

**SENTIMENT MINING IN STUDENT BLOGS IN LEARNING MANAGEMENT SYSTEMS FOR
IMPROVED DECISION MAKING IN UNIVERSITIES**

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Abstract. At present, the Universities and Colleges in the Kingdom of Saudi Arabia used Learning Management Systems. Majmaah University uses D2L from this academic years onwards. This learning management systems supports for classroom instruction management, talent management, communication and collaboration, content management, assessment and testing, virtual classrooms, reporting and mobile learning and student interaction through blogs. These blogs generate voluminous of data which could be more useful to the teacher. The volume of the blog data increases over the time. Sentiment mining deals about extracting unique patterns from the online reviews. Sentiment mining is well applied to many leading social networking websites and found to produce quality results. These generated unique patterns will be much use to the faculty and administration to make important decisions. Applying sentiment mining on the blogs generated by the learning management system is the theme of this proposed research. The existing sentiment mining models will be analyzed and a new model will be proposed. This new sentiment mining model will be thus applied to the blogs generated by the D2L system to produce unique patterns. The unique patterns are the generated knowledge by the system. This generated knowledge will be used by the faculty and administration for improving the decision making.

Keyword: Sentiment Mining, Learning Management System

1. RESEARCH PROBLEM AND MOTIVATION

Many Universities uses the Learning Management Systems for e-Advising. This is a management system which automates the teaching and learning process. This is much useful to the student and faculty. The largest LMSs in the education sector (Trimeritus, 2015) are

- a. Blackboard,
- b. Desire2Learn
- c. Moodle (open source)
- d. Instructure Canvas

These systems have good features such as Online Management of courses, Classroom instruction management, Talent Management, Communication and Collaboration, Content Management, Assessment and Testing, Virtual Classrooms, Reporting and Mobile Learning and student interaction through blogs. The blogs generated by the learning management systems are quite interesting and the volume of blog increases over the time.

Sentiment mining is an upcoming research area in data mining which deals about applying data mining models in the sentiments expressed by the users in online forums. This sentiment mining model generates knowledge. The generated knowledge will be much use to the faculty and administration to make important decisions. Applying sentiment mining on the blogs generated by the learning management system is the objective of this proposed research. The existing sentiment mining models will be analyzed, and a new model will be proposed. This new sentiment mining model will be thus applied to the blogs generated by the D2L system to produce knowledge. This generated knowledge will be used by the faculty and administration for improving the decision making.

2. BENEFITS FOR TEACHERS:

- Change of class timing
- Update of lecture notes

- Update on question papers
- Provide more input to weaker student
- Provide revised homework / assignment etc.

3. BENEFITS FOR THE ADMINISTRATION:

- Change of curriculum / syllabi
- Change of faculty for a chosen course / section of student
- Introduction of new policies/ rules
- Scheduling of classes
- Introduction of new tools/technologies

4. OBJECTIVES

The objective of the proposed research work is outlined as below

1. To investigate the available sentiment mining models
2. To develop a sentiment mining model particularly suitable for learning management systems
3. To generate useful knowledge and to be given to the faculty members and University administration.

5. LITERATURE REVIEW

In order to meet the objective, the review of literature has been carried out in the following context

- Sentiment Mining Applications

Alexandra Balahur *et al.*, (2009), discusses about applying Opinion Mining on Newspaper Quotations and the importance of it. The authors present about using open-domain opinion analysis and topic-specific opinion analysis and infers that open-domain opinion analysis is a more difficult problem than topic-specific

sentiment classification and other sub-tasks defined in opinion mining.

Rodríguez-Penagos *et al.*, (2012) presents modular and scalable framework to social media opinion mining. The author uses this framework for the discovery and clustering of opinion targets and topics in user-generated comments for the telecom and automotive domains. The author concludes stating that come from researching which combinations of automatic annotators can enhance overall performance.

Cambria *et al.*, (2013) presents the new avenues in opinion mining and sentiment analysis. The authors describe the challenge involved in performing opinion mining in natural language processing. This article also explores the relative similarity between the opinion mining methods and sentiment analysis methods in detail.

Samaneh Moghaddam and Martin Ester (2013) presents opinion mining methods to be used in online reviews. The author also presents about Document- level Opinion Mining, Sentence- level Opinion Mining, Phrase- level Opinion Mining and the relationship among the opinion mining tasks.

Sudipta Roy *et al.*, (2013) represents the importance and applications of opinion mining and sentiment analysis in social networks. The author also describes the basic concepts, challenges and comprehensive study in opinion mining and an overview of opinion mining and sentiment analysis in social networks, Many methodologies such as Feature based opinion mining, Subjective and objective based opinion mining, Affectivity based opinion mining, Semantic role labelling and polarity computation, Feature based approach involving syntax tree pruning and kernel based classifiers, Polarity based feature extraction method, Lingual knowledge based opinion mining, Feature based approach using machine learning method, Feature driven opinion summarization method, Semantic orientation based opinion mining etc., are described in detail.

Thomas Scholz and Stefan Conrad (2012a) apply various commonly used approaches for sentiment analysis and expand research by analyzing the specific point of view and viewpoint features. The author shows how the features can increase the performance of existing solutions and how the viewpoints influence the polarity of sentiment.

Thomas Scholz *et al.*, (2012b) illustrates specifics in comparison with sentiment analysis

of product reviews. The author also introduces new methods for the for the determination of the sentiment polarity in statements, which are extracted from news articles. The author also suggests that the automated determination of viewpoints will be quite challenging.

It is very clear from the above reviewed literatures that, no authors were used sentiment mining with the blogs generated by the learning management systems and hence justified the need of the proposed research project objective.

6. RESEARCH METHODOLOGY

Step 1: Analysis of the sentiment mining models

Step 2: Developing a new sentiment mining model

Step 3: Read the blogs generated by the learning management systems

Step 4: Pre-processing of the blogs (cleaning, transformation, scaling, enrichment etc.,)

Step 5: Apply the developed sentiment mining model in the pre-processed blogs and generate unique knowledge

Step 6: Communicate the knowledge to the stakeholders

The responsibilities of the personal involved in the proposed research project are outlined as below.

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