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APPLYING SOCIAL MINING RESULTS FROM OPEN SOCIAL NETWORKS

Annotation: *The advent of web-based communities and social networking sites has resulted in a massive amount of social networking data that is embedded with rich sets of meaningful social media knowledge. Social network analysis and the study of social structures using networks and graph theory help to find a systematic method or process for studying social networks. The article reveals the concept of intellectual analysis of social networks. The key aspect of the article is the application of the results of social network analysis to various branches of human activity.*

Describes the benefits of using Social Mining to identify patterns in big data. Using Social Mining mechanisms, you can find non-trivial and, at first glance, non-obvious patterns in large volumes of information. The article provides examples of software that can be used to quickly collect and analyze data from social networks. Analytics services simplify work and increase opportunities on social networks. Social network analysis provides an effective system for discovering and interpreting online social connections.

Social network analytics goes beyond counting likes, reposts and links. This is a comprehensive in-depth data analysis that helps to understand what attracts more attention or guide users when accessing the brand through social networks.

Key words: *data mining, social networks, big data, data collection, web communities.*

Introduction

Regardless of the field of activity, the widespread penetration of information technology into the life of a modern person can be traced. Advances in technology have led to the emergence of forms of electronic communication such as web communities and social networking sites. They facilitated collaboration and information sharing between users.

The advent of web-based communities and social networking sites has resulted in a massive amount of social networking data that is embedded with rich sets of meaningful social media knowledge. Social media mining aims to extract, represent, and exploit rich sets of meaningful knowledge from massive amounts of social media data, from data in digital text forms to data in multimedia formats.

Conditions and methods of research

Social network analysis and the study of social structures using networks and graph theory help to find a systematic method or process for exploring social networks and for discovering, obtaining, representing and using meaningful knowledge such as interdependence relationships among social entities in networks.

Social network analysis can also be seen as the interaction between data mining and social computing. Data mining refers to the non-trivial extraction of implicit, previously unknown, and potentially useful information from data (such as social media data); social computing crosses social behavior and computer systems in that it computationally facilitates social inquiry and social-human dynamics in social networks, creates social conventions using computer software, and develops information and communication technologies to deal with social context. An important goal of social network analysis is to obtain meaningful knowledge about social networks contained in social network data [1].

Data Mining methods are used to search for non-obvious patterns in large amounts of data. Often, the use of a set of Data Mining methods is called data mining. Data Mining combines methods that have developed in various disciplines, in such sciences and research areas as applied statistics, pattern recognition, artificial intelligence, database theory, etc. Data mining methods are based on an information approach to modeling, in which the model is based on data processing rather than mathematical patterns. The construction of information models is based on machine learning, when the parameters of the model are determined on a training set of data, and the evaluation of the model is based on a test set. Each of the Data Mining tasks can be solved by different methods. Thus, models of decision trees, logistic regression, and artificial neural networks can be used to solve the classification problem. The regression problem can be solved by statistical or neural network methods, while neural networks allow modeling nonlinear dependencies.

Solving business intelligence tasks requires, as a rule, the application of some set of Data Mining tasks [2].

One of the algorithms for implementing effective mechanisms for personalized presentation of information to users based on the use of Data Mining tools includes the following steps:

- Collecting and enriching information about users of the social network.
- User segmentation.
- Interpretation and description of segments.
- Segmentation of guest users based on the built model.
- Personalized provision of information to user segments [3].

Social network analysis (figure 1) makes it possible to solve important practical questions and find unknown insights in sociology, psychology, economics and politics. One of the goals of social network analysis is to classify social network users according to various characteristics that make it possible to predict their future behavior. Intellectual analysis of social networks is successfully used in personnel agencies, educational institutions, banks, and insurance companies. Next, the resulting data will go through social media analytics and can be applied to these various fields.

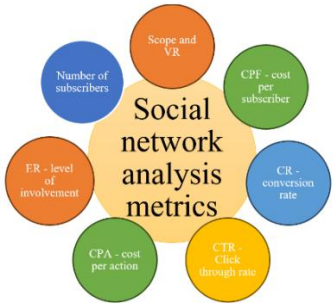

Figure 1 – Social networking analysis techniques

Modern social media mining is a controversial practice that has led to exponential user growth for tech giants such as Facebook, Inc., Twitter and Google. Such companies, considered "big tech", are companies that create algorithms that use user input to understand their preferences and keep them on the platform as often as possible [4].

Research results

Analysis of data from social networks helps to search for people according to the necessary characteristics, identify users, look for relationships between them and predict their needs. Companies use data from social networks and corporate portals to support customer interaction, solve marketing problems, business analytics, information security and to manage employee competencies. The public sector analyzes media materials to identify citizens' interest in certain government events, and also analyzes information from social networks to identify possible fraudulent and terrorist groups. For example, the US National Security Agency uses electronic surveillance and social media pattern-finding programs to generate data needed to predict areas where crimes and terrorist attacks are most likely to occur. There may be users on a social network with suspiciously high activity, or their behavior may differ significantly in some respects. The simplest example is mass spam, viral marketing. However, the content of these messages may also

contain links that carry a hidden threat. Such “activists” need to be neutralized in a timely manner. Similar methods of data analysis and search for patterns are called Social Mining [5].

Using Social Mining mechanisms, you can find non-trivial and, at first glance, non-obvious patterns in large volumes of information. But to do this, the analysis system must first be trained on what to look for. This requires summarizing past experiences and collecting as much data as possible. The more information the Social Mining system receives for initial training, the higher the reliability of the analysis will be. The most commonly used tool for analysis and visualization in this field is a graph, in which the nodes are people or groups, and the arcs show the relationships and flows of information between them [3].

Discussion of research results

The functions of applications designed for analyzing social network data include collecting and accumulating information, modeling the network and its distribution, analyzing the characteristics and behavior of users, their interactions based on location, as well as predicting connections and analyzing objects. Examples of such services for collecting and analyzing data from social networks are:

• FindFace is a Russian web service that helps you find people on the VKontakte social network by their facial photo;

• Publer web service, designed to monitor advertisements and analyze communities on VKontakte, Odnoklassniki and Instagram;

• Pepper.ninja is a social media targeting or audience targeting service. Pepper parses the VKontakte audience using advanced algorithms. It can collect users based on several dozen characteristics: age, gender, geolocation, marital status, place of study and work, what kind of activity they showed, interests and much more;

• Cerebro Target is a service through which access is provided to attract customers using retargeting (retargeting) them from the social network – Vkontakte. Thanks to its use, opportunities are provided for selecting a suitable audience;

• Popsters – a service for analyzing publications in social network communities;

• LiveDune is the largest analytics service that allows you to analyze your own profile and competitors’ accounts, provides reports in pdf files, Excel and Google presentations [6-12].

In order to effectively organize the search for knowledge necessary to support decision-making in analytical systems, the most effective approach is to implement complex DM projects with deep integration of analytical tools into work processes.

6 groups of Data Mining tools are suitable for these requirements: DM Tools (DMFT – Data Mining Field Tools) – these tools are aimed at a special application area. Business Intelligence Tools (DMBT – Data Mining Business Tools) – are not focused on working with Data Mining tasks, but support intelligent data processing methods (for example, clustering algorithms, classifications for business analysis). DM Tools (RDMT – Research Data Mining Tools) – these tools are used to develop new experimental algorithms and methods for intelligent data mining. Mathematical packages (DMMP – Data Mining Mat Package) – these packages were not oriented for Data Mining, but they contain a huge number of algorithms and methods that allow for data mining functions [2]. DM Tools (SDMT – Specialties Data Mining Tools) – these tools are used for certain types or methods of intelligent data processing. Integration packages (IDMT – Integration Data Mining Tool) are sets of algorithms that form either separate software tools or expansion packs. "Sets" of intelligent data processing (DMST – Data Mining Suite Tools) – support a range of algorithms and methods of intelligent data processing. They are focused on working with various data (multidimensional data, structured data and unstructured data).

For a more accessible perception of this information, Table 1 is made, in which a comparative analysis of intelligent data processing tools for the implementation of analytical DM projects is performed [7].

Analytics services simplify work and increase opportunities on social networks. However, the problem remains obtaining reliable information about the user and identifying the intensity of interaction on the network, as well as processing a large amount of data.

Table 1 – Comparative characteristics of DM tools

DM Tools	Export/ Import	Client-server support	Availability of reports	Support for various algorithms	GUI	Visualization
DMFT	yes	no	no	no	yes	yes
DMBT	yes	yes	yes	no	yes	no
RDMT	no	no	no	yes	no	no
DMMP	yes	no	no	yes	no	no
SDMT	yes	no	no	no	yes	yes
IDMP	no	no	no	yes	yes	no
DMST	yes	yes	yes	yes	yes	yes

Conclusions

Social network analysis provides an effective system for discovering and interpreting online social connections. These are examined using a range of analytical techniques, ranging from simple centrality measures to sophisticated multilevel modeling.

Using graph analysis in social networks, one can draw interesting and non-obvious conclusions: which objects are most effective in disseminating information, which objects of network groups generate the main traffic between other groups, which groups of objects are isolated from the network, etc. These findings can be useful in various fields: Internet, marketing, security, advertising, network optimization, corporate psychology. A special area of application of social network analytics services is the study of the interaction and behavior of adolescent children on social networks.

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ПРИМЕНЕНИЕ РЕЗУЛЬТАТОВ SOCIAL MINING ИЗ ОТКРЫТЫХ СОЦИАЛЬНЫХ СЕТЕЙ

Появление веб-сообществ и сайтов социальных сетей привело к появлению огромного объема данных социальных сетей, в которые встроены богатые наборы значимых знаний о социальных сетях. Анализ социальных сетей и исследования социальных структур с помощью сетей и теории графов помогают найти систематический метод или процесс для исследования социальных сетей. В статье раскрыто понятие интеллектуального анализа социальных сетей. Ключевым аспектом статьи является применение результатов анализа социальных сетей для различных отраслей человеческой деятельности.

Описывается преимущества использования Social Mining для выявления закономерностей в больших данных. С помощью механизмов Social Mining можно находить нетривиальные и, на первый взгляд, неочевидные закономерности в больших объемах информации. В статье приведены примеры программного обеспечения, с помощью которого возможно осуществить быстрый сбор и анализ данных из социальных сетей. Сервисы аналитики упрощают работу и увеличивают возможности в социальных сетях. Анализ социальных сетей представляет собой эффективную систему для обнаружения и интерпретации общественных онлайн-связей.

Аналитика социальных сетей выходит за рамки подсчета лайков, репостов и переходов по ссылкам. Это комплексный глубокий анализ данных, помогающий понять, что привлекает больше внимания или чем руководствуются пользователи, обращающиеся к бренду через соцсети.

Ключевые слова: *интеллектуальный анализ данных, социальные сети, большие данные, сбор данных, веб-сообщества.*

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АШЫҚ ӘЛЕУМЕТТІК ЖЕЛІЛЕРДЕН SOCIAL MINING НӘТИЖЕЛЕРІН ҚОЛДАНУ

Веб-негізделген қауымдастықтар мен әлеуметтік желі сайттарының пайда болуы *маңызды әлеуметтік медиа білімдерінің бай жиынтығымен ендірілген әлеуметтік желі деректерінің үлкен көлеміне әкелді. Әлеуметтік желілерді талдау және әлеуметтік құрылымдарды желілер мен графикалық теорияны қолдану арқылы зерттеу әлеуметтік желілерді зерттеудің жүйелі әдісін немесе процесін табуға көмектеседі. Мақалада әлеуметтік желілерді интеллектуалды талдау тұжырымдамасы ашылады. Мақаланың негізгі аспектісі – әлеуметтік желіні талдау нәтижелерін адам қызметінің әртүрлі салаларына қолдану.*

Үлкен деректердегі үлгілерді анықтау үшін Social Mining пайдаланудың артықшылықтарын сипаттайды. Social Mining тетіктерін пайдалана отырып, ақпараттың үлкен көлемінен тривиальды емес және бір қарағанда айқын емес үлгілерді табуға болады. Мақалада әлеуметтік желілердегі деректерді жылдам жинау және талдау үшін пайдалануға болатын бағдарламалық жасақтаманың мысалдары келтірілген. Аналитикалық қызметтер жұмысты жеңілдетеді және әлеуметтік желілердегі мүмкіндіктерді арттырады. Әлеуметтік желіні талдау желідегі әлеуметтік байланыстарды табу және түсіндірудің тиімді жүйесін қамтамасыз етеді.

Әлеуметтік медиа аналитикасы ұнатуларды, бөлісулерді және сілтемелерді санаудан асып түседі. Бұл әлеуметтік желілер арқылы брендке жүгінетін пайдаланушылардың не көбірек назар аударатынын немесе нені басшылыққа алатынын түсінуге көмектесетін деректерді жан-жақты терең талдау.

Түйін сөздер: *деректерді іздеу, әлеуметтік желілер, үлкен деректер, деректерді жинау, веб-қауымдастықтар.*

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АВТОМАТИЗАЦИЯ И УПРАВЛЕНИЕ СИСТЕМОЙ ВОДОСНАБЖЕНИЯ В ЖИЛОМ КОМПЛЕКСЕ

Аннотация: *Вода – важнейший ресурс жизни Человека и всех живых организмов. Автоматизация водоснабжения – это управление и отслеживание водопользования и контроль воды в разных местах. Данная автоматизированная система управления водоснабжением городских территорий может быть использована для равномерного распределения воды их суточного потребления и мониторинга водонакопителей для снижения потерь воды путем оценки*