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CMSE11427 Web and Social Network Analytics

Individual coursework

Optimizing Digital Strategies: Insights from Web and Social Analytics

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# **Optimizing Digital Strategies: Insights from Web and Social Analytics**

## Introduction

This report explores the utility of web traffic and social network analysis across three sections—two theoretical and one practical—to offer strategic insights for businesses including UnicornJobs, RunTartan, HaggisBus.

## **Feasibility analysis on applying recommender systems to UnicornJobs’ dataset**

Recommender systems are systems that aim to predict the preferences of users based on previous searches or purchases of previous users.

### How recommender systems work

Recommender systems work by first collecting and analysing data on users' behaviors, activities, or preferences towards items. This data can come from sources like ratings, feedback or browsing history, etc. The system then uses this data to profile every item and users by giving them some features standing for certain characteristics. After that, for similar users, we can recommand them with similar items based on similarity measures like Jaccard Similarity.

### Using recommender systems in HR for matching candidates and jobs

Two types of approaches are used. The first one is Collaborative Filtering, which let this system recommends jobs based on user behavior data, such as job ratings, without additional information on users or items. It identifies users with similar preferences and suggests jobs liked by these similar users. The second one is Content-Based Recommendation. This supervised approach utilizes user features, like resume details and work experience, and job characteristics, like job descriptions, to recommend jobs. It analyzes user ratings and personal characteristics to suggest positions matching new users’ profiles and preferences.

### Possible benefits

#### Boosting recruitment efficiency

The vast volume of data makes it possible to automatically match individuals with appropriate job positions based on their profiles and preferences, greatly speeding up the recruitment process.

#### Improved Candidate-Job Fit

These algorithms can find subtle connections between candidate talents and job needs by analysing large volumes of data, which raises retention and job satisfaction rates.

### Possible pitfalls

#### Over-Reliance on Historical Data

Systems that rely extensively on previous hiring data may favour candidates with typical career trajectories over those with varied or unconventional backgrounds, thereby decreasing creativity and diversity.

#### Technical complexity and high costs

Developing, testing, and deploying a recommender system can require significant high quality and comprehensiveness of data and initial investment, as well as ongoing costs in order to maintain and update the system.

### Ethical concerns and solutions

#### Diversity and social mobility

If not adequately built, recommender systems can favour candidates who are similar to current employees and may hinder social mobility and disadvantage candidates from underrepresented or economically disadvantaged backgrounds like a low-ranking university.

A possible solution could be making the criteria and decision-making processes of recommender systems transparent, which allows for accountability.

#### Privacy Concerns

The extensive data collection required for these systems raises issues regarding candidates' privacy and data security. For example, according to Udemans, C. (2019), former Zhilian Zhaopin employees allegedly leaked 160,000 resumes to sell online, causing candidates’ panic.

As for solutions, encryption technology such as MD5 or facial recognition can be used to perform multiple verifications in case someone needs to see candidates' CVs.

## Strategic analysis on finding lifestyle influencers for RunTartan

Nowadays, influencers can boost the advertising of your brand by incentivising potential customers to follow your social media accounts. This analysis will be aiming at finding the suitable influencers for RunTartan, which is a Sport Clothing firm.

### Measuring whether someone is a good influencer

Recommended approaches include degree, betweenness, authority.

#### Degree

As a centrality measurement in graph theories, degree means the number of edges adjacent to a node (a single unit in a graph). If we use degree to measure an influencer's impact, we would prefer to choose accounts with a large number of followers. However, we cannot be certain how many of these followers are interested in sport clothing. For example, a popular skinny Korean male star may have far more followers than a fitness blogger, but his followers, mostly girls who might not be interested in sports, are unlikely to be interested in sport clothing. In contrast, followers of a blogger who shares fitness tutorials might bring us a higher conversion rate (followers are more inclined to purchase sport clothing because they exercise frequently).

#### Betweenness

Betweenness is another centrality measurement telling us the number of pairs of nodes that would have to go through a node in order to reach one another on the shortest paths. To calculate it, for each pair of nodes in the network, find all the shortest paths, and then for each node in the network (which we will call node V), calculate what proportion of the shortest paths go through node V. The downside of this metric might appear in scenarios such as with BBC news accounts, which have a vast number of followers interested in a very broad topic (like watching news). Therefore, such an account might have a high betweenness but its followers may have no interest in sport clothing.

#### Authority

Authority refers to a node (often a webpage) that is recognised as a reputable source of information due to being referenced or linked to by many other nodes. Authority focuses only on the number of citations, ignoring the quality of the content. This might not accurately reflect an individual's influence or relevance in the sport clothing domain. For instance, the World Health Organization (WHO) website might be widely cited due to Covid-19 but is obviously irrelevant to Sports Clothing, leading to a mismatch between a spokesperson's actual influence on the target audience and their Authority.

### Tackling ‘echo chamber’

Building a diverse network of influencers could be helpful. Apart from sports, select influencers from different sectors like health care, etc to ensure that the brand advertisement reaches a wider range of potential customers.

#### Pros

It helps to showcase the brand from multiple angles and increase overall brand awareness and increase the contact rate of potential customers.

#### Cons

There may be a risk of inconsistent brand messaging, requiring careful planning of content and communication strategies to maintain a consistent brand image.

## Advertisement campaign analysis on HaggisBus’ web traffic data

## References

Udemans, C. (2019) 'Former Zhaopin employees allegedly leaked 160,000 resumes to sell online', TechNode, 11 July. Available at: https://technode.com/2019/07/11/former-zhaopin-employees-allegedly-leaked-160000-resumes-to-sell-online/ (Accessed: 14 February 2024).