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Predictive Software Model for Quality Assessment

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Abstract: ***Tender usually refers to the process whereby governments invite offers for plenty of projects that must be submitted within a finite deadline. Tendering is the process of providing an offer, bid or proposal, or expressing interest in response to an invitation or request for tender. This paper proposes a machine-learning-inspired approach that can be used to predict the defects in a cost-effective manner. The outcome of such a prediction can help to assess which supplier is likely to offer the best value for a specific project. This should also reduce tender costs. The prediction of defects within the target project supported knowledge from different comes is named Cross Project Defect Prediction (CPDP). The main purpose of CPDP is to predict defect-prone instances (such as classes) in a project (files, packages) based on the defect data collected from other projects on those public software repositories like a promise. In this paper, A software Model for the Tender website is created using the CPDP Algorithm, which helps to analyze, overcome defect and produce a Quality project.***
Keywords: CPDP, Tender, defect Prediction, Artificial Intelligence, Min-Max Normalization

I. INTRODUCTION

Cross Project Defect Prediction (CPDP) nowadays gained more attention, yet there are no systematic efforts to analyze existing empirical evidence. The main aim of this project is to brief, analyze and assess the empirical evidence regarding metrics, modeling techniques, different approaches and performance evaluation criteria in the context of CPDP. The Purpose of the System is to discover bugs in a timely manner leading to significant financial savings in terms of Quality Assurance Cost, enables detecting fault-prone as early as possible, Requires minimum effort for data collection, More efficient and Reducing the manpower and often exhibit good Performance. Different modeling techniques (Machine Learning and Regression) are used in the context of CPDP. The principle of defect prediction is to learn a model from a corpus of data and apply the model to new and unseen data. The training data can be from the same project, i.e., Within Project Defect Prediction (WPDP) or from other projects, i.e., cross-project defect prediction (CPDP). The main aim of defect prediction is to find the faulty units of code, to find the defects in the system, to track and locate faulty changes, classes, functions or statements, for the best use of the available quality assurance resources. Further, need to explore the performance of CPDP vs. Within Project Defect Prediction (WPDP) models.

II. LITERATURE SURVEY

A. The design of a Web-based Tendering System which aims at improving the efficiency as well as transparency. In addition to a prototype which we developed for proof-of-concept, we modeled the new system in of traditional manual workflow by using a Business Process Reengineering tool.[4]

B. This study aims to train better defect predictors by selecting the most appropriate training data from those defect datasets available on the Internet, to improve the performance of cross-project defect predictions. More specifically, the combination of Euclidean distance and linear normalization is the preferred way for TD Selector.[5] In this paper, Min-Max Normalization technique is applied to produce a desirable project.

III. PROPOSED SYSTEM

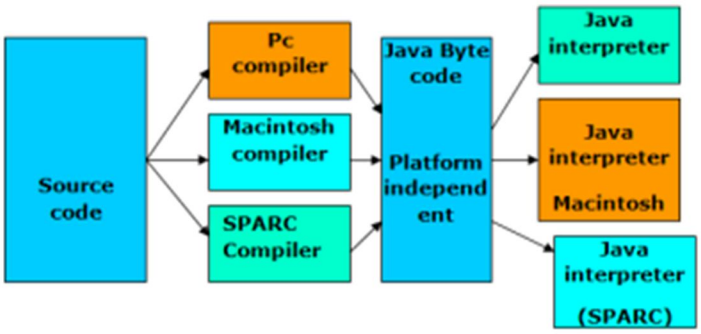
This paper makes use of an integrated machine learning approach based on unsupervised models constructed using a set of predictor variables. Based on these variables, this model estimates the defects in the product prior to testing through unsupervised machine learning techniques. This approach is distinct from previously proposed prediction models. The key premise of CPDP is to learn from data from a set of projects and then to apply resulting models to another set of projects. Therefore, in the presence of relevant data from other projects, CPDP has great practical potential. The prediction outcomes with data from other projects can be of great value as even a tiny decrease in the bug rates can lead to significant financial savings in terms of quality assurance costs, as opposed to exponential growth in repair costs and damages, as a result of failure to discover bugs in a timely manner. Thus, it is demonstrated that this technique can provide a blueprint for overture testing to enhance the effectiveness of tender evaluation activities.

IV. TECHNOLOGY OVERVIEW

A. *Artificial Intelligence*

The term artificial intelligence was coined in 1956, but AI has become more popular today thanks to increased data volumes, advanced algorithms, and improvements in computing power and storage.[1] Artificial intelligence (AI) makes it attainable for machines to find out from expertise, comply with new inputs and perform human-like tasks. Most AI examples that one hear regarding today-from chess-playing computers to self-driving cars- bank heavily on deep learning and tongue process. The computers will be trained to accomplish specific tasks by process giant amounts of knowledge of information and recognizing patterns within the data.

B. *JVM Architecture*



C. *My SQL*

MySQL is a system software used to manage SQL databases or often called the Database Management System (DBMS). Some of the advantages of MySQL include free download by anyone, flexible with various programming and ease in database management.[2]

D. *Servlets/JSP*

A Servlet is a generic server extension. Java classes that can be loaded dynamically to expand the functionality of a server. Servlets are commonly used with web servers. A Servlet is the same as proprietary server extension, except that it runs inside a Java Virtual Machine (JVM) on the server, so it is safe and portable Servlets operate solely within the domain of the server.

V. PROCESS

In this proposed System, the Computer is trained using the inputs given by the user using the machine learning mechanism. In this Tender application, all the Competitors projects are analyzed and the defect-free project is chosen. Which makes the tender publisher get the Quality project.

The Projects are analyzed using the CPDP Algorithm. The Normalization method plays a vital role in this project. It is used for predicting and reducing the duplication of data. There are two types of Normalization, namely min-max, z-score. In this project proposal, Min-Max Normalization Technique is used. Min-Max is formally defined using the following equation.

$$\mathbf{X}_{new} = \mathbf{X} - \mathbf{X}_{min} / \mathbf{X}_{max} - \mathbf{X}_{min} \quad [3]$$

Here X is input, X_{min} is Minimum defect and X_{max} is Maximum defect. Now the inputs are loaded to the X by the User. From the Competitors Project, the defect less project is taken as the Minimum defect(X_{min}) and Project with Maximum defect is taken as(X_{max}). First, the Competitor's project or External Projects are checked with the inputs provided by Tender Publisher using the CPDP Algorithm. If the variables in the competitor's projects are matched with the inputs of the Tender Publisher, the highly matched project is chosen and directed to the publisher page. The less matched projects are rejected. After updating on the website, a mail is sent by the publisher which contains few non-matching parameters to the respective competitor whose project is chosen as the less defect one.

After receiving the mail, the competitor has to change the non-matching parameter in the project and reapply the tender to make it defect less one. Now the reapplied project is analyzed with the same input which is given by the tender publisher and additionally a mail indicating "Tender Approved" message is sent to the respective competitor.

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A. Block Diagram

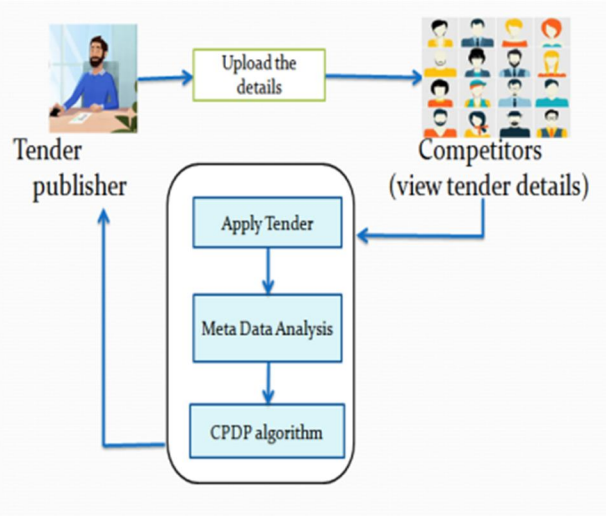

Figure 1. Block diagram for overall process

B. Process Flow

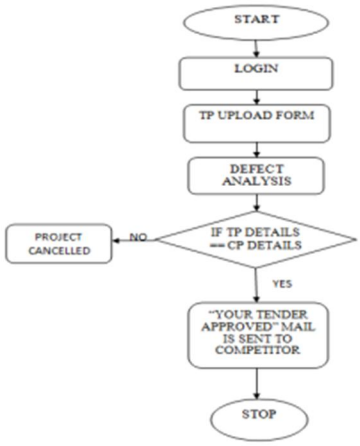

Figure 2. Process Flow for Project Selection

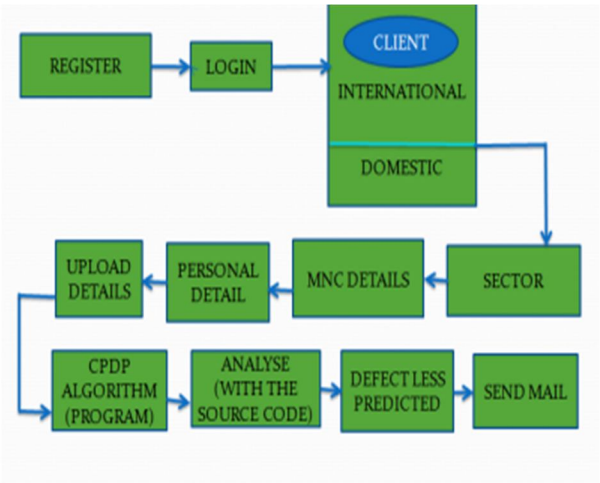

Figure 3. Overall Flow of Tender Application

VI. EXPERIMENTAL ANALYSIS AND RESULTS

The entire process is carried out in the Eclipse Neon tool and HeidiSQL. The login details and input variables are stored in the database. Based on Quality Assessment, the less defect project is selected as the best project.

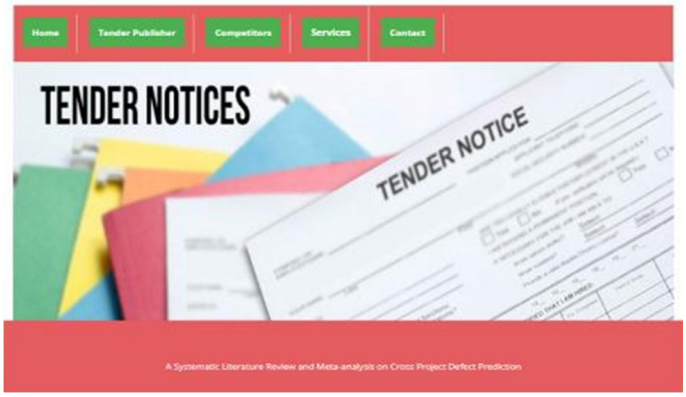

Figure 4. Home Page

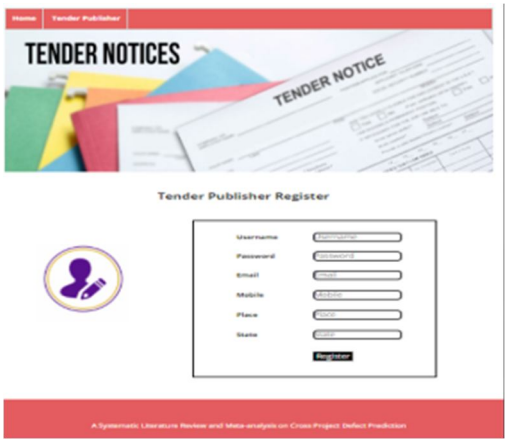

Figure 5. Register page

Figure 5 shows that the tender publisher should register first before login.

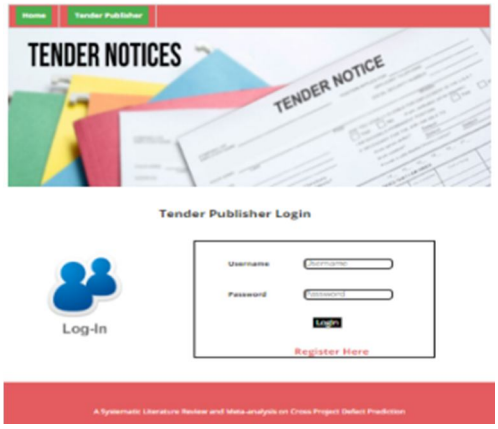

Figure 6. Login Interface

Figure 6 show's that to login, the Tender publisher will enter a username and password that was created previously. If the login is successful, it enters into tender upload form page. If login is unsuccessful, the user should enter the correct details that were registered before.

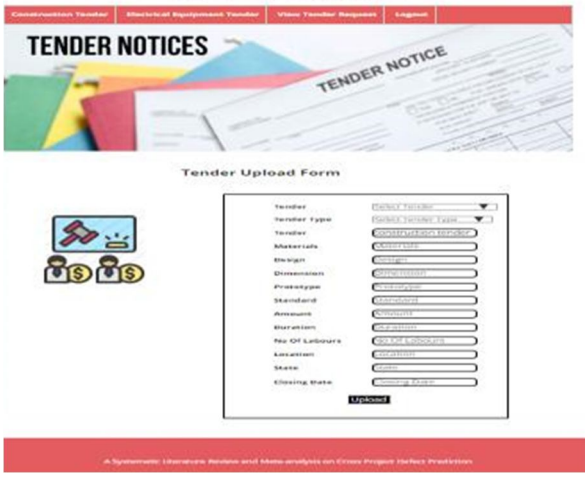

Figure 7. Tender upload form

Figure 7 shows input variables provided by tender publisher for construction tender.

Figure 8. Competitor register page

Figure 9. Competitors login page

It shows that to login, the Tender competitor will enter a username and password that was created previously. If the login is successful, it enters into view tender details page. If login is unsuccessful, the user should enter the correct details that were registered before.

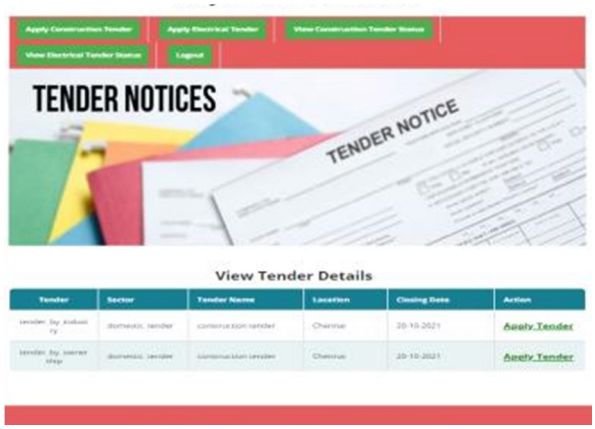

Figure 10. View Tender details in competitor side

Figure 10 contains tender details given by the tender publisher. So competitors can apply tender according to this.

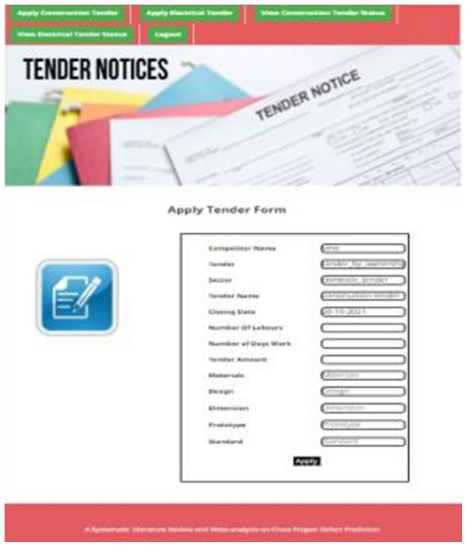

Figure 11. Apply tender form

In this figure 11, competitor should enter the input variables for applying the tender

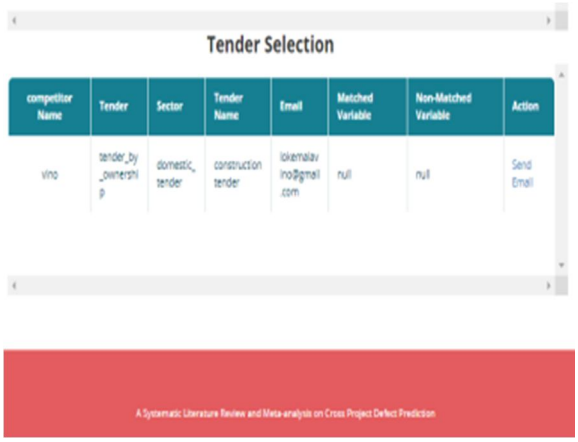

Figure 12. Tender selection

After defect analysis between different projects, less defect project is selected and mail is sent to the respective competitor.

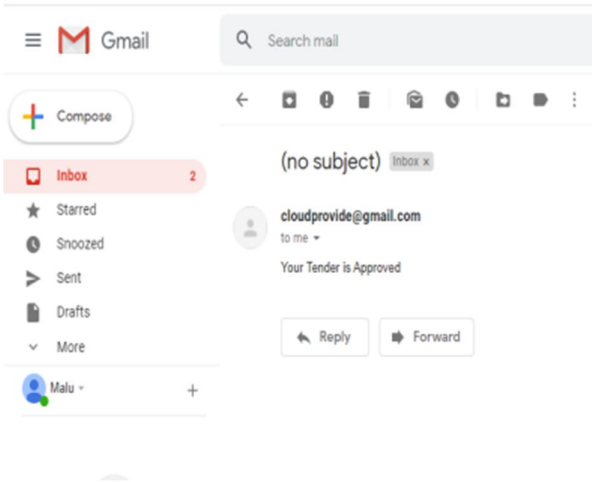

Figure 13. Conformation mail

This figure shows that the conformation mail is sent to the competitors.

VII. CONCLUSION AND FUTURESCOPE

The Conclusion of this System is that it is used to analyze and predict Quality project. This web Application plays an essential role in selecting effective and defects less projects. In Future, it can be enhanced by uploading quotation files such as document, PDF, etc., which contains tender information as the input instead of giving variables directly as input. This web application can also be implemented in Selecting Question paper for Examination.

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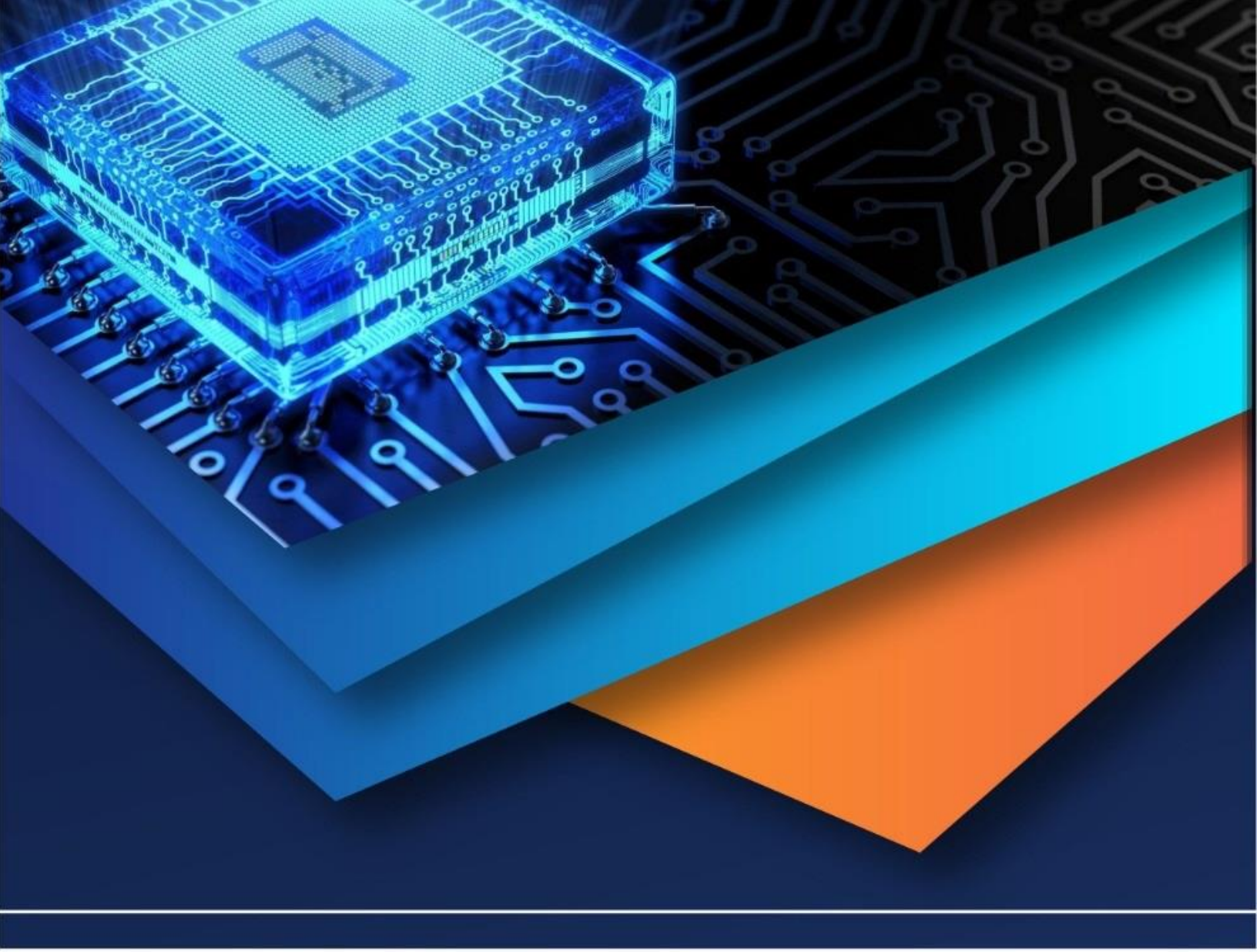

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