ticket bookings, Hospitality and services, Medicine and health care. Business world followed bottom up approach. Practice of HR has changed as per the dynamics of business environment and requirements. The business reasons for using AI in HR are as below:

1. Intelligent Automation: As the cognitive technology AI, meets automation, it enables the system to sense, understand, learn and act. The advent of IA shall reduce the manual, redundant functions and foster innovation since the focus shifts to the strategic and mission centric aspect of business.<sup>4</sup>
2. Data-driven decision making: AI helps the HR team to derive discernments from data and provide commendations which are real time. Today we have software like Natural Language Generation (NLG) that creates data driven text from data, now this makes it a valuable asset of HR domain across the trades. Best part is so called human bias and inconsistencies also can be reduced with the help of AI in HRM functions. Hence this can make faster, at bigger scale, unbiased, more consistent and data-driven decisions.
3. Employee engagement: Employee experience and employee productivity have a direct impact on the business bottom line. These two are the by-products of efficient employee engagement. From facilitating the employee onboarding process to handling their records right until their exit from the organization, AI is enabler to many employee engagement tools that can help organisations retain its valuable assets, its talent.

Many studies on trends of HR says AI will take major portion of HR practice and the world of HR will transform completely. AI transforming the crucial areas of HR which is the scope of this study. AI is effecting entire HR process from Resource planning to Talent Acquisition to Learning & Development, Performance management, Reward and Recognition, Retention and job Design.

The present study will be focused around AI in recruiting, AI in Human Capital Management (HCM), AI in employee engagement and AI in Learning and Development (L&D). Artificial Intelligence is the buzz word of today. Many discussions are taking place about its implementation in HR. Literature review about this topic suggested some challenges for its implementation.

### II. CHALLENGES IDENTIFIED IN THE IMPLEMENTATION OF AI

1. Complexity in HR phenomena such as, to categorize a 'good employee', various metrics are used; one such widely used metric is the performance appraisal score which is unreliable, has validity issues and has shown bias. Many employers are giving it up altogether<sup>5</sup>. Also, it is difficult to differentiate individual performance from team performance due to interdependencies within the job<sup>6,29</sup>.
2. Constraint of small data sets is one of the obstacles, since not much data is available for employee firing because of poor performance. Also the number of employees of a particular company poses a data constraint. More precisely, HR does not possess "Big Data", as most companies have their employee count in thousands not in millions, hence analysis tools may be not be helpful<sup>5</sup>.
3. Who gets hired or fired needs to follow fairness approach -both procedural and distributive justice and measuring the socio-psychological concerns among employees.<sup>7</sup> Amazon had to put down AI recruiting tool since the algorithm showed bias on the basis of gender.<sup>8</sup>
4. Employee's adverse reaction, in order to bluff and fool the algorithm which might affect the organizational outcomes. It is a regular human psychological phenomenon of masking of one's actual capabilities once under a monitored environment. Spontaneity has to be captured to seek ,confirm and gauge the truth and real characteristics. AI will also lead to ethical issues of serious nature.<sup>23</sup>

### III. SOLUTIONS IMPLEMENTED: CURRENT APPLICATIONS

1. In the first challenge, the major drawback is the metrics used by the AI application environment to predict a sensitive conclusion like, a good employee. The metric given as an example by Cappelli and Tavis 2017 is, performance appraisal scores, which may be a cause or reward of being a 'good employee' but cannot be a determinant. Instead, metrics can be identified and constructs can be created to give a better understanding of the concept of a good employee. For example: a combination of five metrics that can be taken into consideration are: Employee Productivity Index + Absence Rate + Training Effectiveness Index + Employee Happiness Index + Employee Ethics Index.<sup>9,30</sup>
2. AI powered by precise data can lead to outsized impact<sup>10</sup>. One of the implementation examples worth know is USPS (United States Postal Service). With the help of machines and advanced optical character recognition (OCR) technology, sorting of mails have been automated. It can read almost 98% of all the hand-addressed mails with precision and 99.5% of the machine printed mails with no human intervention. A count of more than 36,000

pieces of mail per hour is processed by linking a small and limited data set of U.S zip codes and cities. Hence, to make this result work for a company, following steps can be taken:

- i. Setting goals, particularly with a teams which are working cross-functional and tie back to business goals , shall generate meaningful results also, since AI is prescriptive in nature, with a narrowed business objective and a contextually precise data set of an organisation along with building cross-functional teams with visibility across the organisation shall produce significant output of relevance.
- ii. Taming the data chaos is an important step which shall help in eliminating the noise from the captured data. A framework for taming the data disorder and mining high precision actionable values is focusing on stages of employees lifecycles, the steps, systems attached and impact on business. On examining the lifecycles closely, the gaps with leaking value can be identified; focussing on the key data surrounding these gaps shall produce more precise and relevant data. Customising the overall employee experience is of prime relevance.<sup>10</sup>
- iii. Selection of the right technology for the job has to be done with utmost exactitude. AI and machine learning provides a gamut of tools which is quintessential for a growing ecosystem. Top management has to participate in the transformation.<sup>24, 27</sup>
3. Fairness in hiring using AI was questioned when in 2017, Amazon's hiring algorithm failed due to "gender bias" results<sup>11,27</sup>. The data model of Amazon was trained to verify applicants of over 10 years by observing the if any patterns in curriculum vitae submitted to the company and the applications then mostly came from men, a reflection of gender dominance in the technology industry.<sup>14,22</sup>

However, newer technologies have come into being which has overcome the shortcomings:

- i. Knockri: The platform analyses the video in which the candidate answers pre-recorded questions, Knockri doesn't take candidate's gender, ethnicity, or skin colour into account. Based on the applicant's responses, the algorithm provides with scores to four parameters, namely, communication skills, collaboration, empathy and enthusiasm. Thereafter a list of most suitable candidates is created and forwarded to the HR recruiter.

The video screening platform integrates to its client company's existing Application Tracking Platform (ATS) such as Workday, SAP- SuccessFactors, Kenexa-Brassing etc. Or can also integrate the algorithm into existing interview of conference platforms.

The company websites says this led to 62% decrease in cost to fill, 68% decrease in time to screen and 24% more diversified shortlists<sup>12</sup>.

- ii. HireVue: This platform also falls under the video-hiring tool category that uses AI to assess an applicant's video interview however the process it uses is much fun and engaging for the candidates as it uses game-based assessments. The candidates answer the video questions and game based challenges posed to them, which creates around 250,000 data points which is then analyzed on various points like tonality, speech patterns and audio.

The data scientists at HireVue work along with a team of Industrial- psychologists who possess more than decades of assessment and adverse-impact testing experience. The data scientists and IO psychologists at HireVue consider the generally accepted legal, professional and validation standards established within the field of psychology as the basis, and consistently evaluate the evidence and theory behind the interpretations and hiring decisions taken based on assessment results at the same time ensuring protected groups are not undesirably impacted. The team creates an assessment algorithm which removes data from consideration that affects adversely, without significantly impacting assessment's predictive accuracy.<sup>13,26</sup>

- Unilever being one of its global clients has reported that it has saved 90% reduction in time to hire, 16% increase in diversity hires and a total of £1 million as savings.
  - Atlanta Public Schools used HireVue's interview and training platform in 2015 for recruiting its teachers and administrative positions in all 80 schools. Data show that 100% principal vacancies were filled by the first day of school also in-house police recruitment for students to be their counsellors and advisors resulted in 66% reduction in student criminal offences.
- iii. Humantic (earlier DeeperSense): It analyses the candidate's social media besides the video responses. The technology company Frrole designed Humantic to avoid intrusion into the applicant's private data by allowing only public information to be accessed. Also it takes into consideration 16 talent factors, which was correlated with 7 DeeperSense personality traits from which, Dr. Tom Janz ( I/O psychologist , Founder: The Talent Analytics Group) extracted 10 talent factors which holds strong positive or negative correlation. The 16 talent factor are categorically listed below:
- DISC : Dominance- Influence -Steadiness – Compliance
  - Big Five Personality traits: Openness to experience- Extroversion- Emotional Stability-Agreeableness- Conscientiousness<sup>8</sup>
  - DeeperSense 7 personality traits: Positive Resilience- Need for autonomy- Team before self- General regard- Bias for action- Emotional control- Learning ability.
- Recruiters' generally check a candidate's LinkedIn or Twitter profiles, however Humantic doesn't analyze characteristics such as age, race or gender on social media. It specifically analyzes how the expression is made through the content shared or posted on various platforms by the applicant instead of the contents of the post shared. Many companies have adopted to AI in recruitment. Soon others will also adopt else the process appears to be of stone age.<sup>26</sup>Humantic may categorize a person who uses a lot of positive words in their posts as agreeable and a person using many pronouns as reserved (or less open).
- The Talent Analytics lab at Cognizant collaborated with Humantic and analyzed the data of all the hires that had come onboard in the previous 2 years to build 'talent personas' that were eventually given offers. Also the lab team continues to work on the data for the candidates who were not made offers, to understand where it might be missing a potential candidate. In future, it thrives to analyze data for employees who became outstanding performers<sup>14</sup> and also those who left the organization in order to pick out the gaps in employee expectation and their roles at Cognizant.

4. According to a study by LinkedIn believes that video interviews shall become prominent however shall be done with a slight change in its capturing pattern. The questions shall be asked in real time instead of pre-recorded questions, and the candidate will just have to sit and answer in front of the camera without having to record and move next manually to the next question in the interview process. Since not much time shall be given to an applicant to prepare and forge expressions, the shortcomings of recording a bias-free interview shall be conquered. The video interview technology is based on:

Natural Language processing + Facial Expressions<sup>15</sup>  
Following are the parameters using which the results are derived:

- Body language
- Word choice
- Tone
- Interview transcript

Researchers also mention many other technologies are available which can be used by HR in managing its resources. One has to possibly figure out its functions in HR spaces. Some examples could be:FreeHAL- SOAR, Google as a personal assistant, Cyc- currently being used by Cleveland Clinic to develop a natural language query interface of biomedical information,Open Mind Common Sense. There is lack of research on framework applicable to AI implementation in HRM.<sup>6</sup>

The current practice of AI in HR in various fields is quite enchanting. Problems and challenges are faced and way forward is been identified with innovation in this field.Recent Deloitte report quoted to understand the future of HR we must understand millennial also referred as Gen Y. Researchers took interest in finding out what the present working population feel about AI and its implementation in HR functions.Gen Y can be referred to as the generation of people who currently belong to the age group of 18 to 32 years or, more specifically, were born between 1980's and 1990's. This generation is also called the millennials who have stepped into the mainstream workforce and have taken up various leadership roles in the organizations. They are influencers at workplace decisions.<sup>16, 17, 18</sup>

#### IV. OBJECTIVES OF THE PRESENT STUDY:

The present study is undertaken to:

1. Explore areas of AI implementation in HR function.
2. Current workforce i.e Gen Y perspective of AI implementation in HR.

#### V. METHODOLOGY OF THE STUDY

Researcher's usually come across this dilemma of deciding suitable method for the study. This study is one of its kind. It is exploratory in nature as not much information is available on AI and its implementation on HR functions. A qualitative methodology was adopted by the researchers for this study<sup>25</sup>. The study aims to have in-depth understanding of the perceptions of young workforce on the transformation of Business HR practices and its role transformation due to the advent of AI is the aim of the research.



## Application of AI in Human Resource Management and Gen Y's Reaction

Researchers realized such a thorough understanding could best be achieved through semi-structured interviews of Gen Y and feedback from them. A total of 80 feedbacks were studied to prepare this perception-capturing-deep learning model and 10 interviews were taken in order to take a comprehensive view of the various view points. The face-to-face in-detail semi-structured interviews addressed the key HR functionalities which were affected by the new HR technology or HR disruption areas (namely Artificial Intelligence in acquisition, Artificial Intelligence in HCM, Artificial Intelligence in employee engagement, Artificial Intelligence in learning and development) and the impact of recent HR tools and software developed, based on Artificial Intelligence algorithms, which are being implemented in the industry already. With semi-structured interview researchers could probe on the discussion and ensure that the key issues and areas of HR disruptions and implementation of Artificial Intelligence in current business HR technologies developed were addressed with a degree of consistency in all feedbacks received.

Working professionals from Pune, India, received an e-mail in which they were asked to comment and communicate their opinion on the future of HR, the current scenario of disruption of its functions and new technologies being introduced and AI structures that were being instituted in every organization and avenue of work space. The professionals were willing to provide with their valuable feedback and thereafter agreed upon to be interviewed and give their valuable time after the aim of the interview was explained to them and anonymity was promised. Hence no reference is made to their names also to the company where respondents work. Opinion expressed by the employees are not the opinion expressed on behalf of the company. No revelations are made in the report. Interviewees consented by e-mail and appointments were set at the place where respondents were comfortable. Mostly it was at the place of work or place of study or the educational institute. Most of the face to face interview lasted approximately thirty minutes and it was recorded verbatim and later they had been asked to present their consolidated thoughts on the topic. Also conforming to the purpose of the research, the participant belonged to the Gen Y classification of age group, the present workforce which helped to gather fresh thoughts on the advent of AI and its perceived implication on them.

To understand the main themes, sub these of AI and its implementation in HR thematic analysis was done of the feedback taken addressing the links between the mentioned themes.

### VI. DATA ANALYSIS:

Neuroph Studio has been used to create a Multi Layer Perceptron network model by the researchers. Multilayer perceptron (MLP) can be explained as feedforward neural network with one or more than one layers, specifically in between input layer and output layer. Here feedforward indicates a unidirectional flow of data, that is, from input to output layer. This type of network is trained with Backpropagation learning algorithm. MLPs are widely used for pattern, recognition, approximation classification and prediction and. Multi Layer Perceptron can solve problems which are not linearly separable which can be further

explained as when the patterns in classes that can be separated by a single line are defined as linearly separable.

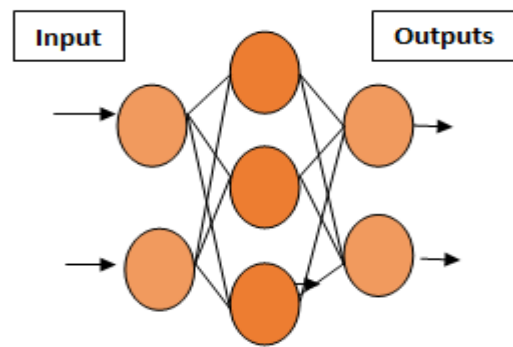


Figure 1: MLP neural network with input, output and hidden layer

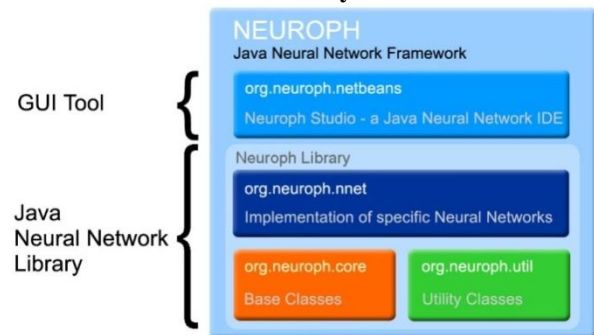


Figure 2: Neuroph Studio Kernel (Java Neural Network Framework)

### VII. DATA INTERPRETATION

In this study, researchers shall be classifying various kinds of HR perceptions captured from the qualitative study of the Gen Y working professionals and recognize them as: **HR Tech Evangelist**, **HR Tech believer** and **passive HR Tech enthusiast**.

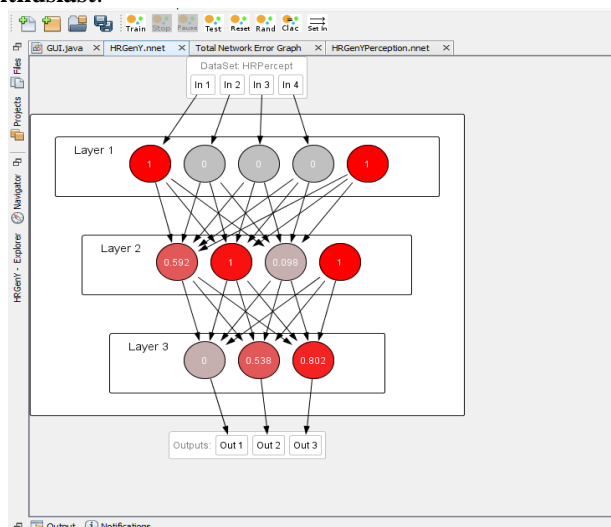
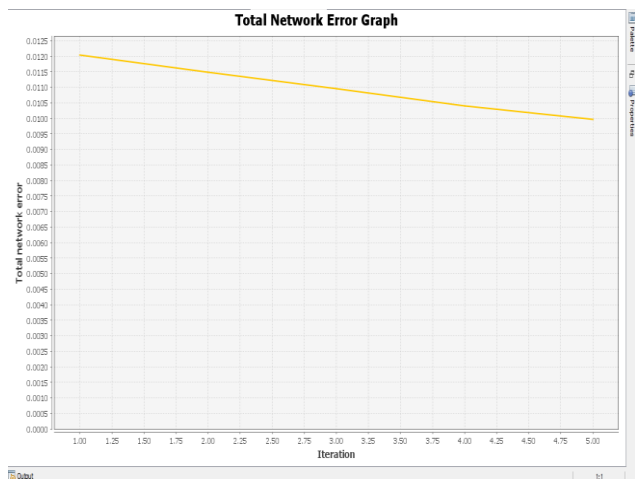


Figure 3: Neural Network with four Inputs and 3 comprehensive outputs with a hidden layer on Neuroph Studio



**Figure4: Network Error Graph on Neuroph Studio displaying 0.01% error (highly accurate model)**

Neuroph is lightweight Java neural network framework which is used to develop common neural network architecture. It contains a well designed, open source Java library with minute number of basic classes which correspond to the basic neural network concepts. Also it has a Graphical User Interface (GUI) neural network editor to create Java neural network components. Neuroph simplifies the development of neural networks by providing Java neural network library and GUI tools that supports creating, training and saving neural networks.<sup>19</sup>

### VIII. RESULTS AND DISCUSSION

The results of the analysis throw light on three major perception pattern categories shown by the Gen Y working professionals, one is HR Tech Evangelist, the ones who can understand and direct the company towards the adoption of AI in various fields of HR taken under consideration in our study, and are excited to be the flag bearers of change. The second category is of HR Tech believer, the ones who feel the need for implementation of AI in some fields of our study, and consider human intervention shall prevail in HR. The third category is that of Passive HR Tech enthusiasts, the ones who are aware about the benefits of AI in HR practices, however are not keen to bring about change in the system of work.

Our field of study includes the following :

Themes and Sub themes as emerged from the study	
Theme	Sub-Themes
AI in Talent Acquisition	Talent Sourcing
	Talent Lead Nurturing
	Talent shortlisting and screening
	Interviews
	On-boarding and Induction process
AI in Human Capital Management (HCM)	Human Resource Planning
	People Management
	People Analytics
	Virtual assistants (chatbots) for HR self-service and HR service delivery
AI in Employee Engagement	Intelligent insightful survey
	Liveemployee feedback platform
	Rewards and recognition programs
	Internal Personalized and messaging communication for employees
AI in Learning & Development	Customised learning pathways
	E-learning analytics

AI in Occupational Health and Safety	Conversational interfaces
	Customised health care
	Safety provision and implementation
	Safety Training
	Accident prevention

**Table 1 Main Themes and Sub-Themes**

The measurement of above themes have been done on the basis of the feedback by each participant of the survey. A scale was devised in order to study the observations, Score ranges are: 0, 0.5 and 1.

Where,

Impact Score	Meaning
0	No impact of AI on the HR practice
0.5	Partial impact of AI along with human intervention
1	Complete disruption due to AI, HR roles hence transformed

**Table 2 Scores & their Meaning**

Impact Scores were taken for each theme given in Table 1, where each sub-theme was considered while recording the observation.

On adding the score of the four components for 81 Gen Y professionals, a trend analysis predictor was created on Neuroph Studio by creating and entering the data set and training the system through deep learning to find the perception category of the sample. This created a deep learning system to predict the category of the Gen Y professional's HR Tech perception category with a network error percentage of 0.01% .

The study depicts 61.72% of Gen Y professionals of the sample are HR Tech Believers. This is interesting finding as HR tech believers were the middle men , that means not on either of the extremes. Adopting any technology with out knowing its implications and long term impact is immatured decision , at the same time avoiding technology usage in today's era is being in fool's paradise. The Gen Y perspectives on AI implemetation in HR is showing a middle way and trend . That means AI will be implemented soon but with caution.

Hence this shows that, the current youth workforce believes in disruption of HR due to AI is certain areas of HR processes as discussed above, AI has taken over the talent acquisition and Employee Engagement space by its usage in various applications being launched, however human intervention is required for the optimal usage and functioning of the highly revelutionized AI systems.

### IX. CONCLUSION

In this study, the researchers conclude that the young working population perceives that leveraging AI into HR space shall enable the capabilities of the Human Resources domain. It believes that AI is not going to replace the HR roles instead shall augment their capabilities that will lead to a collaborative environment. Disruption in HR have started to cause due to business need and other compelling factors. The study and perspectives of present workforce makes it clear that Artificial Intelligence is future of HR. The future has arrived and HR need to boot itself to take up AI in all its functions. Almost all function in HR have potential applying AI in it.

The only worry is about element of human touch being missed in managing the very human function. HR Tech Evangelist, HR Tech believer and passive HR Tech enthusiast all will mould to AI. Having different believers in HR may give balance and cautioned view in implementation of artificial intelligence at workplace. KPMG report talked about HR professionals are not prepared to face future by 2025<sup>20</sup>. This study comes as caution for HR professionals to tie your belts and gear your skills and welcome artificial intelligence to take your positions in organisation.

Researchers propose that further quantitative studies can be undertaken to see the implementation of AI and the challenges that HR professionals pose. It will be interesting to observe if HR professionals roles are changing and they shift from HR Tech enthusiast to HR Tech believers to HR Evangelist.

In this study, various challenges to the implementation of Artificial Intelligence in Human Resources Management practices have been discussed, also certain solutions and their practical implementations are presented. This intends to dispel any presumption and brings clarity regarding the perception of the young workforce.

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### AUTHORS PROFILE



**Dr. Suruchi Pandey, (\* Corresponding Author)**  
Associate Professor, Symbiosis Institute of Management Studies, Symbiosis International University, Pune. [suruchi.p@sims.edu](mailto:suruchi.p@sims.edu), 8308876100.

Dr. Suruchi Pandey Associate Professor at Symbiosis Institute of Management Studies,

Symbiosis

International University, Pune. She has a dual postgraduate degree and PhD in Management. She has experience of 20 years in corporate and academic. Dr.Suruchi Pandey has participated in many international conferences and has published papers with reputed journals. She has keen interest in interdisciplinary research. She has conducted several training and MDP's for corporate.



**Priyadarshini Khaskel**, Masters candidate at Symbiosis Institute of Management Studies, Pune. Prior academic training includes Bachelor of Technology from Guru Gobind Singh Indraprastha University, Delhi. Stint at Wipro Ltd. wherein I was entrusted the responsibility of Log API Convergence of ESB, and its designing in Java Swing. Experience at Byju's focussed on ed-tech product development and maintenance, providing mentoring to K-12 section of the customer pool. Intensive involvement in Indian art, have acquired Diploma in Bharatnatyam from PrayagSangeetSamiti, Allahabad.