Recruitment and Selection App for Recruiter in Human Resource Management

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Abstract - The aim of this project is to reduce the workload of Recruitment Manager. This project is beneficial for work at home concept. Manager will receive a mail or message from the company for the recruitment of a candidate. He will provide these details to mobile application (Android App). This App can be made available on any smart phone like facebook (icon). Using cloud computing the data will get posted on the on various Websites like Naukari.com.

This App will receive resumes which are then forward to the company. Using this basic idea recruitment management process will go on. The TPO aspects for Campus selection are considered in this particular app. Instead of applying manually or on a website, one can download that Application on his cell phone and apply for placement. This application will be fast enough as compared to others. Secondly more enhances work at home concept. In addition to the requirement process, companies can approach to different colleges. They will provide their requirement details to recruitment manager, and then he will publish it on various college sites. Even the aptitude test papers can be sent with help of this App. After receiving the results he will notify the candidates about their selection and will also provide them with detailed schedule using this App.

Keywords

Job Recruitment App, Internal Recruiting, Recruiting Websites.

I. INTRODUCTION

The emergence of the internet as an interactive medium has been a major influence on the recruitment industry. There are now online sourcing channels of all kinds simply because online recruitment is faster, cheaper and easier than paper-based methods. E-Recruitment solutions such as Cloud-based systems support online recruitment by streamlining activities such as sourcing, processing and screening—enabling you to focus on the best applicants. Recruiter Advantage- **Simon** Bird, Director—Traction Group. With all this mobile recruiting functionality being available in the marketplace, it is time for recruiters to get into the game and start engaging with job- seekers using mobile recruiting apps. Those who adopt early may get an edge on the competition.

II. BACKGROUND OF STUDY

Sarah Jacob says,

When you leave the house there are a few things you try to not forget – keys, wallet and, these days, phone. With such a vast user-base as that of mobile phones, it made sense for employers to jump on the bandwagon to begin using mobile applications for recruiting people, and not just in IT jobs.While the natural assumption would be that the technology industry itself would be the first to get in on the app revolution for recruitment, and perhaps most specifically the software side of things rather than a database manager position, in actuality some big, non-tech brands have made their own foray into it.

McDonald's, one of the largest companies in the entire world, not only has a mobile app that lets you find your nearest restaurant and see nutrition information, it also has a careers section. The page loads an employer brand video, which highlights the benefits of working for the company, and it also lets users fill out an application or even directly email a restaurant manager about employment opportunities.

Cummins also has a very in-depth mobile app, providing detailed company information alongside news, history, facts, videos and details about its sustainability practices. In addition to that, users can search for jobs by category or location, and although it is not possible to apply for a job through the app itself like McDonald's permits, users can apply via Facebook, LinkedIn or email.

Providence Health & Services has taken the idea of an app for recruitment a step further and been more creative. With the app, users are able to leave a business card for positions that catch their eye, meaning employers can see their basic info but it doesn't take the time of filling out an entire application form, and users can share positions on social media sites. This app is somewhat unique, but could be a telling sign of what to expect in the near future.

Recruitment through mobile apps is not just limited to companies themselves. The recruitment agency Adecco has its own app that has such features as links to relevant career news articles, collated from respectable websites. This feature gives users an incentive to check the app frequently. The app also includes a YouTube feed of the company's video channel so applicants can see more about the company they're applying to work for.

QR apps are also taking the mobile world by storm. If you've ever seen a square box with black lines in it in newspapers and signs and wondered what it is, it's a QR code. Essentially, these are barcode-like tools that take you to a certain webpage when scanned. Smart phones have apps to read QR codes while others have the ability as a native function.

Employers have caught on to QR codes by placing them in newspapers, at trade fairs and on public transport. People can simply point their phone's camera at the code and be taken directly to the website, recruitment website, specific job details or the company's contact page. Some recruitment sites now even include a QR code by each job vacancies so that applicants can save the position to view later, which is quicker and easier than emailing the link to themselves.

So smart phones have become more than ways to keep in touch with contacts and social media, they have now infiltrated how we look for jobs. With so many smart phone users being app-savvy, and the placement of QR codes being so prominent that more and more people understand what they are and how they work, the move to utilise them for recruitment purposes is one that is certainly here to stay.

A. How is a recruitment app one hand up from online recruiting websites?
- Seekers have the flexibility to search for openings anytime, anywhere
- They get a chance to quickly react to new openings, and don't have to wait to reach home to switch on their computers
- Unhappy employees find it to be a very discreet way to search for a new job
- Seekers get instant updates and alerts regarding new openings
- Various job apps offer 'save search within app', if users want to get back to their options later
- You can check reviews and ratings on the go, before you hit the 'send' button
- You can bookmark jobs and recruiters, letting you get back to them after a while
- Seekers get push notifications for the latest openings tailored to their interests
- Mobile apps keep you on top of all major job openings in the industry

Most recruitment app users are young people – college grads, job seekers from finance, health care, tech backgrounds and more. As a result of this trend, mobile accessibility by employers and recruiters is likely to increase tremendously.

B. How important is it for an Online Job Portal to have a Mobile App?

Many job recruitment apps have seen considerable traffic growth. A recent survey suggested 40% of seekers using mobile devices are expected to abandon an application process if an employer's website is not mobile-friendly. Mobile devices are handy and are more appropriate when it comes to targeting seekers, saving time and resources which could be otherwise utilized optimally.When people get

listings on the go, they are on top of what kind of jobs are being offered in the industry. Also, recruiters get to attract the best talent by targeting them on mobile devices, as opportunities aren't missed when you get posted about them almost instantly. Talent managers and top notch head hunters believe that mobile job apps are time savers compared to manual online searches.

User-Unfriendliness of Mobile Job Apps:
Out of all the mobile job apps, not many are user friendly, but they can still be utilized for search and bookmarking, to refer to them later from a computer.

Another drawback of mobile job apps is the hurry that seekers tend to be in to apply for jobs listed. They may not read through the job descriptions properly and tend to rush in their resumes without tweaking them to match the opening.

Job Recruitment Apps to Check Out:
Beknown, Beyond, Careerbuilder, Indeed, JobServe, LinkedIn, LinkUp, Proven, Monster, TweetMyJobs, Real Time Jobs, Craigster, JobFrenzy, JobCompass, and NowHiring are some examples of free and paid recruitment apps already running successfully in the industry. These vary for iOS & Android and have different functionalities in terms of job application process.

Change is ever-present in today's world of recruitment. First, it was the paperless office, then it was Internet jobs boards, and, just as we got used to that, along came social recruitment. And, while many of us are still catching our breath with social media recruitment, along comes the next big transformational event in recruiting: Mobile Recruitment. And, just in case any of you think that*Mobile Recruiting* it isn't officially 'here', you should be aware that in September last year in San Francisco, there occurred the first annual mobile recruiting conference of its kind, sponsored and attended by all the major players, including the big two of Monster and Careerbuilder. Big players are thinking that mobile is, well… big.

Surprisingly, even though mobile recruiting is officially 'here' and that nearly 70% of jobseekers would like to use their phone for career related purposes, only 3% of employers have a mobile job app. With demand for mobile recruiting being so high and supply being so low, we feel this is a great time to introduce recruiters to the world of mobile recruiting.

C. HR Management Process For Recruitment
When HR planning indicates the need for additional labor, organizations have a number of choices to make. This may be the first step in a full-scale recruitment and selection process, but sometimes hiring additional employees is not the best method to obtain additional labor. It may be appropriate for an organization to consider alternatives to recruiting, such as outsourcing or contingent labor, instead of hiring regular employees. If this is a temporary fluctuation in work volume, the simplest solution may be part-time labor or overtime by existing employees. The costs of recruitment and selection can be staggering; hiring new employees should occur only after careful consideration and only when the organization anticipates a long-term need for additional labor. Estimates on the cost to

replace supervisory, technical and management employees run from 50 percent to several hundred percent of employee. Salaries.1Careful HR planning must consider the overall growth prospects of the organization and accurate forecasting of future labor needs. Recruitment planning begins only when other alternatives have been considered and eliminated.

Recruitment:

The process of attracting individuals on a timely basis, in sufficient numbers and with appropriate qualifications is called Recruitment.

Internal Environment:

Promotion from within your organization's promotion policy will have a significant effect on the recruitment process. If the open position is above entry level, it may be appropriate to promote someone already working for the organization. Many organizations use promotion from within as a motivation tool and a reward for good work or longevity with the organization. When employees see their co-workers being promoted, they become more aware of their own career opportunities. Promotion may be especially important in a stagnant economy where people have little chance of improving their lot by changing organizations. Their only opportunity for career growth and increased income is to move up within their current organization. The problem with promotion from within is that the promoted person leaves a staffing gap in his or her 2 © 2008 Society for Human Resource Management. Myrna gusdorf, MBA, SPHR ormer position, so there is still a position to be filled. However, that gap is likely to

be at a lower, less-skilled position, and therefore it may be an easier position to fill.

The advantage of promotion from within is that your promoted employee is already comfortable with the corporate culture, knows organization policies and will likely get up to speed much faster than a person new to the organization. The disadvantage of promotion from within is that the organization loses out on the chance for new ideas and the creativity that can come from a new person entering the organization for the first time. Clearly, there are pros and cons to both promotions from within and outside hiring. It's not that one way is right and the other is wrong—it simply depends on organizational policy, the type of job being filled and its level within the organization. Higher-level jobs are more likely to be filled by promotion than are lower-level jobs.

External Environment:

Labor Market Conditions

The strength of the economy and labor market conditions will significantly affect your organization's ability to attract and retain top-level employees. When the economy is strong, with little unemployment, your organization may have to compete with other employers for a limited number of skilled employees. This may require increased compensation or benefits incentives to attract quality applicants.

The reverse may be true in a soft economy, with high levels of unemployment.

The problem then is not a shortage of qualified applicants; instead, the problem is managing the huge number of applications that must be pared down to find a few good hires. Local labor market conditions strongly affect no managerial and supervisory positions, and depending on your industry, global considerations may affect your labor market for professional and technical applicants

Legal Issues:

Job Posting

The procedure to inform employees that job openings exist.3

The traditional method to announce a job opening was to post notice of the job on the HR bulletin board; no doubt this is the origin of the term job posting. Today, many organizations post jobs electronically through organization-wide intranets or send e-mails to all employees about the job vacancy. Other employers publish employment newsletters or distribute job announcement flyers. Whatever the method used, the job announcement should include information about the position, the required qualifications and instructions on how to apply. It is important that the job announcement is made available to all employees. Adequate job posting can ensure that minority workers and other disadvantage groups are aware of opportunities within the organization. The downside to job positing is employee cynicism that occurs when jobs are posted as open, but in reality, the organization has already selected a strong internal candidate. Such practices create resentment and mistrust among employees when they believe the job posting is just a formality with little real opportunity for advancement.

Applicant pools can be generated in a number of ways. Depending on your organization's policies and the size of your hiring budget, you may want to use an employment agency. Private agencies and executive search firms are usually used for recruiting white-collar employees, but they can be used for virtually any type of position. Using job criteria provided by your organization, an agency will generate the applicant pool and do the preliminary interviews, thereby screening out unqualified candidates and sending you only those who are actually qualified. This can save a great deal of time; however, private agency fees can be costly because they are often a percentage of the position's annual salary. This can be a significant expense, particularly when filling executive-level positions. If you register your job opening with your state employment office, it may send you similarly qualified referrals at no charge. Depending on the nature of the position, you may also get some unsolicited walk-in applicants, but these still may not generate a large enough applicant pool without further recruitment efforts.

Large organizations often hire in-house recruiters whose sole focus is to generate qualified candidates for open positions. Recruiters are generally used in high-tech industries and focus their efforts on technical schools, community colleges and universities. Since in-house recruiters are employees of the organization, applicants generally base their perception of the organization on their interaction with the internal recruiter. Therefore, recruiters must be made aware of the image they present during the screening interview; it can significantly influence the applicant's attitude toward the organization.

You may choose to advertise the open position in local newspapers, trade journals, radio and television. Advertising can range from a simple help wanted ad in the classifieds to an extensive multimedia campaign. Help wanted ads often include a URL for online applications well as more traditional methods for reply. Some organizations have eliminated traditional methods altogether and accept only online applications. Historically, local newspaper advertising was the common recruitment method, particularly for entry-level positions, because it was low cost and could generate a good number of applicants. If the job you are hiring for requires technical skills not commonly found in your local labor force, you will have to broaden your search geographically by advertising in other areas or working with employment specialists outside of your local area. In general, the more technically specific the job, the wider the geographic recruitment area. Some positions lend themselves well to internships. An internship is an arrangement in which a student is placed temporarily in a position with no obligation by either the student or the organization to make the position permanent. The internship may be a summer or a part-time job while the student is in school, enabling the student to learn the organization and try out the job before settling into a career. It also enables the organization to try out a possible future employee before making a job offer.

Internal Recruiting:

The most significant change in recruiting practices has been the rise in the use of online recruiting. Many organizations post job openings on their web sites or on specialized sites like Career Builder and Monster.com, and some accept only online applications, completely eliminating the hard-copy application. There are advantages to online recruiting. First, it costs less than traditional advertising. It's easy and quick to post an ad; responses arrive faster and in greater quantity; and a wider range of applicants can be generated. Online processes can also screen applications and administer some selection tests, thereby significantly reducing the HR time required to generate a pool of qualified candidates. The online format is immensely popular with job seekers as well because the ease of submission allows them to send out dozens of résumés with just a few mouse clicks. This can create a problem for HR, however. There must be processes in place to filter out those who do not meet minimum job qualifications. The ease of applying for a job online can generate a great number of applications, requiring HR staff to spend time sorting through applications to glean out the few that are actually qualified for the job.

There are as many different methods of recruiting as there are organizations, and there is no one best method for recruiting job applicants. Most organizations use a variety of methods, depending on the nature of the job to be filled, the time needed to properly fill the position and the size of their recruiting budget. Your organization may already have a valid track record for recruiting that will determine what methods work best for your situation.

III. CLOUD DATABASE

The database for the purpose is cloud database. Since cloud gives the multiple amounts of data storage and retrieval super fast.A **cloud database** is a database that typically runs on a cloud computing platform, such as Amazon EC2, GoGrid and Rackspace. There are two common deployment models: users can run databases on the cloud independently, using a virtual machine image, or they can purchase access to a database service, maintained by a cloud database provider. Of the databases available on the cloud, some are SQL-based and some use a NoSQL data model.
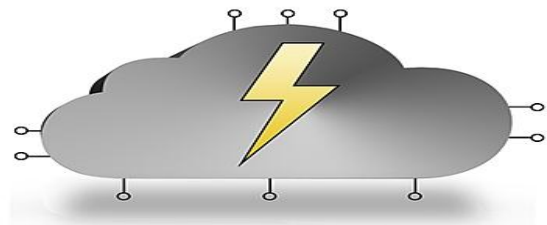

Fig1. Cloud database model

There are two primary methods to run a database on the cloud:

Virtual machine Image – cloud platforms allow users to purchase virtual machine instances for a limited time. It is possible to run a database on these virtual machines. Users can either upload their own machine image with a database installed on it, or use ready-made machine images that already include an optimized installation of a database. For example, Oracle provides a ready-made machine image with an installation of Oracle Database 11g Enterprise Edition on Amazon EC2.

Database as a service – some cloud platforms offer options for using a database as a service, without physically launching a virtual machine instance for the database. In this configuration, application owners do not have to install and maintain the database on their own. Instead, the database service provider takes responsibility for installing and maintaining the database, and application owners pay according to their usage. For example, Amazon Web Services provides three database services as part of its cloud offering, SimpleDB, a NoSQL key-value store,Amazon Relational Database Service, an SQL-based database service with a MySQL interface, and DynamoDB.

A third option is managed database hosting on the cloud, where the database is not offered as a service, but the cloud provider hosts the database and manages it on the application owner's behalf. For example, cloud provider Rackspace offers managed hosting for MySQL databases.

IV. DATA MODEL

SQL database, such as NuoDB, Oracle Database, Microsoft SQL Server, and MySQL, are one type of database which can be run on the cloud (either as a Virtual Machine Image or as a service, depending on the vendor). SQL databases are difficult to scale, meaning they are not natively suited to a cloud environment, although cloud database services based on SQL are attempting to address this challenge.

V. ALGORITHM

For large databases sorting we going to use ID3 algorithm. In decision tree learning, **ID3** (**Iterative Dichotomiser 3**) is an algorithm invented by Ross Quinlan used to generate a decision tree from a dataset. ID3 is the precursor to the C4.5 algorithm, and is typically used in the machine learning and natural language processing domains.

The ID3 algorithm begins with the original set S as the root node. On each iteration of the algorithm, it iterates through every unused attribute of the set S and calculates the entropy $H(S)$ (or information gain $IG(A)$) of that attribute. Then selects the attribute which has the smallest entropy (or largest information gain) value. The set S is then split by the selected attribute (e.g. age < 50, 50 <= age < 100, age >= 100) to produce subsets of the data. The algorithm continues to recurse on each subset, considering only attributes never selected before. Recursion on a subset may stop in one of these cases:

- every element in the subset belongs to the same class (+ or -), then the node is turned into a leaf and labeled with the class of the examples
- there are no more attributes to be selected, but the examples still do not belong to the same class (some are + and some are -), then the node is turned into a leaf and labeled with the most common class of the examples in the subset
- there are no examples in the subset, this happens when no example in the parent set was found to be matching a specific value of the selected attribute, for example if there was no example with age >= 100. Then a leaf is created, and labeled with the most common class of the examples in the parent set.

Throughout the algorithm, the decision tree is constructed with each non-terminal node representing the selected attribute on which the data was split, and terminal nodes representing the class label of the final subset of this branch.

Summary

1. Calculate the entropy of every attribute using the data set S
2. Split the set S into subsets using the attribute for which entropy is minimum (or, equivalently, information gain is maximum)
3. Make a decision tree node containing that attribute
4. Recurse on subsets using remaining attributes.

A. Entropy

Entropy $H(S)$ is a measure of the amount of uncertainty in the (data) set S (i.e. entropy characterizes the (data) set S).

$$H(S) = -\sum_{x \in X} p(x) \log_2 p(x)$$

Where,

S - The current (data) set for which entropy is being calculated (changes every iteration of the ID3 algorithm)

X - Set of classes in S

$p(x)$ - The proportion of the number of elements in class x to the number of elements in set S When $H(S) = 0$, the set S is perfectly classified (i.e. all elements in S are of the same class).

In ID3, entropy is calculated for each remaining attribute. The attribute with the smallest entropy is used to split the set S on this iteration. The higher the entropy, the higher the potential to improve the classification here.

B. Information Gain

Information gain $IG(A)$ is the measure of the difference in entropy from before to after the set S is split on an attribute A. In other words, how much uncertainty in S was reduced after spliting set S on attribute A.

$$IG(A) = H(S) - \sum_{t \in T} p(t) H(t)$$

Where,

$H(S)$ - Entropy of set S

T - The subsets created from splitting set S by attribute A such that $S = \bigcup_{t \in T} t$

$p(t)$ - The proportion of the number of elements in t to the number of elements in set S

$H(t)$ - Entropy of subset t

In ID3, information gain can be calculated (instead of entropy) for each remaining attribute. The attribute with the largest information gain is used to split the set S on this iteration.

VI. BENEFITS

The features, functions and major benefits of the recruitment management system are explained below:

- Structure and systematically organize the entire recruitment processes.
- Recruitment management system facilitates faster, unbiased, accurate and reliable processing of applications from various applications.
- Recruitment management system helps to incorporate and integrate the various links like the application system on the official website of the company, the unsolicited applications, outsourcing recruitment, the final decision making to the main recruitment process.
- Recruitment management system is flexible, automated and interactive interface between the online recruitment department of the company and the job seeker.
- Offers tolls and support to enhance productivity, solutions and optimizing the recruitment processes to ensure improved ROI.

10 reasons to have your own mobile app:

- Mobile internet is the future, also in recruitment.
- Enhance the employer brand of a modern and innovative employer.
- Give extra exposure jobs. People are using mobile devices to search for jobs.
- Fast growing market with huge potential.
- Attracte and engage more (passive) job seekers.

- Great gift to candidates.
- Easy free downloads via your career site.
- All information is easily accessible with one touch.
- Integration of social platforms like Twitter, Flickr and YouTube.

No additional manual action required by automatically generated information transfer.

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