

TECHNOLOGY-DRIVEN PRACTICAL EFFICIENCY IN TALENT RECRUITMENT PROCESS IN NEW ZEALAND

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ABSTRACT

Human resources are the key assets of any organisation. Businesses in order to survive in today's fast-changing world not only rely on human resources, but they also need technology in addition to support their day-to-day activities (du Plessis & Frederick, 2012). As one of the main functions in human resource management, talent recruitment refers to the processes to search, attract and hire capable candidates to satisfy organisations' needs for human resources. Organisations have to improve the efficiency of recruitment as there are significant financial implications for them (Marler & Parry, 2016). In fact, they have started moving away from traditional recruitment methods for reducing the inefficiencies and ineffectiveness in attaining suitable candidates for their operational needs. Instead, the adoption of e-recruitment is evidently more popular in New Zealand talent recruitment practice in the recent decade (du Plessis & Frederick, 2012; Rahman, et al., 2014). Technological advancement including the introduction of the latest Artificial intelligence, is a perceived solution for the enhancement of practical efficiency in talent recruitment (Raviprolu, 2017; Upadhyay & Khandelwal, 2018). Despite the importance and perceived usefulness in improving talent recruitment efficiency (Rodney et al., 2019; Vedapradha et al., 2019), little was known about the e-recruitment practices and the adoption of AI for recruitment in New Zealand. This research aims to fill this gap in the extant literature and to obtain an understanding of the evolution of talent recruitment practice as impacted by the latest advancements of various technologies.

This research adopts content analysis (Krippendorff, 1989) to scrutinise recruitment processes published or displayed on an organisation's websites, social media, and recruitment platforms by 40 large New Zealand organisations. Certain keywords like recruitment practice, recruitment process, hiring process, careers, apply, hire, employ, LinkedIn, SEEK, Glassdoor, and employment policy were used for searching for the secondary data. An inductive approach was used to compare and contrast the collected data to identify the similarities and patterns for modelling the New Zealand e-recruitment process. The findings identify the frequently used recruitment technologies by New Zealand organisations, and there is evidence that a few organisations have started incorporating Artificial Intelligence in their talent recruitment.

Keywords: e-recruitment, AI applications, recruitment methods and processes

INTRODUCTION

Human resources are the key assets of any organisation. Businesses to survive in today's fast-changing world not only rely on human resources ((HR) but they need technology in addition to support their day-to-day activities (du Plessis & Frederick, 2012; Marler & Parry, 2016). Recruitment is one of the main human resource management (HRM) functions, which involves searching and attracting capable applicants from a pool of applicants. Organisations have to improve the efficiency of recruitment as there are significant financial implications for them (Barber, 2006; du Plessis & Frederick, 2012). In their empirical study of HRM in New Zealand (NZ), du Plessis et al. (2006) identified a significant gap between organisational capabilities

and talent recruitment and further suggested HR practitioners value international experience, computer literacy, and change management. This suggestion is still valid in the New Zealand HRM context today as technology has leapt forward towards Artificial Intelligence (AI) applications and the gaps still need to be closed. This research aims to investigate NZ organisations' adoption of technology for recruitment practice and the implication of AI advancement to NZ HR practitioners.

LITERATURE REVIEW

Recruitment is the process of identifying potential talents to fill those job vacancies (Geetha & Bhanu, 2018), which typically includes advertising vacancies, receiving applications, shortlisting applicants, interviewing applicants, and selecting the right candidates (Barber, 2006; du Plessis & Frederick, 2012). Traditional recruitment largely relied on paper, radio, or TV-based advertisements, paper-based resume, and face-to-face interviews, which was time and resource consuming with low efficiency and geographic constraints in securing the most suitable candidates for organisations (du Plessis & Frederick, 2012). These shortfalls stress organisations to move away from traditional recruitment, and the late technological advancement enables organisations to utilise electronic networking resources (i.e. the Internet), various types of software and hardware, and online communication tools (i.e. Zoom and Microsoft (MS) Teams) to improve the effectiveness of recruitment (Barber, 2006; du Plessis & Frederick, 2012; Marler & Parry, 2016). Furthermore, the emergence of AI enticed some pioneer HR researchers to advocate the adoption of AI for future recruitment practices (Nawaz, 2019; Raviprolu, 2017; Rodney et al., 2019; Upadhyay & Khandelwal, 2018; Vedapradha et al., 2019). The following paragraphs review some commonly adopted approaches to e-recruitment and AI recruitment.

Organisations commonly use one or more of the following approaches to e-recruitment: a recruitment portal on the organisation's website, a recruitment account on agency/job listing websites, and recruitment advertisements via the organisation's social media account. The official recruitment portal on an organisation's website created and maintained by the organisation displays job advertisements, job application information, and links for submitting job applications (Braddy et al., 2006), which reduces the traffic of messages and documents between applicants, recruitment agents, the direct manager and the HR personnel (Braddy et al., 2006; Cappelli, 2001). Organisation's websites can also be used to showcase the organisational culture to try and attract applicants (Braddy et al., 2006) so that the applicant-organisation fit would be better achieved (Cober et al., 2000). However, an official portal may not be as effective if the portal is not informative or well-managed (Cable & Yu, 2006). Also, an official portal offers limited options to job applicants compared with job advertisements on agency websites.

Organisations can use job listing websites to post job vacancies to significantly increase the number of viewers of the advertisements. This is because job listing websites provide the convenience for job applicants to search for positions appropriate to their experiences and qualifications across different organisations (Braddy et al., 2006). Organisations also get a chance to search through resumes as millions of applicants post their resumes on popular job listing websites, i.e. SEEK, (Cappelli, 2001). There is a rapid growth in job search using third party websites; this has changed the way how job seekers look for the jobs and how organisations conduct their recruitment processes.

The emergent popularity of social media worldwide has enticed many organisations to set up their social media accounts and advertise their job vacancies (Bicky & Kwok, 2011; Rahman et al., 2014). Social media, i.e. Instagram or Facebook, provide a platform for people to communicate with family and friends and extend their social network in an informal way (Rahman et al., 2014). LinkedIn, a networking website specialising in recruitment solutions (LinkedIn, n.d.), boosted the use of social media for recruitment by organisations (Rahman et al., 2014). Rahman et al. (2014) also suggested that social media offers incomparable support to organisations for efficient recruitment and corporate brand promotion, and there is a rapid growth of using social media for recruitment in NZ.

A school of researchers have started advocating for the adoption of AI for recruitment practice because of AI's advantages in replacing repetitive recruitment tasks and diverting recruiters' roles to be more creative and strategically focused (AI Forum New Zealand, 2018; Geetha & Bhanu, 2018; Raviprolu, 2017; Rodney et al., 2019; Upadhyay & Khandelwal, 2018). McCarthy (1956) defines AI as "the science and engineering of making intelligent machines, especially intelligent computer programs" (Geetha & Bhanu, 2018, p. 64). The key functionalities of AI are to work similarly to human intelligence such as learning, analysing, identifying, and correcting information to deliver meaningful outcomes (Geetha & Bhanu, 2018). AI applications in recruitment practice include screening applicants, applicant engagement, applicant re-engagement, post-offer acceptance, new hire onboarding, and interview scheduling (Geetha & Bhanu, 2018; Raviprolu, 2017). Although the benefits from adopting AI for recruitment are well-perceived by HR practitioners and proven in latest studies, the empirical evidence of how AI is adopted by organisations is still under-investigated.

This research, in particular, is interested in how NZ organisations adopt advanced technologies for recruitment. The reason for defining this aim is that e-recruitment and AI technologies can lead to a high amount of investment (Lepak et., 2007) for NZ organisations but the NZ economic scale is small (AI Forum New Zealand, 2018) compared with other developed countries. The knowledge of NZ organisations' adoption of information and AI technology for talent recruitment will be helpful for AI developers to consider their future design, which better serves NZ recruitment practice. On the other hand, this knowledge could also assist NZ HR practitioners to reconsider HR strategies for NZ organisations when AI is more mature for recruitment and more widely adopted in NZ.

The effectiveness and efficiency of recruitment processes has material financial implications for organisations (du Plessis & Frederick, 2012). However, little was known about the recruitment processes adopted by organisations in New Zealand in the 21st century, and hence this research aims to reduce the identified knowledge gap in the literature. This research will answer the following questions.

1. What are the current recruitment processes adopted by NZ organisations?
2. What are the challenges of the introduction of AI in recruitment practices in NZ?

RESEARCH METHODS

This research applied Organisational Contingency Theory (OCT) to underpin the analysis of data and the conclusion of meaningful findings. Woodward (1965) and the subsequent studies adopt the lens of OCT to suggest positive interrelations between the use of information technology and the improvement of operational efficiency. Operational efficiency can be assessed from transactional uncertainty, risk management, administrative process management, and decision-making effectiveness (Marler & Parry, 2016). According to OCT, it can be inferred that organisations that adopt and update information technology for recruitment practice will deliver better efficiency in terms of reduced uncertainties concerning recruitment processes.

This research is mainly qualitative and adopts content analysis (Krippendorff, 1989) to search for and analyse data published by NZ organisations, guides the systematic coding of collected data to identify meaningful codes and themes. The codes and themes will be redefined and reconceptualised to a satisfactory level so that the findings will be valid and justified (Krippendorff, 1989). Finally an applied inductive approach was used to compare and contrast the collected data to identify the similarities and patterns for drawing conclusive findings. Descriptive statistics were also used for interpreting the findings.

One-hundred and ninety large-sized NZ organisations including listed companies, universities, banks, and governmental organisations were targeted. The reasons for this selection criteria include: 1) these organisations are more likely to invest in information technology and AI technology, and 2) the research had better opportunities to find published recruitment processes from open resources in public. Data was collected through secondary sources such as organisations' websites, organisations' documents, and other

relevant web sources. Certain keywords such as recruitment practice, recruitment process, hiring process, careers, apply, hire, employ, LinkedIn, SEEK, Glassdoor and employment policy were used to start the data collection. After the screening process was completed in May 2020, 40 out of the targeted 190 organisations were found to have available information on their recruitment processes. The 40 sample organisations are from 16 different industries. This coverage of industries makes the selected data arguably representative to the targeted NZ large organisations. Most of these organisations are managing a range from 500 to more than 10,000 employees.

The collected data included descriptions and explanations of practices used by the 40 organisations. The researcher screened 164 items of documented recruitment processes and classified them into the following 12 codes (see Table 1). Further analysis was built on these 12 codes of processes to understand to what extent e-recruitment technology or AI was adopted by the organisations. The commonly adopted processes were used to draw a flow chart (see Figure 1) for explaining the current status of NZ recruitment practice.

Table 1. Codes of Recruitment Processes

CODE NUMBER	RECRUITMENT PROCESS (CODES)	NUMBER OF ORGANISATIONS ADOPTING THE PROCESS	PERCENTAGE OF THE SAMPLE SIZE (40 ORGANISATIONS)
	Social media for job advertisements	40	100%
	Job application via organisation websites	39	97.5%
	Mobile App	2	5%
	Profile creation /personal profile register	32	80%
	Job alerts	19	47.5%
	Email application	12	30%
	Using keywords to search vacancies	32	80%
	Expression of interest	16	40%
	Application assessment and shortlist	22	55%
	Phone screening	16	40%
	Video screening	8	20%
	Face to face interview	16	40%

FINDING AND DISCUSSION

The key findings that emerged from the data analysis include NZ organisations' implementation of multiple recruitment strategies, currently adopted recruitment processes, latest application of e-recruitment technologies, and limited utilisation of AI technology.

Adoption of multiple recruitment approaches

As presented in Table 2, all the selected organisations use more or fewer e-recruitment processes with a combination of traditional recruitment methods. About 40% of the selected organisations still use some form of traditional processes such as manual assessment of applicants, telephone interviews, and face-to-face interviews. However, this finding may be limited by the information published by the organisations.

One explanation for this remaining traditional practice is perhaps HR practitioners' preferences and conventions of using manual assessments of applicant. It is also speculated that there were no suitable technological substitutions available for the organisations.

The majority of the selected organisations (more than 98%) dually use their organisation websites and via social media for their job advertisements. Also, most organisations (80%) enable keyword search for their advertised vacancies so that the job advertisements can reach a wider group of job seekers. In addition, most organisations linked job application processes to their HRM system where applicant profiles were registered for creating a pool of talent. These practices reflect organisational contingency theory as the reduced uncertainty is realised by utilisation of multiple OCT recruitment technologies, hence organisations attain improved effectiveness and efficiency of the recruitment processes. Compared with the finding in the Rahman et al. (2014) study, NZ organisations' adoption of social media for recruitment has improved significantly over the last seven years.

Most of the selected organisations (80%) require applicants to create a profile in the organisations' HRM portal/system. Two organisations developed Mobile Apps for applicants to apply for their advertised vacancies. The utilisation of applicant registration through the use of mobile apps could be a potential step for organisations to move towards the adoption of AI as information on a pool of talent would be collected and stored for future AI applications.

Table 2. Industrial Distribution of Selected Organisations

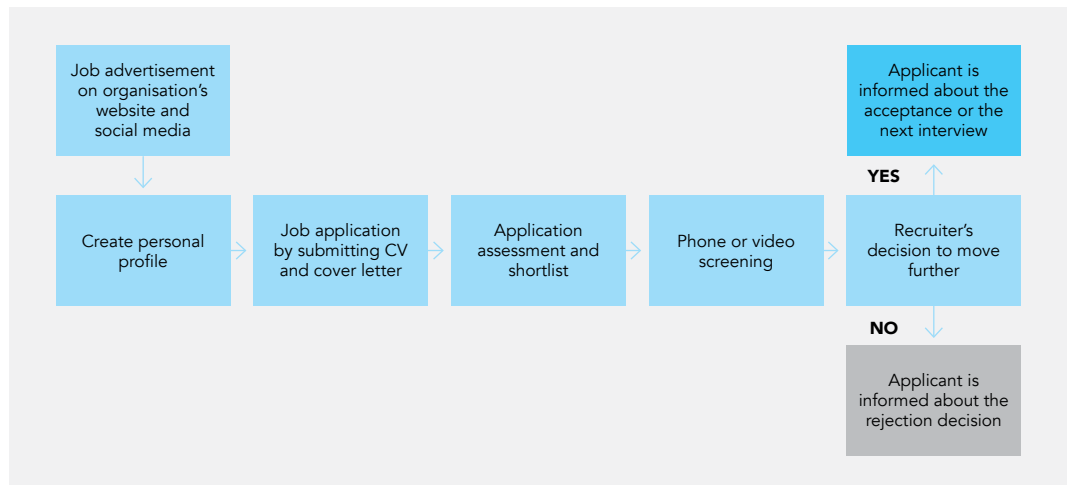
INDUSTRY	NUMBER OF ORGANISATIONS	COMMONLY ADOPTED PROCESSES
Aviation	1	1,2,4,7,8,9,10
Banking, Financial Services, Insurance	10	1,2,4,5,6,7,8,9,10,11,12
Civil Engineering	1	1,2,3,4,9,11,12
Consumer Goods	1	1,2,4
Dairy	1	1,2,4,5,6,7,9
Education & Educational management	8	1,2,4,5,7,8,9,10,12
Food & Beverages, Food research	2	1,2,4,9
Government	1	1,2,4,7,11
Health, Wellness & Fitness, Hospital & Health Care	5	1,2,4,5,7,8,9,10,12
Information Technology & Services, Computer Software	2	1,2,4,5,6,8,10,12
Manufacturing	1	1,2,4,5,9,10,12
Media	1	1,2,8,9,10,12
Oil & Energy	2	1,2,7,9
Telecommunications	1	1,2,4,5,7,9,10,11,12
Utilities	2	1,2,4,5,6,7,9
Wine & Spirits	1	1,2,3,4,5,6,7

COMMON RECRUITMENT PRACTICE

Based on the observations of common recruitment processes adopted by different industries, an illustrative flowchart (see Figure 1) presents the extent of the application of e-recruitment technologies by NZ organisations. Although Consumer Goods, Food & Beverages, and Oil & Energy industries appeared to have limited use of e-recruitment technologies. Their limited usage was ignored in generating the flowchart as there may be a limitation of publicly available information and only a few organisations were included in these industries.

As illustrated in Figure 1, NZ organisations generally advertise job vacancies on their organisation's website and via social media to inform job applicants. Job applicants are generally required to create their profile in the organisations' HRM systems before submitting their curriculum vitae (CV) and cover letter. This is then followed by an assessment of applications and shortlist the candidates. The shortlisted candidates will then be called for a phone or video interview. The HR recruiter will then decide to reject the candidate or take them to the next interview before offering the job. In summary, NZ organisations have to a significant degree been using e-recruitment practices gradually updating traditional recruitment processes with e-recruitment technologies.

Figure 1. Commonly Adopted Recruitment Process in New Zealand



LATEST APPLICATIONS OF E-RECRUITMENT TECHNOLOGIES

Referring to the process code displayed in Table 1 and the summarised processes by industries in Table 2, two of the latest technologies video conference (code number 11) and Mobile App (code number 3) have been adopted by several industries. It was observed that video conferencing has been favoured by banks including the Banking Group Australia and New Zealand (ANZ), Reserve Bank of New Zealand and Bank of New Zealand, whose intention it was to hire applicants from overseas and secure the candidates with best skills and experience. As recommended by du Plessis and Frederick (2012), video conferencing is one of the ways to enhance the effectiveness of recruiting for technical roles. The New Zealand Government also uses video conferencing instead of face-to-face interviews. This finding contradicts that the private sector continuously explores the benefits of new technology compared to the government sector which perceives the benefits are limited (McDonough & Polzer, 2012). Additionally, one organisation in each in of the Civil Engineering and Telecommunications also use video conferencing to screen applicants for improving recruitment effectiveness and efficiency. Nonetheless, online interviews would foreseeably be expanded to

other industries as a result of the COVID-19 pandemic travel and physical distancing restrictions due to the advancement of online communication platforms (i.e. Zoom and MS Teams)..

The Mobile App, although only two organisations claimed their adoption of this technology, has emerged in recent years. It has advantages such as direct access to candidates' mobile phones and reduced time in administrative processes. Furthermore, the Mobile App is one of the platforms that AI technologies utilise for intelligently directing suitable talent to recruiters (Upadhyay & Khandelwal, 2018). Thus, future uses of this technology could foreseeably be fostered by NZ organisations.

LIMITED ADOPTION OF AI

Only one of the 40 organisations claimed to use AI for recruitment and the application is limited at the initial stage – advertising vacancies via social media. The organisation applies an employment philosophy to its enterprise management system, which includes a multi-dimensional, wide-ranging talent frame system. This system uses algorithms to analyse the data which looks for patterns and applies a machine learning technique for job advertisement strategies. The effectiveness of this application cannot be assessed as there is limited disclosure of information.

One challenge for adopting AI for recruitment is the potential breach of NZ Privacy Act 2020 and other ethical issues caused by scanning social media accounts of potential candidates. Another challenge is the cost-benefit considerations for organisations as AI is seen as high-investment technology and NZ lacks the economic scale (AI Forum New Zealand, 2018). It has also been pointed out that NZ's pace for getting prepared for the adoption of AI is slow and NZ organisations are far from full digitalisation (AI Forum New Zealand, 2018).

CONCLUSION

This research offers insight into NZ organisations' adoption of advanced technologies for recruitment practice. Data was carefully analysed and discussed the findings from the process and industrial perspectives. It was found that NZ organisations apply more than three e-recruitment techniques to increase their opportunities of securing the right candidates for their positions. Technologies have been adopted by NZ organisations in every recruitment stage from job advertisements to the final recruitment decision. Also, some advanced technologies such as video conferencing and Mobile Apps have been evident in the latest e-recruitment practice. All of the above evidence demonstrates the significant improvement in e-recruitment practice in NZ organisations over the last decade (see the findings in du Plessis & Frederick, 2012; and Rahman et al., 2014 study).

Evidence also indicated the application of AI, although it was very limited. NZ adoption of AI for recruitment is highly challenging and NZ may be lagging behind other developed countries due to its economic scale. It is urged that the NZ Government should establish a national AI strategy to promote AI applications in NZ organisation management (AI Forum New Zealand, 2018). Also, the designers of AI technology should consider tailored applications to meet NZ organisational needs in terms of legal, ethical, and economic constraints.

The limitations of this research is the findings were drawn from publicly available data, which were collected on and before 8 May 2020. Future research could replicate the research method for collecting and analysing larger-scale data or interview NZ HR practitioners to further validation of these findings. It would also be interesting for future researchers to investigate the influence of the COVID-19 pandemic on the use of e-recruitment technologies to improve the effectiveness and efficiency of obtaining suitable candidates to meet the organisational needs.

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