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E-Moderation of Answer-Scripts Evaluation for Controlling Intra/Inter Examiner Heterogeneity

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Abstract:

Public examinations are conducted worldwide for certification, placement, promotion, etc. As these examinations are high stake examinations, evaluation of the answer-scripts needs to be carried out in a uniform, error-free and unbiased manner. However, the large quantum of answer-scripts pertaining to each subject/course paper invariably introduces evaluation anomalies. Coupled with this, evaluation also suffers from intra/inter examiner heterogeneity and subjectivity. Some of the currently used approaches such as moderation of answer-scripts, in-house verification, personal verification, re-evaluation of answer-scripts and scaling of marks, only provide cursory relief from anomalous and heterogeneous evaluation. This is apparent from alarmingly increasing cases of verification/re-evaluation converging into significant changes in the original marks. In this paper, we propose an E-moderation scheme using machine learning techniques to classify each answer evaluation as negligent or normal and further predict scale.

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E-moderation of Answer-scripts Evaluation for Controlling Intra/Inter Examiner Heterogeneity

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Abstract — Public examinations are conducted worldwide for certification, placement, promotion, etc. As these examinations are high stake examinations, evaluation of the answer-scripts needs to be carried out in a uniform, error-free and unbiased manner. However, the large quantum of answer-scripts pertaining to each subject/course paper invariably introduces evaluation anomalies. Coupled with this, evaluation also suffers from intra/inter examiner heterogeneity and subjectivity. Some of the currently used approaches such as moderation of answer-scripts, in-house verification, personal verification, re-evaluation of answer-scripts and scaling of marks, only provide cursory relief from anomalous and heterogeneous evaluation. This is apparent from alarmingly increasing cases of verification/re-evaluation converging into significant changes in the original marks. In this paper, we propose an E-moderation scheme using machine learning techniques to classify each answer evaluation as negligent or normal and further predict scale.

Keywords— *Public Examination; Evaluation Anomalies; Examiner Heterogeneity; E-moderation; Marks Tuning.*

I. INTRODUCTION

Public examinations under the ambit of summative examination are conducted for promotion, placement, certification, and accountability [1]. As public examinations are taken up by large number of examinees, it creates a large quantum of answer-scripts for evaluation. In a public examination system with a large number of answer-scripts pertaining to each course paper/subject, it is not possible to get all the answer-scripts evaluated by one examiner. When more than one examiner evaluate the answer-scripts pertaining to a subject, the subjectivity of the respective examiner creeps into the evaluation. Therefore, there is a need to evolve a procedure to ensure uniformity within the examiners so that the effect of ‘examiner subjectivity’ or ‘examiner variability’ is minimized.

Also, as evaluation progresses, the same examiner can increase or decrease the standard of evaluation due to various factors such as improved understanding of the subject, the order of evaluation, time of the day, time constraints, fatigue, etc. The evaluation also suffers from ‘Hawk-Dove effect’ [2], where some examiners are liberal in evaluation and tend to award more marks. Some examiners are strict and tend to give less marks. This apart there are also instances of gross negligence/ lapses in evaluation as apparent from alarmingly

increasing cases of personal verification/re-evaluation converging into significant changes in the original marks.

Some of the methods adopted to reduce examiner subjectivity or variability and the attached evaluation anomalies are moderation of answer-scripts, In-house verification, personal verification and re-evaluation [3].

Contributions: This paper proposes a novel approach for classifying the evaluation of answer-scripts as negligent or normal and further predict the tuned marks in an attempt to control the intra/inter examiner heterogeneity in the evaluation. We propose to build an e-moderation model for detection of negligence in evaluation and predicting the tuned marks with the aid of examination data and the machine learning (ML) techniques.

Outline: The remainder of this paper is structured as follows: Section 2 provides the brief description of evaluation anomalies in public examinations and current measures addressing those anomalies along with the related work. Section 3 describes the mechanism adopted for carrying e-moderation of evaluated answer-scripts. Section 4 provides the research methodology used in assessing the usefulness of the proposed approach. Section 5 evaluates the performance of evaluation classifier and tuned marks predictor. Section 6 draws the conclusions and outlines the future work.

II. BACKGROUND AND RELATED WORK

The current study is based on the public examination environment prevailing in most of the academic institutions in India.

A. Evaluation Anomalies and Countermeasures

The two key issues plaguing the evaluation of subjective answer-scripts pertaining to public examinations are negligent evaluation and intra/inter examiner variation in evaluation. If a particular examiner assigns contrasting marks to the similar answer content of two different examinees, we refer it as ‘intra examiner’ variation. During the process of evaluation the standard of evaluation seldom remains constant due to the factors such as a large number of answer-scripts for evaluation, perceived pattern in the answer-script content, order of evaluation, time of the day, fatigue, time constraints,