**Impact of Artificial Intelligence In Recruitment, Selection, screening and retention outcomes in the Irish Market in view of the Global Market**

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**2019**

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# Acknowledgement

In the occurrence of the research completion, I express my gratitude to my supervisor who has provided me with his benevolent guidance and support. In certain times he has provided me with his undying support, constant guidance and motivation that has encouraged me to give my best into the research up until the point of completion. His guidance and support empowered me with proper direction and adequate knowledge on the research topic. Along with him, I am thankful to my friends, family members who were the source of inspiration in certain difficult periods of doubts and monotony as they offered constant support and assurance so that I keep on the efforts to complete the research work successfully.

Also I am obliged and thankful to the responsive survey participants and colleagues who have answered all my queries and doubts with patience and kindness. My journey as a master's student would have been incomplete without the precious guidance and pedagogical support provided by my college faculty therefore I am thankful to the entire faculty of Human Resources at National College of Ireland.

I am highly indebted to my mother for providing me with her support and courage to continue the research work and complete the Dissertation as per the institutional direction. I dedicate this work to my parents as they have been the source of my motivation in pursuing this course of study.

Lastly and most importantly, I am eternally thankful to the lord for providing me with the strength, focus, determination and knowledge to effectuate the concept into fruition.

## Abstract :

Purpose : The objective of this paper is to provide an empirical evidence of the changes AI has caused in different sectors and the impact it can have on the recruitment market of Ireland if it is being implemented by large MNCS during bulk hiring.

## Methodology:

An exploratory approach to create a bricolage about this new area of interest has been taken forward by the researcher. This paper hopes to bridge the gap between curiosity, assumption and speculations regarding the implementation of AI in recruitment scenario with multiple levels of research and data collection methods .

## Findings Limitations

Most of previous literatures have placed arguments regarding job loss due to automation or AI as an intelligent machine that can potentially become a threat to human as they threaten human efficiency. However it was really necessary for this research from the perspective of Human Resources because not all the jobs are susceptible to alteration due to the fourth industrial wave. According to WEF (WEF,)reports jobs with the requirements of unique skillsets will be in demand despite the threat of redundancy.
Moreover , Ireland being the less inclined country among its peer European countries have rise to the idea of exploring further into the domain.
In this paper the researcher has tried to find the correlation between the bulk hiring drives and the effectiveness of implementing AI into finding top performing talents that will be interested in the organisational development for the long run.
Due to the serious gap in knowledge access and relevant resources. It was a challenge to find sufficient data and link it with the research objectives.

## Table of Contents

Appedices

Appedix 1

Consent Form

Questionnaire

Link to the spreadsheet containing candidate responses.

Chapter 1

## Introduction :

In the era of digitization the current industry standards in recruitment has transformed into an online process. In the past couple of years usage of internet has given rise to the online/ web based recruitment and testing candidates through various online test formats. (Baron & Austin, 2000; Brooks, 2000; C.I. Greenberg, 1999; Harris, 1999, 2000).Online recruitment is also known as electronic recruitment that provides additional value to the hiring process as it formulates a user friendly and attractive interface for the prospective candidates. (Yoon Kin Tong, 2009)

Nowadays electronic recruitment seems to be more experimental and has several advanced methods to create a seamless user experience that helps the candidates to choose the right job more effectively (Yoon Kin Tong, 2009).Most companies during the bulk hiring phase would be inclined to go through the online application as it saves time and money at the initial phase of attracting talents and screening candidates before face to face interviews.

The picture below depicts the opinion of HR professionals who believe that the online recruitment has proven to be beneficial in conducting candidate search and mostly effective in finding passive candidates (SilkRoad.2017)
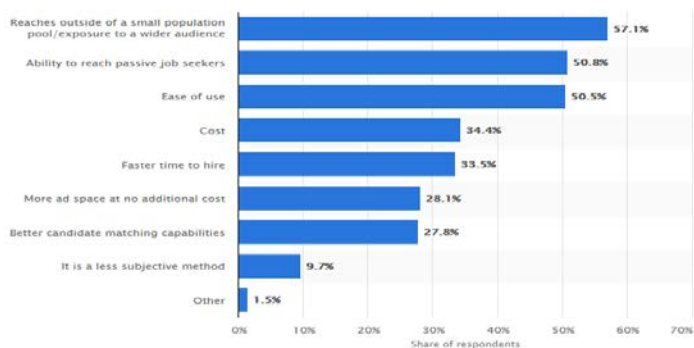


Figure 1.Biggest Pro's of Online Recruitment

Source : Statista

The most discussed option in online recruitment is implementation of Big Data, Data Analysis and Artificial Intelligence as complimentary hiring tools. AI being the most anticipated efficient automation software can be considered as the driving mechanism for a successful business

scaling option. Currently AI is hugely incorporated into various routine tasks and has the capacity to handle data and treat that data across all of it's depth and breadth.

The first introduction to AI was done in 1956 by John McCarthy in his conference paper (McCarthy et al., 1955)

A recent report by Accenture concludes a boost in the Gross Value Added globally as an impact of AI implementation in various industries by 2035.

This paper will look into the future scopes of recruitment with the help of AI. The impact of AI in recruitment and the further effects it will have in screening, selecting and retaining candidates without compromising the human factor.

The chart cited below gives an overview of the current and expected rate of GVA by 2035 which will be a direct result of implementation of AI in various sectors. (Accenture, 2017).
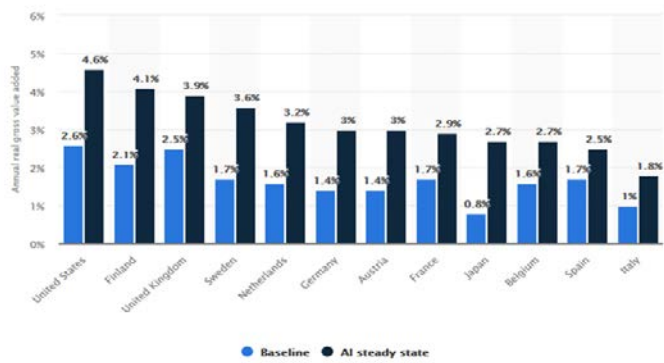


Figure 2. Expected GVA in various countries as a result of AI implementation

Source: Statista

AI in recruitment can be the next step to automating the Human Resourcing Function. Most of the IT/Tech-companies are already considering the options to incorporate AI into their Hiring Functionalities (Entelo. 2017).

The picture attached below depicts the interest area of investment for the leading tech companies as captured in 2018.
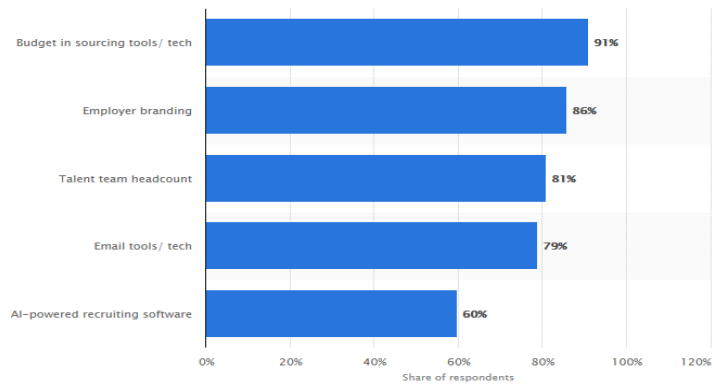


Figure 3. Probable investment areas by the leading Tech companies

Source: Statista

AI has become the integral part of various industrial operation such as vehicle operation, image recognition, predictive maintenance etc. it is also increasingly being incorporated into HR functions across the globe.

The image below describes the top 10 sectors where AI is claiming presence and gaining revenue globally.(Tractica. 2017)

It is quite evident that out of 10 functions tasks like static image recognition, classification and tagging; measures against cyber security threats; digitizing paper-works and intelligent/cognitive recruitment are the functions that can directly be linked to HR operations. This observation can imply that the future of HR functions will be heavily
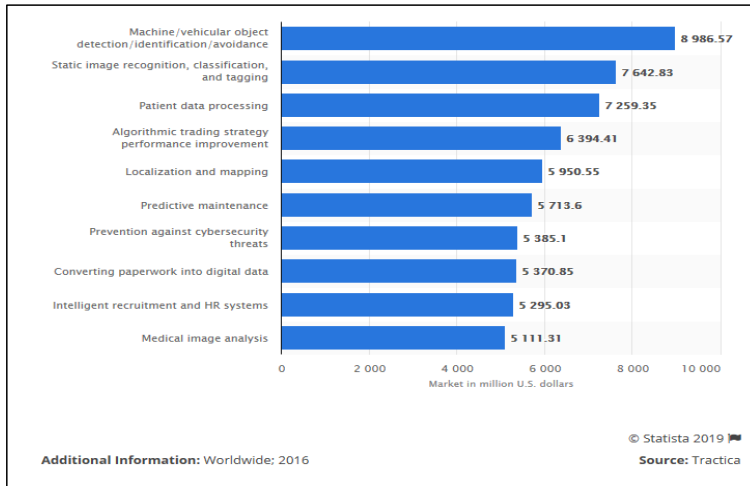
depending on AI



Figure 4. Areas likely to be affected by AI implementation.

Source: Statista

Although similar research in the same domain has been conducted but there are substantial gaps that are inadequate to determine the authenticity of the critical hiring outcomes. In many industries such as IT and other data driven industries require bulk recruitment to meet the talent gaps and in some cases implementing AI into the routine screening tasks are presumed to be delivering accurate results. (SilkRoad. 2017). However it is not clear whether the decision making capacity of AI will be applicable in hiring candidates with qualitative skillsets such as storytelling, emotional intelligence, patience, creativity etc. Moreover the skill defining grids can be different for each and every candidate based on their cultural orientation, gender, generational marker. Therefore an attempt to address the gap has been made through this research. This research work has acquired qualitative measures to gain insight from the humane perspective on the implementation of AI in bulk hiring in any respective industry. This paper hopes to deduce a conclusion and predict the possible outcomes of implementing AI in recruitment functionalities that can benefit the Irish Recruitment Industry in view of the global perspective.

The objective of this research is to find a base for recruitment in any respective industry where it is important to judge candidates on the basis of defined skillsets e.g relevant certification, course title, marks etc. and undefined skillsets e.g storytelling , creativity, emotional intelligence etc. Although the business revenue outcome cannot be directly gauged by the apparent undefined skillsets but will have a lasting effect on the organization in terms of ROI , Psychological contract and networking collabs. AI is a part of the new technological generation where different types of tools and mechanisms are being used to

handle candidate data and analyses statistical information to boost the recruitment process and speed up the screening phase for any recruitment drive. Most of the fortune 500 companies receive huge amount of candidate data during any bulk recruitment drive. In order to process the data and screen the candidates on the basis of merit, skillsets and other defined requirements takes at least 30-60 days in general. In this period candidates are often in the dark about the progress of their resumes and other relevant updates.

# Chapter 2.

# Literature Review:

New technological developments and rapid organisational changes require the new approach of managing human resources based on knowledge(Bara et .al,2015).

Online recruitment has accelerated one step further with the social media screening of candidates that allow a lot relevant data about the candidate that helps in instant background verification of a candidate.(Melanthiou et al , 2015).

The basic issue regarding the acceptability of AI's functionality reverts back to the 'knowledge access problem' wherein the assumption is that while formulating a decision regarding any critical hiring situations there can be scarcity of the relevant data. (Huageland,1989).

As some researchers suggest in the future of organisations HR and AI will be combined to produce uniform functionality(Scholz,2017)

In the recent era the algorithms are capable of creating alternate realities and ideologies (Mager,2012)

The usage of data should be carefully monitored although there can be correct algorithms but there can be scarcity of relevant data. (Stuart & Norvig,2016)

Capability to deal with NLP and handle the data pool can be a difficult task because the AI functionalities are not yet sophisticated and do not have verifiable knowledge(Stuart & Norvig,2012)

Therefore AI can benefit from learning human behaviors and implications. (Heiss, 2017)

In order to communicate with humans it is a prerequisite to have a thorough understanding of written and verbal communication patterns of human beings which is why the AI is required to successfully incorporate natural language processing. (Stuart & Norvig,2012).

In the contemporary scenario Ai can successfully map an individual's personality and create a pattern on the basis of 'Big five' traits that can shed light on a person's 'academic ability', 'sales

ability' ,'motivation' and 'job performance'(Furham, Jackson & Miller,1999; Furnham & Mitchell,1991; Komarraju and Karau,2005)

Ai can possible map a person's emotional state by the analysing the linguistics used in the text.(Faliagka,Ramantas,Tsakalidis &Tzimas ,2012).

As more and more data is fed into the system the results can visibly improve( Banko & Brill, 2001).

With the massive data pooling and handling of confidential candidate data, organisations should be careful regarding the potential non-compliance of data privacy. (Zang &Ye,2015).

As per Stuart and Norvig implementation of AI can pose several threats in the future that varies from the threat of job loss to end of the world. Some of the threats can be aligned with the focus of this research such as :

1. People can lose the unique sense of being
2. People can lose their jobs to automation
3. The usage of AI can lead to deteriorating accountability.
4. AI systems can be used with malintent.etc.(Stuart & Norvig,2016)

While the implementation of AI and Big data is at all time rise there is a significant amount of limitation in understanding the process as there is no proper channel to gain knowledge about what it is and how it works thus feeding into the fear that machines will take over the human race.(Adams & Byrnes,2016; Muller,2016;LaFrance,2015)

Like all the new age technology AI has both benefits and risks.(Nadimpalli,2017).

The risks can generate in the future when the AI would be able to create machines that are intelligent than human beings.(Hussain,2018).

Researchers also share insight on the 'personalization paradox'. Where it is discovered that the data collection to personalise candidates search preferences can lead to vulnerability of privacy breach. If covert data is collected as opposed to overt data then it can induce anxiety in the individual that can cause the individual to withdraw sharing further information.( Aguirre et Al, 2015)

Some studies establish the positive interpretation of technological advances depending on gender and ethnicity. The tenurity of the exposure to computer and new technologies can also vary on the basis of ethnicity and cultural backgrounds .(Badagliacco).

A paper introduced by EU - OSHA suggest that in the coming future the psychosocial and organisational issues will become more critical and important to deal with. The introduction of wearable devices and the idea of those devices being controlled by AI or other intelligent machines can give rise to micro-managing and over monitoring that threatens the boundary of work life balance .(EU- OSHA).

The digital single market annexure proposes a reform in sectors like e-Privacy , digital content archiving,data ownership, free flow of data etc.(Eur-legal). All sorts of information regarding the new evolving digital legislation and the new implementations can be found from the news portal of the digital single market.

In the new Irish recruitment scenario the most favoured form of job application is said to be online. There are differences in navigation of the application based on the internal organisational culture and the bulk hiring methods are mainly preferred by larger MNCS (e-PAC).

In some cases lathers MNCS also tend to hire third party recruitment agencies to shortlist cvs. (e-PAC). Which means the applicant's data does not remain only in the internal database of the MNC but also are stored in third party recruitment database. This can mean a threat of privacy breach.

The rising trend of using online assessments created for the application process to judge a candidate's psychological state of mind have benefits that allow the employer to understand the employee better. However it comes at the cost of breaching and manipulating the employee information to some extent.(Greenberg).

AI can be utilised in the screening process by identifying relevant resumes  and extracting information thus automating the recruitment process (Kaczmarek,Kowalkiewicz & Piskorski,2005).

As some theorists suggest there is a proven interrelation between effective communication and successful candidacy resulting in recruitment(Allen , Scotter & Otondo,2004).

Recruitment activities are followed by the recruitment strategies .(Breaugh,2008).

The invasion of privacy can be defined as the individual's  loss of power in regulating and monitoring their own data in a process that claims to be fair leaving the individual exposed to the vulnerability of unwanted disclosure of personal information.(Tolchinsky et al , 1981)

Although humans can be considered as rational human beings but there are a certain limitation to the rationality as there is limitation in human potential that creates a blockage of collecting all sorts of information regarding a given topic usually generating from intrinsic values and biases(Omohundro,2008;Simon 1968)

Albeit underlying , but intuition plays a pivotal part in recruitment.(Vaahito,2007)

To increase the effectiveness of job advertisements job advertisements can be personalised with the help of certain critical targeting algorithms.(Aguirre et al, 2015)

Job advertisements can thus find the target audience by increasing visibility of relevant jobs to the target audience. (Liu & Mattila,2017)

The concept of data literacy has been explained by D'Ignazio and Bhargava that enables an individual to determine

> 1.''when and where your data is being passively collected about your actions and interactions''
>
> 2.''understanding the algorithmic manipulations performed on large sets of data to identify patterns'' (D'Ignazion & Bhargava,2015)

The new age recruitment has become cost-effcetive ,quicker and error less with the help of advanced psychometrics and the extensive use of new media(Searle,2006)

Electronic recruitment has seemingly become successful since it was first introduced into the HR functionalities(Galanaki,2002)

Organization have the option of using both external and internal recruitment to recruit new talent.(Granovetter,1974)

Usually recruitment process consists of fours stages such as making a decision regarding filling a vacancy, analysis of the job, description of the job, and lastly specification of the person required to do the job(Caroll,Marchington, Earnshaw & Taylor,1999)

The need to define skillsets and match them against personality traits rose at the wake of industrialisation, the idea behind this concept was to find the right person for the right job(Snow & Snell 1993).

The image cited below is a representation of recruitment model proposed by Breaugh et al. It shows the step by step process of strategy development in the process of recruitment cycle.
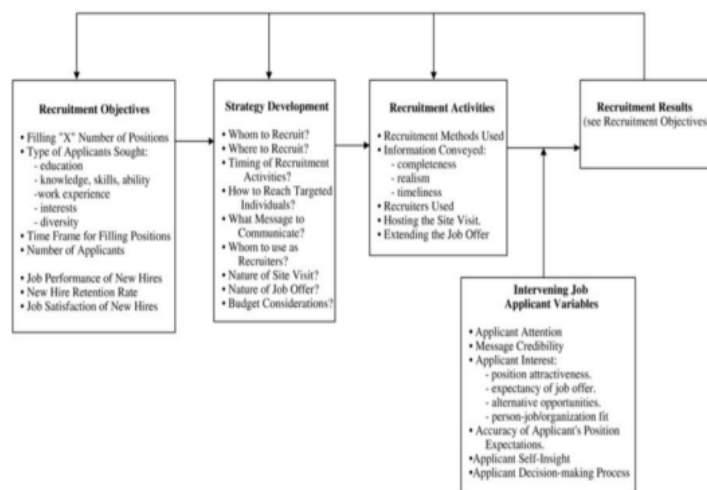


Fig5: Model of recruitment adapted from Breaugh(2008)

(Source : Breaugh et al , 2008)

The image of a certain organisation is represented by the method they adopt to recruit the new talents and the process they implement it(Jarvinen & Korosuo,1990).

As the war for talent intensifies the need to recruit highly efficient individuals aligned for specific tasks are at all time rise(McKinsey,1997 ;Markkanen,2005)

Artificial Intelligence is the product of new age technological revolution that has reduced a lot of repetitive work in the field of recruitment (Dhamija,2012). Initially the recruitment process used to consist of manual handling of candidate's data and screening for further selection but online recruitment has reduced the manual working hours and helped the process gain a momentum resulting in faster screening and selection. If this process is further boosted by AI then HRM activities can be much faster and smoother and

arguably HR analytics as a new technological advantage should be incorporated into organisational decision making functionalities otherwise it runs a risk of being be overpowered by rapidly changing technical scenario.(Rasmussen & Ulrich,2015)

A recent case study by Bramer and Bradley predicted the effectiveness of the online recruitment search engines such as CASPER to respond to user preference, relevancy score and profile element( Bradley K., Smyth B. 2003)  AI in recent times can build upon this concept and handle candidate data and preferences accordingly(Bradley K., Smyth B.2003).CASPER works on two levels to address a query according to the similarity to the target query and also as per the relevance of the specific user in question formulated by  the user's interaction since the inception of the search query . (Bradley K., Smyth B.2003).

First step starts with ranking the jobs as per their similarity score with the help of similarity metrics. Similarity score generates when the query feature is matched with the relevant job feature. (Bradley K., Smyth B.2003).

The defining criteria to identify if a job is a match depends on fixed factors such as salary, job type, job location etc. (Bradley K., Smyth B.2003).

Therefore the job cases are listed in ranks by the server-side stage aligning with the similarity to the query. (Bradley K., Smyth B.2003).

In the next stage the interface that deals with the client query reorders the job rankings as per relevance score generated from the user's search profile. (Bradley K., Smyth B.2003).

This score is generated as per the previous feedback provided by the user in the past for any specific job. (Bradley K., Smyth B.2003).

CASPER gives priority to the jobs similar to the user query and then prioritizes the job cases as per location. (Bradley K., Smyth B.2003).

Implementing Artificial Intelligence in Human Resource applications ranging from hiring, screening, employee communications, feedback and survey conductors can build a faster and personalized employee driven company culture that will ease the overload of repetitive and unnecessary data and let the HR department focus on more meaningful ways to build

employee engagement. According to some researchers Typical traits of human nature can be represented In the digitised version of an individual's identity. (Morgan & Morgan, 2000).

Nowadays AI can rank candidates on the basis of learned data ranging from training data and scoring patterns provided by the human recruitment professionals. (Fliagka et al,2012).

While online recruitment can be a faster method of pooling candidate data it also has the vulnerability towards cyber-attacks. The current workforce is aware of the fast paced job searching and HR experiences that online recruitment paired with AI can offer but it comes with the threat of violating personal information.

With large amount of candidate data , the status of their individual rights to intellectual property before and after joining the organization will also come into question. (Cassassa-Mont et al., 2002).To establish the rights one should be able to establish their online identity. If a management system for identity checks and authentication is formulated then the issues regarding identity theft, intellectual property theft or treating false information can be easier as suggested by recent studies (Cassassa-Mont et al., 2002).

In the current market scenario a large amount of data can be generated through automation which can help an organization set a trend or influence market demands but defining the intellectual property rights, categorizing them according to appropriate usage and assigning credits to the individuals for the generation of the data becomes a huge onus on the individual as the automation is only possible after the data is generated. Many organizations like Electronic Frontier Foundation(EFF) and World Intellectual Property Organization (WIPO) are dedicated to maintain a balance in the digital environment.

Moreover ,the current EU regulation for Data Protection can give an overview of the GDPR trends across Europe including Ireland.

AI has been implemented successfully in personalized consumer merchandising which indicated that the Artificial Intelligence along with IOT (Internet of Things ) are capable of predicting consumer behavior and respond to immediate consumer queries. Similar implementation can be done in the field of HRM as well. AI being the precursor of the anticipated fourth industrial revolution will change the metrics of work in terms of efficiency and cost effectiveness.

Recruitment options paired with AI can also increase workload as it would need close supervision initially. Due to the fact that AI has the ability to deal with a colossal amount of data; even negligible glitch in command or preference structure can create a huge altercations with a massive impact in the industry.

As suggested by Huang and Liao (2015) there are five key factors identified in the implementation of AI/AR in application procedures that can drive the positive impact on a candidate and those are :

(i) ease of use, (ii) playfulness,(iii) aesthetics, (iv) service excellence, and (v) usefulness.
Originally this research was aimed for consumers aiming to find the right product in apparel industry but the same principle set can be applied to recruitment applications as well.  Ease of use and playfulness may help the candidates with low cognitive innovation to build and maintain rapport with potential employers, and on the other hand aesthetics, service excellence, and usefulness can enable candidates with high cognitive innovation (Van Esch, Black and Ferolie, 2019)

While some researchers argue that the utilization of AI can incite fear or anxiety in a potential candidate for various reasons. (Van Esch, Black and Ferolie, 2019)

Given the fact that AI can visibly improve the recruitment process many organisations are avouching  for the development and marketing of AI. However organisations will have to ensure that they focus on the issues regarding slow feedback, selection biases and technological problems. Otherwise candidates will lose the motivation to continue with the job application jeopardizing the quality of talented job applicants .(Van Esch, Black and Ferolie, 2019).

The reasons can vary from the fear of privacy breach to inadequate data handling and many other but some researchers are confident that the use of AI should boost the likelihood of a candidate to complete a job application if the organization is transparent about the usage of AI .According to this research the implementation is that the companies wouldn't have to spend money to maintain confidentiality regarding the usage of AI (Van Esch, Black and Ferolie, 2019)

The most positive argument in terms of implementing AI in recruitment mechanism is to save money and receive the real-time outcome with near hundred percent accuracy. This can mean that both candidates and the organisations can benefit from the fast screening process which will allow the HR to know the candidate in a better way as the validation and criteria authentication would already be completed by the AI before the final screening process.

Research on the theories of face to face communication as opposed to online communication shed light on the theory of interaction wherein factors like coordination, rapport building, information exchange and social contagion are the indicators of the difference between online and face to face communication (Thompson and Nadler, 2002).

Apart from recruitment retention should also be considered as key point while searching for top performing talents in bulk hire. Some of the cases show the unproductivity measures of the employees that effect the organisation and for which some of the organisations have to keep track of what employees do in their work hours.  As per American Management Association's report, 77% of US companies consistently monitor their employees' email, Internet usage and computer files (American Management Association, 2001)

 Implementation of AI can improve the brand image by displaying accuracy in terms of candidate screening and aligning them to their job roles. While some of the recruitment

agencies and the large organisations are already using online recruitment as tool for the organisational recruitment drives processing nearly 60-70% candidate data through online job search engines and e-resumes. Recruitment areas that are mostly affected by the new gen technological implementation are Talent Acquisition and L&D(Talent-Assessment-Study-2018). Many new generation hiring trends now include games and simulations in order to define candidates in terms of performance metrics, consistency and the focus on results .As suggested by the the reports the pre-assessment results can impact the KPI of any candidate that can in turn affect the retention, performance assessments and job satisfaction inside the organisation for any given candidate.( Aberdeen Group Study ,May 2015). Talent acquisition, especially in the IT sector has grown significantly in the past decade and is continuing in growth. Simultaneously the demand for candidates with logical reasoning and analytical skills are also at all-time high. One of the most important trend in recruitment that is seemingly having an impact on employee retention and maintenance of the positive organizational framework is Employee behaviour. During the pre-hiring assessment the sustainability of the employee also can be predicted by the online recruitment tools through online simulators and assessment metrics and in addition to that the implementation of AI can provide the desired accuracy in determining the candidate's consistency metrics and predict if the candidate can sustain in the organisation for the long run. Although the growth rate seems to be flattering for, any organisations and industries the overall demand and outcome ratio is still unmatched. These implementations are being done on a miniscule level as there is a gap of problem identification and detailed research in these sectors.

Apart from the hiring procedure the ethical perspective of the hiring decisions are also to be considered. The recent GDPR rules implemented for recruitment and other services mention rights and policies to protect the privacy and dignity of the data subject. But in some cases especially in mass recruitment drives the questionnaire given to the candidate often include queries regarding gender, age, ethnicity etc. This raises a doubt regarding ethical considerations in the domain of online hiring. Moreover if this pattern of discrimination get detected and accepted by AI it can result in imbalance. Although the presence of AI has been acknowledged in many research papers and the researchers have discussed the patterns and processes that are to be considered while implementing AI and online recruitment tools there are many aspects AI will have problem tracking.

Thus the further research questions formulate through the empirical study of existing literatures.

**Research Questions :**

1. Can AI reduce the routine work in Human Resource functionalities?
2. If AI is implemented in the Human Resource Functionalities , would it effect the equal opportunities in the organization?
3. Are there any critical risk regarding the data privacy of an individual? Does AI have the capacity to take humane decisions that are moral?

Implementation of new technologies have altered the style HRM communication. (Kiesler, Siegel, & McGuire,1984)

In the recent e-pac report the idea of treating the job applicants as customer has risen in the past couple of years with the frequent bulk recruitment drives arranged by the multinational companies in Ireland. Therefore, it can be assumed that the new era of job applications MNC's would likely be treating the candidates on the basis of consumer behaviour rather than potential talent source. This can either mean that the organisations are implying to find the candidates who would stay with the company for the long run similar to the loyalty programs that will help the organisations retain the candidates. This argument can be supported by a new found data regarding the organisations' preferences to hire skilled and talented employees to gain leverage in the long run.(WEF). On the other hand it can mean that the organisation aims to create a brand value of treating their candidates with extra personalised considerations so that the candidates would refer the organisation as the preferred place to work . In the new era of digitization , maintaining a positive digital blueprint in the clouds means increased business. Therefore recruitment function can also be treated as the advertisation of the organisational culture. Which in turn is a new form of employer branding. (Martin & Cerdin,2014)

The implementation of AI can build from the concept of 'creation nets' as suggested by Rubens et al. AI being the new in demand product in the market the organisations could benefit from the threestep process that Rubens et al suggests i.e

*''1. goal-focused creation of new goods and services tailored to rapidly evolving market needs, 2. with multiple institutions and dispersed individuals, 3. for parallel innovation''*

Implementation of AI in the recruitment functionality can prove to be beneficial from both individual and organisational perspective. They can be a part of 'innovation communities' that create the pathway of implementing the new age technologies and appear more adaptable and flexible to upcoming market changes as opposed to stagnant. (Wang 2009)

To yield desired beneficial outcomes the 'innovation ecosytems' should mainly target he three areas where it can drive a change and those areas are research, development and applications. The target population would be association of people with diverse skillsets and expertise. (Judy Estrin ,2009)

Since it is established that the highest rate of recruitment is offered by the IT sector(WEF) the challenges will be aligned to the technological changes. Data privacy and Consumer ethics Would massively impact the sectors dealing in Financial Services , Consumer Services, Information and Communication Technology sectors.

As researchers like T.V Bondarouk et. al suggest IT as the central figure of twentieth century work culture. (T.V. Bondarouk & H.J.M. Ruël ) Any new measures implemented in the IT sector is likely to be implemented in the other sectors as well. New HRM vocabularies like e-training, e-recruitment, e-competence management has been introduced in the work culture in recent years.(Stone, Deadrick, Lukaszewski, & Johnson, 2015 ).

Technologies paired with HRM policies has given rise to concepts like HRM data mining, SMAC(Social Media, Analytics ,Clouds), HR applications for mobile devices etc making the HR a more approachable and accessible form of governance.

In the recent wake of this technological women and men are most likely equally vulnerable to job loss . Apparently according to WEF report women are likely to lose five jobs to gain a single job whereas the ratio for job loss versus gain in 3:1 . Therefore a countermeasure could be implemented by bringing more female population into STEM (Science, Technology. Engineering, Mathematics) professions. Apart from that bringing foreign nationals into into the workforce would also increase diversity in the workplace.

Drawing a parallel from the e-pac reports and the WEF report in relation to the empirical resources  it can be said that the Irish Market is getting prepared for the next industrial revolution as the actions taken for the upskilling, reskilling the current workforce, spreading digital literacy among the future workforce are already in progress. It can be deduced that the competition for top talents can induce a performance paranoia in the organisation. Which often force them to headhunt for talents frequently. Therefore collaborating and creating a business ecosystem to generate, educate, and strengthen the HRM workflow with the help of AI will prove to be beneficial for hiring the next best talent through bulk hiring.

According to the recent WEF report the Global Challenge on Employment , Skills and Human Capital is being supported by the following organistions :

''Adecco Group, African Rainbow Minerals, Alghanim Industries, AlixPartners,The Bahrain, Economic Development Board,Chobani,The Coca-Cola Company,Edelman,GEMS Education, Infosys, LinkedIn,ManpowerGroup,Mercer, Microsoft Corporation,Pearson,The Rockefeller Foundation,SAP,Saudi Aramco, Siemens,Tata Consultancy Services,Tupperware Brands Corporation,Uber,Workday,WPP, Zain '' (WEF)

Most of the companies have strong presence in Dublin and can easily incorporate the idea of implementing the AI into HR functionalities.  The benefit of creating an AI assisted HRM department would mean there would be less investments in third-party recruitment agencies. Along with that if the organisations have their own HRM department assisted with AI the risk of handling candidate data through external servers would also reduce the risks of unintentional exposure of candidate's private data . Moreover the internal as well as the

external candidates would receive uqual preferences during the bulk hiring drives. It is an established fact that the job search engines often target the passive candidates who are external candidates and there remains no guarantee that the candidate garners the same interest of switching jobs as the hiring organisationhad assumed.

AI's functionalities  that operate om automation can be categorised as  narrow category. Apparently the current AI is more equipped to deliver result in the narrow category wherein the goals are predefined.

It is also argued in the OCED paper that Ireland is less automatable compared to the ther European countries.

As per PWC 's report there will be three waves in the automation phase by the year 2020 :

Algorithm wave-

Augmentation wave -

Autonomy wave-

As suggested by Frey and Osbournes model applied in Ireland there are three bottlenecks where AI can have difficulty in automation i.e

perception and manipulation

 creative intelligence

social intelligence

Although this census was conducted from the perspective of Engineering it can well be aligned with the other job roles that have repetitive tasks to be completed at a regular interval.(IGEES, 2018).

The argument to implement AI in recruitment functionalities emerges from the fact that AI is treated as the new era innovation that has potentially driven the fourth revolution. Dublin being the most tech driven city could be impacted heavily due to this change.  For the MNC'S which are highly dependent on technical innovation could suggestively form 'business ecosystems' (Moore,1993). If this ecosystems work in collaboration then they will be able to create a value that implementation of AI in recruitment functionalities could yield.

Chapter 3

## Methodology:

**Defining the area:**

This research can be categorized as a bricolage wherein the researcher has adapted the role of a 'bricoleur'. (Nelson,Treichler, and Grossberg, 1992). The bricolage is a repertoire of multidisciplinary methods and their results combined and presented by the researcher in his/her own unique format.(Nelson et. Al, 1992) As Simmel suggests the 'bricolage' binds and connects the threads and pieces from different parts of the world to describe a pattern or relation between the theories or cases studied.(Weinstein & Weinstein, 1991).

The approach to address this research can be aligned with postpositivism as an attempt to identify the approximate impact has been made in this paper. (Guba, 1990).

The information derived from the candidates are treated from the perspective of conversational analysis and is aligned with the purpose of education and communication.( Gubrium, J. F. & Holstein, J. A. 2002).

**Justification of the research methodology:**

As per some researchers the methodology of research stems from the word view of the researcher (Capaldi and Proctor,2005).

A systematic approach to construct a critical objectives through comparative analysis has been taken into consideration so that it can be replicated for further research.(Lincoln and Guba,1985).

This paper reflects the intrinsic and extrinsic portrayal of beliefs voiced by different participants regarding the impact of a technological implementation therefore it can be justifiably said that the researcher's belief or assumptions deduced from the relevant pool of data has been aligned with the outcome of this thesis.(Creswell,2012). Moreover as some theorists advocate the construct of a structure derived from the multiple subjective truths from different individuals (Capaldi and Proctor,2005), the researcher has tried to formulate a structure of enquiry through the exploratory study of the subject.

As the context of this paper is strictly defined within a sector of technological implementation therefore it was necessary for the researcher to study the phenomenon in a systematic approach and form an exploratory expalantion of the current occurrences as some theorist suggest. (Gast,2010 ;Lincoln and Guba,1985)

Since this area of research is still in the nascent stage and risks and opportunities are being assumed as opposed to measured, the Qualitative method of analysis has been taken into consideration.(Babbie,1989)

In this research data has been generated through observations, visual materials, cultural artifacts, interviews etc.so that an in depth insight can be formed.(Denzin and Lincoln,1994)

As some researchers suggest , the role of the researcher varies on the basis whether the research is quantitative or qualitative(Sciarra,1999)

In this research the participant have been considered as co-researchers and their answers have been treated individually depending on the philosophical framework.(Waters,2017)

There are 13 participants forming a small pool of candidates. This small sample structure is selected keeping the focus on the knowledgeability of the interviwee. The interview participants were selected on the basis of their capacity to handle bulk hiring and their active association with technology  for the in depth analysis of the phenomenon. (Patton,2002).

A qualitative research paper usually consists of narrative description of the context in the form of participants' quotations derived from the interview questions wherein the interview has been transcripted(Lichtman,2006).However in this research the quotations are directly excerpted from the online survey questionnaire wherein the participants have written their own accounts related to the implementation of AI in recruitment.

Along with the excerpts the interviewees have provided confirmative and non-confirmative answers therefore the data collected from that information has been formulated into a pie chart by the researcher herself.

While some researchers like Markham validate the idea of online interviews where the researcher focuses on online interactions(Markham,2005). Some researchers arguably contradict the idea of online interaction as digital/online interactions are not easily 'repaired' in case any ambiguity arises or any wrong structure of enquiry is formulated.(Davis et al., 2004).

The research has attempted to avoid research bias as the questions were open ended and allowed room for the participant to explain what they said .

As some researchers suggest research paper  should avoid research bias and to do that the questions should be open ended and should not  lead  on the interviwee to answer the questions that feel like prompted, the answers should be probed and should build from the perspective of the candidate that creates a meaning out of the situation. (Flick,2002, Holstein & Gubrium).

The reason to select qualitative methodology for this paper was aligned with the flexibility of asking follow up questions that gave the researcher a chance to understand the perspective of the interviwees. The focus of this research was to encourage frank responses from the participants (Madge & O'Connor).

During the course of circulation of survey questionnaire it was necessary for the researcher to establish a rapport on the basis of common ground of understanding that aligns with the concept of suitability of  background  and status between the interviewer and the interviwee(Denzin,1989)

The challenge of this methodology is to share enough information to the candidate so that they understand the requirement of the research but no so much that they formulate the worldview identical to the researcher. The goal of this research was to probe the candidate to share their point of view regarding the topic ''without overly influencing the interviwee''.(J. Coiro, M.Knobel, C. Lankshear, D.J Leu,2008)

Quantitative analysis depends upon the survey format that authenticates the point of view by multitudes of affirmations that is similar to voting between two or three candidates that are already established in the scenario. As some researcher would suggest that surveys can be markers of an emerging patterns of attitude or behaviour but they fall short when it comes to finding explanation/meaning of those patterns or behaviours. (J. Coiro, M.Knobel, C. Lankshear, D.J Leu,2008; Anderson & Tracey,2001). Therefore the interviews prove to be a required tool for providing depth and explanation.(Boneva et.al, 2001)

As this research questionnaire was snowballed towards the participants with technical/administrative/human resource background it was important to establish multiple forms of contact before the interview so as to give the candidate an overview of the study and also to determine the commonalities of the backgrounds and status of the interviewer and the interviwee . (Madge O'Connor,2002; Denzin,1989)

Online interview format was chosen for this research paper as the participants were selected from different parts of the world and some of them were unable to provide a schedule for a one to one /in-person interview due to their busy schedule.(Bampton & Cowton,2002). This format of questionnaire allowed the researcher to save transcription time, travel expenses and travel time and also enabled the candidates to write their own accord in their own time from the comfort of their home/office.(Chen & Hinton, 1999).

As the research is focused on the online phenomenon(implementation of AI in recruitment) that specifies in online interaction , the prospect of online interviews can be justified to be appropriate .(Markham,2005)

This research aims to build on the ethnomethodology deduced from the excerpts of the participants and the concept of internet that is applicable in their life individually (Savolnina and Kari ,2004;Clark Demont ,Heinrich, and Weber, 2004)

Primary data was generated after determining the candidates for carrying out the interview. Individual messages were sent through different social media platforms like LinkedIn , Shapr, Whatsapp etc. . Upon receiving conformation from the interested candidates the data collection began.

There were 13 professionals who were finalised as interview candidates based on their experience, location, type of association with the industry and job responsibilities. It was important to focus on these factors as the insight required was expected to generate from their experience in the work environment and the job role they were associated with.

As per qualitative analysis in concerned , researchers are obliged to focus on insights that are free from ambiguity and errors.(Ghauri and Gronhaug,2005)

The limitations of the research mainly builds upon the factor that both snowball sampling and convenience sampling had to be taken into consideration judging the fact that the insight was required from experience professionals from different parts of the world. The candidates were chosen because they are actively or passively connected with the policymaking scenario in

their organisation. As the insight required both expertise and awareness regarding the policies and their expected implication therefore it was expected that the participants number will be small. Considering the time constraint, geographical and difference in time zones and the participants' organisational commitments the responses received was acceptable.

**Methods of data collection:**

To determine the correct sampling technique an empirical study of non-probability sampling techniques has been considered, which comprises of different sampling methods such as Convenience, Quota, Purposive and snowball sampling (Lim and Ting, 2013). For the purpose of this research purposive sampling technique has been acquired and the questionnaire has been circulated by snowball sampling technique for the purpose of finding professional insights from either of the Human Resource Professionals, Administrative professionals or Professionals with Technical background.

The purpose of utilizing both the sampling techniques was to obtain insights from professionals residing in different parts of the world. One Robotics Operative from India , One Technical Advisor from Australia, One Administrative Professional from Singapore, One Data Analytics Professional from Ireland and One Administrative Professional from the UK. The primary objective was to gain insight regarding the implementation of AI in administrative context and gauging it's overall effect in the industry performance.

**Candidate Background :**

Based on the follow up interviews and social media screening like LinkedIn and personal messaging the data about each individual's work experience and background was found and made into a transcript.

| Candidate | Background | Oprerating Country |
|---|---|---|
| Professional 1 | Business Analyst with 15+ years of experience in consulting in Government and Education sector | Australia |
| Professional 2 | Robot Operating System developer. 5+ years of experience. Closely working with AI | India |
| Professional 3 | 5+ years of experience . Working as a Hiring manager in a leading fortune 500 beverage company. | UK |
| Professional 4 | 18+ ears of experience in sales and marketing. Former International zonal head of a fortune 500 consumer goods company. Currently VP of a consumer goods brand. | Singapore |
| Professional 5 | 8+ Years of experience in consumer goods-FMGC- Zonal Manager | East zone- India & Bangladesh |
| Professional 6 | 7+ Years of experience-Interviewer-Software Engineer | North America |
| Professional 7 | 9+ years of experience in Sales & Marketing- Senior Consultant | India |
| Professional 8 | 8 + years of experience – Lead data scientist | North America |
| Professional 9 | 0-1 of experience-Sales and Marketing Business Management Student | Ireland |
| Professional 10 | 3+ years of experience- Software professional- Testing Background- Currently a Business Management Student | India- Ireland |
| Professional 11 | 3+ years of experience – Software engineer- Currently studying Data Analytics | India-Ireland |
| Professional 12 | Assistant Manager- 5+ Years of experience | India |
| Professional13 | 15+ years of experience in recruitment – CEO of a self formed NGO - Collaborating with government of Nigeria | Nigeria |

Figure 6: Candidate Background

Source:  Created by researcher with the data resource

The data has been stored in a spreadsheet which was used as a source of data analysis.

Interpretation of the data:

This research stems from interpretivism that simultaneously draws from inductive approach(Saunders,Lewis and Thornhill,2009;Bryman and Bell,2011).

As Atkinson & Silverman suggests we are the generation of 'interview society' where every single aspect of life is documented and is a part of the digital consortium.(Atkinson & Silverman , as cited in Fontana & Frey, 2000). The interaction between the interviewer and interviewee often becomes symbolic where it becomes difficult to capture the underlying stream of consciousness and to differentiate the implied from the intended. Qualitative interview thus addresses the problem of 'demands characteristics'. (Denzin,1989).

## Further research:

In the new era of digitization the competitive edge is obtained through recruiting top talents into the organisation. As the employees are not only who they are but also who they know.

Further research in this area can focus on the effectiveness of implementing AI in recruiting unique ,creative skillsets in any bulk hiring drive.

Organisations that would require creative and unique skillsets in a candidate that gives them a competitive edge and creates a niche in organisational outcome where it becomes impossible for the other competitors to imitate the output thereby creating a unique brand identity e.g Netflix, Marvel,Facebook Twitter etc. Also the organisation that deals with large amount of creative data required to build a storytelling narrative can benefit from these bulk hiring drives. The wave of automation is most likely to effect the high risk categories wherein the jobs can be automated, in this case the media, storytelling and communication industry is not likely to get effected by the wave of automation(IGEES,2018).

Will the ethical consideration be same for these industries as well?

How will the AI define the unique /creative skills in a candidate?

## Chapter 4

### Findings/Results:

**Pilot study** : Since this research field was exploratory a questionnaire for pilot study was circulated. On the basis of the result, changes have been made in alignment with the research focus. Initially the questionnaire had a small space allotted for the participant's response but after the response arrived the data could not be made suffice to the required hypothesis therefore the format of the questionnaire was change to elaborative and the participants were given a brief introduction explaining the research area and the requirements of the answers to be considered as eligible.

Initially it was assumed by the researcher that a mixture of quantitative and qualitative analysis would be appropriate in gathering the data that could strengthen/support the hypothesis but after the pilot study it was found that the research area is limiting and there hasn't been any extensive research that can formulate a global opinion regarding the impact of AI in recruitment for the case of bulk hiring. Therefore the questionnaire format was changed to strictly qualitative and the answers required were explanatory.

The questionnaire were sent to the 13 professionals operating in UK, Ireland, Nigeria, Bangladesh, America, Australia, Singapore and India. Each of the professionals are actively or passively linked with bulk hiring in MNC'S and fortune 5OO Companies and play important roles in either decision making or support factors in decision making .

Few of the keywords that were repetitively found in the answers of the candidates were automation, profile screening, machine learning, human-factor, Robotics, Artificial Intelligence, Human replacement,Job loss etc.

It was interesting to find that few of the professionals who belonged from the administrative background were concerned about the job loss because of automation and expressed concern regarding the fact that the machines could replace humans in future work place. On the contrary the professionals who were from the technical background considered AI as a support tool for Human Resource and were confident that AI as an intelligent tool would be beneficial in reducing huge amount of routine work but because of the fact it is just a tool/software it will still be developed by human beings , the decision making power and the critical analysis of any given situation that require a sensitive approach would still require human intervention. While the candidates were questioned regarding AI's reliability in decision making the answers were both positive and negative.

*'' I do not believe that automated decision-making can be fully trusted and feel that a bit of human intervention would always be necessary. After all, the data fed into machines or the automated softwares developed are from human inputs. So, there's always some scope of error.''*( Professional 10)

Regardless of the background the ethical consideration of the implementation of AI in recruitment was paramount among most of the professionals. Countries like India, Bangladesh and Nigeria have a vast population and have a very different approach in handling candidate data than that of European GDPR. In addition to that India has a huge amount of biometric data stored in the cloud that required careful monitoring and protection.

The GDPR rules in Europe including Ireland and UK are considerate of candidate's data privacy but the gap in defining and outlining the breach measures are still pertinent to the ever changing technological evolution. Most of the European law and judiciary systems are slow to pair up with the technological advances and the changing nature of cyber security attacks or formats of privacy breaches.

The professionals operating in Singapore, Australia and Europe were somewhat familiar with the concept of remote work and the privacy issues related to automation. In this scenario the concern was that for the remote employees the workplace communications are thoroughly documented and stored in the clouds whereas in a functional workplace many one on one conversations with the team members and team leads remain confidential or under consideration. There was  concern that the remote employees are vulnerable to micro management due to automation as there would be massive data that will be stored in the clouds regarding their style of communications, problem areas and other miscellaneous

concerns that have been shared over the web with their team leads or team-mates in the due course of their tenure at the workplace. This can give rise to major privacy issues and threat to theft of identity and web security.

On the other hand professionals who were operating in India were concerned about the biometric data privacy breach. The system of linking Adhaar; a biometric identification card that is vastly used in job applications and background verification is being used for the background verification and authentication of employees. The concern was that the Implementation of Ai in recruitment process could expose the huge amount of candidate data out in the cloud that would be vulnerable to any kind of security breach since the Indian Data Protection act is still at a nascent stage and is yet to consider various aspects and forms of data security breaches. (UIDAI)

The professional who built the AI for the recruitment purpose placed an argument for the quantum computing in the future recruitment process. This area is still under consideration and would require further research to yield comprehensible research. For the time being as per her opinion AI cannot be fully trusted with automation as the systems are not yet sophisticated to undertake decision making as an automated process.

Most of the professionals were positive that the implementation of Ai would reduce the time taken for background verification as this task is considered to be the most hectic when recruitment and selection is concerned.
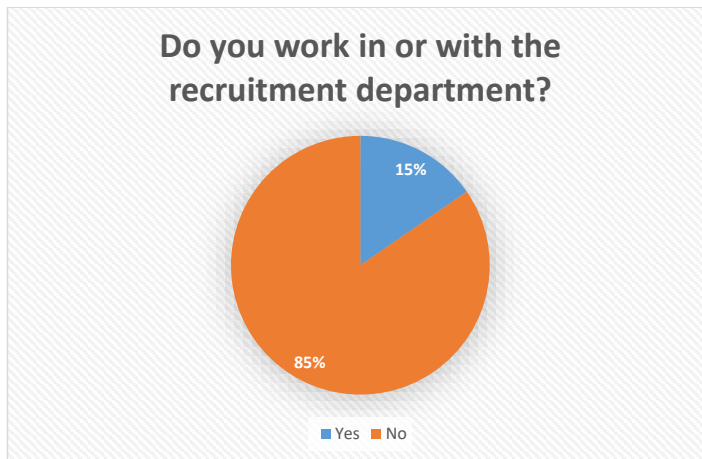


Fig 7

85% of the candidates interviewed do not have a background in Human Resource but are working in either technical teams or administrative boards wherein they are directly linked with the policy or decision making regarding bulk recruitment drives.

15% of the professionals work as Human Resource professionals and are responsible for individual decision making in hiring.

**What is the recruitment rate in your organisation**



Figure 8. Recruitment rate in the organisation

58% of the participants confirmed that there are trends of high recruitment rate in their respective organizations. Since most of the candidates have work experience in MNC's therefore they were familiar with the concept of bulk hiring. 25% respondents confirmed that the recruitment rate in their organizations is relatively low. 17% of the respondents said that the recruitment rate in their organization is moderate and occurs throughout the year.

*''The company that I used to work for usually hired recent graduates through campus placements. It followed a systematic procedure which comprised of an aptitude test followed by 2-3 rounds of face-to-face interview. ''(Professional 10)*
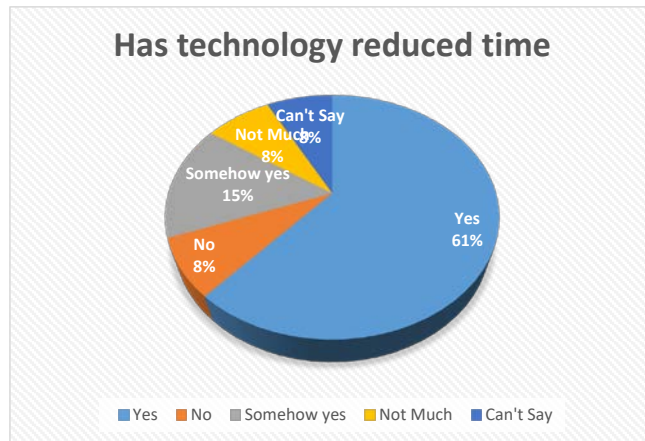
Figure 9. Has technology reduced time

Regardless of the backgrounds the professionals responded positively when asked if they feel technology has accelerated the workplace. 62% of the respondents were strongly positive about the change. 15% respondents were somewhat positive. 8% were not much sure if technology has changed anything, another 8% responded negatively stating that it has actually increased the complexity of the tasks thereby making the tasks more time-consuming. Rest of the 8% were unsure if there has Been any reduction in time consumption.

Most of respondents said that they have not faced any kind of discriminations after the implementation of AI in the recruitment functionality of their respective organisations. 38% of the population were not aware of the implementation of AI in their respective organisation therefore could not confirm regarding the effects of discrimination. Some of the organisations where the rest of the 8% were or are working said that their organisation have not yet implemented the AI into HR functionality therefore said that the question was not applicable in their case.
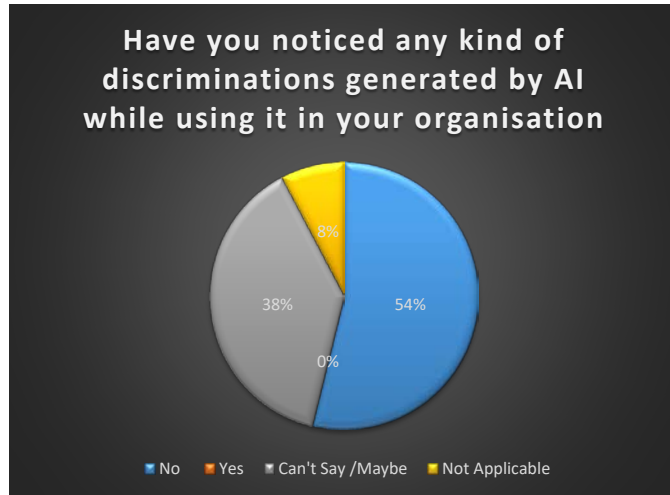
Figure 10. Awareness regarding discrimination as an aftereffect of AI Implentation

Interestingly none of respondents expressed concern that whether the implementation of AI could generate discrimination in the workplace.

One of the candidates said that their organisation has already implemented AI in recruitment and in further explanation said :

> ''There are two processes in North America: 1. General Apply: [Where we got AI] Candidate upload resume and fills the form, it stores in the backend, Uploaded resume get matched by AI to different job descriptions, and these outputs are sent to recruiters, now recruiters could accept or reject recommendation of jobs suitable to candidate. This is AI assisting humans , the feedback from the humans retrains AI on monthly basis. Then they have a standard template and selected jobs is sent by human recruiter to candidates. 2. Quick apply: Where candidate get job recommendation instantly. (This does not have AI currently)''.(Professional 8)

Some of them said that the AI is a software generated by the humans and the bias fed into the system would also have to be fed by the humans as well so implementing AI in the recruitment scenario can only be biased if the user or the creator of the software utilises the system to exercise discrimination.
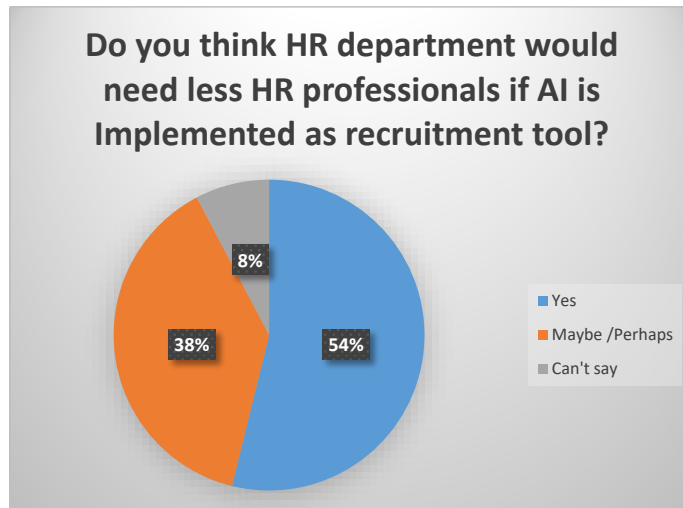
Figure 11. Would the organization need less HR professionals if AI is implemented.

Most of the professionals I.e 54% of the population when asked about the future of workplace as an aftermath of AI implementation stated that the HR department would need less HR professionals as the most of the tasks that are repetitive and consumes manual work would result in job loss for the professional . There was a clear divide in opinions.
One of the professionals stated the anticipation:

> ''Well, yes! But I would say it is a two-faced coin. While AI is seen as to bring the next big wave, certain dark sides cannot be ignored. It is equally crucial to evaluate if incorporating such technologies would lead to job losses or it would create space for new jobs?''(Professional 10)

 38% of the respondents argued that the job role of an HR consists of much more negotiating skills, emotional intelligence, critical cognitive abilities and decision making capacities which is currently not replaceable by AI  because the database for these abilities are not that sophisticated therefore in the near future until there is optimum data available on these area there might or might not be drastic slash in the number of Human Resource professionals working in the recruitment area.
One of them were :
''I always hear this question, Is AI going to cut the jobs? I see that HR recruiters might change their role to "HR AI Project managers and their teams", you need a lot of HR input to build AI and then test it rigorously, building intelligence in artificial intelligence require lot of data. That data has to be curated by someone as HR or HR recruiter, so downsizing will happen if we

*completely convert whole process end-to-end to be dealt by AI which is not happening anytime soon.'' (Professional 8)*

*On further probing researcher was able to get an explanation : '' It would be fantasy if i agree that what you said about face to face interview by AI will happen by 2025. First, we dont have that data to train an AI to do face-to-face interviews Second, Humans generate bias, mitigating bias will be a very hard problem when you have video, sound, text as input to AI. It wont, humans have their own place in terms and AI will come as assisstance, might judge some parameters but humans can overwrite''. (Professional 8)*

*''AI has impacted every industry it has been used, HR department will also get impacted.''(Professional 11)*

8% of the population said that they have unclear idea about the future implications as the changes are very dynamic so with such changes around as the old pattern of job requisites can disappear , new sets of job requisites could also come into demand. Therefore they were unable to assume the outcome.
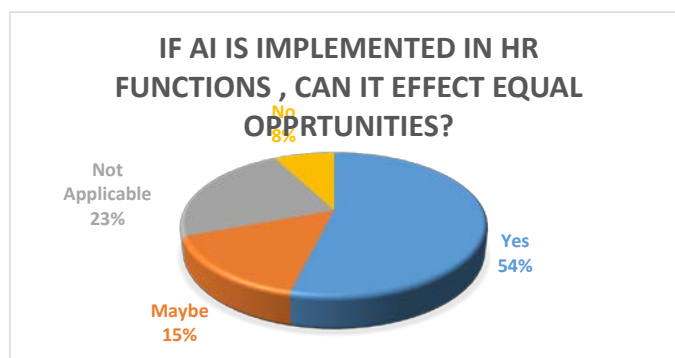


Fig 12 Possible effect on equal opportunities with the implementation of AI in HRD

AI is evidently a software that runs on coded algorithm therefore the bias fed into the system can only be by a human. In this scenario it was quite logical that 54% of the respondents said that it would impact the equal opportunity in an organisational bulk recruitment drive. Two candidates mentioned the example of Amazon's recruitment bias where  the keyword 'women' or 'female' were fed into the system as filtering tools and that later was incorporated by the internal AI algorithm which effected in elimination of a lot of female candidates in a bulk hiring drive. When asked if the implementation could affect the equal opportunities a strong  argument was :

*''It can, as observed in amazon AI recruitment tool, "women" went as a feature in the model.*

*As a data scientist, AI is very transparent. But still, we are not yet their in terms of policies and responsible AI framework to get reliable results. As i said, AI is for assistance not for replacing humans.*

*artificial intelligence includes data analysis. What does integration implies here? Risk: Amazon AI Recruitment tool was scraped due to heavy bias in AI (you can search on google) where they were penalizing women. When we build our recruitment in AI, we build another framework of AI models which ensure there is no bias results coming out.''(Professional 8)*

8% of the candidates negated the idea that the implementation of AI would effect equal opportunities in any organisational bulk hiring drive. Since 23% of the candidates were students and professionals where the implementation of AI is not yet incorporated in their respective organisational recruitment function therefore stated that the question was not applicable to them.

Professionals who were working as consultants , CEO and other backgrounds where the effect of discrimination is yet not evident in their respective organisation said that the implementation of AI may or may not effect the equal opportunities.

When asked aboutif there is any discussion or demands that they have noticed regarding the implementation of AI in their respective organisations one of the answers were from a lead data scientist :

*''I believe there is quite a demand, its quite observable in market. Is it ever more accelerating? AI based products are on peak.''(Professional 8).*

Some of the othe r areas that were highlighted by the professionals as they share their own experience and perspective. Some of the interview excepts are categorised as per the candidate's opinions :

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*Professional 10*

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- ➢ *''Well, it's tough to say that. Although implementing AI will dramatically automate tasks, requiring less manual workers, it would depend on the accuracy of AI-driven models and how faster it can perform.''(When asked if the AI could replace humans in workplace)*
- ➢ *''I don't think AI can completely replace the face-to-face interactions. Typically, general data is fed into machines which drives the machine to perform all sorts of task. However, when an unusual situation arises, machine-driven tools fail to yield the accurate result or to perform the right decision. This is one key shortcoming of such technologies.''(When asked if AI can replicate the humans in the areas where cognitive abilities and emotional intelligence is required)*

- "Yes it is. However, human interventions are atleast partially required to do the final checking".(When asked if humans require to monitor the self-learning intelligent machine)
- "Undeniably yes. No wonder technology is bringing in better changes, however, the use of a general machine driven process or software might cause the loss of able and proficient applicants if they do not fall into that category"(When asked if AI can negatively impact an equal opportunity)
- "Since my organization focuses on mass hiring, it is a tedious task to sort out resumes of the large number of applicants. We would be first looking at this area to include AI".(When asked about the most tedious task their organisation faces during bulk hiring)
- "not yet been incorporated in our recruitment process, data analytics has slowly swept into the process. Especially, considering the huge amount of data generated each day, analytics has become a key player in providing meaningful insights to the accumulated data."(Whens asked if there is any discussion for implanting the AI in their organisation)
- "the background check is the most time-consuming and hectic one. While the interview usually used to be completed in a day or two, the background verification went on for 4-5 days.(When asked what is the most frustrating part of applying for a job)"
- "Yes, definitely, especially the impact of emerging computing technologies have brought into dramatic transformations"
- .(When asked If there are any noticeable changes in the market regarding the implementation of AI)

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*Professional 11*

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- "The good part is faster screening of profiles, easier to get right candidate but the bad things might be biased predictions. But implementing AI will be more cost-effective and less time-consuming".(When asked if AI could reduce time consumption and save cost)
- "In today's connected world analyzing a person's activity to evaluate profile manually is not possible. AI can help in such regards. Systems like CV scoring is very beneficial for a candidate to evaluate an individual's candidature". (When asked how the AI can support the HRD)
- "Data Analytics has penetrated in recruitment for many of the companies. A very small example could be LinkedIn recommending jobs as per someone's expertise."
- "Can be improved. There are many tools available in the recruitment market, integrating any of these to the eco-system will help".(When asked if the existing recruitmentmethods could be made better by implementing new innovative technologies)
- "It has helped to filter out without spending much time as before. Online coding assessments help the candidate pool analysis."(When asked how the AI can support the HRD)

- *Connecting to the right candidates and schedule an interview. In-person interviews are now replaced with telephonic or video interviews to do the primary assessment. (When asked how the AI can support the HRD)*
- *Based on opening positions, profiles were shortlisted from job portals as well as positions were open for referral as well. Shortlisted profiles are contacted by HR team and interviews are scheduled. Based on interviews (technical+HR), a candidate is offered job.(When asked about the recruitment method in their organisation)*

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*Professional 8*

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- *We always build Monitoring algorithms and their accuracy, and also fairness in AI as another important factor. As per current vision, I doubt AI will be fully trusted ever. If someone being very optimistic does approve AI then its a major risk, as current algorithms are not very sophisticated, I assume by 2030 when quantum computing is commercialised then this argument will change.*

- *There are several, the big one where AI will assist is "screening of jobs" for helping candidates suitable roles but we still give control to humans over AI recommendations. I dont think "influence" is the right word, AI Is built to assist not to influence. (When asked if the AI could replace/influence humans in workplace)*
- 
- *In giving job recommendation and parsing fields of candidates like getting experience or skills*
- *Using AI has fundamentally helped everyone but there is always a risk involved. So, you have to ensure that you are keeping a check on AI which is deployed for users in terms of not just Accuracy, but also fairness and explainability of Ai.(When asked about the kind of risks that are involved with the implementation of AI in HRD)*
- *To improve candidate experience and reduce cost.  I would say we cant build spaceship on first day even if we can imagine. A company with 477k employees is massive to scale. Also, countries have different data privacy policies, so all legal checks take time. So any new development in terms on any new product, tests/acceptance to users/scalability take a lot of time. Current recruitment process is getting better but its a long way to go. (When asked about the kind of risks that are involved with the implementation of AI in HRD)*
- *if you release an AI to help recruitment process in any way, then you have to go through Responsible AI*

     *(When asked how the AI can support the HRD)*

## Chapter 5                .Discussion:

Although online recruitment has eased the application process and made job applications relatively easier but the recruitment process consists of several other steps including screening and interviewing the candidates.

While the search engines gain efficiency in finding the passive candidates, they overlook the fact that the candidate might or might not be interested in switching. Moreover the search engines designed for finding the candidates are mostly focused on external candidates. This tendency can cause the internal candidates to feel undervalued. Some of the researchers suggest that being valued at the workplace strengthens an employee's psychological contract with the organization.

AI can build on the organizational structure by learning the candidate preference and company culture. If the system becomes cognizant of individual preferences inside any organization then it can provide the candidates with a better choice of working experiences adjusting to each individual's personal nuances. On the contrary if the system has access to critical personal data in colossal amount it can lean towards micromanagement.

For the initial process of hiring and training the candidate's personalized preferences can help the organization be aware about their learning methods and help them gain insight about the training and development structures in a better way.

Implementation of AI in an organization's pedagogical structure can also be applicable for the remote workers and employees with learning disabilities. AI paired with VR and advanced learning tools can boost the productivity and help the organization reduce the training costs in terms of travel expenses and time management. These steps can further curtail the miscellaneous expenses in the long run. The pedagogical value provided by the organization can boost the company's psychological contact with the employee helping the organization in managing the retention rates.

Most importantly there can be candidates from different countries or continents that have time sensitive residency permit. The feedback that almost takes a month in case of most of the Irish Conglomerates due to various background checks and passport verifications can result in stress and anxiety for the candidate. If the feedback results in rejection then it can get even worse.

While discussing bulk hiring drives the companies should also be aware of the spoofing(Felten,1997; Herzberg& Gbara, 2004) and phishing (Adida et al., 2005; Jakobsson, 2005) as there has been substantial researches on spoofing and phishing. (Yuan et al., 2001 & 2002; Jakobsson, 2005).

EU e governance on the other hand argues in support of the single digital market stating that it would boost ease of access ,open opportunities for cross-border activities with the help of e-signature making the business transactions more efficient , fast and productive.

This same principle can be applied for cross border hiring with the help of AI implementation in the HR functionality that will help save a lot of time verifying the background of foreign nationals.

Specifically looking at the Irish market the e-recruitment seems to be a popular medium of selection and screening candidates after the job application is posted online. (e-Pac)

Globally the results implementation of AI in recruitment functions in different MNC's across different locations have yield positive benefits in terms of cost saving and fast feedback responses and accurate screening procedures. As many of the MNC's are aware of the ethical considerations of the privacy of the data subject they are focusing on investing in building transparent AI that will be free of bias and would deliver balanced outputs. Since Irish SME's MNC's and other small to large scale organisations take a lot of time in manual screening and background verification it stretches the tenure of unemployment for a candidate who is looking for a job and creates a long waiting period for the employees who want to switch. Bringing AI into the scenario not only increases the chance to efficiently search for candidates for a given criteria but also will help speed up the response time. This saved time can help the organisation search for few more potential candidates who can be fit for the job.

Limitations :

Qualitative research as opposed to quantitative research are more susceptible to scrutiny as there are limited resources to authenticate and validate the researcher's point of view. In this research the primary challenge was to find people working with new emerging technologies who are aware of the benefits and risks associated with AI. Specifically it was a hard task to find the implementation details in the Irish market scenario. Since the concept is very new, the current discussions are only being placed on what if's rather than actual assessment of the problem. As Yawson argues there is a need to establish the ecosystem analogy as there is a serious gap in implementation of innovation and incorporating those innovation in policy strategies on national level.

Some of the candidates were sceptical about the study itself . As the concept is new and there are literally no previous research in the same area. In the previous literature those were discovered by the researcher for the purpose of validating the research hypothesis only mentioned AI and Big data as the probable tools that could be implemented for a better e-recruitment  experience. Therefore it was a challenge to drive the research into the desired area of exploration. Moreover the ethical considerations associated with the GDPR and the data privacy policies made the some of the candidates more anxious  to share their ideas regarding the upcoming era of digital identity management. Although most of the candidates responded positively regarding implementing AI in the recruitment functionalities they were only partially considering the idea because it has a promise of efficiency , frugality and can

deliver results more quickly when a large number of data has to be handle for organisational purposes.

Candidates were selected on the basis of their geographical placement to gain an overall insight into the concept. Since the research was for academic purpose and funded by the researcher herself it was a challenge to travel and sit for a face to face interview for each and every candidate in their respective locations. Therefore the measure to explain the concept in the consent forms was implemented. Although the researcher has tried to explain the concept and made the intrerviwee population aware of the themes this research was planning to touch; it was a near impossible task to find quantitative analysis measures to substantiate those themes as the area is still unexplored. Also according to their different geographical locations the concept of AI, Data protection and human consideration bore different meaning to different individuals. To formulate the responses into an understandable and meaningful hypothesis was an added challenge.

Every new innovation has it's share of risks and benefits which changes the living experience of an individual sometimes even alters the  cultural value system an individual develops from his/her ethnicity or culture. It all depends how the innovation is received and utilised for future implementations.

 Although the pattern of the evolving logic seemingly interested the candidates but in the due course of finding secondary data and other validation measures the researcher has faced serious limitations in terms of time constraint,  constraint in the  volume of responses and lack of flexibility of movement for conducting the interviews.

Despite the limitations and constraints few research reports were taken into consideration to find a method of validating the themes emerging from the researcher's intrinsic research and insights.

## Chapter 6.  Implementation of Findings and Budget Overview :

 Irish recruitment market could benefit from the cost effective and real time operating results provided by AI as it can lower the time gap between candidate application and feedback presentation. In the global scenario IT companies are implementing AI into routine HR activities like CV screening and sorting the preferred candidate profile which takes a lot of human hours to process the data and derive a conclusion. This cost has been effectively reduced by Companies like Lo-real and LinkedIN talent solution. During the bulk hiring drives if AI is implemented into the candidate screening process it can reduce hiring and re-hiring cost drastically.

In the Irish market scenario the currently the multinational companies are using Application Tracking System. As per e-PAC Ireland's report 20% of the big MNC S were considering the option of implementing ATS .

Online testing is also a popular method of judging a candidate on their cognitive abilities , judgement skills and personality tests .

Innovations are ideas that propose a solution to an identified scope of improvement and translating the results into profitable outcome .(Bessant & Todd 2011).

In the recent WEF report it is stated that in the next five years nearly7.1 billion jobs will be lost due to redundancy. As compensating as it may sound , the fourth industrial revolution would likely be introducing around 2.1 billion jobs in the specified sector of mathematics, architecture and computing.

## Chapter 7

### Recommendations :

As per the research findings it is evident that MNCs SMEs and other enterprises would require AI to be implemented into regular Human Resource functionalities. Especially for finding the right candidate from a massive pool of candidate data, AI can help match the candidate profile against the job profile with more efficiency and cost effectiveness. The only concern will be to set the ethical considerations for reviewing candidate's profile in alignment with the global and local human rights and organisational culture.

## Chapter 8

### Conclusion:

Implementing AI into recruitment process especially while completing mundane manual tasks will be done by fast paced data analysis and Machine Learning. It is important to identify the scopes in HR functions that can be paired with AI especially in attracting talents and screening candidates so that the re-hiring cost can be curtailed during bulk hiring drives.
Despite the challenges regarding implementations and other privacy concern AI apparently is a software that has to be operated with the help of human intervention therefore it is the way of using AI in any respective industry that will yield negative or positive results.
More often than not a human Resource Professional faces the need to make a decision based on these skillsets so it can safely be argued that implementation of AI in the Human Resource Functionality would just reduce the repetitive work that comes extra with the cognitive tasks.

Therefore basic requirement for a Human Resource Professional would not be extinct due to implementation of AI.

Automation is likely to impact every job sector to a certain degree but the adaptability of the industry it is being implemented into will decide how the organisation structure is going to operate. The jobs that are at high risk of extinction will be replaced by jobs that are more innovatiove and demand creative,cognitive abilities. Ait is also important to cosider the legal implications of the same.

## Chapter 9

### CIPD Statement for MAHRM Dissertation

A personal learning statement-

During the course of research, the process has made me balance my intrinsic and the extrinsic values. In several occasions of framing an argument or collecting data I was tempted to deviate from the main structure of the thesis. It was challange to screen the most perfect alignment of information suitable for this research as there is a plethora of relevant and irrelevant information out there. This research paper has made me capable of differentiating the most necessary information required to complete a task and leave the rest. It was also an interesting find that the despite the geographical distance candidates communicated about the data privacy breach and other privacy threats in a similar way. That gave me the impression that when it comes to individual concerns regarding privacy and safety human beings across the globe act in uniformity. This insight has given me an understanding of universal human concern and provided me with the perspective to address those concern in a sensible way. Apart from that I have also learnt to pitch for a cause and induce appropriate response from the candidates/participants which I think will help me in the long run while I work in this industry. This course has helped me build a practical framework based upon a research perspective that initially starts with being able to access the necessary resources , primary and tertiary data and then analysing it with the help of a mind map. This course has enabled me to identify the problem points in a situation and draft a solution that can be implemented in both in practice and theory

# Chapter 10.

## Reference List

1. Aguirre, E., Mahr, D., Grewal, D., de Ruyter, K., & Wetzels, M. (2015). Unraveling the personalization paradox: The effect of information collection and trust-building strategies on online advertisement effectiveness. Journal of Retailing, 91(1), 34–49.

2. American Management Association, Survey of Business Monitoring of Employee Internet Use, June 2001, AMA

3. Accenture. (2017). *Potential impact of artificial intelligence (AI) on real gross value added (GVA) worldwide, by country, by 2035. Statista*. Statista Inc.. [Accessed: July 30, 2019]. https://www.statista.com/statistics/621583/worldwide-artificial-intelligence-impact-on-economic-growth/

4. Adida Hohenberger, S., & Rivest, R. (2005). Separable Identity based ring-signatures: theoretical foundations for fighting phishing attacks. Technical report, Computer Science and Artificial Intelligence laboratory, Massachusetts Institute of Technology, U.S.

5. Badagliacco, J. M. (1990). Gender and race differences in computing attitudes and experience. Social Science Computer Review, 8, 42-63.

6. Bampton, R., & Cowton, C. (2002). The e-interview. Forum: Qualitative Social Research, 3(2). Retrieved March 24, 2006, from : http://www.qualitative-research.net/fqs/fqs-eng.htm

7. Baron, H., & Austin, J. (2000). Measuring ability via the Internet: Opportunities and issues. Paper presented at the Annual Conference of the Society for Industrial and Organizational Psychology, New Orleans, LA.

8. Bessant, J. & Tidd, J. 2011. Innovation and Entrepreneurship 2nd ed.,John Wiley & Sons, Chichester.

9. Boneva. B., Kraut,R., & Frohlich, D. (2001). Using email for personal relationships. American Behavioural Scientist, 45(3), 530-549

10. Bradley K., Smyth B. (2003) Personalized Information Ordering: A Case Study in Online Recruitment. In: Bramer M., Preece A., Coenen F. (eds) Research and Development in Intelligent Systems XIX. Springer, London

11. Breaugh, J. (2008). Employee recruitment: Current knowledge and important areas for future research. Human Resource Management Review, 18(3), 103-118

12. Breaugh, J. A., Macan, T. H., & Grambow, D. M. (2008). Employee recruitment: Current knowledge and directions for future research. In G. P. Hodgkinson & J. K. Ford (Eds.), International Review of Industrial and Organizational Psychology, 23. (45–82)New York: John Wiley & Sons.

13. Brooks, P.W. Jr. (2000, June). Internet assessment: Opportunities and challenges. Paper presented at the 24th Annual IPMAAC Conference on Professional Personnel Assessment Washington, DC.

14. Cappelli, P. (2001, March). Making the most of on-line recruiting. Harvard Business Review, 139-146.

15. Cassassa-Mont, M., Bramhall,P., Gittler, M., Pato, J.,& Owen, R. (2002). Identity Management: a key e-business enabler. Technical report HPL-2002-164. HP Laboratories, Bristol, U.K.

16.  Clark, L., Demont-Heinrich, C., & Webber, S. (2004) . Ethnographic interviews on the digital divide. New Media & Society, 6(4), 529-547.

17. Chen, P., & Hinton, S. (1999). Realtime interviewing using the World Wide Web. Retrieved March 25, 2006, from http://eprints.unimelb.edu.au/archive/00000210/01/realtime.pdf

18. Creswell, J.W. (2003), Research Design: Qualitative, Quantitative, and Mixed Methods Approaches, Sage, Thousand Oaks, CA.

19. Denscombe, M., 2014. *The good research guide: for small-scale social research projects*. McGraw-Hill Education (UK)

20. Denzin, N. (1989). The research act (3rd ed.). Englewood Cliffs, NJ: Prentice Hall.

21. Doyle, E. and Jacobs, L. (2018). *Automation and Occupations: A Comparative Analysis of the Impact of Automation on Occupations in Ireland*. [ebook] Available at: https://igees.gov.ie/wp-content/uploads/2018/07/Automation-and-Occupations-Technical-Paper.pdf   [Accessed   5   Aug. 2019].

22. Entelo. (2017). *Leading recruiting tools tech companies intend to invest in worldwide in 2018. Statista*. Statista Inc.. Accessed: July30,2019.https://www.statista.com/statistics/880903/leading-recruiting-channels-tech-companies-will-invest-in-worldwide/  EFF(Electronic Frontier Foundation) http://www.eff.org

23. European Commission: Attitudes towards the impact of digitisation and automation on daily life  (2017b).  https://ec.europa.eu/digital-single-market/en/news/attitudes-towards-impact-digitisationand-automation-daily-life

24. European Commission: Communication on the mid-term review on the implementation of the digital single market strategy: a connected digital single market for all (2017a). https://eur-lex. europa.eu/legal-content/EN/TXT/?qid=1496330315823&uri=CELEX:52017DC0228

25. EU-OSHA (European Agency for Safety and Health at Work): Foresight on new and emerging occupational safety and health risks associated with digitalisation by 2025. Publications Office of  the  European  Union  Luxembourg  (2018).  https://osha.europa.eu/en/tools-and-publications/   publications/foresight-new-and-emerging-occupational-safety-and-health-risks/view 312 P. V. Moore European Commission: Communication on artificial intelligence for Europe. European Commission, Brussels (2018)

26. Felten,E.W., Balfanz, D., Drew, D., & Wallach, D. (revised 1997). Web Spoofing : an Internet Con game .Technical Report 540-96. Department of Computer Science, Princeton University, U.S.

27. file:///C:/Users/x18101577/Downloads/2017%20Deloitte%20Global%20Human%20Capital%20Trends_%20Rewriting%20the%20rules%20for%20the%20digital%20age218.pdf
https://doi.org/10.1016/j.chb.2018.09.009

28. Flick, U. (2002), An Introduction to Qualitative Research, Sage, London

29. Fontana, A., & Frey, J. (2000). The interview: From structured questions to negotiated text. In N. Denzin & Y. Lincoln (Eds.), Handbook of qualitative research , (pp. 645-672). Albany, NY: Sage Publications.

30. Galanaki E., Lazazzara A., Parry E. (2019) A Cross-National Analysis of E-HRM Configurations: Integrating the Information Technology and HRM Perspectives. In: Lazazzara A., Nacamulli R., Rossignoli C., Za S. (eds) Organizing for Digital Innovation. Lecture Notes in Information Systems and Organisation, vol 27. Springer, Cham

31. Greenberg, C.I. (1999). Technological innovations and advancements for psychologists working with organizations. The Psychologist-Manager Journal, 3, 181-190. Guba, E.G (1990). The alternative paradigm dialog. In E.G. Guba (Ed.), The Paradigm Dialog(pp. 17-30).Newbury Park, CA: Sage

32. Gubrium, J. F. & Holstein, J. A. 2002. From the individual interview to the interview society, In J. F. Gubrium & J. A. Holstein (Edit.) Handbook of Interview Research, Thousand Oaks, CA: Sage Publications.

33. Harris, M.M. (1999, April). Practice network: I-O psychology.com-the internet and I-O psychology. The Industrial-Organizational Psychologist, 36, 89-93.

34. Harris, M.M. (2000). The Internet and industrial/organizational psychology: Practice and research perspectives. Journal of e-Commerce and Psychology, 1, 4-23.

35. Haugeland, J. (1989). Artificial intelligence: The very idea. MIT press.

36. Heiss, J. L. (2017). Cooperating AI Making artificial intelligence more human

37. Herzberg, A., & Gbara, A. (2004). Trustbar: protecting(even naïve) web users  from spoofing and phishing attacks. Cryptology: Eprint Archive Report 2004/155

38. Hussain, K. (2018). Artificial Intelligence and its Applications goal. Artificial Intelligence, 5(01).

39. Holstein, J., & Gubrium, J. (1995). The active interview. Thousand Oaks, CA : Sage Publications.

40. Holstein, J., & Gubrium, J. (Eds.). (2003). Inside interviewing : New lenses, new concerns. Thousand Oaks, CA : Sage

41. Huang, TL. & Liao, S. Electron Commer Res (2015) 15: 269. https://doi.org/10.1007/s10660-014-9163-2

42. https://www.dataprotection.ie/en/dpc-guidance

43. https://mettl.com/downloads/wp-content/uploads/sites/12/2018/06/Talent-Assessment-Study-2018.pdf

44.  http://reports.weforum.org/future-of-jobs-2016/

45. https://www.cin.ufpe.br/~rvf/AI%20and%20Environmenal%20Issues.pdf

46. https://www.hindawi.com/journals/tswj/2014/864180/

47. https://www.nytimes.com/2017/02/15/us/remote-workers-work-from-home.html

48. https://www.publicjobs.ie/restapi/documents/e_Recruitment_report.pdf

49. https://uidai.gov.in/

50. Irish Government Economic and Evaluation Service April 2018(IGEES) Available at : https://igees.gov.ie/wp-content/uploads/2018/07/Automation-and-Occupations-Technical-Paper.pdf[ Accsessed on 5th August, 2019]

51. Jakobsson, M. (2005). Modeling and Preventing Phishing Attacks. Presentation to  Phishing Panel of Finacial Cryptography, Indiana University, U.S.

52. Klaus Schwab, *The Fourth Industrial Revolution* (World Economic Forum, 2016).

53. Leavy, N. and Rooney, M. (2006). PAS-e-Recruitment PROOF 13.Available at: https://www.publicjobs.ie/restapi/documents/e_Recruitment_report.pdf [Accessed 5 Aug. 2019].

54. Mason, J., 2017. Qualitative researching. Sage.

55. Melanthiou, Y., Pavlou, F. and Constantinou, E. (2015) 'The Use of Social Network Sites as an E-Recruitment Tool', Journal of Transnational Management, 20(1), pp. 31–49. doi: 10.1080/15475778.2015.998141.

56. McCarthy, J., Minsky, M.L., Rochester, N., Shannon, C.E.: A proposal for the Dartmouth Summer Research Project on Artificial Intelligence (1955). http://www-formal.stanford.edu/jmc/history/dartmouth/dartmouth.html

57. Morgan, K. & Moorgan, M (2000). The Role of classical Jungian Personality Factors in CSCL environments, Norwegian Research Council Publication Series 2000, 183-191

58. Madge, C., & O'Connor, H. (2002). On-line with e-mums: Exploring the Internet as a medium for research. Area, 34(1), 92-102.

59.  Mager, A. (2012). Algorithmic ideology: How capitalist society shapes search engines. Information, Communication & Society, 15(5), 769–787.

60. Mairesse, F., Walker, M. A., Mehl, M. R., & Moore, R. K. (2007). Using linguistic cues for the automatic recognition of personality in conversation and text. Journal of artificial intelligence research, 30, 457–500.

61. Markham, A. (2005). The methods, politics and ethics of representation in online ethnography. In N. Denzin, Y. Lincoln (Eds.) . The Sage handbook of qualitative research. Thousand Oaks, CA :Sage. Retrieved March 25, 2006,  from : http://faculty.uvi.edu/users/amarkha/

62. Marsden, P. V. & Campbell, K. E. (1990) Recruitment and selection processes. The organizational side of job searches in R. L. Breiger (Ed.), Social mobility and social structure (pp. 59–79). New York Cambridge University Press

63. Nadimpalli, M. (2017). Artificial Intelligence Risks and Benefits. Artificial Intelligence, 6(6).

64. Neuman, W. L. (2013). Social research methods: Qualitative and quantitative approaches. Pearson education.

65. Nelson, C., Treichler,P.A, & Grossberg,L. (1992). Cultural studies. In L. Grossberg, C. Nelson, & P.A. Treichler(Eds.), Cultural studies (pp. 1-16). New York: Routledge

66. Nilsson, N. J. (2014). Principles of artificial intelligence. Morgan Kaufmann.

67. Omohundro, S. M. (2008, February). The basic AI drives. In AGI(Vol. 171, pp. 483–492).

68. Osborne, M.A., Garnett, R., Swersky, K. and de Freitas, N., 2012, 'Prediction and fault detection of environmental signals with uncharacterised faults'. In: Twenty-sixth AAAI Conference on Artificial Intelligence (AAAI-12).

69. Parry, E., & Olivas-Lujan, M. (2011) Drivers of the Adoption of Online Recruitment – An analysis using Innovation Attributes from Diffusion of Innovation Theory. Electronic HRM in Theory and Practice, 159–174.

70. Poole, D., Mackworth, A., & Goebel, R. (1998). Computational intelligence: a logical approach.

71. Rani, U., Furrer, M.: Work and income security among workers in on-demand digital economy: issues and challenges in developing economies. Paper presented at the Lausanne University Workshop 'Digitalization and the Reconfiguration of Labour Governance in the Global Economy', 24–25 November 2017 (2017, unpublished)

72. Rich, E., & Knight, K. (1991). Artificial intelligence. McGraw-Hill, New.

73. Rubens, N. et al. 2011. A Network Analysis of Investment Firms as Resource Routers in Chinese Innovation Ecosystem, Journal of Software, Vol. 6, No. 9, pp. 1737–1745.

74. Ruel H J M, Bondarouk T V, Looise J C (2004), E-HRM: Innovation or Irritation? An Exploration of Web-Based Human Resource Management in Large Companies, Purdue University Press/Lemma Publishers, Utrecht.

75. Saunders, M. and Thornhill, A. (2003), "Organizational justice, trust, and the management of change", Personnel Review, Vol. 32 No. 3, pp. 360-375.

76. Salin, E. D., & Winston, P. H. (1992). Machine Learning and Artificial Intelligence. Analytical chemistry, 64(1).

77. Savolainen, R., & Kari, J. (2004). Conceptions of the Internet in everyday life information seeking. Journal of Information Science, 30(3), 219-226. Searle, R. H. (2006). New technology: the potential impact of surveillance techniques in recruitment practices. Personnel Review, 35(3), 336–351.

78. Searle, R. H. (2006). New technology: the potential impact of surveillance techniques in recruitment practices. Personnel Review, 35(3), 336–351.

79. Selwyn, N., Gorard, S., & Furlong, J. (2005). Whose Internet is it anyway? Exploring adults' (non) use of the internet in everyday life. European Journal of Communication, 20(1), 5-26

80. SilkRoad. (2017). What are the biggest pros of online recruiting?. Statista. Statista Inc.. Accessed: July 30, 2019. https://www.statista.com/statistics/790690/opinions-of-hr-practitioners-about-the-biggest-pros-of-online-recruiting/

81. Strohmeier, S., & Piazza, F. (2015). Artificial Intelligence Techniques in Human Resource Management—A Conceptual Exploration. In Intelligent Techniques in Engineering Management (pp. 149–172). Springer International Publishing.

82. Sivaram, N., & Ramar, K. (2010). Applicability of clustering and classification algorithms for recruitment data mining. International Journal of Computer Applications, 4(5),23–28.

83. Talent-Assessment-Study-2018. (2018). [ebook] Metti. Available at: https://mettl.com/downloads/wp-content/uploads/sites/12/2018/06/Talent-Assessment-Study-2018.pdf [Accessed 15 Jul. 2019].

84. Tomassen, M. E. (2016). Exploring the Black Box of Machine Learning in Human Resource Management: An HR Perspective on the Consequences for HR professionals (Master's thesis, University of Twente).

85. Tractica. (2017). Cumulative revenue of top 10 use cases/segments of artificial intelligence (AI) market worldwide, between 2016 and 2025 (in million U.S. dollars). Statista. Statista Inc.. Accessed: July 30, 2019. https://www.statista.com/statistics/607835/worldwide-artificial-intelligence-market-leading-use-cases/

86. Thompson, L & Nadler J. (2002). Negotiating via information technology: Theory and Application. Journal of Social Issues, 58(1), 109-124.

87. Van Esch, P., Black, J. and Ferolie, J. (2019). Marketing AI recruitment: The next phase in job application and selection. Computers in Human Behavior, 90, pp.215-222.

88. WEF (World Economic Forum): How to prevent discriminatory outcomes in machine learning. World Economic Forum Global Future Council on Human Rights 2016–2018. WEF, Cologny, Switzerland (2018)

89. Weinstein, D., & Weinstein, M.A. (1991). Georg Simmel : Sociological flaneur bricoleur. Theory, Culture & Socielty, 8, 151-168.

90. White House Office of Science and Technology Policy. Summit on artificial intelligence for American industry (2018). https://www.whitehouse.gov/articles/white-house-hosts-summitartificial-intelligence-american-industry/ Summary of report. https://www.whitehouse.gov/ wp…/Summary-Report-of-White-House-AI-Summit.pdf

91. WIPO (World Intellectual Property Organisation) available at : http://www.wipo.int Yawson, R. M. 2009. The Ecological System of Innovation: A New Architectural Framework for a Functional Evidence-Based Platform for Science and Innovation Policy, XXIV ISPIM 2009 Conference: The Future of Innovation, Vienna, Austria, pp. 1–16.

92. Yawson, R. M. 2009. The Ecological System of Innovation: A New Architectural Framework for a Functional Evidence-Based Platform for Science and Innovation Policy, XXIV ISPIM 2009 Conference: The Future of Innovation, Vienna, Austria, pp. 1–16.

93. Yoon Kin Tong, D. (2009), "A study of e-recruitment technology adoption in Malaysia", Industrial Management & Data Systems, Vol. 109 No. 2, pp. 281-300. https://doi.org/10.1108/02635570910930145

94. Yuan , Y., Ye, E ., & Smith, S . (2001). Web spoofing revisited: SSL and Beyond. Technical report TR2001-409 .Department of Computer Science Dartmouth College, U.S.

95. Yuan ,Y ., Ye, E.,  & Smith , S. (2002). Web spoofing revisited: SSL and beyond. Technical report TR2002-417 Department of Computer Science Dartmouth College, U.S.

## Appendix 1.

## Impact of Artificial Intelligence in recruitment: Measuring scopes and possibilities.

### Intro:

Hi,

I am Aratrika, currently studying at National College of Ireland. This questionnaire is a part of my Master's Thesis in Human Resource Management. As a part of Gen-x I have grown up being familiar with new technological changes and have witnessed the impact of those technologies in our lives which has revolutionized how we work. Now in the current time we are at the wake of possible fourth Industrial Revolution with the introduction of AI in the technical scenario. This ripple of innovation is going to affect every single aspect of our lives. We live in the era of 'Gig economy'; as per CIPD's recent report approximately 1.3 million people are working as a part of 'gig-economy'(CIPD, 2019). As the framework of employment is changing it is important to have the knowledge and understanding about the upcoming changes and it will start with having questions, perceptions and opinions.

I would require your opinion/perspective regarding this change and it's anticipated outcomes in the field of Human Resource. I have framed the questionnaires that would be later used for the qualitative analysis. Please extend your abundant support to help me gain an insight into the current market trends as professionals/students/freelancers/anyone with relation to the technical or HR field so that a thorough conclusion can be drawn on the basis of your thoughtful contributions.

### Reference:

CIPD. (2019). To gig or not to gig? Stories from the modern economy | Reports | CIPD. [online] Available at: https://www.cipd.co.uk/knowledge/work/trends/gig-economy-report [Accessed 29 Jul. 2019].

Thank you for being a part of my journey,

Aratrika Chanda

## Consent form:

You are invited to participate in an online survey on HR Administration and Management circulated through third-party website for in-house or out-sourced responses. This qualitative survey is a part of a research project lead by Aratrika Chanda. It should approximately take 15-20 minutes/sessions to complete.

### Participation:

Your participation is voluntary and honorary. You can refuse to take part in the survey at any given point without any consequences/penalties. You can refuse to answer any any part of the questionnaire and may exit anytime during answering the questionnaire.

### Risks and opportunities:

There are no risks involved in this survey as the data collected will be kept in secured devices and will be removed after analysis. The confidentiality of this survey is also ensured by the fact that there will be no collection of email addresses and other details.

On the beneficial aspect your opinion and insight will help the researcher gain a valuable market insight in the HR administration field.

### Confidentiality:

The survey analysis or submissions will be sent and stored to a link at form.google.com which does not collect your personal data such as: Your name, email address or other tracking information (i.e IP address). Your responses will be anonymous and your participation will be kept confidential.

This research is conducted solely for scholarly purpose. No further use of the provided data will be used or stored for any future purposes whatsoever and is subject to the consent of the individual.

### Contact:

For any further queries regarding the survey, all questions are to be forwarded to the email address: achanda80@gmail.com

By clicking the ''YES'' button you confirm that

1. You have voluntarily agreed to take part in this research without any expected remuneration.

2. You have read the above information.

3. You are above 18 years.

If you do not wish to proceed you can decline the participation.

## Agree

◯ Yes

◯ No

## Appendix 2

Questionnaire:

1. Do you work in or with the Human Resource Department?
2. What is your current role in your organization's recruitment process?
3. How does your recruitment process progress step by step?
4. Who is responsible for recruiting, is there a recruitment operating method that covers the whole organisation?
5. Would you say that your company has a high or low recruitment rate?
6. Have your recruitment tools changed over the years?
7. What technologies have drastically altered your recruitment process?
8. What is the most time-consuming process for recruitment in your organisation and how have you been trying to speed up your recruitment?
9. Has technology reduced time spent on recruitment?

10. What is your opinion about the current recruitment process?

11. Has your company thought about different technological solutions regarding recruitment?

12. Why did you go to different technological solutions? Why exactly this? How did the need for such a product arise? When and how did you start using the product? Has there been a demand for the product? Is it ever more accelerating?

13. How aware are you about the use of Data analytics or artificial intelligence in your recruitment process? Please explain your perspective.

14. Has there been any discussion regarding the implementation of AI in recruitment in your company?

15. What kind of discussion does the use of artificial intelligence in the recruitment process arouse?

16. What phases of the recruitment process, do you think that AI could influence?

17. Do you see any risk for recruitment process if artificial intelligence and data analysis is integrated?

18. Do you believe AI based decision making is reliable?

19. In your opinion, can AI/data analytic operations effect equal opportunities for applicants?

20. Have you noticed some kind of discrimination during the recruitment process when using AI?

21. What changes (good/bad) do you think AI and data analytics will bring to human resource practice? In your opinion will technologies like AI change the requirement of face to face interactions – such as interviews?

22. Do you believe that with artificial intelligence, the size of the HR department will change?

23. Will there be more control tasks in the HR field by monitoring algorithms and machines? Do you believe that at some point data and automated decision-making can be fully trusted?

# Appendix 3

# Appendix 4

Link to view the spreadsheet containing candidate responses:

https://docs.google.com/spreadsheets/d/1eTZuTSPJiPUoPaS0Cticz683npGItB9dBb8UBKiIYCg/edit?usp=sharing