Employing Smart Pre -screening Technology in Recruiting Sales Interns in the IT industry of Sri Lanka

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Abstract

This study will discuss about perceptions of online smart screening technology in the domain of entry level sales occupations in IT domain of Sri Lanka. Although Sri Lanka belongs to the late majority region of the adoption curve in terms of recruitment technologies, the growth of IT sector has paved way for a greater amount of job opportunities ultimately making pre-screening a challenging task. This research demonstrates the theoretical background of the topic, and it shows the present situation of the recruitment domain with primary and secondary data. The primary research contains, the result of the conducted questionnaire with a sample of 5 IT companies and from 80 individuals who work as entry level sales employees in IT companies. Also, this study contains 3 in-depth interviews with selected Human Resource heads , who elaborated their opinions about the issues they face due to the traditional prescreening system.

Key Words

Facial Recognition, Emotional intelligence, Recruitment, Pre-screening, Sentiment Analysis.

1. Introduction

Recruitment of interns is a common problem across most of the enterprises in Sri Lanka. Particularly HR functions are face numerous hardships in the selection of sales interns to the organization. Below are the major problems faced by HR departments when recruiting sales interns.

a. Excessive Time Consumption

Time consumption during the recruitment processes has always been a drawback in the traditional recruitment process practiced by organizations(Sandanayake *et al.*, 2018; Alessandro, 2021) Various kinds of recruitment stages such as pre-assessment, interviews and personality analysis consumes more time in the recruitment process which delays the onboarding by a significant amount of time (Kumari *et al.*, 2021). In addition, studies have also revealed that sorting out applications manually consumes more time for recruiters to finalize their decision(Sharma and Malik, 2018; Alessandro, 2021). Optimization of the selection process would positively affect the HR value chain creating efficiency and additional time to complete the remaining/other functions within the HR department**.**

b. Inability to source skillful candidates

Organizations focus more on the recruitment of skilled and qualified candidates in order to survive in a highly competitive environment (Sharma and Malik, 2018). Studies show that the current recruitment processes followed by organizations are not sufficient to assess the skill set of sales candidates (Harrolle *et al.*, 2018). In most instances, recruiters find it difficult to analyze the soft skills and social skills of candidates to make their final decision. Further studies say that the required skill set of a candidate has been evolving over time, Communication skills, soft skills, technical skills, and personality traits are looked into at present in terms of recruitment(Oksanen, 2018). Studies have proven that customer facing sales skills, personality and communication act as a major component in the selection criteria. (Deeter-Schmelz *et al.*, 2020).

c. Lack of genuineness in candidates

Studies reveal that candidates are more prone to cheat during prescreening activities such as online assessments (Chandler and Paolacci, 2017; Kumari *et al.*, 2021). Due to lack of monitoring in the services provided by the existing

recruitment platforms, firms are finding it difficult to source suitable candidates for their job openings. In the pre-screening process, the current systems can easily be manipulated by using certain key words in the CV which increases the chances of a candidate getting selected. Moreover, employers have also raised concerns in the past for pre-screening unqualified candidates (Chuks Okolie and Irabor, 2017).

d. Unpleasant experience

The high complexity in the sales environment is a major cause for difficulties faced during recruitment of sales persons (Boles, Rutherford and Loe, 2019). In addition, gender discrimination also has a major impact in causing unpleasant experiences among candidates during the interview process. A study conducted by Verité Research concluded that even in Sri Lanka there is a significant impact of gender discrimination in terms of employment opportunities(Verité Research, 2020). A significant gender bias has been established in entry level B2B sales openings in recent research (Ashnai *et al.*, 2020).

2. Literature Review

There are several processes and techniques used at present to hire candidates by the HR department. These processes will be discussed below. Adoption of video recruitment is one of the most significant movements of the recruitment industry towards technology. Mainly video recruitment is facilitated by Google meet, Skype, Zoom and Microsoft teams. The use of pre- recorded videos in hiring is also an emerging trend in Sri Lanka which was ignited by a startup called Sixer Video. Social media recruitment is another avenue which got boosted with the growth of technology. LinkedIn is another major platform that is significant in social media recruitment. Since LinkedIn provides a place for companies to advertise, it eases the process for candidates to apply for job vacancies.

According to a survey done by IES on 50 organizations, 25% of the organizations used Psychometric forms to assess the suitability of a candidate (Sills, 2014). Psychometric tests comprise of structured questions which test upon the critical thinking and general knowledge of a potential candidate. This paves way for the selection of the best candidate out of a resource pool. Companies get CVs, from many sources such as career websites, job portals and emails. CVs obtained from different sources are difficult to be sorted and pre-screened in the selection process (Sandanayake *et al.*, 2018). To overcome this, CV analyzers were introduced to screen multiple CVs according to set key words and sentiment which reduced the workload of recruiters.

a. Review of exsisting applications and interventions

The selection process is heavily impacted by modern technology where each stage of the selection process is being efficiently carried out with the aid of technology. Studies show that AI is considered as the new block in the recruitment industry(Ween, 2020). Different areas of AI have been explored to establish an easy and efficient recruitment methodology within the companies. The major explorations in AI and related software solutions produced in this domain are discussed below.

Facial Recruitment

Facial recruitment is considered as one of the advanced hiring mechanisms up to date where the system uses micro facial expressions of a candidate in order to rank the candidate (Ween, 2020). The system ranks the candidates by extracting the body language and facial expressions expressed during the interview. The system also goes one step further to analyze the top talented employees of the companies and generates a new list of companies(Johansson, Herranen and Mccauley, 2019). Facial expression detection is commonly used in terms of analyzing personality traits based on the universal emotions or the behavior of the candidate (Su, Suen and Hung, 2021).In addition studies on facial cue analysis (Rupasinghe *et al.*, 2017), eye gaze detection (Khosla *et al.*, 2009) and approaches based on facial action coding system (Kodra *et al.*, 2013) are significant in this domain. Facial recruitment is on high demand and many companies are facilitating this technology. The major players of this market segment are Hire Vue, HR Avatar, Verint and Gecko.ai.

Voice Based Recruitment

Voice is another key area that is analyzed during job interviews. Tone of speech and key words used while talking are extracted and analyzed to find the sentiment in the speech of the candidate (Sawhney *et al.*, 2019). In addition to these metrics loudness, clarity and words per minute are also calculated by the system to identify the fluency of the speaker. Metrics such as speaking fluency , speaking rate and use of filler words are considered in voice based recruitment during the screening process(Chen *et al.*, 2018). Usually, the voice analysis function is embedded into to the facial recruitment to provide more value to the product. Taking this into consideration, Hire Vue and HR Avatar can be considered as the front runners who utilize the voice analysis into their criteria as well. Voice based analysis has potential to play a vital role in recruitment of sales candidates as the major function of sales candidates revolve around

communicating with stakeholders (Deeter-Schmelz *et al.*, 2020).

Text based Recruitment

Text based recruitment techniques refer to the use of text to identify the potential of a candidate. AI chat bots are employed to create conversations with the candidates and the chatbot records the responses of the candidates to perform a sentiment analysis on the received text. This can be viewed as one of the efficient methods of pre-screening large amount candidates without human effort. MYA and Text.io are two of the major companies who provide text based recruitment solutions in the recruitment industry(Sawhney *et al.*, 2019). Apart from social media text mining and behavior profiling using data available in resumes, text-based approaches can also be utilized in real time questionnaires(Voicu, 2014). Text based recruitment solutions are helpful in recruitment as the systems are backed by AI, situational questions can also be directed towards the candidates in real time.

b. Exsisting Application Perspective

Features	HR Avatar	Hire Vue	Verint	Tal View	Sixer Video	Rooster Jobs	Proposed Solution
Facial Recognition	✕	✓	×	✓	✕	✕	✓
Sentiment Analysis	✓	✕	✓	✓	✕	✕	✓
Voice Analysis	✓	✕	✓	✓	✕	✕	✓
Applicant Tracking System	✕	✕	✕	✕	✕	✓	✓
Focused on Sri Lanka	✕	✕	✕	✕	✓	✕	✓
Gender Analysis	✕	✓	✕	✕	✕	✕	✕
Pre-recorded Videos	✓	✓	✓	✕	✓	✕	✓
Job Search Tool	✕	✕	✕	✕	✓	✓	✕
Information Collection (Personal Data / CV)	✕	✕	✕	✕	✕	✓	✓
Mobile Version	✕	✓	✕	✓	✓	✕	✕

Table 1: Competitor Analysis

c. Review on existing hiring algorithms

The model developed by Khosla and his collogues describes the co relation between digitalized nonverbal data in terms of behavior profiling in facial recruitment(Khosla *et al.*, 2009). Model also proves that nonverbal data could be a great source in improving the quality of decision making specially in the context of recruitment and tourism. The model relates the input data to four behavioral categories such as Dominant-Warm (DW), Dominant-Hostile (DH), Submissive-Warm (SW) or Submissive-Hostile (SH). In this way the model helps the recruiter in understanding the behavioral profile of the candidate and there by supports in decision making. The model proposed by the author monitors the facial expressions of candidates using eyebrows, cheeks, lips and records the questions that caused the changes in facial expressions using a time stamp. The model is applied to a database with limited amount of data and yielded a 90% accuracy.

The model proposed by Yu-Sheng Su and his collogues predicts the behavioral competencies of a candidate according to the facial expressions given by the candidate at a recorded interview(Su, Suen and Hung, 2021). The model has two major components where one recognizes the facial expressions whereas the other decodes the facial expressions to predict the behavioral competency of the candidate. The decoding function is based upon behavioral ecology view of facial displays (BECV) thus the expressions are conceptualized to reflect future behaviors of the candidates. The model was completed using a real-time video-recorded interview with a histogram of oriented gradients and support vector machine (HOG-SVM) and convolutional neural network (CNN) recognition. The model was trained to predict six competencies and reached the validation accuracy level of 83% - 85%.

Several commercially available facial hiring vendors suffer difficulties in identifying gender and racial lines of the candidates (Raghavan *et al.*, 2019). Facial recruitment vendors have suffered a lot of legal and ethical concerns which ultimately ended up in lawsuits that have made them to discontinue providing their services. The gender and racial bias have always been a concern on commercially available products and continue to be a highly monitored concern. Hire Vue and Amazon are two major organizations who had to give up on their facial recruitment technology due its short coming in terms of racial and gender biasness.

3. Tools and Technologies

Tools	Purpose
Operating System	
Mac OS version 11.1	An operating system is an essential component of a computer which manages the application software within the computer. To work with different applications needed for the development of the application a supportive OS is compulsory
Backend Development	

Flask	Flask is a python based micro web framework that is used to build applications simply. Flask provides the necessary tools, libraries, and technologies to build. Applications easing the work of developer.
Python	Python is an object-oriented language that is considered as a high-level programming language. Since python is a dynamically typed language it offers continence to the developers as well. Python is used in the machine learning and back-end building of the application (Khoirom *et al.*, 2020)
Front End Development	
React.Js	React Js is a java script based front end library used to develop attractive UI components in applications. React is an SEO friendly framework which allows to use reusable components and dynamic web applications with ease.
Libraries	
Keras	Keras is a software library that offers python interface for artificial neural networks.
Database	
Mongo DB	Mongo DB can be classified as a cross platform document-oriented database program. IT can be used as an alternative for traditional relational data bases.
Cloud	
AWS	Amazon web services is the leading cloud service provider in the industry which offers flexible payment methods for resources used.

Table 2: Tools and Technologies to be used

4. Discussion and Inferences

The proposed solution aims to provide an efficient and effective recruitment mode in the selection of sales interns. The solution consists of a progressive web application which allows the candidates to record themselves when answering pre-determined questions by the employer. Later this recorded video is analyzed, and an overall score is given to each candidate in terms of the performance of each candidate during the interview. A statistical representation of the candidate's emotional analysis will be shown to the employer.

Based on the review our main objective to aim is to build an application that provides better infrastructure to the entire interview hiring process with the help of facial emotional recognition deep learning algorithms running over the interview video. Once the interview is over, the recorded video will be analyzed with the help of FER (Facial Emotional Recognition) library, which will display the subject's displayed emotions by tracking his facial features, and it's evaluated against the questions asked.

Before the interview could be evaluated, the model used to identify the emotions are trained with available data. The FER library uses a Convolutional Neural Network, which first get trained using images with labelled data which states the emotions associated with the images. This states that the path of machine learning we are taking on is a supervised learning path. After its trained, unused data during that training phase is used to evaluate the model's validity.

Once the model is ready to capture emotion, the interview video is then sent to the model to assess how the subject performed capturing his emotional and stress levels. Once the video is sent, the model analyses video taking in only relevant frames which hence reduced the time needed to predict the emotions, hence the results are obtained in real time. The emotions captured at specific time intervals are recorded at each time intervals and the algorithm predict the most observed emotion during that time, and this is then paired up with each of the interview question, and the overall performance of the subject is obtained.

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Biographies

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