ANALYSING AND SIMULATING USER FEEDBACK IN NEURAL NETWORK

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ABTRACT

As web has become valuable part of one's life so an individual wants to learn through effective learning. In this research we will focus on the need of taking user-feedback and study various tool used to conduct feedback survey. Here we consider feedback as information the system receives from the user as the result of system's performance. We organized the end user feedback survey during our research, and compiled the feedback data in CLARA and through Neural Network to get the final analysis of current learning scenario.

Keywords- Learning Object , Learning Management System, Learning Object Repository

I INTRODUCTION

In 1960, the University of Illinois started a teaching system based upon connected computer systems where students could access educational resources on a particular course while listening to the lectures that were recorded via some form of remotely equipment like television or audio device. Educational organization started to take advantage of the new source by offering distance learning courses using computer networking for transferring information. The evolution of e-learning provides opportunity to students to get education through virtual classroom, as in past if they wanted to pursue their education but were restricted due to the distance of the institution.

E-learning can be in two forms -synchronous or asynchronous. Synchronous learning is done in real-time, with all learners interacting simultaneously. e.g. - Skype conversation, or chat rooms or virtual classrooms. While asynchronous learning is self-paced and enables participant learners to exchange ideas or information without the depending upon the condition that other learners must get involve at the same time. e.g.- email, blogs, discussion boards, hypertext documents.

Linear learning is a Computer-based learning or training (CBT) refers to self-paced learning activities delivered on a computer or handy device such as a tablet or smart phone. Linear learning presents content in a linear fashion and often used to teach static processes, like reading an online book or manual. Computer-supported collaborative

learning (CSCL) uses instructional methods designed to encourage students to work together on learning activities. This learning is different from the traditional approach to instruction in which the instructor is the main source of information, and also from accessing of content, sometimes directly from the instructor's material, whereas collaborative learning uses blogs, wikis and cloud based document portal.

II CONTENTS OF E-LEARNING

Learning Object is an approach to learning content where learning content is divided into smaller chunks of information. LO's can be combined together to get larger LO. They range from anything to anything made for special educational purpose[1].

Metadata is an approach to data that gives information about the data. It is a kind of catalogue which provides keyword match procedure to search any learning object in a repository. In practice most commonly used metadata standard are IEEE LOM and Dublin Core metadata standards. The Dublin Core contains 15 elements for use in any resource description but it does not include attributes describing pedagogical perspective of a document, where as IEEE LOM consider it. IEEE LOM[2] contains nine categories of data elements to describe a learning object-general, lifecycle, meta-metadata, educational, technical, rights, relation, annotation, and classification. Whereas Dublin Core standard include two levels: Simple & Qualified. The elements are Title, Subject and its Description, Document Type, its Source, Document relation, coverage, creator, Publisher, Contributor, permissions or rights, date, format, Identifier and Language. The elements of qualified Dublin Core include three categories-Audience, Provenance, and Rights Holder, additionally Qualifiers that refine the semantics of the elements in a way that may be used in Semantic Web[3].

III ADMINITRATIVE TOOLS FOR E-LEARNING

Learning Management System (LMS) is an e-learning platform that offers features consist of several modules that support course development, course administration and content presentation system. A LMS allows us to sort through global online catalogue for complete access to all the learning resources available to us and then can easily select the courses that match our specific needs for learning and certification.

A Learning Content Management System (LCMS) is also a multi-user e-learning environment where education developers may build, store up, reuse, handle, and deliver digital learning resource from a central object repository[14]. Learning resource may be learning object; media based content graphical content etc., these objects can be reused, recollected and reassembled [4]. This is the basic characteristic of LCMS that make it different from other databases and LMSs.

Learning Object Repository (LOR) is a sort of digital library which enables educators to share, control and use learning objects. LORs also implement metadata standards that enhances the capability of LO retrieval [5].

IV ROLE OF USER FEEDBACK

Feedback is a significant part of the learning and interaction in e-learning systems. We conducted a feedback survey to find out what users of E-learning systems really want, and get the intelligence of revealing a pattern of customer behavior and attitudes that can reliably help us identifies trends and quickly solves issues customers may have. By this feedback surveys, we will get the opportunities to deliver superior customer service, fix misunderstandings, or avoid repeat business.

V TOOLS AND TECHNIQUES FOR TAKING USER FEEDBACK

a) **Receiving Synchronized feedback from users-**:It's a difficult task to get feedback from users who are taking an e-learning course because user get caught within taking the course with small or no ability to ask questions. A program called BugMuncher [6], and was initially built to offer feedback and remarks on parts of a website that aren't running. It lets us to emphasize the question on the screen and then provide feedback. This data is then sent to the administrator who receives the remarks and also a screenshot of the emphasized regions[8].

b) **Survey Polls Quizzes Tools for eLearning [7]:** For Free Survey, Polls, and Quizzes tools for eLearning we get 27 tools that free for use. addpoll, The easy way to generate polls, surveys and html forms on the web. Answer-Garden,it is a new minimalistic feedback tool. Boo-roo, good polling solutions can be created in our browser through this inclusive poll builder. Doculicious**,** by this tool embeddable web forms can be created that generate PDF documents. Fluid Surveys, it an online survey software by which forms and questionnaires can be created. Such type of many user feedback tools are in existence.

c) **Capturing and Consolidated SME Feedback[8]**: REVIEW™ tracks feedback remarks, threaded comments, and more in one centralized site, Comment Catcher is designed for communicative users to easily collect eLearning course feedback. This tool allows us to combine and rank all of our subject matter expert's feedback in one location for easy evaluation and inclusion into our course. Review Link, Review Link tool allows users to publish their courses directly to Review Link. Then the subject matter experts can send their comments directly on the course pages.

d) **An Integrated Evaluation Method [9]**: This projected evaluation process collects user feedback by classifying it according to inspiration to e-learn in groups, as we found this technique simpler than using traditional behavioral methods.

e) **Using variables to track scoring and feedback:** A game using rapid identification techniques[10] ,uses a variable to make available tracking of scoring and ongoing feedback to the user regarding their performance.

f) **E-learning usability checklist for beginners** [11]: Usability is a critical issue in designing an e-learning course. Generally this factor highlights up only when efficiency downs or when users comment on usability factors during feedback sessions. Visibility of icons or buttons, Course management and feedback mechanism, Accessibility, Consistency and functionality, Assessment

Strategy, Memo ability, Aesthetics, Reducing redundancy are the utility factors on which user can give comments.

g) **Using data mining techniques for user feedback [12]:** The Apriori algorithm for Association Rules was applied to get relationships among URL references based on the navigational patterns of students. Hsu et al (2003) introduced a test result feedback (TRF) model that evaluates the relationships between student learning time and the analogous test results. Their objective was to develop a tool for supporting the instructor in reorganizing the course matter; apart this, a personalization of the course customized to the individual student requirements.

VI PROCESSING END USER FEEDBACK

6.1 Collecting feedback data: During this research work we made a feedback survey of 90 students who are learning through e-learning systems in different organisations. We conducted survey in following organizations

(i) IACM Networking institute, Paschim Vihar, New Delhi.

(ii) Lovely Professional University study center, Paschim Vihar, New Delhi.

(iii) Network training institute (NTECH) ,Janakpuri, New Delhi.

(iv) Sikkim Manipal Univ. Study center, paschim Vihar,New Delhi.

We modeled a Student feedback form attached in Annexure .The questions asked in this form is based on some parameters, to check the utility of e-learning systems students are using currently. These parameters are following –

1. Course features
2. Course material
3. Presentation
4. Interaction
5. Language
6. Method of learning
7. Accessibility
8. Ease of use
9. Quality
10. References
11. Quizzes
12. Interoperability
13. Feedback
14. User and group management
15. Repository support

6.2 Analyzing the data: We analyzed the data on each parameter to get the clear picture of end user response on each parameter. In fig1, % (agree, neutral, disagree) shows if user is satisfied with shown 15 parameters or features in the learning system.

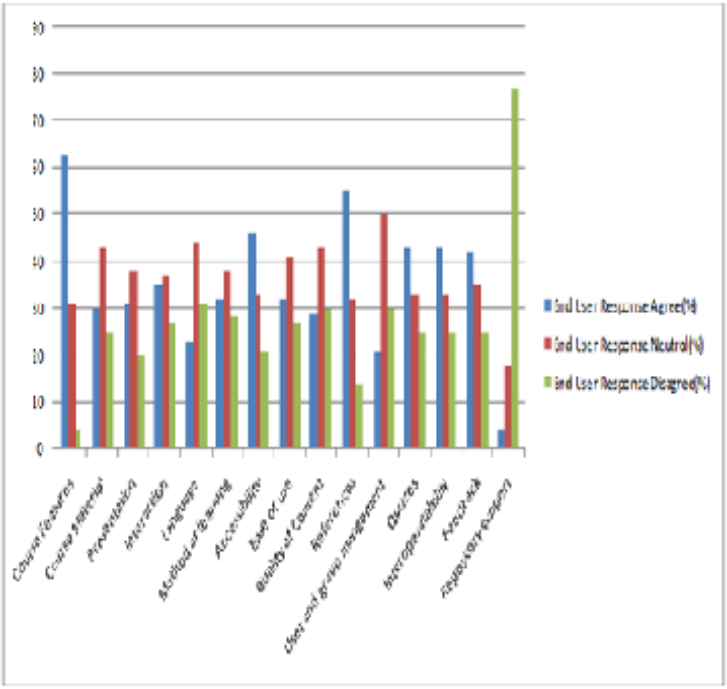


Fig1: Bar plot of End user response

From fig1 we can conclude-

a) More than 60% of students are fully satisfied with the course features (course coverage or course meeting their needs) provided in the learning system they are using.

b) More than 40% students are satisfied with the accessibility of content, questionnaires and quizzes sessions, and feedback sessions and with interoperability of learning system they are using.

c) The two main features that are- user or group management and Repository support got highlighted because only 5 to 10% students are satisfied with these features. And more than 70% are saying that their LMS are not providing repository support.

6.3 Clustering the data through CLARA tool:

When we processed input feedback data into R-tool (statical tool) which is a tool for clustering large objects (CLARA) then we got the clustered data as output. We will use this output clustered data as Target Data in Neural Network Training which is discussed in the coming section (IV).

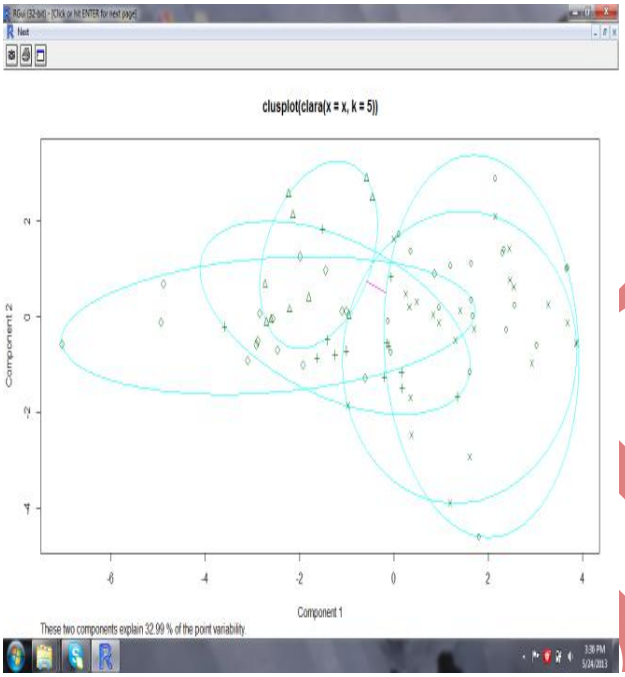
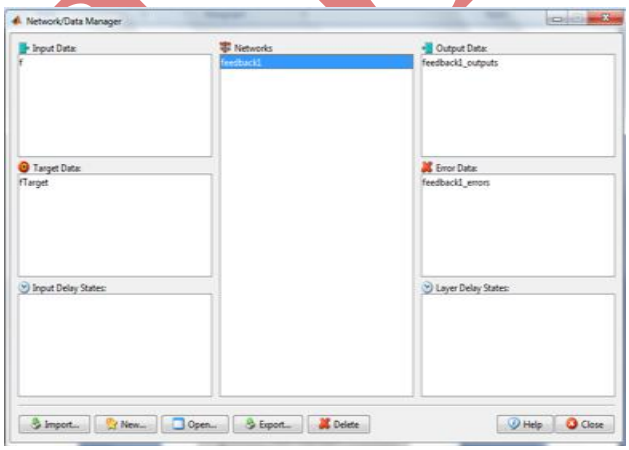


Fig2: Clustering the input feedback data

In fig2, we have taken k=5(no. of clusters we want to make) because we are clustering the data based on different LMS offering different courses. We clustered the data for following courses-MCSE/CCNA, MBA, IP telephony, N/w basics, N/W security.

6.4 Training the data with NEURAL NETWORK in MATLAB

(i) We imported the normalized feedback data as Input data and then took its transpose. Then imported output clustered data as Target data and its transpose is also taken. Then we run nntool command to access network data manager and then create new network named feedback1as shown in fig3.



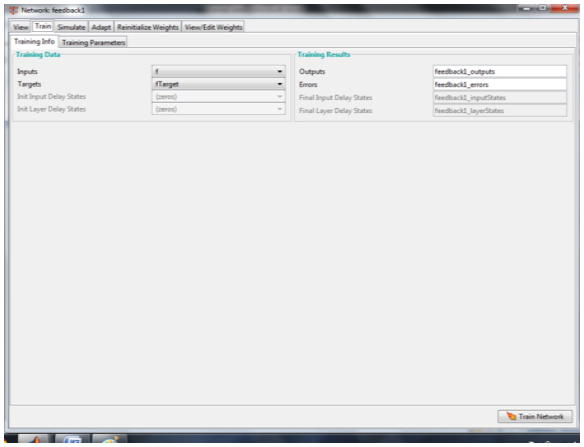


Fig3: Importing data and creating new network **Fig4: Training the network**

(ii) After creating new network we train the network with giving Input and Target data a shown in fig 4..

(iii) When we train the network through nn tool we got the following console-

(iv) We get three types of plots after training the data, these are plotperform, plotregression and plottrainstate.

Plot perform shows the best validation performance on some value of epoch as shown in fig5. Training stops whenMean Squared Error (MSE) of validation samples is started to increase.MSE is the average squared difference between actual Output and Target value

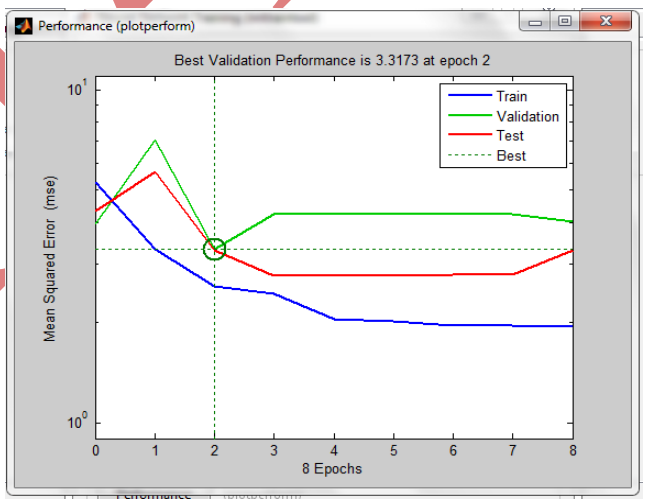


Fig5: Plotperform

(v) Plotregression shows the plot between Output Data and Training samples ,between output data and validation samples and between output data and test samples. R value shows the correlation between Output and target values as shown in Fig6.

(vi) Plottrainstate shows the system state after training based on the default values of different input parameters as shown in Fig7.

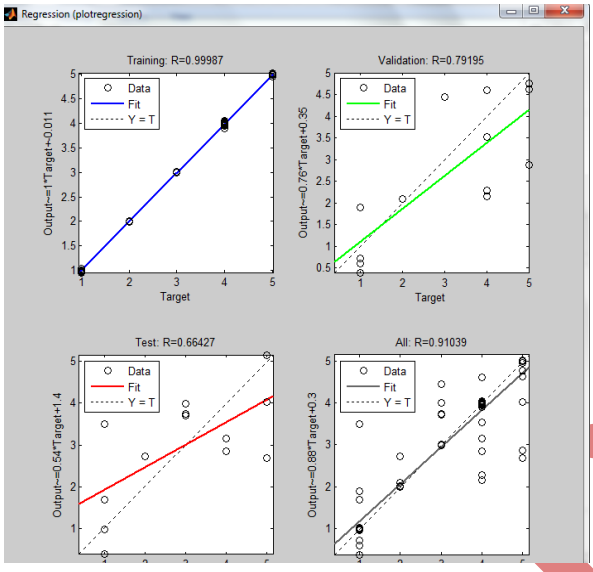


Fig6: Plotregression

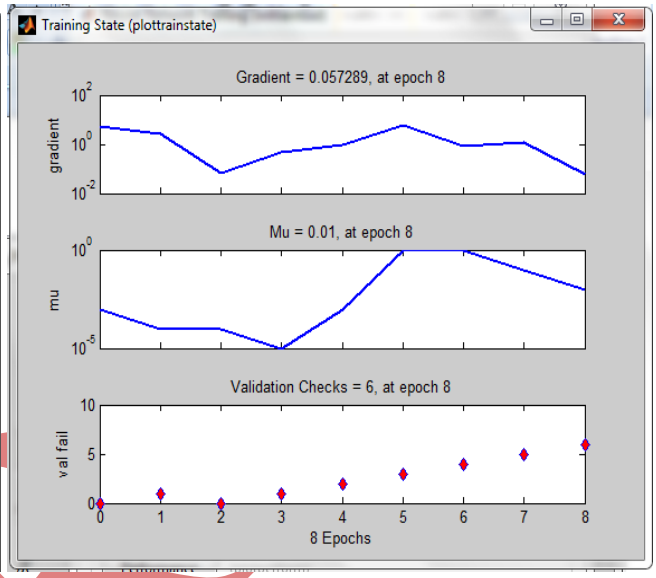


Fig7:Plottrainstate

(vii) When we run nftool for the same input and target data we get output as shown in Fig8-

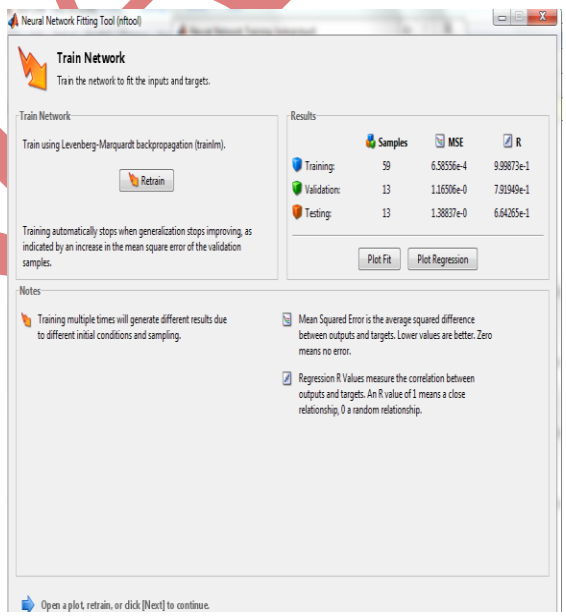


Fig8: Mean square errors values for each samples

VII CONCLUSION AND FUTURE ASPECT

In this article we studied the contents and administrative tools for E-learning. Requirement of user feedback is discussed so as to enhance the quality of current E-learning platform. Various tools and techniques for user feedback are described. We organized the end user feedback survey during our research, and compiled the feedback[13] data to get the final analysis of current learning scenario. Clustering in normalized data is done to get the target data, on basis of which training in Neural Network is done on input feedback data through MATLAB platform. Weights parameters are altered to get least Mean Square Error and Best Validation Performance. For future aspect we can do prediction and classification in Artificial Neural Network.

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