

USING ANALYTICS AND SOCIAL NETWORK FOR UNIVERSITY RECRUITMENT IN MADHYA PRADESH

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ABSTRACT

Modern university communication methods mostly rely on social media to deliver content straight to the intended audience, guaranteeing a huge audience at a reasonable price. Institutions are unable to identify the unique learning needs and interests of prospective students and offer them specific suggestions on the academic courses they should take. As a result, colleges use social media to promote all of their academic programs (e.g. engineering, management, commerce, and economics). while also building global communities.

In order to direct their attention to educational programs social media can help researchers recruit hard-to-reach, marginalized communities for their studies. Three State Private Universities (VIT Bhopal University, LNCT, and Symbiosis, Indore) talk about how they used big data analytics to find possible rivals on social media in this study.

Using an automatic analysis method developed for use with texts from social network profiles (management, commerce, engineering, economics, etc.), we may identify participants' interests in any topic area.

The suggested strategy can enhance the efficiency of university marketing communications on social media, regarding educational programs to users' interests, future applicants' satisfaction with the university.

Keywords: social media, social network sites, personnel recruitment & selection, Kruskal – Wallis multivariate analysis, psycho-diagnostic / linguistic analysis

INTRODUCTION

Communication techniques have changed dramatically because of social media tools and networking websites, both informally and increasingly professionally. The use of an online platform or website (a social networking site) that allows people to communicate, usually for a social purpose, through a variety of services, the majority of which are web-based and offer opportunities for people to interact over the internet, such as via e-mail and "instant messaging," is known as social media communication (a form of real-time, direct text-based communication between two or more people using personal computers or other devices).

Social media are "a series of Internet-based applications that build on the theoretical and technological foundations of Web 2.0*, and that enables the creation and exchange of user-generated content," according to Kaplan and Haenlein (2010).

In 1999, the phrase "Web 2.0" was created to refer to websites that go beyond the static pages of older websites. In contrast to websites where users are restricted to the passive viewing of material, Web 2.0 sites enable users to interact and cooperate with each other in a social media discourse as the creators of user-generated content in a virtual community.

For employers, using social media as a recruitment tool presents both potential and difficulties. Social media may speed up the hiring process, make it more efficient, and enable employers to target and hire highly suitable applicants. Since some data (at the personal as well as the professional level) may not be generated for the purpose of recruitment, admissions, and therefore may provide honest supplemental information on the applicant, it can be a useful additional source of information on potential job candidates or the aspirants (entrants) in universities. It might provide candidates with a variety of sources of information about the company and the opportunity to get in touch with current workers to get a more accurate job preview. There are, however, a few things to take into account.

There are two goals that cannot be easily and effectively solved if a university uses social networks for recruiting. Selecting applicants who have a strong interest in a certain subject and are motivated to learn is the first task. Tools used frequently on social networks to segment audiences rely on social, demographic, and geographic information. The user profile information – subscriptions to relevant groups and pages, timeline postings, connection networks, etc. – could be used to fill in the gaps in these data in order to better describe participants' needs and interests in education. Politics and marketing already employ strategies for analyzing and interpreting user data to build effective information impact. These methods are based on psychodiagnostics and

linguistic analysis (a branch of psychology concerned with the use of tests in the evaluation of personality and the determination of factors underlying human behavior.) N. Mangal, et al., 2016, M. Kosinski, et al., 2014, H. A. Schwartz, et al., 2013, and D. Markovik, et al.

The changing function of social media and its growing impact on the recruitment and selection process are the topics we then examine. A variety of potential ethical, legal, and moral conundrums are emerging in the human resource management (HRM) industry as a result of access to social media platforms like Twitter, Facebook, and LinkedIn as profiling tools both inside and outside the workplace.

The second recruitment responsibility for universities is to persuade applicants to choose a particular institution and specialty in the face of competition at the on-campus, regional, national, and international levels. All institutions today are trying to connect with students on social media, but only some of them are successful. The use of mass communications rather than personified ones, the publication of advertising content without adapting it to youth culture, the use of conventional marketing techniques that are ineffective in network communities, the incorrect positioning as a result of misinterpretation of applicant selection criteria on behalf of a university and a specialty, and other factors all contribute to the poor effectiveness of university marketing communications in social networks. The number of students drawn to a higher education institution is directly correlated with the university's effectiveness on social media, according to research projects on improving the efficiency of entrants' recruiting (R. Rutter et al., 2016; A. Fagerstrm, G. Ghinea, 2013).

This small-scale research project sought to provide answers to the following research questions against the backdrop of these challenges, which examined the broad implications of social media for employment relations:

- What steps in the recruitment and selection process for admission to different courses do universities employ social media platforms at, and how and why? What equipment do they select, and why?
- What do they think the costs and advantages of utilizing social media for hiring and admissions are?
- What are the advantages and disadvantages, if any, of a university or its affiliate using social media for recruitment, particularly in connection to privacy violations and admission laws relating to admission discrimination?
- How do universities manage legal and reputational risks? What procedures and techniques are employed?
 - How would this study affect the recommendations made to vice chancellors, registrars, stakeholders, or other university representative bodies/-ies about the use of social media for admissions?

Utilizing social networking sites for recruitment the creation of web-based profiles on social networking sites (SNSs) expressly enables users to engage in social media tool-based communication. These networks were primarily intended for socializing with friends and family, but they have since developed into a crucial professional tool, especially in the recruitment industry. In this case, they have two main functions. First, SNSs can be used as a tool for marketing; both job searchers and potential employers can utilize them for this purpose. The three case study organizations used in our research acknowledge this. The second is as a screening mechanism. Employers can use information from SNSs to quickly and affordably acquire a more comprehensive picture of a possible employee than what is available through conventional recruitment approaches. The potential of SNSs as a recruitment tool is evidenced by their recent expansion. This also brings up some issues, though, which need to be addressed. The reliability of the information on SNSs, its accessibility to the entire applicant pool, privacy concerns, the relative costs and advantages, and the consequences of the wider variety of information they provide on promises to equity and diversity in the admissions process are a few of these. These websites "may be useful 'friends', but also have the potential to be dangerous 'foes' if utilized improperly," as Davison, Maraist, and Bing (2011) note.

Purpose of Research:

In order to identify upper-form students who are interested in a particular science field among social network users, segment the audience according to educational programs, rank participants based on the extent of their expressed interest, and hire those individuals into the relevant departments, research is being conducted.

Objective of the Study:

To confirm using the participant's information that they are accessible in a social network for a certain course of interest and specialty.

To achieve this, the researcher proposed the following hypothesis: "Social networks assist a specific department in identifying potential applicants."

Examples of Social Networking Sites (SNS) and Tools

Blog – a conversation or instructional website that is published online and has articles (or "posts") that are often shown in reverse chronological order, meaning that the most recent post is presented first. Before 2009, blogs were typically the creation of a single person, occasionally a small group, and frequently covered a particular topic. More lately, "multi-author blogs" with content produced by several different authors and professionally edited have emerged. Regular entries of opinion and event descriptions make up blogs (blogging). Simply put, the size of a microblog's material is smaller.

Facebook – a social networking website that lets users build individual profiles, add friends, and send and receive messages. Users also receive automated updates when

their own profiles are updated. Additionally, individuals can sign up for user groups with similar interests that are categorized by similar traits (e.g. workplace). Through the website, users can communicate instantly.

Google – a multinational company based in the United States that specializes in Internet-related services. Its most well-known product is its core search engine, but it also offers a wide range of other goods, including Google+, the second-largest social networking site in the world (as of January 2013).

LinkedIn – a social networking platform specifically for business networking. Users save a list of the contact information of individuals with whom they have some kind of relationship, known as connections. Following various businesses, finding jobs, people, and business prospects may all be done with this list of connections.

My Space – a collection of user profiles on the internet. Typically, these contain images, details about the individual's interests, and blogs. Users communicate with one another through messaging and social interaction on My Space.

Podcast – an assortment of audio, video, PDF, other electronic data that can be subscribed to, downloaded, or streamed online to a computer or mobile device.

Twitter – a well-known microblogging site that lets users send and read tweets, or messages that are visible to the public. Tweets are text-based updates with a character limit of 140 that are displayed on a user's profile page. The tweets of other users can be subscribed to.

YouTube – a website where users can upload, share, and view movies that is owned by Google. It features a wide range of user-generated video material, such as amateur video blogging, TV and movie clips, and more. The BBC and other media organizations also make some of their content available on the website. Most videos allow viewers to post and reply to comments. A growing number of businesses are using YouTube to tell prospective employees about their business and open positions.

Wikipedia – a crowdsourced, web-based encyclopedia project; its 18 million articles were created by volunteers from all over the world; practically every item is open to visitor editing. a well-known web 2.0 site, although not specifically a social networking site.

Yahoo – an American multinational internet company well-known for its social networking services and user-generated content, such as online message boards (Yahoo! Groups), a community-driven Q&A website (Yahoo! Answers), and photo sharing (Flickr).

Source: Adapted from Workplaces and social networking, Broughton et al. (2011).

2. LITERATURE REVIEW

Rutter, Richard & Roper, 2016, in his analysis of the effects of this activity, particularly social media interaction and social media validation, on student recruitment, he provided evidence from research into branding activities related to social media. The findings show a beneficial impact of social media use on performance, particularly when a company or organization gains a lot of Facebook Likes and Twitter Followers. When universities use social media interactively, a particularly strong and positive effect is produced.

Holland, P. and Jeske, D. (2017), highlights the most important issues for HR academics and professionals in the field of recruitment and selection related to the evolving role of social media in the workplace, as well as how it indirectly affects a number of other HR practices, such as applicant data mining, which shows a lack of moral, ethical, and legal frameworks.

Yioula Melanthiou (2015), aimed to identify if companies use social media during their recruitment processes to attract and screen applicants. Three critical elements guided the research: the use of social media to attract and screen applicants; the legal implication of e-recruitment and social network screening; and the possibility of using e-recruitment as the main hiring strategy.

Md. Sajjad Hosain (2021), on the basis of most of the previous studies, the utilization of SM information for various HRM practices is rising although such utilization is mostly limited to talent search and recruitment & selection at present. Further, it was found that Facebook and LinkedIn are the two most accepted sites among the hiring professionals

N. Mangal, et al (2016) quoted that Analysis of tweets would help in designing smart recommendation systems. He proposed an approach that combines both sentiment analysis and classification thus, he could be able to extract the topic in which users are interested.

A. Feshchenko, et al. (2016), understood that due to the globalization of education, top universities are constantly looking for innovative methods to attract bright, talented young people from both their own country and abroad. A focused informational influence on a specific audience with specific features is required because university resources are constrained in terms of coverage and attracting applicants. The author also stated that these social networks are a source of open data that can be used to define potential applicants with a list of the necessary characteristics in accordance with the university applicant model. These data interpretation and analysis allow universities to

identify promising applicants in any country or region and establish direct communication with them via social media without a mediator.

3. METHODOLOGY

This research has attempted to answer these questions by means of a literature review and taking forward the studies to following three universities that have used social media for the purposes of recruitment. These organizations are:

- a. VIT Bhopal University, Sehore
- b. Symbiosis University of Applied Sciences, Indore
- c. LNCT University, Bhopal

Head of the departments/ Program Chairs of Engineering, Humanity, Management & Commerce, Economics were contacted apart from administrators, e.g. Registrars, Dean of student welfare, Career Development Council (CDC), PAT Cell (Placement and training Cell), T&P cell (Training & placement cell).

Six thousand (6000) randomly selected communities (sample) from each of the three towns (Indore, Sehore, and Bhopal) were analyzed for their thematic content as part of the project. As far as we are concerned, the interest of high school students in one or another subject field is connected to the probability of entering a particular university faculty. A user's interests in social networks are presented via the texts published on his/ her profile timeline and participation in groups. Analyzing these texts and groups, to our mind, we are able to define the research areas this user is inclined to (linguistic analysis- examines language, speech units in terms of their component elements, function, and other characteristics; morphological phenomena, nearly similar to textual analysis). Then we can divide possible entrants according to their interest into three groups (Humanities, Engineering, Management & Commerce and Economics) and differentiate users in every group according to the extent of their interest.

Tools Used: To pursue this research study content analysis has been performed, which suggests the analysis of relationships involving those values assigned to communication symbols, to further describe the communication, draw inferences about its meaning, or infer from the communication to its context. D. Riffe, et.al. 2005, 2015). By counting relevant textual units (in our case, these are separate subject-related words) we plan to discover the interest of a particular user – a potential entrant – towards a particular area of knowledge. In addition to content analysis a statistical method Kruskal-Wallis (alternate to one-way analysis of variance) has been used (determines whether there are statistically significant differences between two or more groups of an independent variable (to be recruited aspirants) on a continuous or ordinal dependent variable. It is a rank-based nonparametric test- when population is uncertain, i.e. data is not distributed normally).

The basic tool for mining data from social networks is Application programming interface (API). It enables getting public data including the fields in a user profile (name, surname, city, country, gender, education, interests, favorite books and so on), content of a user personal page (timeline) and list of favorite groups and pages.

4. DISCUSSION & OUTCOME

We have tested the hypothesis that a user's interests may be defined via analyzing the text derived from a timeline in social networks of private university students. University recruitment campaign starts in June, 2017 and finishes in September, that is why I cannot check the methods on real entrants up to now. At the current stage of the research, we have four university students' profiles that have been selected from those of each social networking site of all four universities under study (with due request from officials) social network and those texts that had been published on the timeline before they entered the university. Small texts, e.g. 20 kilobytes and less out of the sample. Overall, we have 443 texts which is nearly 13% of the original sample.

As a result of content analysis of topical communities four vocabulary 400-word markers each have been completed. These vocabularies define what topic a particular text is: humanitarian or non-humanitarian. We have compared the texts from the student's timeline with this vocabulary and found that the humanitarian topic of the texts on a user's timeline correlates with choosing a humanitarian faculty to study at (A. Feshchenko, 2017). But this hypothesis has not been proved for non-humanitarian students. The second analysis of texts derived from the social networks' profiles demonstrated a highly-precise definition of entrants for Humanities and not so precise definition for other fields, especially management & Commerce and Economics. Checking non-Humanities entrants (Engineering, Economics and Management & Commerce) profiles manually we paid attention to high frequency of words from the Humanities vocabulary.

To improve the methods of tests classification a statistical analysis of Kruskal – Wallis multivariate analysis has been performed. A set of statistically defined significant words have been defined and have been treated as markers after field specific classification of the texts from users' timeline. This led to a significant decrease of lexical units (a single word, a part of a word, or a chain of words that forms the basic elements of a language's vocabulary) in vocabularies and increase in the precision (linear regression 67%) of Engineering and management & Commerce entrants.

The method of linguistic analysis (is to understand the content of the text. Statistical methods are used to find the most probable meaning of the text) of the wall content in relation to an entrant's educational interests should go along with the analysis of thematic communities this entrant participates. Entering a community and subscribing to a page in social networks may characterize an entrant's interests. If we choose topics that are relevant to education and cognition out of the entrant's interest spectrum, we

might achieve a higher precision of the entrants’ classification according to their subject fields.

The study covers the analysis of the thematic content of the communities of six thousand (6000) in equal numbers from each town (Indore, Sehore, and Bhopal). We have downloaded and generalized the entrants profile data that is connected to the communities they participate in. Out of the overall number of the communities we have chosen 1010 that have been mentioned in the profiles of 15 users. The topics of the communities have been defined through the manual expert assessment. As a result, we have made up a classifier of communities and defined a share of every rubric in the total number of communities (A. Feshchenko,et.al.2013).

The classifier test applied to 933 private university students showed that 74% of them are followed to communities and pages the topic of which may be connected with a certain subject field: 432 Engineering students, 111 Economics and 238 Management students, and 152 - Commerce students. 69% engineering students do not have any following to Management and Commerce or Economics communities, 14% of them have much more following to Management content than any other. Therefore, the precision of defining people interested in Management with the help of the classifier is 83%. Only 17% of all Engineering students have been mistakenly defined as non-engineering ones. Out of all Management & Commerce students only 13% are subscribed to the corresponding theme, 8% are followed to mix content pages where such topics as Management & Commerce prevail, and 73% are followed to Engineering topics. Only 9% of Economics have any subscriptions related to their study (Table 1).

Table 1. Testing the topics of student’s subscriptions with the classifier.

| | Following up content | | |
|-----------------------|----------------------|----------------|--------------|
| | Pure & Relevant | Mix & Relevant | Not relevant |
| Engineering | 69% | 14% | 17% |
| Management & Commerce | 19% | 8% | 73% |
| Economics | 9% | 0% | 91% |

Inaccurate definition of interests in management, commerce and economics could be explained with limited selection of communities to draw up the classifier. From 900 analyzed communities’ 338 ones conform to engineering, 33 - to management and commerce and only seven - to economics. To enlarge the qualifier, the communities’ sample was increased to 25 000 by expanding the investigated group of potential entrants of the whole Bhopal, Indore & Sehore area. (150 000 people). 1300 communities were connected with school subjects, 63% of them - with humanitarian sciences, 18% - with management and commerce, 9% - with economics. The new qualifier has not been

tested by the Madhya Pradesh university students yet, but we suppose that identification of students' educational interests will be more accurate. Only engineering is now established as having the potential to reveal subject interest through topical communities. Our research finds people having only interest in Engineering can be precisely identified by using the methods of text analysis in user profiles as well as in groups and on pages that they follow up. These methods applied to profiles of potential entrants of 2021-22 allow to determine relative frequency of mentioning linguistic markers in profile wall texts and absolute quantity values of following for content related to the Engineering. Researchers assume these data allow to rank all users according to extent of interest and to narrow target audience during engaging entrants in social networks. Study will be able to estimate outcomes of this approach after enrolment campaign in August to October, 2021. The following results are expected: expansion of entrants' location, increase of enrolment competition for the educational programs in Engineering, expanding share of first-year students who have learned about the university through social networks, reduction of expels from the university and improvement of academic performance in the first year of study.

One of the important tasks of the project on development and support of university recruiting campaigns in social networks is to search for the effective methods of influencing entrants choosing their future university.

One of the factors to solve this task is that recruiting companies should exactly perceive the criteria of entrants' choice among higher education institutions and post the information in social networks according to these criteria. We carried out the analysis of advertising campaigns of some Madhya Pradesh Pvt. universities and defined key subjects that they use in social networks for engaging entrants. These data were checked and enriched with the questioning of 347 entrants from different cities in Madhya Pradesh (Table 2).

Information needs of entrants were compared with actual content of the said private university's page in a social network and it showed divergence of supply and demand. The checklist with key subjects for entrants received as a questioning result can be used during crafting the content plan for official university pages in social networks. Relative popularity values of subjects by target audience can be transferred to absolute values in the number of posts. The statistics of popular subjects and quantitative values of posts that are proportional to the statistics by planning 80 posts per month (three posts a day) is presented in table 2.

Table 2. Results of the interviews conducted with university applicants in Madhya Pradesh's Bhopal, Sehore, and Indore (August, 2022)

| Required information for choosing a university | Share of the respondents information when choosing a university | Number of respondents |
|--|--|-----------------------|
| Information about the department | 92% | 10 |
| Life hacks for university entrants | 75% | 5 |
| Student's stories. A sight from the inside. How is the learning process organized? Reviews | 76% | 4 |
| Information about instructors | 44% | 4 |
| Photos of the university and its dormitories | 52% | 4 |
| News about entertaining events | 55% | 4 |
| Official news | 33% | 3 |
| Information about vacant places to study for free | 29% | 2 |
| News about research results | 27% | 2 |
| Infrastructure | 32% | 3 |
| Passing threshold, enrolment competition | 27% | 2 |
| Employability | 19% | 2 |
| Future profession specialty | 17% | 1 |
| Ranking and the status of the higher educational institutions | 15% | 1 |

| | | |
|---|-----|---|
| Tuition fee | 17% | 1 |
| Quality of the education | 14% | 1 |
| Traineeships abroad | 9% | 1 |
| Specialty | 6% | 1 |
| Location | 5% | 1 |
| Required documents and the algorithm of filing them | 2% | 1 |
| Scholarship programs | 3% | 1 |
| Opportunities for entering volunteer organizations on the university basis | 3% | 1 |
| License and accreditation | 3% | 1 |
| Information about creative entrance exams | 1% | 1 |
| Conditions for being offered with a place in the dormitory for the period of taking exams | 1% | 1 |
| Doors Open Day | 1% | 1 |
| Information about possible future salary after graduation from the department | 2% | 1 |

The next factor influencing recruiting success is connected with adaptation of advertising campaigns under cultural features of the young generation and under style specifics of social network content. To inform the target audience universities mainly use explicit advertising text content. At the same time entrants' information needs are related to various representation formats (text, photo, video, audio, surveys, references, discussions) and to various genres (advertising, useful and fun information). Therefore, it is very important to meet these expectations when planning the content of

pages/communities for entrants. The tentative plan of 80 posts for a month considering the variety of genres and formats is presented in table 3.

Table 3. Posting schedule for the entry community.

| | | Genres | | | |
|---------|-----------|-------------|--------|-----|-------|
| | | Advertising | Useful | Fun | Total |
| Formats | Text | 6 | 6 | 4 | 16 |
| | Photo | 4 | 4 | 2 | 10 |
| | Video | 2 | 1 | 1 | 4 |
| | Audio | 1 | 1 | 0 | 2 |
| | Survey | 2 | 1 | 1 | 4 |
| | Reference | 4 | 3 | 3 | 10 |
| | Total | 19 | 16 | 11 | 46 |

So three options - high-demand subjects (Table 2), formats, and genres (Table 3) - are to be considered during scheduling the posts.

The next factor of successful recruiting is individualization of communications with entrants when inviting them to visit the landing page. In social media marketing the automated targeted advertising is common that is marked with the low conversion level caused by direct advertising influence and depersonalized handling. Personal invitations are more effective, while communication is established between two subjects, the name of the targeted person is mentioned and the netiquette rules are observed. This approach demands more manual actions and seems to be more expensive. At these private universities the students are actively involved in the process as volunteers, at the same time financial expenses are almost excluded.

5. CONCLUSIONS

The performed analysis of data about students received in social networks allows to find out correlation between the content of texts from user profiles and the list of following. It partially confirms a hypothesis that it is possible to define educational interests according to the user data in social networks. The data analysis methods used in the research confirm a hypothesis only for students in Engineering. Further in the research we attempt to find the reasons of lack of similar correlations for students in management and commerce and Economics. A logical further step for identification potential entrants in social networks is their informing and recruiting. Researcher expects the offered approach allows these universities to reduce marketing costs as well as to expand geographical coverage, to increase the number of entrants, to enhance enrolment competition.

All things considered, the presented recruiting method can be implemented for promotion of other educational products, for example, massive open online courses or postgraduate educational programs, if possible to them.

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